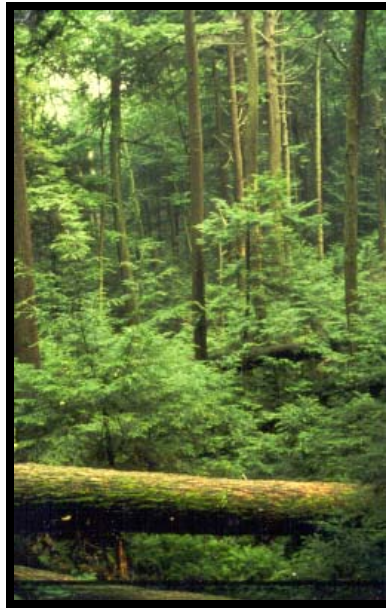


1895 ~ 1995

THE LEGACY OF PENN'S
WOODS



A HISTORY OF THE PENNSYLVANIA BUREAU OF
FORESTRY

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CHAPTER ONE

Before Forestry

Before European Contact

The Native Americans (referred to as "Indians" by the European settlers) lived in and utilized the forests of what came to be Pennsylvania for thousands of years before European settlement. From these forests they harvested food (nuts, fruits, various plants, and meat) and wood for fuel and construction. Various sources have estimated that pre-European-settlement forests covered 90 to 95 percent of Pennsylvania's land area of 28.7 million acres. By this estimate 25.8 to 27.2 million acres of the state were forested. The native woods were described by some sources as an unbroken expanse of trees. But by other reports there were probably many clearings which had been created both by natural forces and by the natives. It is known that Indians burned the woodlands to clear them for villages and agriculture, to remove game or fend off enemies, or to drive out pests. Forests also burned when fires, accidentally ignited, spread out of control. The pre-settlement forests had adapted to Indian and natural fires to the extent that burnable fuels generally did not accumulate to dangerous levels. Thus the forests that the first Europeans saw in America had already had been affected by humans. Still the forests were huge and wild, covering enormous expanses over most of the land; they seemed inexhaustible to Europeans.

However, the newcomers' different view of forests and their consequent use of resources changed the landscape of Pennsylvania. Though the Indians modified the areas around their villages by clearing them for crops of corn and squash, they spent much of their time and effort moving to wherever the things they needed were available. Their settlement generally remained small. They did not cluster together in ever increasing concentrations. The new Americans clustered. They reached out further and further for resources with increasing power cutting large areas of forest. The new Americans enthusiastically adopted the Indian technique of piling wood around large trees and firing the piles to clear areas with minimal labor. Setting the woods on fire to clear underbrush and drive out pests and game was readily adopted by the settlers. Fire became an increasingly destructive problem in the forest when settlers cut large numbers of trees, then left huge piles of wood they could not use to dry and burn in hotter, more destructive fires than from the native-era fires. These fires burned the remnants of cut forests and spread to standing forests.

William Penn

William Penn was concerned about conserving forests for commerce. England needed wood and America had it, so he was careful to let the investors in his new venture know that his "Charter of Rights" instructed the colonists in 1681 that "in clearing ground, care be taken to leave one acre of trees for every five acres cleared, especially to preserve oak and mulberries for silk and shipping." This suggestion was disregarded by most citizens who had come to this country to escape from rules. Penn undoubtedly saw clearing around the region of Philadelphia when he arrived there in 1682, because earlier settlers had been cutting trees for more than forty years. The Dutch had built a fort and a small settlement (later burned) nearby about 1620. In 1638 Swedish settlers had established a small colony on the Delaware River. Unlike most Europeans, who built of stone, brick, and lumber, these settlers built cabins of logs, and the design was carried west by pioneers, becoming a common American building

technique. By 1662 settlers had erected the first sawmill in Pennsylvania in what is now Philadelphia. Dutch, English, and French traders were competing, and sometimes fighting, for control of the area and use of its resources. Thus forests near the colonial settlements were quickly affected by cutting for fuel and building material and burning for agricultural clearing. A European wit traveling in early colonial America is quoted as saying, "The forests of America are more widowed than virgin."

Location, Location, Location

It's an old real estate axiom that three things determine the value of real estate—location, location and location. Pennsylvania had location (it still does). Lake Erie is on the northwestern boundary, connecting to the Great Lakes. In the southeast, the Delaware River provides a water highway for ships coming from and going to the Atlantic. To the west three large rivers, the Allegheny, the Monongahela, and the Ohio, converge (Pittsburgh began at their convergence). The rocky barrier of the Blue Ridge Mountains in Pennsylvania breaks with a valley that let the settlers through. At the location that became Harrisburg—now the state capital—John Harris ran a colonial-era ferry carrying hordes of settlers and their belongings south and west across the wide Susquehanna River.

Colonists from all points north and east had to travel through Pennsylvania to go to the West and South. The area became rich and populous as a moving tide of people flowed across its land and used its resources. According to John Stemmons, author of *Pennsylvania in 1800* "from 1795 to 1805 one of the world's greatest migrations of people moved into and through Pennsylvania." Many stayed and many moved on, but they changed the forests and the land whether they stayed or whether they migrated. Where people settled, they worked feverishly, clearing forests for agriculture, cutting trees for fuel and other products, and moving the resources they needed to where they wanted them to be. Trails became roads, rivers became canals, and canals were followed by railroads. Settlements became cities, fed with resources from farther and farther away. Horsepower of the animal kind changed to horsepower of the mechanical kind, allowing people to move more material, faster and farther. Fire, a barely controlled clearing tool, spread everywhere. Wood, the ever present raw material, went up in flames but there was always more.

By 1850, 2.3 million people were living in Pennsylvania—only 24 percent in cities and urban environs. There were 128,000 farms. This peaked at 224,000 farms in 1900, when the population balance had shifted from largely rural to primarily urban. In 1900, 55 percent of the 6.3 million Pennsylvanians were living in cities and urban environs. The population had almost tripled in fifty years and switched from largely rural to increasingly urban, a trend which continues to this day.

Pennsylvania's location and its resources made the state a center of early urbanization and industrialization, creating many demands on forests. The forests were cleared for farms and towns. Trees were cut for fuel and for thousands of products. Wood was the fuel of choice because little else was known. Enormous quantities of wood were needed to heat homes and make charcoal to smelt iron, until the late nineteenth century when the opening of the Mesabi Range replaced the small, local iron ore deposits, and the introduction of coal and coke replaced charcoal. Before the conversion to coal, the iron industry required the cutting of 3.5 million acres of forests between 1765 and 1895. Even after conversion to coal, massive quantities of wood became ties for the railroads, and millions of pieces went into the coal mines to prop up the roofs and walls. Even more wood burned than was cut—millions of acres burned in uncontrolled fires

Early Fire Laws

The problem of uncontrolled fires was identified early in Pennsylvania's settlement. Law after law was enacted to control careless burning, but each was mostly ineffective because no public agency was funded and staffed to enforce the law and educate the public.

Laws must be adequately enforced and have the support of a majority of the citizens in order to be effective. From 1700 to 1735, the General Assembly enacted a series of laws against "unseasonable firing of woods" and established liability for damages. These laws did little to reduce forest fires. In 1794 a legal conviction of "willfully setting the woods on fire" imposed fines of "not less than twenty dollars or more than fifty dollars." An 1824 law forbidding the "willful setting of fires" carried a fine not to exceed \$500 and imprisonment at hard labor not to exceed one year. This was a severe punishment-more than a year's earnings for many at that time, but with little ability to enforce the law and no good system to persuade people of the need for the law, there was, again, little change in people's behavior. Another fire law was enacted in 1860, making "willful setting" of forest fires a misdemeanor subject to a fine not to exceed one hundred dollars and imprisonment of no more than one year. A "fire prevention act" in 1870 made county commissioners responsible for finding and prosecuting persons guilty of burning timberland. It was neither funded nor, for the most part, enforced. In 1879, a fire prevention act again provided that "any person or persons who shall wantonly and willfully kindle any fire on the lands of another, so as to set on fire any woodlands, barrens or moors, within the limits of this Commonwealth shall be guilty to pay a fine not exceeding three hundred dollars, and undergo an imprisonment not exceeding twelve months, or either or both, at the discretion of the court; and prosecutions for such offenses may be commenced at any time within two years from the commission thereof."

In 1897, after formation of the Bureau of Forestry, the 1870 fire protection act was changed to include penalties for the failure of county commissioners to comply with the measure, and the state treasurer was authorized to pay half the expense of employing forest fire protection staff. A companion law made township constables forest fire wardens, with authority to recruit persons for extinguishing forest fires, and compensation was authorized.

These were the early attempts at fire control through legislation, without an education and enforcement system. The enactment of law after law after law forbidding reckless use of fire gradually evolved into a combination of laws that prohibited various unsafe practices, established enforcement systems for the laws, attempted to educate people regarding fire prevention, and provided systems for detecting and controlling fires.

Education and Persuasion

In 1791, the Philadelphia Society for the Promotion of Agriculture offered medals to those who planted locust trees, which were needed for hard and durable posts and ~ treenails (wooden pegs).

By 1873, concern for the destruction of forests by agents beyond that of fire led Governor John F. Hartranft to request legislation to prevent "stripping of our mountains and hills for their trees." In 1874 Hartranft again asked for "some measure to arrest the wanton and indiscriminate destruction of the forests of the state." As forest clearing and burning continued, citizens' groups coalesced around the view that, in addition to the enactment of laws, organization, education and persuasion were needed to protect forests effectively. This would eventually lead to the political and citizen support needed to establish the Bureau of Forestry.

In April of 1885, the governor was authorized to designate a day each year as Arbor Day. The day was earmarked as a day to plant trees to celebrate and safeguard forests by planting trees. The

legislation was amended in 1961 to honor the memory of Dr. Joseph T. Rothrock as "the Father of Forestry in Pennsylvania." Pennsylvania's first state park-Valley Forge-was created in 1893. Farmer education programs, called "Farmers' Institutes" were inaugurated in Pennsylvania in 1896, and were sponsored by the state Department of Agriculture and citizens' groups. The department's new forestry division budgeted nine dollars a day for one hundred days worth of speakers at institutes in the forestry counties. Dr. Rothrock and other forestry speakers were active participants.

Money from Michaux

The Michaux State Forest District in the South Mountains, one of Pennsylvania's twenty state forest districts, is named to honor two distinguished French botanists who had much to do with early American forestry. French nobleman and botanist F. {Francois) Andre Michaux and his father {also named Andre) traveled extensively in America from 1785 to 1805 studying social and economic conditions, with special emphasis on classifying forest trees and plants. They published an account of their experiences in *Michaux's Travels* and their forestry findings in the landmark three-volume work, *North American Sylva*. Returning to America in 1817, Michaux the son bemoaned "the alarming destruction of trees in America."

In 1855 Andre Michaux's will left a legacy of \$12,000 "for the extension and progress of agriculture and more especially of silviculture [science-based management of forests] in the United States." This was a significant amount of money at the time, representing more than most people could then earn in a lifetime of work.

The American Philosophical Society of Philadelphia, custodian of the Michaux Fund, decided in 1870 to promote silviculture by financing a series of lectures on forest botany and the new (to America) science of forestry. The lectures, known as the Michaux Forestry Lectures, were among the first attempts to educate the Pennsylvania public on forestry. They were a key to establishing an understanding of forestry in Pennsylvania and in the United States. In 1877, Dr. Joseph T. Rothrock, professor of botany in the auxiliary faculty of medicine at the University of Pennsylvania, was chosen as the Michaux Lecturer. It was the best possible choice, bringing together knowledge, eloquence, and commitment to education and action. The work also took persistence. Rothrock often said in speeches recalling those times that his first audience was two people and the janitor, but he modestly conceded that in later years his illustrated lectures were very popular. The Michaux lectures on many phases of forestry were delivered each winter for the next fifteen years until 1892. They were given mainly at the University of Pennsylvania but drew interested and concerned citizens from beyond academia.

A Citizens' Group Devoted to Forestry-the Pennsylvania Forestry Association

In the mid-nineteenth century Pennsylvania citizens began to form groups to deal with forest-related problems. Some organized to preserve forests in parks and wilderness areas, some to study and promote better care of forests; some organized to prevent or delay laws and regulations that might interfere with private actions. Citizens met and discussed their versions of what was to be done, and in the American tradition they formed associations. Of all the groups that organized, the Pennsylvania Forestry Association was the stalwart group that pushed most consistently and firmly for a state agency devoted to forestry.

The association was organized and funded initially by prominent Philadelphia citizens who discussed the forest problem in various forums. A women's club in Philadelphia led by Mrs. Brinton Coxe and Mrs. John P. Lundy met in early 1886 to discuss action to reduce the rampant destruction of forests. The group first met in conjunction with other Philadelphia-based groups, such as the Historical Society of Pennsylvania. Among the speakers at one significant organizing meeting were Dr. Joseph T. Rothrock and Bernhard Fernow, who was then head of the new U.S. Division of Forestry in Washington.

The Pennsylvania Forestry Association (PFA) sprang from the concern generated by these meetings. It organized first as the Association for the Promotion of Scientific Forestry, and in June 1886 opened for business, as the PFA, at 1525 South Fourth Street in Philadelphia. John Birkinbine was secretary of the association. Although not in attendance, Dr. Rothrock was elected president at the organizational meeting. The first issue of the association's magazine, *Forest Leaves*, was published in July, just one month later, \$5,000 having been raised to start the association, hire staff, and publish the magazine. The money from Michaux's legacy, although not assigned to the PFA, helped enormously, creating a focus of information by continuing Rothrock's lectures. The organization grew quickly, pushed along by forest conditions and public attention created through speeches, meetings, and press reports. By 1887 the association had 450 members. In contrast, the American Forestry Congress (a national group) had only 139 members at this time.

The PFA was a major influence in Pennsylvania, and nationally as well. Two national forestry groups (the American Forestry Congress and the National Forestry Association) met with the Pennsylvania Forestry Association on October 15, 1889 in Philadelphia at the eighth meeting of the American Forestry Congress. The American Forestry Association (AFA) was formed from the two national groups as a result of this meeting. (The AFA, known today as American Forests, is still operating as a national voice for citizens' forestry concerns.) The state association, PFA, and the national association, AFA, made a potent team for forestry. It appears that for a short time PFA's *Forest Leaves* served as the national association's magazine until AFA began publishing one of its own (first called *The Forester*; then *American Forests*).

Both the American Forestry Association at the national level and the Pennsylvania Forestry Association at the state level recognized the need and value of educating and informing large numbers of people in order to achieve results. The PFA saw to it that the Michaux Forestry Lectures did not end in 1892 as scheduled. With the association's financial backing, Dr. Rothrock went "on the road." Rothrock's speeches for the PFA were illustrated with the new technology of lantern slides, showing the forest problems across the state. The best available camera and a projector with dissolving limelight were used to bring the images of forest destruction to the people. The lecturer's transportation was a buckboard pulled by two horses. His message was, "Forests are a crop, protect them from fire, take care of them." If most of the people weren't seeing the denuded Pennsylvania hillsides, Rothrock would bring the scenes to them. Rothrock seems to have been all things to forestry in Pennsylvania. He was the lecturer traveling the state, talking to groups. He also served at various times as secretary of the PFA, as its president and vice president, and in 1892 as editor of *Forest Leaves*.

Dr. Joseph Trimbel Rothrock, a Leader

As a life-long labor of love Dr. J. T. (Joseph Trimbel) Rothrock educated, cajoled, led, and managed the establishment of forestry understanding and the state's role in forestry. He became known as "the father of Pennsylvania forestry," and was at various times (sometimes simultaneously) explorer, surgeon, botanist, professor, and Michaux Forestry Lecturer; Pennsylvania Forestry Association president, vice president and spokesman; editor of *Forest Leaves*; member of the Pennsylvania Forest Commission; and the Pennsylvania forest commissioner and administrator of tuberculosis sanitariums. Rothrock was energetic, persuasive, involved, and a lover of forests since childhood. Yet he never professed to be a forester. His credentials were those of an informed scientist, botanist and medical doctor.

Rothrock was born April 19, 1839, in McVeytown, Pennsylvania. He died, at age eighty three, on June 2, 1922, in West Chester, Pennsylvania. Numerous memorials recall his contributions to improving the state's environment. His name is carved in the gray stone of the former education building in Harrisburg with other eminent Pennsylvanians. A plaque on a boulder at McVeytown commemorates his place of birth. An inscription

honors his achievements in a corridor of the State Capitol. A state forest is named for him.

Like many Pennsylvanians, Rothrock's grandfather was a farmer and a German immigrant, coming from the Palatinate, to Berks County, Pennsylvania. He raised a son who became a doctor, who raised a son who became a doctor, and the father of Pennsylvania forestry. In a 1915 speech, Rothrock recalled conditions from the time of his youth (about 1855). "Sixty years ago I walked from Clearfield to St. Mary's; thence to Smethport- 60 miles; most of the way through glorious white pine and hemlock forests. Now these forests are gone." He went on to describe contemporary forest conditions that concerned him: "6,400 square miles; more than 4 million acres of the State are desolated, cut and unprotected from fire." He referred to similar destruction in China and worried that "unless we reforest, Pennsylvania highlands will wash to the oceans."

In 1862 Rothrock earned a Bachelor of Science degree in botany from Harvard, where he was deeply influenced by the renowned Harvard botanist As a Gray. He enlisted in the Union Army from Harvard on July 1, 1863, and saw action at Antietam and Fredericksburg, where he was seriously wounded. By the end of the Civil War he was a captain in the 20th Pennsylvania Cavalry. His service ended June 6, 1864.

In 1867 Rothrock received his doctor of medicine degree from the University of Pennsylvania. He taught botany, and then was a surgeon, helping to found the Wilkes-Barre Hospital. In 1865 and again in 1873 he took part in exploratory expeditions to British Columbia and various wild regions of the western United States, serving as botanist and surgeon. From 1867 to 1869 he was professor of botany, human anatomy and physiology at the Agricultural College of Pennsylvania (now Penn State). In 1880 he studied at the University of Strassburg in Germany, specializing in botany. He visited European managed forests while there.

He was described as "small in stature, energetic, enthused." He had been ill as a child, spending much time outdoors and walking to recover. He worked one summer as an axman for the Philadelphia and Erie Rail-road, cutting wood for the rail lines, reveling in being outside and working hard. Rothrock described himself as "an Episcopalian and politically a Republican, when my conscience will endure it." He almost drowned as a child, almost died from wounds at Fredericksburg, and often said that because of these events he felt his life had been given back to him twice and that he consequently owed a debt to life. He repaid that debt many times over.

Rothrock was closely linked to the Pennsylvania Forestry Association throughout his career. He served it in many positions, but it also served as support and pulpit for him. As general secretary of the association, writing in the December 1892 *Forest Leaves*, he called on the association "to incite the interest of people throughout the state on forestry- to preserve, protect and propagate forests." He pushed for a series of lectures funded by PFA to call attention to forest conditions, to show people that much of the state's forested lands were becoming areas of desolation. "Don't let forest land area fall below 15 percent of the state's surface," he said, "save land with trees, for the air we breathe, to protect watersheds, and for future timber. Stop wasting and burning ripe trees.

He became the state's first commissioner of forestry in 1895 and set in motion the purchase of lands for State Forestry Reservations, the training of foresters for state service, the establishment of forest tree nurseries for reforestation, and the formation of a system of facilities and people to detect and extinguish forest fires. In 1902 while forest commissioner, he used his medical training to set up the first informal tuberculosis camp in Mont Alto State Forest for the fresh-air cure of tuberculosis patients. Rothrock

resigned as commissioner in 1904, but served as a commission member and in many other active forestry roles for the rest of his life. In 1914, at eighty, he resigned from the State Forestry Commission because of ill health. He had laid the foundation of Pennsylvania state forestry and built it well.

The Report of the Forestry Commission of Pennsylvania, 1895

A lack of credible information was part of the difficulty in getting state action regarding forest conditions. The Pennsylvania State Board of Agriculture, established in 1876, evidenced interest in forestry at the board's first meeting in 1877 when discussions turned to such topics as "Forests and Water," "How Can a State Best Promote the Interests of Forestry," and "List of Trees Adapted to Ornamental and Parochial Planting in Our State."

After several years of discussion, an attempt was made to report on the condition of Pennsylvania's forests. On April 26, 1887, a joint resolution of the General Assembly authorized Governor James A. Beaver to appoint a committee of "not more than five persons to serve without compensation, to examine and consider the subject of forestry in Pennsylvania, and report the results of their labors, by bill or otherwise to the next regular session of the legislature." The committee was appointed, the study was made, and a forest commission was proposed and rejected by the legislature in 1888. Speaking at the meeting of the American Forestry Congress in Philadelphia October 16, 1889, the Honorable Washington Townsend of West Chester said, "Pennsylvania is not ready to adopt a proper system of forestry. When the people thoroughly understand the matter it will come."

On May 23, 1893, Public Law 115 "relative to a Forestry Commission" was approved. It charged the governor with appointing two persons, one a competent engineer, the other a botanist, to examine forest conditions and suggest action, reporting by March 15, 1895. The commission was authorized to hire a statistician, and \$20,000 was approved for expenses. From June 1, 1893, to March 15, 1895, the commission did its work. Dr. Rothrock was the botanist member; W. F. (William Findlay) Shunk was the engineer member. A previously appointed engineer had been unable to serve. Shunk became ill and the bulk of the work fell to Rothrock. Shunk, however, did add valuable information to the report regarding geologic and water features as they related to forests.

The commission delivered its report March 14, 1895, one day before the legislated deadline and \$5, 167.84 under budget. The report created public understanding anticipated earlier by Townsend. The commission report that started action for a state forestry agency is summarized (paraphrased) as follows.

- *The state has no land other than that immediately around public buildings.*
- *The amount of forested land is down from more than 90 percent to 36 percent of the state's land area. It is falling below safe levels for wood supply, water protection, and public health.*
- *Some of the problems arise from clearing land for agriculture when that land would best be left in forests; some arise from uncontrolled fires and some from destructive logging.*
- *Excessive taxation, combined with high fire risk, drives people to clear forests far beyond the needs of agriculture or wood supply.*

The actions proposed were:

- *A full-time forestry commission office should be funded and staffed to deal with the state's forest problems.*
- *On behalf of the state, the commission should 1) acquire land suitable for growing forests to protect the headwaters of streams, ensure wood supply, and demonstrate the benefits of forestry to the public; 2) organize a fire prevention and protection system to enforce laws and educate people regarding careless use of fire, and detect and extinguish fires as they occur to minimize damage; 3) assist wood industries and forest landowners in growing and utilizing materials from the state's forests; 4) continuously gather and distribute information regarding the forest situation 5) propose solutions to the tax drain on forest land that motivates cutting and abandonment of forests.*

The report spoke to people's concerns and the common belief that forested headwaters would prevent flooding, ensure water flow for navigation and waterpower, and protect drinkable water supplies. More people were concerned about water than were concerned about timber. Many people were affected by frequent floods because of their location in flood-prone areas, and waterpower and water transportation were major economic factors at the time. We know now that forests' relationship to flooding is not as direct as the 1895 report assumed, but forests do slow the run-off of storm water, prevent water siltation, and affect water in many other ways.

W. F. Shunk, the engineer member of the commission said in his section of the report:

We hither to a wooded country and for six generations the axe has been busy making room for corn and grass. He concluded that forest removals probably affected water flow, but that experts lacked agreement as to the extent of the effects. It is enough, however, for practical purposes to have learned that the forests influence the flood. The proverb says, 'When you sell a cow you sell the milk too.' So the man who plants a forest plants its functions too, which will act in due time whether the man knows of the influence or not beforehand. The trees hinder sun and wind from drying the ground; from melting and heaping snow. They fend the shock of beating rains. Their offcast leaves and twigs and their dead trunks decay quicker in the moist air of the forest than on the open field, forming a loose thirstful mold, sheltered and fostered by the yearly renewing ground litter. Their damp shade favors the growth of moss, another strong water drinker. The matted floor, and in winter climates, the cover of deep snow, keep the soil tender and open in texture, thereby promoting absorption; whereto likewise the deep going tree roots give furtherance by making channels downward in the under earth. Side roots hunching the soil like moles and the tangled surface cumber and slacken the flow of water after heavy rains; and all these agencies, whatever other duties they may have, do work together to the one end of holding back waters which would else make flood.

Dr. Rothrock did the bulk of the report. He emphasized the importance of forests as a commercially important crop:

The art of forestry is the production of the largest crop of the most desirable timber in the least time and at the least expense on land that is unsuited for remunerative agriculture, or for profitable grazing. Such at least must be our definition for the present, in this country. It may happen, however, in the future that forest growth will be the best paying crop on lands which are also well adapted to either agriculture or grazing. The law of supply and demand will decide this. It will thus be recognized that forestry is but an extension of agriculture and that it is subject to exactly the same business laws that

govern our ordinary agricultural operations involving only a longer reach of years to mature a slower growing crop.

Rothrock was careful to leave the practice of clearing forests for agriculture on suitable soils unthreatened by a forestry agency. Agriculture was still predominant in the Pennsylvania of 1890, although rapid urbanization and industrialization would change that. Rothrock went on to say that forests were more than a crop "Forests provide beauty. They affect our air, water, and our future."

The commission report estimated that there were about 15,973,737 acres of cleared land and 9,099,817 acres of woodland in Pennsylvania in 1895. Adjusting tax assessors' reports with the report of the Pennsylvania Department of Internal Affairs, Rothrock estimated that 36 percent of the state was forested, but that much of the timberland was in "stripped or brushy condition." This was a tremendous reduction in forested acreage from the 90 to 95 percent of the state covered with forests at the beginning of colonization.

Rothrock admitted that records regarding land use were thin. About 6,823 square miles, 4,366,720 acres of land, were not accounted for.

Assessors' lists include only farm and woodland they omit towns, cities, mining fields, lakes, etc. The present method of making forest area returns fusing assessors' records is in urgent need of reform while not wholly unreliable, it is unpardonably bad. We assume most of the unaccounted-for portion to be stripped lands, from which all trees have been cut.

The report asserted that deforestation was rapid and continuing.

In 1859, the region between Altoona and north to the New York line in one direction and in the other from Renova west to Warren was essentially a wooded country. It is now [1895] in the main stripped of its timber. In one of those counties (Cambria), Judge Barker has stated that it is becoming depopulated. The area was a mixed crop of white pine, hemlock and hardwoods. It has undergone two great cullings: first for white pine, second for hemlock, a third is underway for any salvage not burned. In those portions of Luzerne, Lackawanna, Carbon, Monroe, Pike, and Wayne counties which as a whole are in most immediate relation to each other, there exists an area of about 970 square miles (620,800 acres) which may be regarded as more of a menace to the prosperity of the Commonwealth than as an element of strength. White Haven was a log boom and lumber town years ago with millions of logs run down the streams, There is almost no activity now except in summer of 1894 I counted thirty-six solid white stumps still standing on an acre of ground and saw second-rate shingles manufactured from the portions that lumbermen had rejected in earlier years. This area in the Pocono plateau is not soil suitable for agriculture, fires sweep across the area almost every year; the loss of the wood business will depopulate the area.

Government itself, through tax policies, was indicated as a cause of much forest destruction. Rothrock estimated that:

The amount of land, seated and unseated [seated land is defined as land cleared for agriculture and improvements, unseated refers to uncut forests] advertised to be sold for taxes by the county commissioners in the different *counties of the commonwealth* in June of 1894, so far as heard from, was upwards of 1, 500,000 acres, or 2,358 square miles. *This doesn't include 5,600 small portions in cities and towns. As thirteen county treasurers didn't report, it's fair to suppose there is considerable more that will be sold for taxes. As the state contains 46, 000 square miles, it appears that one mile out of every*

nineteen is being sold for taxes (2 or more years owed). People are cutting their trees and abandoning the land rather than pay annual taxes that exceed the land's value: 4,716 square miles is woodland which has been stripped of timber and not developed for agriculture, another 4,000 square miles has been cleared for agriculture; then exhausted and is being abandoned. This equals 8,716 square miles-5,578,000 acres that have ceased to be an element of strength, and this area is becoming constantly in worse condition.

The commission report indicated two extremes of forest utilization. Harvested wood was utilized completely by wood charcoal and wood chemical operations, as they cut all trees of all species. These operations converted forests to thickets of sprouts, a natural reaction to frequent cutting and the repeated fires that swept through cuttings. The lumbering operations, on the other hand, were notoriously wasteful by today's standards. Stumps were cut high, leaving large volumes of wood on the land. Only the biggest and best wood was taken to the mills and only certain species were cut. Tons of small logs, branches and tops were left lying on the land to dry and fuel enormous fires. Northeastern forests recover rapidly from logging but the repeated hot fires kept that from happening. Rothrock noted that:

Hemlock was not recognized as important lumber as long as white pine remained abundant but it is in demand now because white pine is exhausted here and hemlock is exhausted in New York.

The commission's report detailed the changing importance of various species of trees for lumber as species and areas were depleted. Early lumbermen moved most of their logs to the mills by floating them in rivers and streams. The logs were held in place for storage and sorting by barriers formed from chained-together logs, called "booms." The phrase "boom or bust" is appropriate: the lumbering towns that sprang up around log booms tended to do exactly that—they boomed for awhile; then the economy was "busted" as the nearby forests were exhausted.

The commission report estimated the log volumes, and the change in tree species moving through the huge log boom at Williamsport, Pennsylvania, as shown in table 1.

In 1875 the volume of pine logs passing through the boom was almost ten times that of hemlock. By 1893 there was 5.6 times more hemlock than pine. (Years later, in 1930, hemlock was named the official state tree in recognition of its usefulness and its persistence throughout the history of the state.) Rothrock predicted that hemlock would be exhausted after the pine, because the state's rapidly growing tanneries required large quantities of hemlock bark (as a source of tannin), and sawmills were processing increasing amounts of the wood into lumber.

The commission's report, Rothrock's follow-through, and the citizen support that he generated with PFA and other groups generated the political pressure needed to form a Division of Forestry in the Department of Agriculture in 1895. On March 13, 1895, an act was passed to create a State Department of Agriculture to "encourage and promote the development of agriculture, horticulture, forestry and kindred industries." A commissioner of forestry was specified for the department. July 3, 1895, a \$5,000 salary for a forest commissioner was approved along with \$3,000 for a clerk. Dr. Rothrock became commissioner; Robert S. Conklin became the clerk.

CHAPTER TWO

PEOPLE AFFECTING FORESTS

Four Human Forces Affecting Pennsylvania Forests

Before we follow the evolution of Pennsylvania state forestry further, a pause is in order to look at four major human forces affecting Pennsylvania forests.

Clearing. *Wherever settlers went the forests were cleared to grow food and make room for buildings and associated development.*

Fires *The constant risk of fire, from accumulated fuel and the careless use of fire, reinforced the attitude that "the time to cut trees is now!"*

Harvesting. *Enormous quantities of wood were used in the industrialization of Pennsylvania. It was the available fuel and raw material for most enterprise. The wood was harvested at unsustainable rates because there was always more over the next hill, and it was taxed too much and burned too often to keep as an investment.*

Taxes *Rapidly growing towns, cities and counties needed local services, so taxes were levied on the most local and available resource- land. Constantly rising annual taxes made retention of forests costly because of the long- term occupation of land required for trees to reach maturity. If forest income wasn't taxed away for roads and schools, one was likely to lose one's forest to fire. The combination of fire risk and taxes made forests an unlikely investment.*

In modern societies, all four of the forces listed above are normal, and necessary in varying degrees. But they can, and do, get out of balance and destroy forests in the long term unless public policies restore the balance. The state agency charged with maintaining Pennsylvania's forests has had to deal with these four forces from the beginning to the present-some new ones have been added and will be discussed later.

Clearing Forests for Agriculture and Development

To the European settlers trees were both raw material to build an economy and a hindrance to the development of agriculture. The first impulse was to clear trees for agriculture since food was a daily need and agriculture was the orientation of the people who came to Pennsylvania. The assumption was that good soil should be stripped of trees for growing crops. Because of the minimal knowledge of the day, however, there was little understanding of the soils under forests. Wherever people settled, they cleared forests whether the underlying soils were suitable for agriculture or not. The belief in agriculture as the best land use was so strong that a state forest agency could do little about agricultural clearing except to point out that some forests grew in soils unsuited for agriculture and should not be cleared. Clearing for agriculture declined as farmers abandoned the rocky soils of the northeast for the deep soils of the Midwest. Reports of agricultural clearing in Pennsylvania (tables 4 and 5, pages 22 and 23) show that from 1896 to 1902, annual clearing of forests for agriculture declined by almost seventeen thousand acres. Clearing for towns and cities and associated development has

continued. This, along with agricultural clearing, was assumed in the early days to be a better use of land than forests. Cleared land was labeled "seated," meaning "improved," and that condition are still considered to be improved today.

Fires-A "Nugatory" Force

Newspapers were supportive of the state's enforcement of fire laws. The *Philadelphia Record*, July 10, 1899 declared, "It is a pleasure to know that two misdemeanants found guilty of kindling forest fires are languishing in the Huntingdon County Jail. The news ought to be spread abroad in the State as a deterrent to others who, out of willful malice or a mere spirit of devilry are guilty of this crime. The yearly destruction of growing timber in Pennsylvania by reason of spreading fires inflicts heavy loss upon owners of woodland property and *makes almost nugatory*, the efforts of the State for forest preservation."

Fires did indeed make forestry efforts nugatory. Thousands of forest acres burned in Pennsylvania year after year. An annual fire loss of 350,000 acres was not unusual. In 1897, the forestry commission estimated that fires had burned 191,029 acres of Pennsylvania forests. This was reduced by better fire protection to 64,186 acres in 1903, but would rise again in dry years.

In September 1899, the American Forestry Association's magazine, *The Forester*, quoted Rothrock: "The recent destructive forest fires in Centre County bring prominently forward the laws passed by the legislature of 1897 for the suppression of forest fires and the question may be raised, and doubtless will be, are these laws effective? The answer is, yes."

Rothrock cited figures to show that the loss to forest fires had dropped from \$1 million in 1886 to \$53,000 in 1896. He said "Two fire laws are responsible: First, the Act of March 30, 1897, making constables of townships ex officio fire wardens, responsible for extinguishing and reporting fires under penalty for failing to do so; they also can require the assistance of others; second, the Act of July 15, 1897, making it the duty of county commissioners to appoint persons under oath whose duty it shall be to ferret out and bring to punishment all persons or corporations who either willfully or otherwise cause the burning of timberlands. There is a penalty to be levied against the commissioners if they fail to make the specified appointments."

Rothrock's report started listing causes of forest fires soon after the commission was established. Table 2 shows such a listing for 1899. Note the preponderance of railroad-caused fires, the many cause "unknown" fires, and the attribution of "tramps" as the cause of one fire. The low number of fires reported probably indicates poor information.

Because forests are flammable there will always be forest fires from natural causes and human activities. That is why forest fire problems will be noted throughout this history of state forestry. Today's technology allows quick detection and control, generally, of fires before large areas are burned; but fires have not gone away, nor will they, as a factor to be dealt with.

Wood Charcoal for Iron Furnaces

The colonial iron industry changed Pennsylvania forests significantly because it relied on them for its wood-charcoal fuel. The many place names containing the word "furnace" indicate former blast furnaces sites where iron ore was smelted. The process required

iron ore, of course, but it also used large quantities of limestone and wood. Iron ore, limestone ridges and hardwood forests came together in Pennsylvania to make ideal conditions for a major industry. In the eighteenth century all of the many iron furnaces operating in Pennsylvania were fueled with charcoal from wood. The Codorus iron furnace near York is cited (spring 1952, *Forest Leaves*) as being a key to Washington's defeat of Cornwallis at Yorktown in the spring of 1778. Washington's army spent the terrible winter of 1777 at Valley Forge. They were almost out of cannons and ammunition. Iron produced by Codorus and other Pennsylvania furnaces was used to provide cannons, cannonballs, and other armaments for Washington, and was an important factor in winning battles in the campaign of 1778.

By 1850 there were 145 charcoal furnaces in Pennsylvania. During the Civil War year of 1864, these furnaces produced 1 million tons of iron for the Union war effort. Each furnace required twenty thousand to thirty-five thousand acres of forest to sustain it, so it's estimated that from 1760 to 1895, more than four million acres of Pennsylvania's forests were harvested for this purpose from two to four times. Fires, escaping from the charcoaling operations, often followed the cuttings.

Much of the forest land acquired by the state came from the iron companies. They were willing to sell their forests because by the time of the new Division of Forestry, coal was replacing wood as their fuel of choice. Thus, the forests that the state agency had to deal with had been shaped in many cases by the early iron industry.

According to J. N. O. Birkinbine (reporting to J. T. Rothrock in 1897) in 1845 all the iron furnaces and forges in Pennsylvania still used charcoal fuel. Birkinbine states that it was the custom of iron masters to purchase twenty thousand acres or more around their furnaces and forges to supply wood for charcoal. As they depleted the supply close to their furnaces, workers went further—often ten to twelve miles—to get the needed wood. At the start of work early each morning, a huge wagon drawn by six mules would leave the furnace for the charcoal kilns. The wagon would return that night loaded with charcoal. Birkinbine reported,

As a rule the men who chopped and coaled [made charcoal] saw nothing of their families from Monday morning until Saturday night when working on jobs that were remote from the furnaces and forges. The charcoal makers [called "colliers"] built simple cabins at the work sites. When the men moved on to new wood sources the cabins would be abandoned. They were built of logs cut from the woods nearby and were covered with leaves and earth for insulation and some protection from rain and snow.

Rattlesnakes, copperheads and blacksnakes found the cabins to their liking and would drop in' from the ceiling or curl up in the occupants' beds. The colliers, knowing that the snakes ate toads, would keep several toads in the cabin. A missing toad served as a snake-alarm, indicating the need for a search of the area to find and evict the visiting snake.

Menus were simple and unvaried, the prime requirement being that the food didn't spoil quickly: bread, salt pork, potatoes, beans, onions, molasses and coffee were the common fare. The daylight hours were used to cut wood, pile it and burn it. Coaling-making charcoal- was an art. The wood was piled in conical piles; then covered with just the right amount of earth to allow burning with reduced exposure to oxygen, creating conditions for making charcoal.

It took about three cords of wood to yield one hundred bushels of charcoal. The land produced thirty cords of wood per acre suitable for charcoal over a twenty-five year

period; so iron companies had to keep twenty-five times their annual needs in acres of growing trees. Many companies scattered their cuts over their acreage to maintain an average hauling distance. This left a considerable area growing, but the growth tended to be thickets of sprouts due to frequent fires and cutting on a short cycle. The ironworks didn't replant after a cut but they did attempt to control fires and cattle grazing because they wanted their land to reforest.

Birkinbine suggested to Rothrock that the considerable acreage in the mountains held by the charcoal industry might serve as nuclei for systematic forest reproduction and forest conservation. Notwithstanding the heavy demand on the woods made by this industry, Pennsylvania is undoubtedly indebted to the charcoal iron works for a large portion of the forests which are spared. These are not, however, the magnificent groves of half a century ago, but rather considerable areas of coppice [small sprout growth] yet they serve a good purpose in possibly influencing the climate and water supply.

There has been a marked difference between practices of the lumber industry and the charcoal iron industry, the former cutting over a tract and then abandoning it, the latter protecting and encouraging new growth. At most blast furnaces and bloomeries the workmen were organized to fight fire. When an alarm was given all who could be spared were sent out stop the spread of the fire, not only on property connected with the iron works but on contiguous land. Often the entire work force spent days fighting fire at the expense of the iron works proprietors.

Mr. William M. Potts, manager of the Isabella Furnace at Wyebrooke, writes that, 'We can show you in Elk County a large area which was cut in 1886-7, and then preserved from fires and cattle, which now has a dense growth of beech, birch and maple on it, from eight to twelve feet high, while just across the valley is another lot which was cut in 1881-2 which has suffered from both fire and cattle which is just beginning to reforest.' There are two primary sources for the fires: first, the railroad companies burn their old ties along the right of way without any care for fire containment; 2nd, Small farmers in clearing for cropland burn brush and timber without caring whether the fire spreads or not. The cattle difficulty can be overcome by compelling farmers to keep cattle out of the sprout land.

Most charcoal furnaces closed with the opening of the Mesabi Range in the late nineteenth century. The discovery replaced small, localized iron deposits, while the introduction of coal and coke replaced charcoal as fuel. The charcoalers had had a mixed effect on forests. They cut areas over and over, and fires spread from their operations, but they had retained blocks of forest land and tried to encourage natural reproduction of forests. These often were the tracts of land available for purchase when the new state forestry agency started to acquire land.

Carbonizing Wood

A large wood chemical industry developed in Pennsylvania as an offshoot of charcoal operations. The industry used a process called "carbonizing" to extract chemicals from wood. The carbonizing process involved heating wood, condensing the vapors, and extracting chemicals for commercial acetates, methylic alcohol and wood tar. The business was most prominent in northern Pennsylvania and southern New York, with Binghamton, New York its business center.

The industry was still significant as late as 1921, according to the forest commission's reports of that time:

There were 40 chemical wood plants in Pennsylvania last year [1920] using about 400,000 cords of wood per year. It is a young business. The first plant in the state was erected at Brandt in Susquehanna County in 1869, seventeen years after the first chemical wood plant in the u. S. Most plants now are in the northern tier Pennsylvania counties where birch, beech and maple are plentiful.

Distillation of wood is carbonizing or roasting wood to derive the chemicals in it. The principal products are wood alcohol, acetate of lime, wood tar and wood gas. Each cord yields nine gallons of alcohol, 189 pounds of acetate of lime and 47 bushels of charcoal. Wood tar and wood gas resulting from the process are not marketed. In 1920, wood chemical plants generated \$8,000,000 in products, making alcohol used in fuel, material for paints and varnishes, celluloid, aniline dyes, smokeless powder, photographic films, transparent soap and artificial leather. The acetate of lime from the process is used in white lead, chloroform, drugs, varnishes paints, artificial leather, high explosives, in textile industries and artificial vinegar. The charcoal produced is used for fuel, chicken and cattle feed, deodorizers, manufacturing high grade steel, powder, medicines, fertilizers and as a filtrate.

The chemical plants [in 1920] own 136,000 acres and need 500,000 acres of forest to be sustained from wood in Pennsylvania-two thousand people are employed with a \$2 million annual payroll.

This use of wood has been replaced {almost completely} by artificial synthesis and nonrenewable sources of chemicals such as coal, oil and natural gas. The forests seen today where these companies operated resemble the iron-furnace areas coming from the same complete utilization of trees of all sizes and kinds.

Wood in Coal Mines

The forests of Pennsylvania in the nineteenth century were also impacted by the long-dead forests underground in the form of oil, gas, and coal. In 1859 Colonel Edwin Drake's oil well in the woods near Titusville proved to the world that Pennsylvania could garner usable wealth from its distant past. Northwestern Pennsylvania dominated the world oil supply for a time thereafter. Drilling for oil and gas didn't significantly affect major forest areas, but related organic deposits in the form of coal would have large forestry ramifications.

Coal took over many of the fuel and chemical uses of wood as coal burning and chemical extraction technology developed, but this did not reduce the use of wood. Wood was still used in massive quantities in the extraction of substitute materials like coal.

The June issue of *Forest Leaves* reported in 1924,

Last year the anthracite mines in Pennsylvania used 567 million board feet of lumber, about seven board feet for every ton of coal mined. [The wood was used primarily as mine props-to prop up the walls and ceilings of coal mines.] The miners prefer long-grained timber like chestnut, oak, pine, spruce and hemlock because the timbers crack and split under excess pressure, sounding an alarm before falling. The timbers thus warn them when the rock structure is settling. Short-grain woods are not wanted in the mines because they break without warning

Mine prop timbers are eleven feet or more long, six inches in diameter at the small end. The typical price is five to six cents per running foot. Mines also use wood ties for coal cars on the mine rail lines, preferring oak, maple, birch, beech and hemlock. All the wood used in the mines stays in abandoned mines, so each new mine requires more wood.

Wood is also used for mine sprags. Sprags are pieces of wood used to check and regulate the speed of mine cars as they run in and out of the laterals to the shafts. A sprag is a cylindrical piece of wood about 22 inches long, and 2.5 inches to 3 inches in diameter with a 3.5 inch taper point on each end. A wheel is locked by casting a sprag between the spokes. The car stops when the sprag strikes against the car sill. Miners say dogwood makes the best sprags; it's soft enough to indent, locking the wheel firmly, but strong enough that it doesn't shatter.

The mines pay \$20 to \$27 per thousand for sprags-1.5 million sprags were used in coal mining in Pennsylvania in 1923. The mine coal cars are also built largely of wood, the car boards being made of oak, maple, pitch pine and chestnut.

The amount of wood reported as being used in the mines was several times the annual production of all the forests of Pennsylvania. Wood was imported by rail from all over the country to meet the demand. While coal replaced wood in many applications, its extraction used even larger quantities of wood. Later, as strip mining increased, large areas of living forests would be destroyed to mine the fossilized ancient forests (coal).

Migratory Lumbermen

Wood was a basic American resource from the start of European settlement. It was what the colonists had to exploit for trade, and exploit it they did! The American penchant for technology was applied to wood early in settlement. In 1631, North America's first water-powered sawmill was built on the Salmon River in South Berwick Township, Maine, near the New Hampshire line. There were no water-powered sawmills in England at that time. The American colony was passing the mother country in technology.

By 1812 there was enough wood industry in Pennsylvania that a law was enacted requiring the registering, with the nearest justice of the peace, of "all logs, shingles or lumber placed in or near the Susquehanna or Lehigh River and their tributaries." Wood theft was common. In 1824 a law defined the penalty for cutting timber on land of another as "twice the value; treble if converted to the offender's use."

Much of the American economy in the nineteenth century was based on a large but migratory forest products industry that sought out the most accessible sources of wood. The industry created successive lumber centers of the world as it swept across the forested continent, cutting the best available trees; then moving on. Starting about 1850, Bangor, Maine, was the leading center of lumber production. Glens Falls, New York, was next. By 1860 Williamsport, Pennsylvania, was a leading center of lumber production. The lumbermen moved on from there, extracting the best wood in massive quantities; building lumber centers in succession across the Great Lakes states: Saginaw followed Williamsport; then Muskegon, Marquette, Ashland, LaCrosse, and Eau Claire. Stillwater, Minnesota, was next {named for Maine's town of Stillwater, on the Penobscot River above Bangor, the source of loggers and river drivers pouring down through the forests}. The lumbermen rolled on, eventually all the way to the Pacific Ocean and the biggest trees they had ever seen.

Handsome, large forests of white pine and hemlock made Pennsylvania a timber production leader. In 1860, during the era of the Williamsport boom, Pennsylvania led the nation in lumber production with a little under two billion board feet. The Commonwealth's production peak was reached in 1899 at 2.3 billion board feet (wood harvests are now close to that again but on a sustainable basis). By the time this peak production was reached in 1899, the center of the lumber business had moved further west and Pennsylvania was third in the states in lumber production.

At first wood transportation was water- based, and wood cutting followed the major watercourses. Rafting was the method of movement. The logs were bound into large rafts and floated down rivers to processing centers. The Susquehanna River at Harrisburg and the other major rivers in the state were full of lumber rafts on their way to the mills. Then, logging railroads using Climax and Shay locomotives changed the dependence on water transport. Logging companies reached far into the woods with their rail lines; then hauled the wood to concentrated mill locations. Mill towns of various sizes grew everywhere. Very large mills fed by railroads were created in prime locations such as Williamsport.

The Williamsport Boom

In 1897 Joseph C. Righter Jr. of Williamsport sent a report to Rothrock titled *The Lumbering Industry of the West Branch of the Susquehanna*. Righter asserted in his report: "Forestry begins with lumbering! This, of course, is contrary to the opinion generally received. We must realize the importance of the industry to the state and provide for its perpetuity." Righter's report on lumbering in the Williamsport area constituted a major section of the forestry commission report of 1888-1889 and is the source of the information on Williamsport that follows:

Log booms and sawmills rose to new heights of production in Williamsport, Pennsylvania, in the 1860's, giving the town, the county seat of Lycoming County, the name 'Lumber City'.

Williamsport was a center of lumber technology at the time. Looking at the area in the 1860s in terms of lumber technology would be like looking at today's high technology centers that have sprung up in various places to create increasingly sophisticated computer systems. One piece of Williamsport technology that may not seem very technical today was called a boom. The boom, consisting of floating logs connected by cables, collected and held logs as they floated down the river. Booms allowed mill owners to hold, sort and protect large volumes of logs by floating them in the rivers near their mills. The technique was brought from Maine to Pennsylvania by migrating lumbermen and developed to new levels in Williamsport.

There were mills and small booms at Williamsport before the big boom arrived. The area's first mill was built in 1792 on Lycoming Creek; another followed on Bottle Run in 1798. These were all pine mills. In 1838 the Big Water Mill of Cochran and Biers was operating, it burned in 1863. A large steam mill was operated by Inman in 1852.

It was the combination of talents and money of John Leighton of Maine and James Perkins of Philadelphia that brought the big boom to Williamsport. They visited the area in December 1845. Leighton, who chose the location for the boom, was experienced in building and operating log booms and saw that the natural conditions were ideal. He selected a point known as 'Long Reach' for the boom. The bend of the Susquehanna River here and for many miles upstream draws logs toward the south side of the river.

The river is level here, without swift currents, and a high range of mountains on the south side serves as a barrier for any overflowing logs in the boom. The Susquehanna Boom Company was incorporated March 26, 1846. The first large boom was completed early in 1850. It allowed mill owners to sort, store and protect hundreds of thousands of logs.

Successful log drives to the boom in the next four years attracted many mills and much commerce and competition. The Loyalsock Boom Co. was formed in 1856 by mill owners at the lower end of Leighton and Perkin's boom. After much wrangling, and some violence, the two companies merged as the Susquehanna Boom Company in 1858.

The boom was flooded, ripped out and rebuilt many times. Storing logs, corralled with strung-together timbers and floating in a river is risky at best. In 1860 the first big flood after the building of the boom took out the boom and fifty million feet of logs. In September 1861 the boom at Lock Haven broke and its logs rushed downriver into the Williamsport boom breaking it. The boom was not repaired for more than a year, it being the midst of the Civil War and hard to get materials.

Various floods continued to plague the boom and require rebuilding. In June 1889, the boom broke in a flood and 300 million board feet of logs went down the river, many floated all the way to the Atlantic Ocean at Chesapeake Bay. About half of the logs were recovered. Mills were built where the logs piled up along the river and the wood was processed at the sites.

The boom was repaired after each flood and made stronger and bigger. By 1897 it was eleven miles long, stretching in a bow across the river, with 252 piers, each Pier was 22 by 50 feet and 22 feet high, 100 feet apart. The boom was hung each spring; floating logs were attached to the piers with inch-and-one-quarter thick steel cables about 30 feet long. The cables allowed the logs to rise or fall with the river. Extra cables were added for high water.

The boom company stationed men at different streams upriver to notify it if the water started to rise. From where the men were stationed, floodwaters took two days to reach Williamsport; giving time to react and protect the boom.

Lumber manufactured at Williamsport in 1897

*The big logging and lumber manufacturing companies, near the turn of the nineteenth century, went through enormous quantities of wood. The information below, excerpted from Righter's report in the *Pennsylvania Forestry Commission Report, 1898~1899*, shows the size of these businesses, and it shows also that these businessmen knew that the rate of harvest would exhaust wood supplies around their mills.*

The firm of F. H. & C. W. Goodyear of Buffalo furnishes wood to two mills at Austin, and one at Galeton (both Potter county). One mill at Austin is the largest in the State. The three mills use 175 million board feet of timber annually, with the wood coming from tracts owned by the company on the headwaters of Pine Creek and Sinnemahoning Creek. Two thousand four hundred men are employed (fifteen hundred only being needed in the spring for hemlock bark peeling season). There are 11 mechanical log loaders, five Shay patent engines and 207 log cars. Seventy five miles of railroad line were built to bring logs to the Buffalo and Susquehanna (B & S) Railroad (virtually controlled by the Goodyears). Wood moves on the B & S line to the different mills.

There is enough timber left to supply the mills for the next ten years.

The loggers live in forty camps in the woods. Logs are cut, then peeled and cut to lengths of ten to forty feet, to be skidded to the railroad with horses. On steep slopes,

slides are built consisting of three logs placed side by side and hewn out in the center to form a chute, slides are oiled, or, in winter, iced, to get the logs quickly to the skidways. Descending logs fly off the end of the slides hundreds of feet in the air like cannonballs. Sometime spikes are driven into the slide to slow the logs on the steepest slopes.

The Penn Tanning Company does all the peeling of the logs. Mechanical log loaders at the railroad sidings work ten-hour days. Each can load four hundred logs per day. The log cars average twenty logs each and a hundred cars are loaded per day. The Marion Steam Shovel Company of Marion, Ohio, makes the loaders, which are pivotal power houses with stationary cranes. They are coal-fired, steam-boiler powered. The loaders use tongs on cables to reach out seventy-five to one hundred feet on either side of the railroad cars. Each loader costs \$3,250 and weighs fifteen tons and has a Keagen & Halpin light for working at night. A loader will bum three hundred pounds of coal per day on average. The Engineer operating the loader gets four dollars per day [a handsome salary then].

Shay locomotives (sometimes called stem- winding engines), built by the Lima Locomotive Machine Co., Lima Ohio, pull the rail cars. The biggest one weighs seventy-seven tons. These locomotives are adapted for very steep grades, sharp curves and rough construction. The drivers on each side adjust to irregularities in the track.

About eighty thousand acres of land is yet to be logged. The land carries fifteen thousand board feet per acre of hemlock and two thousand board feet per acre of hardwood: maple, birch and beech. There is very little ash and cherry.

The mill at Austin (called the large mill) is two stories high, 60 feet wide and 230 feet long. It's whitewashed on the inside to lighten the interior, using a mixture of water, salt, sour milk and lime. The mill has a large engine room with a large dynamo for lighting and eight boilers. There are two band saws, plus a variety of gang saws, slashers and trimmers. A jack ladder hauls logs from the log pond to the deck. From the deck, logs are thrown, raised and turned by various mechanical devices. The band saws run on twin steam feeds and the other machines are run by ropes and pulleys. Rather than using leather belts common to many mills, this mill uses seven thousand feet of manila stevedore rope in endless loops in grooved pulleys.

Small slabs sawn from the logs are made into kindling for firewood and hauled away in rail cars to the cities. Sawdust is moved by endless chain arrangement to a large bummer to be burned for steam for the boilers. As there is not enough sawdust to keep the fires going, a machine called 'the Hog' grinds up slabs for more fuel.

The log pond is kept from freezing in winter by running the mill engines' exhaust steam into the water using several eight-inch-diameter horizontal pipes. The mill runs twenty-four hours a day and makes 300, 000 board feet of lumber per day. The timber sawed is all hemlock.

One hundred and twenty five men are employed in the mill and seventy-five worked in the dock and yards .The monthly payroll averages \$9,000.

Another logging operation feeding the Williamsport mills in 1897 is that of F. A. Blackwell of Gleasonton. Operating on Young Woman's Creek, his crews load two trainloads of wood per day, twenty cars each at three thousand board feet per car. They also send ten thousand cords of hemlock bark to the tannery at Gleasonton and four carloads of hemlock pulp wood per day to York Haven. Another four carloads of pulp wood each month is sent to Lock Haven.

The mills and logging jobs discussed above were producing more than the estimated sustainable cut for all the forest land left in the state in 1897. The report clearly states that it was understood that the forests in the area would be exhausted in another ten years.

Timber Cut and Bark for Tannin

In 1895 hemlock bark was the primary source of tannin for the leather industry which was spreading across the hemlock-growing areas. Pennsylvania had abundant forests of hemlock, which brought tanneries, which brought cutting of hemlock for the bark, and sawmills and pulp mills to use the harvested wood for lumber and paper. Hides came by rail from the West to Pennsylvania. Hemlock bark chips (and sometimes chestnut and oak bark chips) were soaked in water to extract the tannin. The hides were hung in the tannin solution until tannin infiltrated them, making tough, long-lasting leather.

The Pennsylvania harvest of hemlock in 1896 was estimated at 1.3 billion board feet. The peeled bark went to the tanneries; the logs went to the sawmills.

Reports for 1902, just six years later, not only show a continuing decline in the white pine cut but also hemlock still predominating. The overall cut has declined a bit to 1.3 billion board feet equivalent; acres cut for farming have also decreased.

The process of cutting hemlock trees, then peeling off the bark and leaving the logs in the woods to dry, created the misconception that the logs were just left to rot. The waste caused by hemlock bark operations was often reported in writings during this time.

Writing in *Pennsylvania Forests*, September-October,

1986, forester Arthur Bennett says,

During colonial times large trees, including hemlock, were cut and simply burned in place for land clearing. A few small tanneries probably did take just the bark and leave the logs then. But between the Civil War and World War I, there was heavy demand for hemlock lumber for everything from factories, to homes, and sidewalks. The wood brought premium prices so there was every economic incentive to harvest hemlock for bark and also for logs.

The customary practice was for the loggers to cut hemlock and peel the logs in the spring and early summer as bark came off easily then. The bark went to the tanneries right away but the smooth, slippery logs were left in the woods to dry, generally not being moved until the fall or spring: after harvest. The dry logs were easier to move and handle and floated better in the water transport systems of the time. Knowing the above, one can understand why whole hillsides were visibly covered with thousands of peeled logs for sometimes up to a year and why some folks started and believed the myth that the trees had been cut only for the bark.

I have often challenged those who believe the wasted-hemlock myth to show me the areas where rotting logs should still be visible [in the 1940's]. I assured them that I could still show them the old hemlock stumps but that there were no signs of large numbers of logs left in the woods. No one has called my challenge.

Tannin from hemlock bark has long since been replaced by artificial sources, and the tanneries have departed the hemlock areas to be closer to cheap labor, the new sought-after world resource for many industries.

Pulpwood

The big lumber-quality trees were greatly reduced by the tide of wood harvesting all across the East, but a new technology followed on the heels of lumber, one that would

use wood waste and small material. In 1866, at Corinth, near Glens Falls, New York, one of the first ground wood pulp and paper mills was using quantities of wood. Rags had been the common material for paper until then. The company operating this mill was the Hudson River Pulp and Paper Company, later to become the giant forest products concern, International Paper Company. The first paper mill in America was established at Roxborough (now part of Philadelphia) in 1793. It probably used rags, the common raw material for paper, for the pulping stock. The "ground wood" process used wood and was based on techniques similar to those used for grinding grain. Wood fibers were literally ground from wood held against large grinding stones. Chemical wood pulping came later.

Rothrock's forestry commission report of 1895 contained information about the relatively new pulp and paper industry:

Mr. J. J. Nutting of the Lock Haven Mills, manufacturers of paper from wood pulp, says, 'In regard to the consumption of wood, we use on average, 40 cords of 128 feet each day. Two-thirds is jack pine and is second- growth stuff and of no value as lumber. The yield per cord varies from 800 to 1,200 pounds of paper according to the quality and kind of wood. We also use second-growth, soft maple, some slab wood, poplar, cucumber and aspen. We do not use spruce or wood suitable for lumber. Our supply comes almost wholly from farmers who cut wood in the wintertime when there is nothing else to do and no other work for their teams. ,

The wood pulp industry will undoubtedly assume greater proportions in our state. We know little about the best wood to be used but find the ability of the industry to use small material and waste wood a valuable addition to our industry.

The pulp industry has "assumed greater proportions" in the state, along with lumber, and many other forest industries it is less migratory now. The industry has settled down now to a sustainable use of forests, based on fire protection, reforestation, and forest management.

Taxes

Rothrock identified taxes as one of the early factors motivating landowners to deplete forests rapidly. He led several efforts to correct the problem, and foresters over the years have attempted many solutions. The problem of annual taxes taking income from a resource that is not an annual crop continues. People no longer decimate forests and abandon the land rather than pay the taxes, because land values have risen and attitudes about land have changed. Forest owners today use income from salaried employment to pay annual taxes on their land because they value the land as an amenity or plan to sell it for development in the future.

In 1894, various Pennsylvania county commissioners were offering 1.5 million acres of cut-over forest land at tax sales. It wasn't considered worth the taxes to be paid on it. Public Law 287, June 1, 1887 and the Act of May 25, 1897, "For the Preservation of Forests and Partially Relieving Forest Land from Taxation," attempted to solve the problem. Owners maintaining forest land were to receive a rebate of 80 percent of their taxes for the first ten years. There was a sliding scale over time, acreage limitations, and various restrictions. It was very unpopular with town and county officials who resisted it broadly. Owners had to sue to collect.

The Forester reported on the law in March of 1899:

The Pennsylvania Legislature has enacted a law, 'For the Preservation of Forests and Partially Relieving Forest Land from Taxation, that owners of land in that State having on

it forest or timber trees of not less than fifty trees per acre shall be entitled to receive annually from the commissioners of their counties a sum equal to eighty per centum of all taxes paid upon said land. The amount is limited to not exceed 45 cents per acre and no one owner can receive abatement of more than 50 acres, and must prove that each of said trees measures at least eight inches at a height of six feet above the ground, and that no portion is cleared, and that trees have been maintained in sound condition for the period of abatement. Pennsylvania forestry commissioner J. T. Rothrock states regarding this law, 'It is based on one of the most profound principles of political economy- that the forests are actually of more use to the state than they are to the individual. This law offers much needed relief for the high taxes landowners have been laboring under. The taxation of timber, which so long as it stood was yielding no revenue, swallowed up the profits of farmers and drove lumbermen, in self defense, to sacrifice the land, which in the future might have yielded wood. The taxation not only robbed the owner, but, to an even greater extent, the State.'

Rothrock was deeply concerned about the abandonment of forest lands due to taxation. Writing in his commission report in 1899, he inquired, "Should forest land be taxed? Trees serve the state so long as they stand and thereby earn the right to stand untaxed. Is it wise policy to tax land with standing timber so heavily that the owners in self-protection must cut it? Would it not be wiser to let it stand untaxed; then collect a share of the income? It is the experience of this Department that the excessively high rate of taxation is the direct cause of the abandonment of large areas."

Legislation in 1901, titled an "An Act for the Encouragement of Forest Culture and Providing Penalties for the Injury and Destruction of Forests," amended the Act of 1897.

The new act took limits off the applicable acreage and loosened requirements. For areas planted with no fewer than twelve hundred trees per acre, owners were to receive from county commissioners the sum of 90 percent of taxes assessed, or not more than forty-five cents per acre: this was for the first ten years. For the next ten years, rebates were set at 80 percent of taxes assessed; for the third ten years the rate dropped to 50 percent.

Local taxing authorities resisted these reductions in taxable resources. They often ignored the laws. They added complex local rules making it difficult to use the laws, and they sued to have the laws declared unconstitutional. There was so much resistance from local authorities that Rothrock declared, in his commission report of 1904, "Rebates are clumsy and unpopular with officials. We need a better approach. But one of the most patent facts, still, is that the forest cover on our non- agricultural land is being taxed out of existence." While acknowledging problems with tax rebates, Rothrock still maintained that the existing tax systems were destructive to forests. He said,

It was the dictum of a former governor that every acre of the State no matter how poor or how located was worth at least \$1.00, yet under the Reservation Purchase Acts we have purchased land from tax sales at prices as low as two and one half cents per acre; other common prices are 7, 8, 9 and 14 cents per acre. Since large areas are advertised and sold every two years for unpaid taxes the query arises: why are the taxes not paid? We find answers in the tax records .A tract of 1,100 acres partly lumbered in a certain county was valued for taxation purposes in 1902 at \$2.22 per acre. Taxes were ten mills for county purposes, ten mills for road purposes, thirteen mills for school purposes and eight mills for poor purposes-a total of 41 mills. 1

Seated [agricultural] and highly productive land could not long bear a tax rate of forty-one mills, much less can it be borne by unseated [forest] land. It is cheaper for the

owner, after removing all marketable timber to abandon his land to tax sale. On the barrens of Carbon County: much of barren area has been cleared once or more for charcoal, now coal mining dwarfs all industries. The land is assessed at \$10 per acre on parts that are not cleared, and \$20 per acre where cleared. [Taxes here were close to forty five cents per acre per year.] At this rate, timber growth will not pay the taxes. There is no place from which one may not see signs of extensive fires.

The "Auxiliary Forest Reserve Act" of April 8, 1905, attempted to register private forests as if they were in effect state forest reserves, and taxed them accordingly. It set a maximum assessed value of one dollar per acre on land declared auxiliary forest. The state treasurer was to pay two cents per acre to the counties for schools, one cent per acre for roads. This law was declared unconstitutional in *Tubbs v Tioga*, September 1906.

There was more tax talk in the 1906 commission report. "Land in the last 5 years has gone from \$1.00 per acre to more than \$2.00. A county or township can in a rapid and highly successful manner destroy the forests within its borders simply by raising the tax rate. The problem in dealing with this is that the State Constitution in Article 3, Section 7, prohibits special or local legislation exempting property from taxes."

And so it has gone, local jurisdictions must have their annual taxes. Everyone must be taxed equally. The owners of forest land must pay annually for as long as they have the land. The attempts to solve this problem from the long-term aspect of forestry have become more and more complex, until one must hire a lawyer and an accountant to utilize the forest tax-relief programs that come marching through the legislative bodies, year after year.

CHAPTER 3

From Division of Forestry to Department

An Agency Composed of Rothrock and Conklin

As mentioned in earlier chapters, the Division of Forestry was established in the Department of Agriculture in 1895. It reported to the Pennsylvania Forestry Commission. Dr. J. T. Rothrock was appointed on September 14, 1895, as forestry commissioner to lead the new agency. The division would eventually become the Department of Forestry, and then a bureau within a larger agency. These terms will become intermixed in this history at times as the agency name changes.

No one was better qualified to be the first forestry commissioner than Rothrock. He knew the many problems to be solved, and he was known by the people who would have to help solve them. The Forestry Division was initially little more than Rothrock and Robert S. Conklin, who joined him as clerk on November 8, 1895. Conklin would become commissioner upon Rothrock's retirement in 1904.

The division kept legislators well informed on forestry problems from its beginning, even after the Capitol building burned, destroying many of the division's records. Rothrock reported in the *Preliminary Report of the Commissioner of Forestry 1896~ 1897*,

By the burning of the Capitol building on February 2d, 1897, the mass of material which we had collected, at no little expense and labor, bearing upon forests fires as well as the quantity and kinds of timber cut during the year 1896, were destroyed. But a few hours before the fire, Mr. Conklin and I had completed our estimates upon data at hand. These lay on my table and were rescued.

Rothrock's report emphasized the need for fire control.

The State Forests of New York with fire wardens lost 1 acre out of 347 to fire in 1895, a much drier season than 1896, when Pennsylvania-without fire wardens-lost one acre out of 51 to fires. Our estimates are conservative because many areas gave no answer to our requests for information. We have not included the destruction of leaf mold and the actual soil in the values lost. The area burned over in Pennsylvania in 1896 was equal to a strip of land one mile wide and 280 miles long, it would require a wagon train 112 miles in length to haul the bark destroyed by fire.

Rothrock accomplished many things during his tenure (1895-1904) as commissioner. Two of his decisions solidified the state's role in forestry. First, he started a land acquisition program that allowed the state to directly control land of its own in major forest and watershed zones. The acquired lands were first called forest reservations or reserves, now they are called state forests. From 1898 to 1910, 924,798 acres, almost half of today's state forest acres, were acquired with Rothrock's active involvement.

The second major step taken by Rothrock was to start a forest academy to train foresters for state service. The academy was necessary because in 1895, as the Pennsylvania Forestry Division was beginning, there were only three technically trained foresters in the United States. There were no American forestry schools. By 1900 a few American schools were turning out a handful of trained foresters, but not nearly enough for the needs of the time. The academy also helped Rothrock deal with the state's

political patronage system. Political affiliation, not technical qualification, was the deciding factor in filling most government jobs. Rothrock generally avoided staffing his agency with political appointees by specifying that trained foresters were needed for his jobs; then he made sure that trained people were available.

Pennsylvania stood out in the world for its forestry program as the nineteenth century was ending. The state and Dr. Rothrock were singled out in a December 2, 1898, letter from a renowned European forester, Sir Dietrich Brandis. Brandis wrote to Dr. Carl Alwin Schenck, a German forester working with Gifford Pinchot to establish the forestry program of George Vanderbilt's Biltmore estate in North Carolina.

I sympathize to the fullest extent with your wish to show that American forestry can be made remunerative. For that, however, you ought to have the management of a forest that can be made remunerative; one where there is still a stock of merchantable timber on the ground and where growth is fast and natural regeneration easy. There are two powerful interests at work in the U. S. in favor of conservative forest management to put forestry on a sound footing: I. The wish of lumbermen to adopt conservative lumbering, and, II. The millions in capital invested by paper pulp manufacturers in machinery. If I do not mistake, these two interests will do more for the cause of forestry than either the federal government or the governments of the individual states. I will except Pennsylvania where, under Professor Rothrock, matters seem to be progressing on correct lines.

Sir Dietrich Brandis was an influential world forestry leader, who had brought forestry to India during British occupation. After that accomplishment, he was involved in training foresters from around the world, including just about all the early foresters of America. Dr. Schenck (a student of Brandis's) declared, "if Rothrock was the father of Pennsylvania forestry, Brandis was the grandfather of world

Rothrock was a careful and detailed recordkeeper. Notes in his 1897 account book show attention to detail, hands-on involvement, and frugality. "January 21-15 cents for one ball of twine; February 16- 24: to Pine Grove Furnace-self and horse-\$1. 75; horse and buggy for five day trip-\$7.50." These were times before easy travel by automobile.

Table 6 shows careful cost containment but significant growth in budget as the agency worked toward its goals.

Rothrock continued to advocate the concept of forests as protectors of water resources, as mentioned in his first commission report.

There were plenty of water problems to point to. Writing in his division's report of 1897, he observed,

One of the signs which (in itself is all right) but provokes a smile in Harrisburg, is the prohibition against spitting on the pavements- this in a town where the water supply is usually filthy! If the quality of the water provokes expectoration what is to be done? If enough of coal culm can pass into drinking glasses to blacken the water what is there to arrest the disease germs and the unmentionable filth from the cities along the river above Harrisburg? There is muddy water after a rain in Lancaster from all the cleared fields. We need to protect the headwaters of the State with forest reservations.

The statements regarding forests and water were based on the knowledge of the time, but the technical expertise to manage forests once they were acquired was not yet available in Pennsylvania. In 1895, as Rothrock was organizing his small agency, there were only three people in America trained as foresters. They were Bernhard Fernow, Gifford Pinchot, and Carl Schenck. All had been trained in Europe.

Fernow, a German with American citizenship, headed up the new Division of Forestry in the U.S. Department of Agriculture. Pinchot, the only native-born American and a New York and Pennsylvania resident, worked as a consultant to millionaire George Vanderbilt, and to other wealthy landowners, and to friends of the wealthy Pinchot family. Schenck, a German citizen living in the United States, collaborated with Pinchot, putting in place the first large forestry projects in America at Vanderbilt's: Biltmore estate near Asheville, North Carolina. He also established the first on-the-ground forestry school in America, later to be called the Biltmore Forest School.

In addition to the lack of technical forestry professionals to do the needed work, the fledgling state forestry agency confronted major gaps in communications and information. Transportation was linked to the limitations of movement by water, railroads, and horses. Communicating and gathering information over long distances was extremely difficult. Electricity was a still-new, although rapidly spreading, technology. Waterpower associated with large factories was the source of most electrical generation. The remote forests had no factories or electricity, so most communications moved by mail. Because staffing was minimal, the division gathered information on timber cut, fires, and conditions through fifteen hundred "practical correspondents," citizens who sent information by mail to the Harrisburg office.

Rothrock identified the need to reach people with information about forestry from the start. In 1898, he suggested that schools should educate students on the principles of forestry. He asked for funding to "furnish tree seeds and information to schools starting the next Arbor Day," and began a program to educate students about the new science of forestry. Problems in understanding forestry developed early. People saw it simply as a means of saving all the trees, not harvesting them. The concept of careful forest harvesting and renewal, over long periods, was hard to explain and still is. In the commission's 1899 report, Rothrock vents some frustration about this.

The popular idea of forestry is that no trees are to be cut. This is a delusion! Forestry has been said to begin with the axe. It is doubtful that any virgin forests in the state ever yielded 100,000 board feet to the acre but it is said that in German-managed forests there are acres that produce this amount.

He went on to urge the training of foresters in a Pennsylvania school, and placing them in charge of state-owned forests to increase their productivity.

Reappointment for Rothrock -1899

There was concern that Rothrock might not be reappointed as commissioner in 1899, but his popularity and strong connections with private citizens groups apparently won over other political considerations. American Forestry Association's magazine, *The Forester*, November 1899, cheered the reappointment with this headline: "The Example of Pennsylvania -Reappointment of a Worthy Official in Spite of Political Clamor." *The Forester* article quoted the *Philadelphia Ledger*.

Dr. Rothrock is eminently fitted for the post of Commissioner of Forestry. Dr. Rothrock, it is said, was marked for removal, to make room for someone having greater ability as a political worker. The report carried widespread dissatisfaction and protest and it is gratifying to learn that it was without foundation or, if his removal was contemplated, that Governor Stone has listened to the voice of the people.

Rothrock was clearly not just a botanist and a physician interested in forestry, he was an effective political activist. Observe his appeal to the pressing concerns of the day and his

use of backing from organized groups in this plea to the legislature for funding to further expand forestry reservations in 1899:

We must be concerned for forested headwaters for flood protection and maintenance of stream flow. . This letter from an industrialist explains why: The Hon. T. Jefferson Coolidge of Boston, Treasurer of the Amoskeag Manufacturing Company, with mills in Manchester, New Hampshire using the power of the Merrimack river, describes the terrific freshet of March 2, 1896 which compelled the stopping of mills with their 6,000 operatives for some time. 'It is evident that some cause is at work, turning the stream into torrents with long droughts and fearful discharges of water. There is but one explanation, it is simply the cutting down of the forests around the headwaters of the Merrimack, the Pemigewasset and other affluent. The woods hold back the water and allow it to trickle slowly into the streams.

In addition to linking forests to water power, a strong economic concern of the state, Rothrock made sure that legislators knew of citizen support for his positions. He attached this message to his plea for funding from the state legislature:

1st. The State Grange of Pennsylvania in their last two annual meetings has passed resolutions calling upon the legislature to approve State Forestry Reservations.

2d. The Maritime Exchange of Philadelphia has petitioned the legislature for State Forestry Reservations.

3d. The Board of Trade of Philadelphia has done the same.

4th. The Pennsylvania Forestry Association with membership in every county in the Commonwealth has joined the request.

5th. The Engineers Club of Philadelphia has also asked for it.

6th. Almost every leading newspaper in the Commonwealth has repeatedly, editorially and otherwise joined in the general call for State Forestry Reservations.

7th. Various leading industrial journals such as the "Manufacturer" have been outspoken in their demand that in their interest and protection, the State assume control of the high watersheds of the Commonwealth, where the water power which they require is produced.

A most respectable following is earnestly asking the state to act in this direction.

The adjacent state of New York has been a Pioneer in this movement, and secured as public property already (starting in 1885) a large portion of the Adirondack region. Three years ago the people of New York approved a constitutional amendment to save the State Forestry Reservations. Within a month the question was raised as to whether to allow settlement by cottagers on any part of the reserve. This constitutional amendment was defeated by the largest majority (345, 000) ever given to any measure, state or national, in New York.

Rothrock had done his homework. Scientifically founded or not, flood and waterpower protection through forestry reserves was an issue. He let it be known that he had built a large and diverse constituency to support purchase of forestry reservations, and as a last stop he waved the progress of the state of New York before Pennsylvania legislators. If there was anything a Pennsylvania politician hated, it was being outdone by New York. He added additional clinchers regarding the problems of fires and taxes:

A tract of land covered with valuable hemlock was assessed at the rate of two dollars an acre, then raised the following year to four, then to six. When the owner protested, the following year it was assessed at eight dollars. The protest made was unavailing and the owner immediately put in mills, removed the timber and allowed the county to take the land. The plea of the counties was that they must have the tax to build roads. The result was removal of the timber, no money for roads and unproductive land. It was not solely the taxes that drove the owner to cut the timber. After paying the taxes he had no protection against fires which the state allows to go year after year unchecked. It used to be that fire did little damage to green timber. That is no longer true. So much of the state is barren and sun-exposed that evaporation removes the moisture from those areas and even from the woods. In these conditions fire will burn even green timber. The state should become a large owner and producer of timber because the century required to mature a crop of trees is as nothing to the state but disheartening to the individual.

Rothrock was successful in adding to the funding and authority for forest reserves. The reserves are discussed further in the section "Forestry Reservations," on page 33.

Department Status -More Support for State Forestry

On February 25, 1901, the legislature and governor approved Rothrock's plan to raise his division in the Department of Agriculture to a significant new status-the State Department of Forestry. Rothrock was appointed to head the new department and Conklin became the department clerk on February 27. The new department began to purchase land rapidly and add staff. George Wirt, the department's first technically trained forester, was employed. He became jack-of-all-trades, establishing forest tree nurseries, surveying boundaries, operating improvement cuts, and building a forestry school for the state. Strong commission members such as Mira Dock promoted forestry and pushed aggressively for increased funding.

Mira Lloyd Dock

Women weren't to be in professional forestry for some time to come, but they led many early forestry efforts such as the founding of the Pennsylvania Forestry Association. Mira L. Dock of Harrisburg was actively involved in the cause of forestry and served as a member of the State Forestry Reservation Commission. The supervisory board of the Forestry Division and then the Department of Forestry was a Forestry Commission composed of a commissioner of forestry, the chairman of the State Board of Health, the deputy secretary of internal affairs, and two others appointed by the governor. The State Forestry Reservation Commission (for purchasing land) was associated with the Forestry Commission and overlapped it somewhat.

Dock not only served on the commission, she gave speeches promoting it and traveled in its behalf. *The Forester*, March 1899 reported that

Under the auspices of the art department of the Civic Club of Philadelphia, Miss Mira Lloyd Dock, a member of the American Forestry Association, has been giving lectures in several cities of western Pennsylvania on the four topics that follow:

I National Reserves, general and special.

II State Reserves, The Adirondacks and Pennsylvania reserves, School of Forestry, Pennsylvania Forestry Laws, a prediction and its fulfillment.

III Municipal Reserves, Parks, parkways and playgrounds, Park-making-a national art.

IV Local reserves, within reach of every village, relation to schools, roadsides and the State Reserves. Massachusetts Reserves for the protection and preservation of beautiful and historic places.

With these lectures, Miss Dock provides an admirable little list of books, circulars and so forth, bearing on forestry subjects. Miss Dock's work has been of great service; for she could not have chosen a better way to further the interests of forestry.

Mira Dock served twelve years on the State Forestry Reservation Commission, from 1901 to 1913. She could be counted on to speak to groups, testify at hearings, or go into the forests to bring back reports for the commission. A commission resolution on her leaving in 1913 states, in part, "We recognize that the present advanced condition of Pennsylvania in forestry is largely due to the interest and assistance of women of the State. We have always regarded Miss Dock as their representative, believing that her place in our meetings cannot well be taken by any person. She constituted a class of which she was the sole

George Wirt-The State's First Forester

The department's first technically trained forester, George H. Wirt, was employed April 1, 1901. His first assignment was to prepare a forest management plan for the Michaux State Forest, then being purchased west of Gettysburg in the South Mountains. Wirt established a tree nursery in the reserve on April 20, 1901. There were no sources of forest tree seedlings in the large quantities needed in America at this time. He also located boundaries, planted trees, and put fire protection and careful timber sales in place on the reserves. Wirt was a native Pennsylvanian, born in McVeytown on November 28, 1880. His forestry education was in Germany and at the Biltmore Forest School, operated by Schenck in North Carolina. He graduated from Biltmore in 1901. In 1903, Wirt was assigned by Rothrock to start a forestry school to train the foresters needed in Pennsylvania. He became the first director of the State Forest Academy at Mont Alto and served there until 1910. His leadership set the foundation for a practical school to train the foresters who would manage and protect the growing state forest lands. Many graduates of the school eventually became commissioners of Pennsylvania's forestry agency.

On May 16, 1910, Wirt was stationed in Harrisburg as state forest inspector to upgrade the management of the agency's forest land. In 1915 he became the state's first chief forest fire warden, and in 1923 he became chief of forest protection. Whatever he was assigned to do was done and done well. He served Pennsylvania forestry in multifaceted and important roles for forty-five years, retiring in 1946.

Forestry Reservations-Land for State Forestry

Pennsylvania's forest reserves have had various names at various times. They will be referred to here as forestry reservations, forest reserves, or state forests.

The Pennsylvania State Forest Reservations which became state forests started with legislation in 1897 creating and funding a Forestry Reservation Commission to be appointed by the governor for the purpose of securing land. The commission was first authorized to "locate acquire and condemn, subject to jury damages, three reservations of not less than forty thousand acres each, upon the headwaters of the Delaware, Susquehanna and Ohio rivers." Only "un-seated" lands from tax sales were to be purchase at first. "Unseated" was a tax assessor's term meaning land without "improvements" such as fields and buildings. High taxes on forest lands forced many

people to cut their forests and abandon their land. The forests suffered but the state benefited by being able to purchase large amounts of tax-sale land at bargain prices.

Early purchases were in the headwaters of the major rivers specified, including the Allegheny River, although one of the early purchases, the Michaux State Forest, actually lies in the Potomac River watershed. The tax-sale lands purchased in 1898 and 1899 totaled 39,277 acres: 14,090 acres were in Clinton County, 15,000 in Clearfield County, 1,536 in Lycoming County, 1,244 in Monroe County, and 7,407 acres were in Pike County.

Pennsylvania and New York stood out at this time as the two states having both the wealth and the interest in purchasing forest land for public purposes. New York planned to use its purchases for watersheds and fire protection. The areas were for wilderness with no harvesting allowed. Wealthy owners of Adirondack estates became a driving force for the wilderness approach in New York. They wanted the forests around their lands preserved. Pennsylvania took a different approach, purchasing land for watersheds and fire protection, but also for growing and harvesting wood on a sustainable basis.

In September 1899, *The Forester* reported on the creation of New York's Adirondack

Reserve, quoting *The New York World*:

The reclamation of these woods from private ownership is an enlightened policy. The entire wilderness should have remained a heritage for all the people of the State. Its benefits as a magnificent park, a conservator of the water supply and an unequalled sanitarium could not be estimated.

In 1899, Pennsylvania's Act of 1897 was amended to allow purchase of unseated lands whether they were up for tax sale or not. This allowed strategic land areas to be purchased. The *Forest Commissioner's Report*, 1900, announced that the state, through the Department of Agriculture as custodian, owned 40,605 acres and 99 perches, purchased under the Acts of March 30, 1897, and April 28, 1899. In addition, under the Act of May 25, 1897, the state owned 57,768 acres and 12 perches, making a total of 98,370 acres, and 111 perches in forestry reservations. The lands were purchased in Elk, Lycoming, Clearfield, Clinton, Pike, Cameron, Tioga, Centre and Mifflin Counties. The state had acquired significant amounts of land to practice forestry; now it needed rangers and foresters.

Once the state had acquired significant land areas, it faced the same risk of loss from fire, timber thieves, and other adversities, as did private owners. There was a compelling need to hire competent forest managers and land overseers to protect the state's investment. Simple protection from fire and theft was the first order. In 1901, Hiram Rake was appointed in Pike County, on a part-time basis, as the first State Forestry Reservation ranger. George W. Armstrong was appointed as full-time ranger in Clinton County a short time later.

Forest rangers were usually chosen from the areas in which they would serve. They needed to have practical knowledge of the area and the people where they worked. The rangers' duties, at first, were mainly protective, but eventually, as foresters became available to manage the forests, they would be assigned any of a variety of projects. By January 1912 there were ninety rangers on Forest Reserves in twenty-six counties.

Naming State Forests

State forests were named for many of the early forestry leaders. Some State Forestry Commission resolutions regarding forestry reservation/ state forest names with the year of the action follow:

1900: *Reservation lands in Clinton and Centre Counties between the Susquehanna River and Beech Creek were named the Hopkins Reservation in honor of A. C. Hopkins, former member of the Forestry Commission.*

1900: *Lands along the valley of Licking Creek in Mifflin and Juniata Counties were named the Rothrock Reservation in honor of Dr. Rothrock. These forests are near his boyhood home, McVeytown, and cover land he repeatedly crossed on foot while attending school at Academia, Juniata County.*

1905: *All lands south of the Susquehanna River and the southeast side of Cumberland Valley were named South Mountain Reservation, and split into two divisions: Mont Alto (named for the previous owner, Mont Alto Iron Co.) and Caledonia, named for the previous owner, Caledonia Mining and Manufacturing Co. The company owner, Thaddeus Stevens had named the company after his hometown Caledonia, Vermont.*

1905: *Lands in Tioga County were named the Stone Reservation in honor of former Governor William A. Stone, who approved many of the laws forming the Department of Forestry.*

1906: *The reserve located in southwest Perry County was designated as Pennypacker Reservation in honor of Governor Samuel w. Pennypacker, who vigorously promoted the cause of forestry.*

More Acres; More Income

The commission at first allowed property owners near forest reservations free grazing rights for their cattle. This privilege was abused persistently by overgrazing, and by 1906 the commission had added "rule 17" to reservation rules, requiring permission and putting grazing under the control of the commissioner. Timber sales were also begun around 1906 as foresters were hired and the reservation lands recovered some forest growth.

Table 8, gathered from forestry commission reports, indicates fluctuating but gradually rising revenues from the state lands.

By 1912 there were 966,295 acres in forest reservations. The 1916-1917 *Forest Commissioner's Report* notes that the name "forest reservations" had been changed to state forests. The total area in state forests had risen to 1,017,773 acres by 1917. Efforts began in 1920 and continued into 1929 to fund a bond issue to acquire an additional five million acres of land for state forests. Several attempts failed, the last when the governor's office opposed it. The total state forest area today (1995) is 2.1 million acres.

Significant Actions in 1903

The commission saw many significant changes and additions in 1903.

Persons employed by the commissioner of forestry for protection of the state forestry reservations were given constabulary power.

The position of deputy commissioner of forestry was authorized. Robert S. Conklin was appointed to the position on April 1, 1903. I. C. Williams became clerk for the department.

The Pennsylvania State Forest Academy was established at Mont Alto on state forestry reservation land. The name was changed to Pennsylvania State Forest School in 1924.

Mont Alto-A Forest for All Reasons

The Mont Alto section of the South Mountain Reservation has been a forest for all reasons. The reserve in Franklin County, southeast of Chambersburg, harbored the training grounds for most of the early employees of the forestry commission. It has contained a tuberculosis sanitorium, a major tree nursery, a forest research center, and at the same time, it has been a recreational resource for the state's citizens.

Before its purchase by the state, the forest was a source of wood for charcoal-fired iron blast furnaces. George Wirt wrote in the 1902 commission report that:

From the beginning of the nineteenth century until almost the present time, the Mont Alto Estate has been in the possession of men who were manufacturers of pig iron and who managed their forests in such a way that they obtained a comparatively equal yield of wood for charcoal each year. The owners also ran a sawmill on the site and operated farms in some sections. The usual frequent fires, pine beetles and clearing for fields have removed much of the forest at times.

Mont Alto Park starts its entrance where the old furnace building used to stand, and the park extends back for nearly a mile through what is known as the valley of a thousand springs. This park is the only one already established on forest reservations and the state can be proud of it. The little Antietam Creek, which rises in the mountains back of the park, flows the entire length of the park. The 'ramble' along the stream proceeds through laurel, rhododendron, and under the shade of white pine, hemlock, gum and sycamore. The ramble passes many springs, retreating to the large spring known as the 'Pearl of the Park.'

The park that Wirt mentions came with the state purchase of land May 1, 1902. A charcoal-fired iron blast furnace had been operating there since 1807. At full production it employed five hundred men and seventy-five horses and mules. In 1875 the Cumberland Valley Railroad and the Mont Alto Iron Company built Mont Alto Park as a commercial venture. People came by train from Harrisburg, Chambersburg, Philadelphia, Baltimore, and Washington; sixty-six thousand people patronized the park in 1883. The park had a dining room, shooting gallery, bowling alley, and croquet field placed in and around the natural settings, such as the ramble, a winding footpath through the woods along a stream.

Iron furnace company lands were typical early acquisitions by the state and they sometimes had some recreational facilities already in place. Caledonia State Forest, purchased in January 1903, had a history similar to Mont Alto. The land had supported a charcoal iron furnace, established in 1837, which was burned by Confederate soldiers on their march to Gettysburg in June 1863. When the state bought the land it included picnic grounds, a dance hall, and the Graeffenburg Inn.

According to George Wirt, practical forestry started on Mont Alto in the spring of 1902 with a forest tree nursery where six pounds of pine seed were sown. Wirt also supervised the planting of ten thousand one-year-old pine seedlings, and pruning and thinning a pine-thicket area. This area was very popular with recreationists and many campers used the site. Road improvement work was underway in 1902 to improve access.

The Mont Alto Forest Academy

Rothrock gained authorization to establish a forest academy at Mont Alto in 1903. When Pennsylvania's forestry agency was established, there was no educational facility available in America to train the foresters needed. By the fall of 1898, Dr. Carl Schenck was starting work on a forestry school at Biltmore Forest in North Carolina-George Vanderbilt's American forestry experiment. Pennsylvania's first degreed forester, George Wirt, came from this school. A few weeks after Biltmore opened, the New York State College of Forestry at Cornell University began to accept students. By 1900 the Yale University Forestry School had been established at New Haven, Connecticut, with a \$150,000 gift from Gifford Pinchot and family. Pinchot had plans for the Yale graduates. He was going to hire them to staff the newly established U.S. Forest Service, which he headed. By 1903 there were a few forestry graduates, but they were either headed for federal service or were not practical enough for Rothrock.

There were professional disagreements regarding the emphasis of American forestry curriculums as soon as there were curriculums to disagree on. At Biltmore Estate, Dr. Schenck was beginning to train a few foresters in subjects that included logging methods. Pinchot and Schenck had a falling out over this in 1901. Pinchot called Schenck "an antichrist" for including logging methods in a forestry curriculum. Pinchot was not against harvesting forests, but he didn't believe that foresters needed to be taught about logging. He saw the role of foresters as maintaining forests by controlling the way they were used. He would later propose federal regulation of all private-forest harvesting, creating an enormous row over policy in the forestry profession. Schenck believed that foresters needed to have practical knowledge of logging because it was their job to make forestry an economically viable proposition. Schenck's and Pinchot's argument concerning the extent of foresters' involvement with economic use of forests has continued to be debated into the present.

A professional society for foresters, the Society of American Foresters, was formed in 1900. It was initially a small (three- or four- person) group, meeting in Pinchot's mansion in Washington, D.C. The foresters dined on baked apples and gingerbread and sometimes met and ate with President "Teddy" Roosevelt, who was a friend of Pinchot's. By 1903 the Society of American Foresters had only fifteen member foresters. That was the extent of the new American profession. Rothrock, clearly, had to do something to produce more foresters for Pennsylvania. He also wanted practical foresters, well based in science but knowledgeable about using axes and saws to harvest trees, and he wanted people willing to live in the woods in primitive conditions. He decided to train his own foresters. By act of May 13, 1903, the commissioner of forestry was authorized to establish a forest academy at Mont Alto, Franklin County, on lands belonging to the South Mountain Forestry Reservation. The commission paid \$5,685 to buy a building and land adjacent to the forest reserve to set up the academy, and George Wirt was put in charge.

Four students entered the academy in June 1903, ten more in September; thirteen from this class remained in 1904. At first, students were paid thirty dollars per month to attend the academy, since they also worked on the forests and were committed to working for the commission upon graduation. This was soon changed to pay them nothing while in school, but give them room and board and their education. The three years of courses and fieldwork covered subjects such as chemistry, physics, algebra, silviculture, zoology, and German. There was heavy emphasis on practical work in the forests, such as firefighting and the use of forest tools-axes, compasses and tree-measuring devices. In

September 1904, seven more students were admitted. The students were required to "furnish their own clothing, a uniform such as may be adopted, and a horse and riding outfit." They were also required to be competent physically and mentally. The first entrance examinations were held in Harrisburg on August 26, 1904, by a committee of educators.

The school was run somewhat like a German forestry school or military academy. There were strict rules with a demerit system. Eight demerits in one year would get a student expelled. Nine infractions were named for demerits. For example, "insubordination-two demerits; telling an untruth-three demerits; violation of a rule of the academy-two demerits; profanity-one demerit; abuse of horse-one demerit." In this pre-automobile era, horses were important. Students were required to supply their own horse and to care for it as instructed." At stable the order of duty shall be: lead to water, clean stalls, groom horses for at least twenty minutes."

There was little entertainment at the remotely located academy. As a matter of fact, there was a distinct policy of accustoming students to life in the woods so that they would feel no dissatisfaction with the lack of "social situations" far back in the forest reservations. There was basketball, but no coach, and it was popular.

Members of the first class graduating from the academy in 1906 all received employment and were placed on various forestry reservations. On September 1, 1906, a new class of thirteen students entered the academy; each had to post a \$500 bond and commit to working for the commission. The academy harvested wood valued at \$1,237 during 1906 with students involved in much of the work. In 1906 competition for the academy was created. The Department of Forestry was established at the Pennsylvania State College as a technical school. This school and the Mont Alto Forest Academy operated separately for many years, but eventually negotiations were begun to combine these two institutions of forestry education.

In 1917, seven out of eight Mont Alto graduates went into military service for World War I. The bring-your-own-horse requirement was dropped. Cars had taken over transportation, even far into the woods. There were forestry schools in many states by now and the value of a commission-operated academy was questioned.

After World War I, talks regarding the merger of the two Pennsylvania forestry schools increased, but not without debate. Rothrock was concerned that the practicality of Mont Alto would be lost in a merger with a traditional university. Writing in *Forest Leaves*, December 1921, he said,

Our public school geographies give more space to Afghanistan than to the forest area covering almost one half of their own State! Is it surprising when a past President of an Agricultural College should have declared not more than 20 years ago, 'Forestry is a fad, and he would have none of it! Is it surprising that we need forestry education in Pennsylvania?'

The state must in sheer self protection acquire five million acres additional in the next ten years. The state forestry department will then need 150 to 200 trained men. The requirements of a successful forester are such that the men undertaking it should be either carefully selected or at least given a chance in summer work force to face a practical forest test which will generally eliminate the sentimental dabbler. The most expensive forest school in the country, if not the world, is the Yale University School of Forestry where the cost of instruction per student per year falls between \$1,200 to \$1,500 per year.

The disadvantages of a forestry school at a traditional university are: 1. The students study about the forests instead of studying the forest. There is no opportunity to coordinate theory and practice; 2. There is considerable loss of time and expense in forest visits; 3. There is a lack of contact with forest people and practical life; 4. The students develop social tastes and habits that later bring discontent when they are placed in the usual forest environment. Advantages of a school attached to a forest (such as Mont Alto) are that the disadvantages listed above are overcome!

Pennsylvania is unique in that it is the only state that maintains a forest school for its own forest service. Yes, there are two professional forestry schools in Pennsylvania but the output of both does not exceed the need. Amalgamation of the two is being considered for economy's sake, but New York State spends four times as much on one of its two schools of forestry as Pennsylvania spends on both of hers.

The Forest Academy program and the forestry school of the Pennsylvania State College (now Penn State University) were merged in 1927. In 1929 the facilities at Mont Alto were turned over to the local common-wealth campus branch of Pennsylvania State College. Instructors from Mont Alto either transferred to Penn State at this time or moved to the North Carolina forestry school, taking their students with them. A research institute operated by the Forestry Commission remained at Mont Alto.

Tuberculosis: The Invalid's Camp at Mont Alto

In his report of 1902, Rothrock estimated that five thousand Pennsylvanians had tuberculosis. People infected were genteelly referred to as "invalids, or consumptives." The disease reduced lung capacity to barely life-supporting levels and was often a death sentence. There was no known cure, but patients living away from the city in a fresh-air environment seemed to recover. Rothrock suggested in his report that state forest reservations be used for recovery camps-sanitoriums.

The tuberculosis "fresh-air-cure" was based on observations made of people who lived and worked outdoors. In the 1906 commissioner's report, Rothrock recounted his experience with colliers (men who cut wood and converted it to charcoal for a living). "The collier's cabin must be regarded as one of the predecessors of the sanitorium for consumptives. Such was the known immunity of charcoal burners to the disease that sixty-five years ago Dr. Abraham Rothrock, then practicing medicine in Mifflin county, was in the habit of ordering his tuberculosis patients to go and live with colliers."

Rothrock acted on his belief in the curative powers of fresh air in 1902 and started the first small camp for tuberculosis patients on top of South Mountain four miles from Mont Alto Station School. He maintained it with private contributions until June 1, 1903, when the legislature appropriated \$8,000; \$15,000 more was appropriated for 1905-1907. On June 1, 1907: the camp was transferred by the legislature to the newly created Department of Health.

Even after public funding was received, the sanitorium relied heavily on private donations and the efforts of the *Rothrock*, 1921 patients themselves. Mira Dock, a member of the State Forestry Reservation Commission, reported on her visit to the camps in the 1902 Commission Report. "On Sept 27, 1902, accompanied by my sister, L. L. Dock, a trained nurse, with considerable experience in camp life, I visited the Invalid's Camp at Mont Alto Reservation. The camp is located on a wide plateau, reminding us both of places in the Black Forest, much resorted to for the fine air by invalids who are locally known as 'air snappers'.

Dr. Addison M. Rothrock, reporting as camp physician for South Mountain Camp Sanitorium in 1903, described the camps as "located in the heart of the 50,000-acre Mont Alto State Forestry Reservation, with fine cool air (lows of 16 below zero in the winter.) This camp was started in June of 1903. The area is isolated from air contamination. Air breathed by the camp inmates is filtered through many miles of foliage. Its isolation is such that no hostility or dread, on the part of others, is caused by the presence of so many consumptives. The water supply is ample and pure. There were 35 patients in this camp in 1903."

People in the camps were expected to care for themselves, supplying their own food, clothing, and other necessities. The state provided cabins to live in and little else. Camp housing consisted of a one-room cabin, ten feet square, for every two male residents, and a two-room cottage, twelve feet by eighteen feet, for every two female residents. Each cabin had two beds, two chairs, a wood stove, oil stove, and a lantern. A plot for a small vegetable garden was available for each camp.

There were exacting rules.

1. *No patient shall go more than five miles from camp without permission.*
2. *If a patient leaves for more than twenty- four hours the key to the cabin must be left with the Superintendent.*
3. *No spitting upon the ground is allowed in the camp or in the neighborhood.*
4. *No tobacco can be used in any form, nor abuse of alcoholic beverages, nor improper or obscene language; and a proper observance of Sunday is required.*
5. *Winter and summer the inmates of the camp must sleep with their windows open.*

Those not abiding by the rules were asked to leave. Closed windows were a major offense against the rules as the purpose of the camps was to expose patients to maximum amounts of fresh air.

If ever there were a multipurpose forest, Mont Alto would be it. Few other forests can claim to have served as training ground for foresters, tuberculosis sanitorium, tree nursery, research center, wood producer, park, hunting and fishing site, and a place for general recreation.

CHAPTER FOUR

A new Leader - Robert S. Conklin, 1904-1920

From Clerk to Commissioner

On December 31, 1904, new commissioner of forestry Robert S. Conklin forwarded his report of state forestry activities to Samuel w. Pennypacker, governor of the Commonwealth of Pennsylvania. Conklin, who served as Rothrock's clerk as the Division was being founded, and then deputy commissioner when forestry became a department, had been appointed commissioner on June 1, 1904. Rothrock had resigned on May 31, 1904, because of poor health, but remained active as a commission member and in various roles for most of the rest of his life.

Conklin was born in Mountville, Lancaster County, Pennsylvania, July 24, 1858. He attended public schools and apprenticed in a printing office, becoming foreman of the *Columbia News* printing plant and working for a time in the State Printing Office in Harrisburg. His route to the commissioner's office was at first political rather than through forestry. He was appointed message clerk of the House of Representatives in 1893. Then he was appointed clerk to the Division of Forestry on November 8, 1895. Despite a lack of professional forestry training, he became Rothrock's key assistant, dealing for nine years with the growth and myriad details of operating the agency. By 1904 he was well equipped to head the forestry effort. He served as commissioner for the next sixteen years.

Conklin concentrated on five areas: (1) continuation and further development of the forest academy; (2) expansion of the state forests; (3) improved fire prevention and protection; (4) promotion of forestry on forest ownerships of all types; and (5) improved information gathering on forest conditions in the state. The Mont Alto Forest Academy had been operating for less than a year when Conklin became commissioner. He introduced competitive exams as a requirement for entrance to the school, increased the number of instructors, expanded facilities, and strengthened the courses. Conklin's two sons graduated from the academy and worked as foresters for the department for several years.

Conklin established a research center at Mont Alto in affiliation with the forest academy in 1904. The center studied practical topics such as tree planting techniques and forest insects and diseases, but it also went further, researching the growing of willows for baskets and wicker, and studying nutrition and production of chestnut meal (flour ground from roasted chestnuts) for bread and other foods.

With annual crops of foresters coming from the academy starting in 1906, the number of department foresters grew from one to seventy- one during Conklin's tenure. Forest rangers were increased from five to eighty-five. Most of the department staff was assigned to work on the state forests.

The Age of Tree Planting

With so much deforested land in Pennsylvania, tree planting was crucial. Northeastern forests will reproduce naturally if trees are available to produce seeds and sprouts. But large expanses of the state had been cleared and cropped. In other areas, all the trees

had been burned repeatedly for miles around, leaving no natural source of tree seeds. These areas had to be planted to return them to forest.

Conklin expanded state forest tree nurseries started by Rothrock. The state had to accomplish this because just as there were no foresters at first, there were initially, no tree nurseries available. In his book, *The Birth of Forestry in America*, Dr. Carl Alwin Schenck notes that in 1896 there were no tree nurseries in America. He brought white pine from Germany for his first plantings at Vanderbilt's Biltmore Estate. The seedlings, wrapped in damp moss, traveled by steamship from Germany to New York City, then went by train from New York to North Carolina- altogether a seven-week journey. And they lived!

American forests eventually paid a heavy price from widespread importation of European trees, shrubs and materials. Various insects and diseases traveling with the imports found American trees much to their liking. One import, chestnut blight, killed all the mature chestnut trees in our forests. The tree exists now only as persistent sprouts.

The first tree plantings in Pennsylvania occurred on a state forestry reservation in October 1899. One thousand Carolina poplar (a cottonwood species) cuttings were planted on three acres in Pike County. The planting was a complete failure due to poor soils, scrub oak competition and repeated fires.

The Forest Commissioner's report for 1898- 1899 advised that tree planting crews should be organized with "a foreman to superintend the laborers; a boy to carry seed [legumes were planted with the trees] and water for drinking; twenty laborers, each being furnished with a mattock and an apron with two pockets, one for white pine, one for seeds of the legume esparcet-sainfoin. Each laborer can dig and plant in 1,150 holes per day. Trees should be spaced four feet apart -2,300 per acre. The cost equals \$2.72 per acre-at the daily rates of \$1.50 for the foreman, \$1.25 for each laborer and 75 cents for the boy."

The first successful forest tree plantings in Pennsylvania were white pine seedlings planted on top of South Mountain near Mont Alto in April 1902. They were set four feet apart, survived well and by 1906 were about three feet tall on average. Plantings in cities preceded forest plantings. *The Forester*, November 1899, reported plans for large-scale municipal tree planting in Philadelphia in cooperation with the Forestry Commission. The presence of state nurseries and a state forestry agency promoted city programs. In 1901, Public Law 569 encouraged the planting of shade trees along public streets. The same year, Public Law 610 encouraged tree planting along roadsides. There was a protection program in the law offering tax abatement for landowners who protected the planted trees through fencing and other means. The abatement was not to exceed one-fourth of the road tax. It was used somewhat, but the rebate amounted to only fifty cents per tree and it was unpopular with city and town officials because it made extra work for assessors.

May 1907, Public Law 349 allowed townships to appoint shade tree commissions and use advice from the forest commissioner. Mr. I. C. Williams of the forest commission offered some advice regarding the planting of trees along city streets, in 1907. "For wide streets plant American elm, sugar maple, red maple, American linden, sweet gum, scarlet oak, and red oak; for narrow streets, plant Norway maple, red maple, cucumber tree, ginkgo, pin oak and hardy catalpa. Shade tree commissions should be warned against promiscuous pruning by promiscuous pruners. Municipalities should pass

ordinances forbidding the hitching of horses to trees and any trees set along the street curb should be protected by tree guards."

By 1909, 5.8 million forest tree seedlings were growing in state nurseries. A 1910 commission report describes the tree nursery at Mont Alto using rye, cowpeas, and manure from the forest academy stables as fertilizer to improve the clay soil. The Mont Alto forest tree nursery was a large operation by 1910, but it had started as a small experiment in 1903. The second large tree nursery was established in Clearfield County on state forestry reservation land in 1911. Most state forests had at least one small tree nursery and state foresters grew and planted trees of every imaginable species.

Initially the state nurseries were used exclusively to reforest state lands. Starting in 1910, seedlings from state nurseries were made available to private forest owners. From 1910 to 1915, 430,620 seedlings were sold to private land owners at the cost of production. In April of 1915, the commission was authorized to charge for the cost of production plus packing and shipping. Over the next twelve years, 14,627,006 tree seedlings were distributed for planting on private lands.

A cooperative program with the Department of Highways resulted in the planting of 5,538 trees along thirty-six miles of concrete highways in Adams, York and Delaware Counties in 1920. In 1921, nine thousand more trees were ordered for highway plantings for the spring of 1922.

Nursery capacity was reduced by problems getting tree seeds and lack of manpower and materials needed to operate nurseries during the World War I years of 1917 and 1918. By 1920 the department was operating three large nurseries and one small one. Annual capacity of all state nurseries was ten million seedlings. The leading species planted were white pine, Norway spruce, Scotch pine, pitch pine, red pine, European larch, red oak, white ash and jack pine. By 1923, 34.9 million trees had been planted on both state and private lands. By 1936, the total number of trees planted in Pennsylvania had risen to 179 million seedlings, grown and planted on state and private lands.

State Forests for Recreation

Recreation was part of the program for forestry reservations from the beginning. The Mont Alto Forestry Reservation included a park and the forest commission added more parks as more lands were acquired. Hunting, fishing, camping and hiking were very popular uses of forestry reservations. The demand for public use rose as populations increased, and as more people lived in urban environments. Improved highways and automobiles gradually made even remote forest accessible.

In 1913 the Department of Forestry was authorized to lease small tracts of state forest land to Pennsylvanians for campsites. The first lease was along Pine Creek in Shippen Township, Tioga County. The early leases were simple tent sites. The program became extremely popular and took considerable resources to administer. There was competition for favored sites, and political influence was exerted at times to obtain the preferred areas. The program grew into longer-term leases and people began to build on their leased sites. The structures ranged from woods shanties to handsome houses.

The program allowed citizens to come to the state lands and enjoy them, but it also allowed those with long-term leases to convert pieces of public land to private use for considerable periods of time. There are presently about four thousand cabins on state land leases, but no new leases have been issued since 1970. The function of operating parks has been split out from the forest commission into a separate agency for state

parks, but general recreational use of state forests continues to rise, exerting considerable pressure on today's state forest resources.

General Changes During Conklin's Tenure

State forest acreage more than doubled during Conklin's terms as head of the department. Starting with 443,592 acres on June 1, 1904, the department added 605,100 acres, increasing state forests to more than one million acres by January 1, 1920. Forestry demonstration areas were put in place in the state forests. At Mont Alto, tree plantations were established, fire lanes and special fire protection efforts were tested, and forest-improvement cuttings were made so that the visiting public could see forestry at work.

In 1905 the commissioner of forestry and the Forestry Reservation Commission were authorized to give municipalities the privilege of impounding water on state forest reservations, establishing again the importance of forests for water protection. State forestry employees were made ex-officio forest fire wardens in 1907, and in 1909 the commissioner of forestry, as the chief forest fire warden, was authorized to appoint forest fire wardens throughout the state. Constables were relieved of forest fire duty and a new system of fire wardens was established. A professional state-level fire organization was approved in 1915 and headed by George Wirt. This completed the basic fire prevention and protection organization still working today.

Municipalities were authorized in 1909 to acquire lands suitable for establishing municipal forests and the department was called on to advise these new public owners. Private landowners with forest problems were also assisted on an informal basis.

In 1911 the department began to build and staff forestry exhibits at large expositions and gatherings. It presented one of its largest public forestry demonstrations at a major exposition conducted in 1911 by the Western Pennsylvania Exposition Society in Pittsburgh. The exhibit was forty-five feet long by twenty-seven feet deep, and showed nursery beds with seedlings and a large map of the state indicating the locations of forest reserves. It included a collection of leaves and buds of important tree species, and logs from principal timber species. A popular feature of the exhibit presented a chronology of historical events displayed against a large cross section from an oak tree relating the growth rings and the tree's history to various historical events. Visitors to the exhibit could see that the tree had sprouted from an acorn in 1644, the year William Penn was born, and that the tree had been cut down in 1904, 260 years later.

The years 1904 to 1920 were building years for the Department of Forestry. Purchases of land, in some cases, included buildings which had to be converted, maintained, or demolished. Other areas had no structures, so facilities had to be built. In 1911 a double cottage for foresters was being built at Mont Alto, a forester's house was underway near Eastville, a ranger's house was going up at Tea Springs, another had been contracted for Clearfield County, and there were plans for more facilities in Clearfield and Monroe Counties. Many of the structures acquired as part of the purchases of estate lands required large doses of maintenance and renovation. Miles of boundary lines had to be located and marked on the newly acquired lands and many more miles of roads, fire lanes, and bridges needed to be established or improved. Department foresters and rangers had to become road and bridge engineers, housing contractors, and fire tower builders. Later, they added telephone line installation to their talents and later still they became radio system experts.

In 1914 shade tree commissions were being formed to deal with trees in the cities. The cities of Pittsburgh, Wilkes- Bane, and York formed commissions and eleven boroughs did likewise. The State Forest Commission was called on to provide advice to these municipal commissions, establishing the early basis for present urban forestry programs.

The state forestry reservations were renamed state forests and the State Forestry Reservation Commission was renamed the State Forest Commission in 1919. It was approved for the commission to condemn land to round out the boundaries of state forests. The state forests at this time paid a county tax of one cent per acre per year as well as road and school taxes of two cents per acre per year.

For the first twenty-five years of the state forestry agency's existence, the focus was on acquiring forest land and staff to manage it, and building a forest fire protection and law-enforcement system. The department urged private forest owners to be careful with fire and encouraged them to consider forest management, but little was offered in the way of assistance until 1910, when state-grown seedlings were made available for private planting. A new policy, in July 1920, authorized the department to assist private land owners with forestry advice. By the end of 1921, eighty forestry reports had been prepared for 131 private owners with 28,659 acres of forests. Department costs for this program were \$835.78; charges to the owners served were \$117.35. These were the modest beginnings of advisory programs to the private ownership sector, controlling almost 70 percent of the forest land in the state.

Still Burning Forests

The area burned by forest fires in 1913 was 470,738 acres. Many of the fires were, to quote the commission report of the year, "just one of a long repetition of fires in the same areas." In 1913, revisions were made to the general Fire Warden's Act of 1909. This had been a good step toward better fire protection, but had failed to provide adequate patrols for early detection and for fighting fires while they were still small. It's possible to extinguish a small fire in the forest, but there is little that can be done with a large fire except to enclose the burning area with fire lines, then wait for the enclosed area to burn out. Despite law after law, it was clear that fires would continue to occur; so a better system to detect them and get to them quickly with firefighting crews was in order.

The department began pressing for fire tower and patrol systems to detect forest fires in their early stages so that a quick response could be made. Losses of buildings, offices, and records from fires were all too common during these times. A typical example is recorded in department records regarding a May 1915 fire that burned forester Homer Metzger's house at Tea Springs (Eastville). The local records for the forest were burned, and Metzger lived in a succession of tents and rented rooms for months while a new house was being built.

The cycle of fires is somewhat predictable. Fires increase in the spring after the snow melts and before the leaves are on the trees. In the fall, after the leaves drop from the trees and before snowfall, the number of fires increases again. Then, as now, the leading cause of wildfire was people being careless in the forest. The burning of household trash, operation of equipment in woodlands, children playing with fire, and campfires are all sources of fire starts. Also, the intentional starting of fires (arson) has always been a leading cause of wildfires. The greatest number of forest fires almost always occurs during the spring.

The department stationed people at lookout points, some of which, called tree towers, were little more than perches in tall trees. Man-made fire-lookout towers followed, initially

built of wood, then of steel, roving patrols were operated during the risky seasons of spring and fall. The first tall steel forest fire observation tower was erected on state forest land in Franklin County in 1914.

The Communications Connection

Today we take for granted the ability to make instant telephone calls from almost anywhere to everywhere. Computer modems and faxes transmit information in a blink of an eye and radio and television heap fresh news on us from allover the world. This was not the situation in the early years of state forestry. Rothrock and Conklin sent and received information primarily by letter. It could take several days to find out about a fire or other problem. Telegraph systems followed the roads and rail lines from settlement to settlement, but many foresters and rangers were located a day's travel or more from the nearest telegraph office. Slow communication was a nagging problem in dealing with fast-moving forces such as forest fires. The likelihood of controlling a forest fire decreases with every minute that action is delayed.

Beginning in 1914 and continuing into the 1920s, the department worked to link together the far-flung outposts of forestry by telephone. Foresters and rangers learned to string telephone wires, set and climb poles, and hook up telephone units from high, remote mountaintop fire towers, to ranger cabins and out to the main lines near town. Maintaining the lines once they were strung was a major part of forestry work. Brush grew into the lines, ice and falling trees brought them crashing down, wildlife became entangled in some lower lines and carried them off, and trigger-happy gun enthusiasts-some young, some not- loved to shoot insulators off the telephone poles.

Advancing communication technology has continued to be a major factor in reducing the response time to fires, from several days by mail, to hours by telegraph, to almost instant communication by wired telephone, to today's instantaneous wireless radio transmissions. Forestry, and particularly forest fire control, has progressed with each new communications improvement. For many years, though, before all this was available, fires burned while people waited and waited to hear the news.

Bureaus within the Department

Governor Martin Brumbaugh signed Public Law 797 on June 3, 1915, establishing the Bureau of Forest Protection under the Department of Forestry. The bureau was made responsible for preventing, controlling and extinguishing fires on all forest land in the commonwealth. George Wirt, in one of his many roles, was appointed chief forest fire warden to head this new bureau on September 1, 1915. By 1917 Wirt had placed competent full-time fire wardens in twenty-one fire districts across the - state. By August 1918 there were 1,475 men, mostly fire wardens in a fire organization put together by Wirt. Local protective associations" were being organized to use local resources to build fire lookout towers, and to patrol and fight fires. Telephone lines were being strung to towers allover the state. In 1919, ninety-two trees were used as fire observation stations, thirty-five wooden towers and nine steel towers were staffed, and nearly all were connected by telephone.

At the same time, the Bureau of Publicity was formed within the department. George Wirt had proposed an educational bureau in 1912 to educate the public in forestry. The department's foresters, meeting in Galeton in August 1915, passed a resolution endorsing the idea of "a special bureau to educate and inform the public about forestry." Certainly, public education had been done before, but this was a new and more intense campaign. Forester N.R. McNaughton headed the Bureau of Publicity, starting

November 6, 1915. One of the bureau's first projects was to create and staff a three hundred-square-foot forestry exhibit at the Pennsylvania Welfare and Efficiency Conference. The bureau issued 450 news articles, and a contract was signed with the Vitagraph Company for a "motion picture" of forest fires. The theme was fire prevention; the title was "The Curse of the Forest."

Mont Alto was used to stage a forest fire for the film. The Bureau of Publicity purchased one copy of the film, released in October 1916. The movie, in three reels, was first shown to the Wildlife League convention in the fall of 1916. In June 1917 Eastern Motion Pictures was hired to make a duplicate copy of "The Curse of the Forest," but this was still below the estimated need for at least four copies. Over time, the film was viewed by two hundred thousand people, but a lack of budget to acquire large numbers of duplicates restricted its showings.

Other bureaus formed within the Department of Forestry were the Bureau of Silviculture, for forest management on state and private lands, and the Bureau of Administration, for handling the many details of running a large department.

State of the Forests in 1920

The Forest Commission's Report for 1920 stated "45.47% of the Commonwealth's 8,720, people in Pennsylvania. This is ample to meet every resident's wood needs if the forests are all made productive. Five million acres of the forest area is land not suitable for clearing for agriculture." Table 10 shows the land ownership categories of Pennsylvania forests in 1920 as reported by the commission.

The Demise of Chestnut Trees

From 1908 to 1913, the chestnut blight fungus swept through Pennsylvania, presenting a tremendous challenge to the Department of Forestry. Infected and dying American chestnut trees were first noted in 1908 on estates of wealthy residents near Philadelphia. The estate owners were concerned about the loss of aesthetic value and others were concerned about economic losses because chestnuts were very valuable and useful trees. Unfortunately, no amount of money or concern could stop the blight. It was such an effective killer of trees and spread so easily on the wind that in a few years, the American chestnut, one of the dominant and valuable trees of Pennsylvania and many other states was essentially wiped out. The blight would continue to spread to wherever chestnuts grew until all the chestnut trees in American forests were infected. The species is tough. American chestnut trees can still be found sprouting new growth over and over from killed-back stubs, only to be decimated again by the blight.

Chestnut blight, first discovered in the U.S. at the New York Zoological Park in 1904, is believed to have come from Asia on materials imported from Europe. William A. Murrill found the blight fungus on trees in parks near New York City. Next, it was found devastating trees along the shores of Long Island Sound. After the blight was identified in Pennsylvania in late 1908, a state inspection, organized to determine the extent of the disease. The program started operating in the spring of 1909. The Pennsylvania Department of Forestry had the services of the best expert on the disease available, Dr. John Meckleborough to survey the problem.

By 1910 chestnut blight was found in Pennsylvania all along South Mountain to the Maryland line southwest of Gettysburg. It was also found in Northampton, Bucks, Montgomery, Chester, Lancaster, Pike and Monroe Counties. Reporting on the findings, commissioner Conklin said, "The usefulness of the chestnut timber is so well known and recognized that its loss would be a calamity of appalling proportions."

Pennsylvania was one of the first states to attempt to stop the disease. The legislature authorized \$275,000 in 1911 for research; on September 1, a Chestnut Commission was formed. S. B. Detwiler, a Minnesota forester, but a Pennsylvanian by birth, headed the commission, with offices in Philadelphia. The Pennsylvania Forestry Department had worked at setting up a field organization to combat the disease a month previous to formation of the Chestnut Commission, and now they turned their organization over to the new commission. The strategy was to try to save as much of the wild chestnut as possible and to prevent spread of the disease into the western counties. An early attempt was made to clear a barrier zone near the New Jersey state line to keep the disease from spreading across Pennsylvania but it was concluded that it was already well advanced into the state. By 1913, after much effort and the expenditure of hundreds of thousands of dollars, it was concluded that the American chestnut could not be saved.

American chestnut was one of the most common forest trees in Pennsylvania, found on all kinds of soils and at all elevations. Before the blight struck it is estimated that 20 percent of the forest trees in Pennsylvania were chestnuts. The trees grew large-up to seven-teen feet in diameter. Nuts from the trees were valuable food sources for wildlife and people. Chestnut lumber was handsome and easily worked into furniture and trim. The wood was durable and used for railroad ties, poles, and long-lasting fence rails; the bark was a source of tannin for leather tanneries. President Abraham Lincoln-known as the rail-splitter- undoubtedly split chestnut logs for the rail fences so common to his time in America.

A valuable tree species was lost but other species, primarily oaks, have filled the gaps left by the American chestnut. Looking at a Pennsylvania woods today, those unfamiliar with the history of chestnut blight would not see that a common native species was missing. Although nothing was found to stop the blight, the efforts to save the chestnut trees established a considerable forest research system at the federal level, which still bears dividends in its work on forest problems in general.

Chestnut trees still sprout from blight-killed stubs in American forests. Some of the sprouts survive for years before they are infected with blight again, and researchers are finding a virus that kills the chestnut blight fungus on these sprouts. There's hope that the virus may be used eventually to kill the blight consistently so that American chestnut may grow once again in our forests.

White Pine Blister Rust

White pine blister rust probably came to America and eventually to Pennsylvania on white pine seedlings imported from Europe. Pines infected with the disease developed swollen blisters on their stems. The trees died as the blistered areas enveloped their vascular systems, and bright orange spores drifted into the air as the blisters burst. The disease spread first through the white pines of New England in 1905. There was much concern that the valuable white pines of the Northeast would be decimated because, like chestnut blight, spores from the blister rust fungus blew easily on the wind.

The Department of Forestry reported blister rust near Philadelphia in 1905. The disease spread very gradually from there; at times forestry authorities believed that they had stopped the spread of the fungus. According to *Forest Leaves*, fall 1922, victory over the disease was declared prematurely in 1921 when authorities thought that blister rust had been confined to the northern end of Wayne County by an aggressive Department of Agriculture campaign to remove the disease carriers.

The pine disease has a special requirement that makes it a less successful tree killer than chestnut blight. It spreads on the wind like chestnut blight but cannot transfer directly from tree to tree. The fungus has to pass through a stage of living on an alternate host, currants and gooseberries, genus *Ribes*, before it can infect pines. S. B. Detwiler of the U.S. Bureau of Plant Industry, and previously head of the Chestnut Commission, found the alternate stage of blister rust on leaves of black currant and made the connection to the disease's life cycle.

The white pine blister rust control solution was to destroy all currant and gooseberry plants near white pines. This was easier said than done. By 1927 blister rust was found throughout Pennsylvania. Work crews scoured the woods removing *Ribes*. School children were organized and trained to hunt and pull out *Ribes* in pine areas. At the height of control efforts, 850 people were employed in control work in Pennsylvania.

In 1929 control of white pine blister rust became a cooperative program between the Pennsylvania Department of Agriculture, the United States Department of Agriculture, and the Pennsylvania Department of Forests and Waters. The Pennsylvania White Pine Blister Rust Law gave all legal authority for control of this disease to the Department of Forests and Waters in 1933. Control work proceeded for decades but by 1972, with better understanding of the impossibility of removing all ribes from pine forests and the realization that because of the functioning of the disease, pines would not all be infected, control efforts were ended. Pennsylvania still has significant forests of white pine because, fortunately, this disease is not a consistent killer of trees.

Gypsy Moths Come for Dinner

Gypsy moths {also spelled, in the past, gipsy moths) are another imported pest affecting forests. The insects first found the forests of Massachusetts to their liking when they escaped there from a research project investigating possible silk production by gypsy moth caterpillars. In the larval {caterpillar) stage, they are voracious eaters, consuming the leaves of most tree species when hungry. They prefer oak leaves and have spread in alarming numbers through the oak-filled forests of the Northeast.

The insects can make a summer hillside look like winter as they devour every leaf in their paths. In a large gypsy moth infestation, of even one year, significant growth is lost, weaker trees are killed, and many others die over time from being weakened by the defoliation. The healthiest trees will generally survive one year of defoliation, but mortality increases significantly when defoliation occurs two or more years in a row.

The first small infestations of gypsy moths near Loretto, Pennsylvania, in 1920 were quickly eradicated. Three more infestations were eradicated in following years. By 1932 gypsy moths were widespread in the state and doing significant damage. A national plan was formulated during this time. The plan was ambitious, setting goals to exterminate gypsy moths in New Jersey; erect and maintain a barrier zone along the edges of the infestation in New England; exterminate any infestations found outside the zone; restrict shipment of nursery stock and other products that might carry gypsy moth eggs from New England; and develop and test the use of natural enemies of the moth in New England. A yearly budget of \$925,000 was raised to be used in Pennsylvania, New York, and New Jersey.

The difficulty was in keeping the insects in one place. Gypsy moths lay eggs inconspicuously on any handy solid surface. Cars, trucks, recreational vehicles, and goods moving from infested to uninfested areas carry the eggs. People from New England, moving their household goods to Pennsylvania, unknowingly brought the insect

with them. Campers and truckers carried them too. In our free flowing society, there was just no way to keep the insects out. DDT, lead arsenate, and various spray programs were attempted. They killed the insects but left unwanted side effects, and gypsy moths kept returning, carried by the constant flow of goods and people. In 1963 the use of DDT against the gypsy moth was discontinued.

In October 1971 gypsy moth control responsibilities were transferred from the Pennsylvania Department of Agriculture to the Department of Environmental Resources. Efforts now center on developing natural controls-insects, diseases, and parasites-that will kill the gypsy moth. Biological agents such as bacillus are used as sprays when called for.

A parade of forest insects and diseases-some native, some imported-passes through any forested area. The oak leaf roller in Pennsylvania, building from a small infestation in 1967, spread until, at the peak in 1974, 1,045,000 acres were defoliated. This was one of Pennsylvania's most destructive insect attacks, killing oak timber valued at \$100 million.

Like forest fires, insects and diseases will always be with us. A state forestry agency dealing with these pests has always been important and will continue to be.

Tales of Two Forests

In the first decade of Pennsylvania's state forestry agency, rangers and foresters far back in the forestry reservations carried out their responsibilities despite bad roads, no roads, un-located boundary lines, fires, wood poachers, low pay, and poor living conditions. Correspondence from these times tells a great deal about their daily concerns. With no phones, no radios, and often no electricity, mailed letters were their primary means of communicating with the far-away headquarters in Harrisburg. Many letters inquired about eagerly awaited facilities to replace the tents, shacks, and boarding houses that served as offices and living quarters.

A sampling of correspondence from Department of Forests and Waters general correspondence files in the Pennsylvania State Archives follows.

White Deer State Forest

Raymond B. Winter was the forester assigned to White Deer State Forest. He also worked at Young Woman's Creek State Forest. He graduated from Mont Alto Forest Academy and was assigned to the forestry reservations September 1, 1910. Winter's letters are handwritten on white bond stationery; across the top is printed: "Pennsylvania Department of Forestry, Forester's Service." Winter had neither typewriter nor an office to keep one in for many of the early years. Letters from head-quarters (mostly from Commissioner Conklin) are typed-the copies are blue carbon copies on yellow paper. The headquarters' typewriter had a faulty, worn down "m", turning matter into "ratter."

August 1910, Winter corresponded with Conklin from Mifflinburg, where he was staying at a desolate-sounding boarding house named Forest House. His expenses show \$24 per month for board and \$10 for horse feed and stable. Winter describes the facility as "drafty" and indicates problems with the proprietor, who kept trying to raise the rent and reduce services. Winter wanted to move but there was little else available in the area. Also in 1910, Winter reports to Conklin, "There are reports of chestnut trees dying in the area. Scouts from the Chestnut Commission are working nearby and I will talk with them."

A May 11, 1911, letter from Winter to Conklin reports, "planted 10,000 white pine in old fields on the forest this week." Winter asks permission to go to State College to attend a meeting of the Pennsylvania Forestry Association. Permission was required from the commissioner before a forester could leave his assigned forestry reservation.

Management was brusque in these times.

June 10, 1911:

To Mr. R.B Winter, Mifflinburg, Pennsylvania:

I find among your expenses, one for a trip to Pittsburgh. We do not pay expenses to Pittsburgh.

Yours Truly,

Commissioner of Forestry

October 4, 1911, from Winter to Conklin:

"There are more reports of chestnut blight killing trees near Mifflinburg."

Winter complains to Conklin on July 31, 1911, "It is almost impossible to get men with anything this month on account of harvests in the valley and the huckleberry crop in the mountains. Some men are making 3-4 dollars per day picking berries and families pick too. Our \$1.50 per day can't get men." Blueberries were commonly called huckleberries in the early 1900s. Picking them for shipment to the cities was a source of scarce cash.

Winter reports more indications of the spread of chestnut blight December 2, 1912, and works in another complaint about wages. "Chestnut blight crews have found 100 diseased trees, the Chestnut Commission pays their workers \$2.00 per day, our rangers can only pay 20 cents per hour for actual time worked, making it very difficult for us to hire help on the forest." A 1913 note mentions again that the Chestnut Commission is hiring chestnut blight scouts at high wages, causing difficulty in hiring help in the forest.

Equipment for the foresters was very limited. Apparently, one folding-sight compass, with tripod and pins, and a surveying chain were shared and shipped back and forth between foresters. Frequent notes in 1911-1912 ask, "Who has the compass and surveying equipment?"

Positions were tenuous. The political parties sought to place political friends in state jobs whenever administrations changed. In 1912, Winter writes to Conklin, "We have received certificates of enrollment. We are all Republicans but scared of signing, is this a trick?" (Winter eventually was fired in one of the administration changes, and then later rehired in another change.)

May 13 1912, Winter reports that "We are struggling to get phone lines in, the work is slow. Chestnut from the forest is serving nicely as poles.

In 1913, problems with leasing campsites in the forest to hunters for \$15 per year took considerable volumes of correspondence. One, called "Crabapple Campsite" was in contention among various influential people. Arguments flowed back and forth by mail as to who reserved the campsites first. Winter asked Conklin to referee.

Commissioner Conklin was fond of trout, occasional notes from Winter (1911-1912) indicate: "Sending you a mess of trout by freight wagon today." Conklin's typed thank-you notes indicate that sometimes the trout arrived in good condition and sometimes they took a slow journey and arrived spoiled. Most materials moved by freight in these times, communications were by letter, and occasional urgent messages were conveyed

by telegraph. A telegraph message was sent, for example, from Conklin to Winter to dismiss a fire warden who got drunk and refused to follow orders.

From 1915 through 1917, there are frequent notes requesting a typewriter. Letters from Winter in 1917, still handwritten, indicate that he was starting to provide forestry advice, on request, to area landowners. In the fall of 1917, hunters were competing again for camp leases and confusion reigned on the forest as Winter wrote to Conklin, "There is much confusion over Boney Shanty camp. Men by the same name claim to have leased the Boney Shanty camp but on different forests." Winter's budget, attached to this letter, indicates that his salary was \$100 per month in 1917.

World War I was of concern in 1917. Many letters discuss draft numbers and categories. Winter was class 1A and likely to be drafted into military service at any time. He wrote to Conklin, "I am on the #32-36 list waiting for notice of being drafted. I want to serve but who will take care of my forest?" By July 31, 1917, many foresters and rangers were being drafted. December 1917, Winter to Conklin: "20 inches of snow here. My Ford is useless in going anywhere." February 18, 1917-ttip to a meeting in Harrisburg! Winter's expenses for the trip show: "Railroad from Mifflinburg to Glen Iron to Lewisburg; then to Harrisburg." The total cost for the three-day trip is \$8.22, including meals and hotel.

July 17, 1918, Winter reports: "We are cutting chestnut for telephone poles from dead trees on the forest and stringing telephone wire to fire towers." Winter's budget sheet shows that he has just received a raise-to \$125 per month. Rangers received fifty to sixty dollars per month. World War I was in full force in 1918. A U.S. Division for Production of Spruce Products is being formed to harvest strong, light spruce in the Northwest for airplane propellers and fuselages. Winter considered volunteering for this division. September 5, 1918, Winter was drafted. By October 1 he was in Lewisburg at Bucknell University attending Army Training Corps school. Ranger Roadarmel took over the forest reservation for Winter and was raised to sixty dollars per month. Winter's service pay was thirty dollars per month. By November 15, 1918, the war was winding down and Winter was allowed to resign from the army, and by late November he was back at Mifflinburg and his beloved White Deer Forest.

February 11, 1919, the typewriter quest continues. Winter writes: "Still no typewriter. I was told in January that I would get a machine in a few days. I have waited since for over a month." April 17, 1919, a typewriter arrived at White Deer Forest! Winter's letters are typed hereafter.

From 1916 to 1919 there were numerous letters from Winter regarding game officials poisoning varmints and vermin. (Varmints and vermin were whatever the game officials said they were.) Mostly, officials seem to have been trying to kill foxes and raccoons suspected of eating game birds and their eggs and killing farmers' chickens. Most chickens were "free range," then and thus were available as prey for wild animals. The poisoning consisted of scattering frankfurters ("doggies," Winter called them), sausages, and other bait laced with strychnine wherever the varmints were thought to be. The problem was that the local residents' valued hunting dogs frequently ate the poisoned bait and died. The residents showed their dislike for state actions by burning the state's forests. Winter met with the residents and promised to write to Harrisburg to try to stop the poisoning, and he did, over and over and over for several years, until it appears that the activity stopped.

On August 4, 1919, Winter writes to Conklin about a local dilemma. "We have lost several phone line insulators in the forest. It's reported that boys are shooting them off for sport." Two weeks later he reports, "I have talked with the boys' families and then the

boys. They have admitted to shooting the insulators and will each pay \$3.00 from their working money." These were simpler times.

December 1919, the age of the automobile has begun with symptoms reported by Winter. "We are losing trees near the roads as people are driving into the forests and digging up the states trees for ornamentals. They are very difficult to catch as they come and go very quickly at unpredictable times."

There were letters back and forth in 1920 regarding a political flap. Winter was accused of being involved in the campaign of a local senatorial candidate. He denied it.

Throughout the file of letters over the years, it becomes apparent that forester Winter had a deep devotion to his work and the forests that he worked in. It is fitting that a state park is named for him.

Tea Springs -Logantown, Pennsylvania

Homer Metzger was the forester in charge of Tea Springs District. His letters were brief and more formal than Winter's. For example:

Pennsylvania Department of Forestry Foresters' Service

Logantown, Pa. July 24, 1911

Hon. Robert S. Conklin,

Harrisburg, Pa.

Dear sir:

I have yours stating that I am paying my cook too much. It is impossible for me to get a cook at 10 cts an hour. I can get a cook at 12 and 1/2 cts an hour by paying seven days in a week. Kindly advise me.

Yours Truly,

Homer S. Metzger

Pennsylvania Department of Forestry

Forester's Service

Logantown, Pa. Aug. 19, 1913

Hon. Robert S. Conklin,

Harrisburg, Pa.

Dear sir:

Will it be satisfactory to paint the barns white with green trimmings?

Yours Truly,

Homer S. Metzger

In 1913 Metzger's budget for the year totaled \$755: \$500 for 4.5 miles of new road, \$100 to repair and "brush" 5.5 miles of old road, \$60 for 3 miles of new fire lanes, \$25 for brushing 6 miles of old fire lanes, \$70 for cutting new trails.

January 9, 1914, Metzger writes to Conklin, "Relative to yours of the 6th inst., concerning the removal of the pile of manure at Kulp's camp on White Deer Creek, beg to say there is 30 or 40 loads there. The nearest place to haul this that will be off the White Deer Creek watershed is to Tea Springs. Over this distance, only one trip a day could be made. The manure has been there for sixteen years and lost much of its value. A bridge will have to be built across the creek to get the manure out at a cost of about \$125. I

may be able to give the manure to some farmers for hauling it. Will you kindly advise me?"

In July of 1913 there were staff cutbacks. Metzger, in charge of twenty-seven thousand acres with two rangers, was asked to cut one position. He states, "That as this is a long narrow reserve, two rangers can be kept busy." But he reluctantly indicates which ranger he would prefer to keep if the cuts were insisted on.

In fall 1914, letters indicate that Metzger and a crew were gathering tree seeds from the forest for the state nurseries. The seeds gathered were white oak, red oak, box elder and red maple. Trout were being stocked in the streams of the forest and grapevines planted for food for game birds, in a cooperative program with the state fish and wildlife agencies. Considerable housing was being built at this time. Many letters are concerned with wives of rangers and foresters asking about needed facilities-water pumps, kitchens, chicken houses, and hog pens are frequently inquired about. Commissioner Conklin discussed wallpaper for a kitchen in a long and repetitive series of letters over several months.

Letters from Metzger in September 1914, refer to his living in a tent because the forester's house has burned. As cold weather comes, his letters to Conklin ask, with increasing urgency, " Any prospects of a house being built this fall? I can stay in the tent for a couple of months yet but if no house will need to look for winter quarters." Living facilities were sparse, but the mails were working well. Letters mailed from Logantown in the morning got to Harrisburg the next day by about 3:30 in the afternoon. March 18, 1916, Metzger's letters indicates that he is boarding out and carrying his office with him while still waiting for a house. The rented facility burned and the office records and instruments were lost. More letters report that he is moving from place to place for the winter as facilities close, rents are raised, and life is otherwise made difficult. A forester's house was being built, but there were frequent delays caused by shortages of materials and the moods of the contractor, Mr. Beck. Many letters discuss missing lumber, delays with the mortar, etc. June 7, 1916 Metzger reports that he has moved into the new house and connected the "light plant" {electrical generator}.

In 1919 correspondence indicated that Metzger is in charge of Tea Springs Forest with 26,000 acres and McElhattan forest with 11,505 acres.

The Forestry Staff Goes to War

When the United States entered "The German War" on April 6, 1917, many members of the forestry department were called into service. Most of the young men who trained at Mont Alto Forest Academy enlisted. They were accepted readily because their job requirements ensured exceptional fitness for military service.

A 1916 forestry department report lists forty-two members of the department in the service as well as six students from the forest academy. The 1917 department annual report states,

War conditions have severely affected The Bureau of Silviculture. On January 1, 1916, our working force consisted of the forester in charge, one stenographer and ten assistants. By December 31, 1917, enlistments and resignations had reduced the bureau's force to the forester in charge and the stenographer.

The department suffered severe shortages of staff and materials throughout the war, although construction of steel fire-lookout towers continued and was mentioned in reports in August 1917.

The forests of Pennsylvania were not drawn upon significantly for wood supply for this war to the extent that they would be in World War II. Large quantities of American wood were used in World War I for wood and paper products and for shipping containers, but the largest amount of wood by far was supplied by the forests of Europe. Huge volumes of lumber went into shoring up trenches and building bunkers in battle line after battle line as the allied forces moved forward by trench warfare. Most of this lumber came from the forests near the battle sites as troops on both sides built their protective shields of soil and wood. The French forests, grown by their foresters and landowners over generations, were harvested nearly to the disappearing point to meet war needs. American foresters were commonly assigned to the tasks of supervising logging jobs and running sawmills near the front lines. From this, many Pennsylvania foresters and rangers saw the benefits of European forestry first hand, as they harvested and processed trees at the front in American engineer battalions created especially for this function.

CHAPTER FIVE,

Gifford Pinchot-

New Views

Pinchot Whirls into Harrisburg

Recently-elected Governor William C. Sproul asked Gifford Pinchot to look at the operation of Pennsylvania's Forestry Department in 1919. Pinchot looked, decided he wanted the job of forest commissioner, and Commissioner Conklin was out in early 1920.

Pinchot was the first American trained in forestry, and the first forester to be Pennsylvania Forestry commissioner. He had been chief of the U.S. Forest Service and was used to the power of office, and to getting his way. His family wealth gave him freedom to do what he wanted. In a letter to Governor Sproul, March 23, 1920, Pinchot said, "Yesterday you expressed interest in knowing what has been done in the Department of Forestry since you were good enough to ask me to take charge. Because of engagements made before your offer reached me, I have had but six days in Harrisburg since my appointment, otherwise there would be more to report. A good beginning has been made in substituting a feeling of cooperation and mutual interest among members of the department instead of the previous condition of master and man, and the result is already evident in a marked improvement of output morale"

Pinchot worked hard to raise salaries and budgets but conserved funds on things he viewed as unnecessary. For sometime after taking office, he wrote letters on old stationary with Conklin's name crossed out and his inserted. The letterhead contained an interesting statement

Pinchot took charge quickly once he was in town. He was definitely the boss, but he raised the responsibilities of his staff with a firm rule that the foresters in charge of districts were to be consulted on all decisions in their area. Department employees were

woefully underpaid compared to other state employees in the 1920's. A letter from George Wirt to district forester in 1920 stated that, " we know that thirty cents per hour is not an adequate rate for fire wardens but it is the maximum we can pay." Full-time forest rangers earned only seventy to eighty dollars per month and foresters were pleased to receive two hundred. Pinchot thought the salaries were abysmal.

Born in Simsbury, Connecticut, in 1865 of French immigrants, Pinchot lived a privileged life. His family had gathered considerable wealth in various business ventures in New York and Pennsylvania. The Pinchots mingled with the Roosevelts, Vanderbilts, and other wealthy families as social and economic equals. Pinchot lived in palatial homes from New York City to Washington D.C. He liked the family's largest estate-Grey Towers-in Milford, Pennsylvania, the best. His wealth provided him with the finest education from private schools in New York City and Paris, and at Yale University, 1885 to 1889. After Yale he graduated from the world-famous French Forestry School at Nancy in 1890. He became the first American-born formally trained forester.

Fresh from forestry school, Pinchot set up shop in New York City as America's first forest consultant. Millionaire George Vanderbilt hired him to help assemble his Biltmore estate in western North Carolina, and establish there one of the first large forestry programs in the nation. In turn, Pinchot hired Dr. Carl Schenck from Germany to handle details at Biltmore. He had his eye on a bigger national assignment. In 1898 he was appointed by President William McKinley to head the young Division of Forestry of the U.S. Department of Agriculture, replacing Bernhard Fernow.

In 1905 Pinchot became chief of the newly created U.S. Forest Service, appointed by his good friend, President Theodore Roosevelt. He was fired from that position by President William Howard Taft in January 1910 after sparking a loud, long and furious interagency war with Secretary Ballinger of the Interior Department.

From his Grey Towers estate at Milford, Pinchot worked around the edges of public forestry in the ten years after leaving the forest service. He was itching to return to a position of public responsibility when Governor William C. Sproul asked him, as a commission member, to lead an examination of the State Forest Commission. He volunteered to be the agent of the changes that he saw as necessary.

Pinchot served as Pennsylvania forestry commissioner for only two years. He decided to run for the governorship just as he entered his second year of service. Because of Pinchot's experience and his "now-if-not-sooner" philosophy, his short two-year term brought many changes to the department. He quickly instituted a public relations unit to deal with news media, write speeches, and present information to the public in various forms. Pinchot had always understood the value of such work. As chief of the U .S. Forest Service he had conducted such an effective public relations campaign-with a mailing list of nearly 750,000 people-that Congress had prohibited his agency from spending public funds on such matters as writing news articles.

Strong fiscal and organizational controls were quickly established by Pinchot. He divided the state into twenty-four forest districts with a district forester in charge of all activities in each district. The headquarters office was divided into four units covering each of the department's major responsibilities. He expanded "service forestry" efforts, providing forestry expertise to increasing numbers of private forest owners and forest industries.

Pinchot specified that formal forestry training was a requirement for positions in forestry. He upgraded the forest academy to a four-year school, offering the bachelor of science degree in forestry. He extracted from the General Assembly a special appropriation of

one million dollars for an expanded fire- detection system-a huge amount for those days. This fund built more than fifty new steel fire towers in strategic locations with telephone connections and road access. The effort established the base for what became eventually a network of 160 fire observation towers.

The Forester's Letter

Pinchot, believing that it was important to keep people involved and informed, started a newsletter called *The Forester's Letter*, to be mailed to all employees of the department. In *The Forester's Letter* #1, March 23, 1920, he says,

The state foresters who met in this office on Friday March 12th at my request proposed a form of reorganization of the department, including bureaus of operation, silviculture, land lands. The Bureau of Forest Protection is already in existence and will continue. Lewis Staley has been selected as Chief of the Bureau of Operations. State Forests administration will be grouped into units of 50,000 acres. We have started work on salary readjustment.

I am asking each forester to send a news item every week-50 to 100 words on doings on the forests. Please mail your items by Tuesday of each week to be used in our news service by Friday.

The Forester's Letter #3, April 16, 1920, asks foresters to give priority to utilizing chestnut blight-killed timber:

Rules and orders will be published in The Forester's Letter each week. I am particularly anxious that each forester, so long as fire duties permit, should make every effort to dispose of dead, dying, infected or threatened chestnut timber on his forest to purchasers who will themselves log and remove it. This is a matter of great importance to the state since we are threatened with the destruction by time and weather of hundreds of thousands of dollars worth of material.

White pine blister rust is discussed in *The Forester's Letter* # 13, June 17, 1920, and indicates that companies are starting to hire foresters:

Rockhill Coal and Iron Co. is looking for a forester to care for 20,000 acres.

Pay special attention to white pine blister rust. Prior to 1919, only five infections were found in Pennsylvania. They were removed at once and none have been found since, but watch closely for signs of the disease and report findings to this office.

Starting July 1, foresters with their own cars used for work will receive 12 cents per mile in reimbursement.

Fifty Board Feet Will Make a Coffin

Pinchot was at his finest when putting words in the mouths of political leaders and using their power to focus attention on problems. He was also a master of vivid imagery and mass communications. On June 16, 1920, he mailed a letter to 23,500 industries in Pennsylvania regarding a governor's conference he had organized to call attention to the state's importation of wood. The letter states:

Fifty board feet of lumber will make a coffin. Penn's Woods are producing about 50 board feet a year for every person in the state. Our forests supply wood enough to bury our people but not enough to keep them alive. It takes more than 250 board feet to do that. ' So said Governor Sproul at the recent conference of wood-using industries called by him to consider the coming scarcity of timber.

Many firms attending the governor's conference on wood supply mentioned in Pinchot's letter were not ostensibly in the wood business. They were companies like Bethlehem Steel Co., Midvale Steel & Ordnance Co., Lehigh Coal & Navigation Co., Berwyn White Co., Rochester and Pittsburgh Coal & Iron Co., J. E. Baker Co., Landis Machine Co., Milton Manufacturing Co., Lovell Manufacturing Co., Pennsylvania Railroad System, Pittsburgh and Lake Erie Railroad Co., and the Philadelphia & Reading Railway Co. Railroads and mining companies used enormous amounts of wood and also owned considerable acreage of forest land so they were logical attendees of the conference. Pinchot used the conference to assert that importing wood into Pennsylvania was economically foolish and was contributing to declining interest in fire protection and in the growing of local supplies of wood.

Timber is a primary material. Most wood is now imported into the state, and the time is almost here when Pennsylvania dealers can get lumber only by bringing it three thousand miles. Cross ties for railways and mine props for the anthracite fields are being imported from the Pacific Coast. It takes double the amount of wood produced in Pennsylvania just for the wood used in Pennsylvania coal mines.

Almost one-quarter of the lumber used in Pennsylvania goes into boxes, crates and other such containers, more than for any use except building. Each adult Pennsylvanian uses double his or her weight in paper, and paper is a product of the forest. An alarming scarcity of wood is clearly in sight and burning the woods is the reason. Forest fires have reduced one-sixth of Pennsylvania to worthless barrens. The Department of Forestry has undertaken to call the attention of the businessmen of Pennsylvania to this threat against their own prosperity and the welfare of the whole State.

Pennsylvania in 1920 only produces sixteen percent of the total lumber needed in the state. Each Pennsylvanian uses 309 board feet annually; only 58 board feet of this comes from Pennsylvania. We are all paying extra for freight to bring our wood thousands of miles from beyond the borders of our state.

The forestry department under Pinchot gathered considerable information on the state's wood industry and made sure that the information was broadly distributed. A department study of the thirteen pulpwood mills in Pennsylvania in 1920 found that they were consuming almost 500,000 cords annually. The problem, as Pinchot saw it, was that 75 percent of the wood used in Pennsylvania pulpwood mills was imported from other states and Canada. Pennsylvania was fourth in the U.S. in wood pulp production after Maine, New York, and Wisconsin. The mills employed 7,144 people, paid wages of \$12,461,984, and the wood pulp produced was valued at \$60 million. Fifty-six percent of the mills used the soda process. Spruce was the favored wood, but 55,025 cords of slabs and edgings, mostly hemlock, were used by the industry. But while all this activity made jobs in the mills, it didn't produce many jobs or much income for local forest ownerships.

Pinchot campaigned in speeches and articles for more wood to be processed from local trees, and he urged the growing of more wood on state and private lands. He suggested planting cuttings of fast-growing Carolina poplar, recommended for pulp production. This wood was selling in Pennsylvania in 1920 at \$22.58 per cord. He increased timber sales on state forests, raising receipts to \$50,000 per year. State forest land acquisitions

continued at a modest pace under Pinchot. He promoted a \$25 million bond issue to increase forest land purchases by another five million acres, but failed to win approval.

Commissioner Pinchot often repeated the mission of the department, as given in the laws authorizing state forestry programs. He stated in the *Report of the Forestry Department 1920 - 1921*,

It is the function of the department to purchase, manage, control, protect, maintain, utilize and develop state forest lands; to take such measures for the prevention, control and extinction of forest fires as will assure a reasonable protection from fire to woodlots, forests and wild lands within the state; to encourage and promote the development of forestry and to obtain and publish information respecting the extent and condition of forests in the state.

More People and Facilities

The one million dollars that Pinchot secured for forest fire protection allowed tremendous expansion of the fire lookout system. The new money paid for erecting fifty steel, sixty-foot-tall fire towers and connecting the whole system by telephone. In each tower maps showing the territory within twenty miles were mounted on round tables, allowing the people manning the towers to locate exactly any fires spotted. An alidade (sighting device) was set on a pivot in the center of each map to swing in any direction to sight on a fire. With the new system, fires could be spotted, located, and reported quickly.

By January 1, 1921, there were 201 persons employed year-round by the department, 60 were foresters, 82 were forest rangers and the rest were clerks, stenographers, and surveyors. During fire season, the department employed 69 towermen, 52 inspectors, 214 fire bosses, and 17 patrolmen. There were also 581 special forest-fire wardens and game protectors, not paid by the department, and 1,695 local forest-fire wardens, paid only when actually fighting fires. Under the law of May 7, 1921, the leadership of the department was composed of a commissioner, deputy commissioner, and chiefs and assistant chiefs of the bureaus of operation, forest protection, silviculture, and research. District foresters and other foresters were required to be "persons educated and trained in forestry." A district forester was in charge of each of twenty-four districts. Each district had an office with clerical support and assigned foresters and rangers. In addition to the fire lookout system, the department added considerably to the accessibility of state forests in 1921, building 199 miles of new roads and 280 miles of new trails, while maintaining and repairing 1,334 miles of old roads and 1,167 miles of old trails. The department also developed 143 miles of road and 157 miles of trails as fire lanes. The department also considered the broad context of forests, as in May 1921 it identified and set aside from harvesting "Unusual and Historic Groves of trees."

A Controversy: Regulate or Educate?

During Pinchot's term as commissioner, he continued to advocate strong federal regulation of timber harvesting on private forests. He wrote and spoke frequently regarding his belief that federal authorities should control how private forests were managed. The concept created major wars in forestry circles, and with forest industry and private landowners all over the nation, until a real war (World War II) turned America's attention to basic survival.

In December 1920, most of the state foresters in America met in Harrisburg to organize as the National Association of State Foresters. At the meeting, Pinchot pushed vigorously for the state foresters' endorsement of federal regulation of private forests. His opponent in a debate on the matter, argued for improving forestry on private lands

through educational and advisory efforts. That opponent, curiously, was a federal bureaucrat-Col. William B. Greeley, the new chief of the U.S. Forest Service.

The state foresters did not endorse Pinchot's call for federal regulation in 1920, although debates on the matter have certainly continued over ensuing years throughout the profession. Systematic federal regulation of private forests has not come to pass, although a mass of federal regulations now affect various private forestry activities in various ways. States have also imposed forest practice regulations to varying degrees, as have some towns and counties. Greeley's call for educational and advisory programs to improve the care of forests is also in action through various federal and state programs. The public's answer to the 1920s Pinchot-Greeley "regulate or educate" debate, over time, has been, "Yes, let's do all those things."

Pinchot took leave without pay in April 1922 for his successful drive for the Republican nomination for governor. In November he was elected governor of Pennsylvania. He served one term (from 1923 to 1926) as the state constitution permitted, was out of office for a term and then ran successfully for a second term in 1930. His 1930s term, and ambitions for higher political office led to a stronger political patronage system that fired state employees (including foresters) of the "wrong" party off and on until civil service protection ended the practice.

Predictions

In the December 1922 *Forest Leaves*, J. S. Illick of the Pennsylvania Forestry Department made some predictions regarding forests. It's interesting to observe present conditions in light of these estimates. More than seventy years ago Illick said,

In 1860, Pennsylvania was first in the nation in lumber production. It's now in 20th place. Of the 28,692,480 acres in the state, 28,650,000 acres (or thereabouts) were originally in forest growth.

Forests were cut initially primarily to clear for agriculture. The situation changed between 1860 and 1900 when only a small percentage of the cutting was to clear for agriculture, instead most cutting was by large lumbering operations in the mountains. Much of the land that was originally cleared for agriculture has been abandoned as unsuitable for crops and is now coming back to forests. By 1972-50 years from now-Pennsylvania should have 14,000,000 acres of lands covered with forests.

Pennsylvania's original forests carried at least 17,500 board feet and 10 cords of wood per acre. Cut-over land carries about 4 cords of wood per acre on average. We estimate that the average acre of Pennsylvania forest now carries 6.25 cords per acre.

Wood volume on the average forested acre will rise from 6.2 cords in 1922 to 26.5 cords in 1972. In 1922, values are \$2.00 per acre for land, \$7.00 per thousand board feet for timber, and 50 cents per cord for fuelwood. We estimate the average value of forest land at \$137 per acre by 1972.

Illick's projections pointed in the right directions, but modestly. Pennsylvania forests covered more than 16 million acres in 1972. The acreage of Pennsylvania forests has continued to increase. It is now 17 million acres, and these acres are very well stocked with trees, growing twice as much per year as the harvest rate.

The Passing of Dr. Rothrock

Dr. Rothrock died after a short illness on June 2, 1922, at his home in West Chester, Pennsylvania. He had been involved for almost sixty-two years in shaping the commonwealth's role in forestry. Rothrock was lecturing about forestry before there was such a profession in America, but he did more than lecture. He built a department to operate forestry programs in the state, trained foresters, bought land, and served on the Forestry Commission Board to shape state forest policy for decades. It was an amazing commitment from an impressive person.

Technology and Fire Control

Forest fires remained a major problem in the 1920s, but new detection systems, better fire fighting technology, telephone communications, and improved staffing was beginning to help. In 1920, 1,597 fires bummed 240,263 acres of forests; by 1921, the area bummed had been reduced to 162,295 acres, although there were 2,384 fires. (This has been the trend over time; there are more fires, but better detection and suppression reduces the area burned.) Half of all the fires were still in March, April, and May. Railroads caused 35 percent of the fires in 1920, 40 percent in 1921. There were eleven hundred miles of active railroad lines through the forests of Pennsylvania. Fires spread from sparks emitted by locomotives on these lines and from maintenance crews bumming brush, used ties, and other debris.

The department manned sixty-six towers in the fall of 1921. Fifty steel fire towers, ranging from thirty-seven to sixty feet tall, had been built in 1920. In state forests there were twenty-four steel towers, twenty-five wooden towers and forty-four tree towers. On private lands there were forty-six steel towers and fourteen wooden towers.

Pennsylvania's 1921 forest fire detection system had 686.9 miles of telephone lines to maintain. The department's firefighting tools consisted of 1,000 compressed-air tanks to spray water on flames; four gasoline water pumps, placed with district foresters; 3,500 torches for backfiring; 3,000 collapsible pails for carrying water; 1,200 hand axes; 1,000 double-bitted axes; 5,000 canteens, and 5,000 especially constructed fire tools for building fire lines and beating down fires. The especially constructed tools were "Rich rakes" and other such fire tools built by a former state fire warden named Rich. He patented the tools, which had the advantage of being constructed by someone who knew about fire fighting. Rich was also a founder of the Woolrich company and a congressman. The 1920s firefighting tools may not sound technological today, but they were a great advance from the old system of men using forked sticks to scratch fire lines in the ground and green hemlock boughs to beat out flames. Above all, the telephone lines allowed for quick reporting of fires.

New Views-Forest Monuments and Scenic Areas

By 1921 the Forestry Department was operating seven state forest parks covering more than two hundred acres. Several of the parks were reconstituted private parks, such as the one mentioned earlier at Mont Alto. In addition to the parks, from the beginning of state forestry, areas of special beauty or interest had been set aside informally on state lands. This was formalized in the 1920s. Areas of special natural or recreational interest were set aside on a regular basis by the State Forest Commission "because of their noteworthy or historic groves of trees, or scenic attributes, they have been considered worthy of special preservation." The actions had the force of law from a 1920 Act "Regarding Unique and Unusual Groves of Trees." There were nine forest monuments covering twelve hundred acres, and two special scenic areas in 1921.

Pennsylvania was a national leader in public lands. In 1922, the state ranked number two in the nation in state-owned forests, with 1,126,236 acres. New York was number one, with 1,936,492 acres of state-owned forests; Wisconsin was third with 380,443 acres.

The Allegheny National Forest

The first federal purchases for national forests in Pennsylvania were initiated in 1921 for the Allegheny National Forest. The Pennsylvania enabling act of 1911, which allowed the U.S. government to acquire forest land in the state, had been amended, deleting the clause that allowed the state to take back any lands acquired by repaying the acquisition costs with interest. The new national forest was the first application in Pennsylvania of the Weeks Law, under which lands could be acquired in the East, with permission of the state involved. The National Forest Reservation Commission, formed under this law, was approved to purchase 412,000 acres in the headwaters of the Allegheny River.

The Weeks Law had passed Congress July 11, 1916, after years of torturous discussion. Prior to this the federal government could only acquire forests in the West.

The beginnings of the Weeks Law hark back to efforts by the Appalachian National Park Association, the Society for the Protection of New Hampshire Forests, and others, to encourage federal acquisitions of forests in the southern Appalachians and in the White and Green Mountains of New England. The 56th Congress, in December 1899, was urged to set up parks in mountainous headwaters to protect states from drought and floods believed to be caused by destructive logging. Governors of the states were actively involved in promoting the law, and President McKinley, and then Roosevelt discussed the need for the law in messages to Congress. Protection of the navigability of rivers and streams was the cardinal purpose behind the Weeks Law, although wood supply for nationally strategic reasons was discussed as well. Forest management and timber production were added to watershed concerns as compatible activities.

The eastern national forests weren't created easily. Over ten years, six Congresses considered forty-seven different bills on the subject. The bill that became law was submitted by Representative John W. Weeks of Massachusetts-later senator, and later (1920) secretary of war. While secretary of war, Weeks became president of the National Forest Reservation Commission. The commission included the secretary of the interior, secretary of agriculture, two members of the Senate appointed by the president, and two representatives appointed by the Speaker of the House. The importance given to forest influences on stream navigability is indicated by the involvement of the secretary of war, who was concerned with the ability to move military forces on American waters. (Later research has shown that neither the lack nor the presence of forests has much direct effect on navigability, but the accepted opinion of the time was otherwise.)

It was required that land purchases approved by the commission also be approved by the state. Agricultural lands within national forest purchase boundaries could be resold for farming by the secretary of agriculture. The Weeks Law also required that twenty five cents out of every dollar paid to the federal government for timber harvesting or other national forest use, be remitted to the state for schools; in addition, ten cents of each dollar of income was to be spent for roads in the national forests, and another ten cents put into a sinking fund to repay money advanced for roads.

The Pennsylvania Forestry Association welcomed the establishment of the national forest in Pennsylvania. The association had campaigned for it vigorously. While forest

preservation was one item on PFA's agenda, it clearly saw a role for the federal forests as producers of timber. *Forest Leaves*, June 1922, said,

A National Forest within the borders of the State of Pennsylvania is soon to become reality. It will be in the heart of the once-famous white pine and hemlock region, where lumbering was the first industry; followed by oil and gas. Today, most virgin timber has been cut. About half a million acres of mostly cut-over land will be bought.

Owing to the highly developed industrialized condition of our country, there will always be a large demand for forest products, which are so important to the prosperity of our region. One of the most important future functions of the Allegheny National Forest will be to help supply this demand.

As PFA said, most of the timber in the Allegheny National Forest had been cut and fires had bummed over the land. Writings by James Vessey, a forester who worked in the new national forest, describe the area as the "Allegheny Briar Patch." Vessey saw the forest- to-be from the beginning of purchases as he worked in various roles, ranging from land surveyor, to recreation planner, to chief of information and education. In the summer of 1924, he surveyed land near Sheffield for purchase for the new forest. Reminiscing in the November-December 1986 issue of *Forest Leaves*, Vessey recalls, *There was no road to Sheffield in 1924. We took a trolley car over the top of the Glade Bridge and then walked. We boarded out at various farm houses for the summer to be close to the work. In those days the area was known as the 'Allegheny Burn' or 'Allegheny Briar Patch.'*

Vessey left the forest for a time, then returned in 1933 and was hired as a recreation planner. He worked in the Loleta recreation area, which was at the time an abandoned lumber mill tract. According to Vessey,

There was an old log pond with a dam and a little booth where people could change clothes for swimming. A new dam was built and the area was improved. The fires of 1926 had burned up from Bear Creek, burning out the whole area. The only trees at Loleta were aspen, and not many of those.

Today, the Allegheny National Forest covers 465,200 acres. Seventy years of forest growth has erased evidence that there was a logging town called Loleta, or that the area was considered a burned-over briar patch.

Robert Y. Stuart, 1922-1923

Major Robert Young Stuart served as deputy forestry commissioner under commissioner Pinchot. He was acting commissioner during Pinchot's leave of absence to run for governor, and then, after Pinchot's inauguration-in January 1923-was appointed commissioner of forestry. Stuart was born in South Middleton Township, Cumberland County, Pennsylvania February 13, 1883. He graduated from Dickinson College at Carlisle with a bachelor of arts; then attended Yale University School of Forestry, graduating with a degree in forestry in 1906.

On graduating he entered the U .S. Forest Service, as most Yale forestry graduates did then, and worked in various positions in the national forests and in Washington. At the start of World War I, he took military leave and was sent to France-in September 1917-as a captain, heading the 19th Forestry Engineer Regiment. He was assigned to the American Expeditionary Force headquarters in France to secure timber for the two

forestry units over-seas-the 10th and 20th Engineers. He supervised the substantial movements of wood from French forests to the Allied war effort through- out the war, rising to the rank of major, commanding the Fifth Battalion, 20th Engineers. At war's end, in June 1918, he returned to the United States and rejoined the U.S. Forest Service.

He returned to Pennsylvania in May 1920 to serve as Pinchot's deputy. Stuart continued many of Pinchot's programs, including *The Forester's Letter*, but he changed it to a more inclusive *Service Letter*, and expanded it to include more comments from the field staff and an open forum for discussion on a weekly basis. This *Service Letter* of May 16, 1921, is still very applicable. "Mouths are getting larger. The reason is simple. Words are getting bigger. Please write and speak clearly, using words that are common to everyone." Further on, the *Service Letter* informs readers that

George Wirt received the following letter from Dr. Schlich of Oxford, England: Regarding your question on the loss of increment (annual tree growth) from the loss of litter (leaves, twigs and fallen woody material). The loss in the case of beech woods in the Spessart was found to amount to 13 per cent annually if the litter was removed every 3 years, and it was 10 per cent annually if it was removed every 6 years. This means that on an area normally capable of producing 100 cubic feet of new wood per acre per year, if the litter is removed every 3 years, the annual production will fall to 87 cubic feet per year. If litter removal is every six years, the annual production per acre per year drops to 90 cubic feet.

The degree of detail contained in this correspondence regarding organic matter in the forest is very advanced for this time.

Department reports in 1922 indicate that there was widespread settling and subsidence of large areas in the anthracite coal region as mine props rotted and collapsed in abandoned mines. Forest areas were destroyed by the settling in some case. There were frequent fires to be dealt with by the department, and conflicts with the coal companies who wanted protection from fire but questioned the necessity of anticipating collapsed mines or replanting trees on the abandoned areas. The forestry department gave the area special attention for fire protection and urged that trees be planted by the companies, "realizing," as Stuart said, "that there will be some losses."

Starting in 1920 the department began building campsites in state forests for the motoring public. Going for a drive to see the countryside was a growing attraction. By 1923 the forestry department had fourteen Class A campgrounds located in state forests along main roads. The sites were designed for tenting motorists, who often used special tarps hung from their touring cars. There were twenty Class B campsites in state forests served by secondary roads. These areas had lean-to shelters. The automobile age and the burst of prosperity after World War I brought increasing numbers of people to the state forests.

CHAPTER SIX

The Department of Forests and Waters- New Management

A New Department of Forests and Waters

June 1923, the Department of Forestry was reorganized into the Department of Forests and Waters. The reorganization consolidated the Department of Forestry, the Water Supply Commission, and the Bureau of Topographic and Geologic Survey. The stated purpose of the department was "Acquisition and management of state forest lands, development of state parks, improvement of waterways, protection of water supply, supervision of flood control projects, and protection of state and private lands."

Robert Stuart was appointed by Governor Pinchot to a cabinet-level position as the first secretary of the Department of Forests and Waters. Forestry became a bureau, in a larger department. During 1922-1923, the push continued for a \$25 million bond issue to increase state forests to six million acres. It was proposed to use profits from timber sales to pay off the bonds. The bond issue proposal continued to be debated all the way into November 1928 when it was voted down in a referendum.

Upon the end of Pinchot's first term as governor, Stuart returned to the U .S. Forest Service. He became assistant chief in charge of public relations in February 1927, then was appointed chief of the Forest Service-succeeding William Greeley-on May 1, 1928. Stuart was destined to serve as chief and lead the Forest Service as President Franklin D. Roosevelt began his struggle to deal with the Great Depression. He managed the forestry side of Roosevelt's massive CCC (Civilian Conservation Corps) programs, tremendously expanding forest service lands, trails, roads, and facilities. Pennsylvania, with its growing mass of state-owned land and its connections to Stuart, shared bountifully in the flood of money and manpower from federal CCC projects. Many of the campsites, trails, roads, ponds, and other facilities enjoyed in Pennsylvania today were built during this time. On the morning of October 23, 1933,

Robert Stuart died at work in his office in Washington.

Lewis E. Staley, 1923-1927

The size and complexity of the new Department of Forests and Waters meant that the head of the agency could no longer directly manage public forestry matters. Lewis Emory Staley was appointed deputy secretary to serve as state forester-administrator of the department's forestry bureau. Staley was Pennsylvania's fifth state forester, but the first who did not hold the title of commissioner. He was also the first to have graduated from the state's own forest academy-Mont Alto.

Staley was born on April 24, 1881, at South Mountain in Franklin County, Pennsylvania. He was attracted to forestry and the nearby Mont Alto Forest Academy, where he enrolled in the first class, in 1903, and graduated in 1906 in a class of seven men. He worked in the Mont Alto State Forest until 1910, supervising the early forest-improvement cuttings in the young forests that crept back over the land as fire protection

took hold. From 1910 to 1920 he was forester in charge of Mont Alto State Forest. He moved next to the Harrisburg forestry headquarters, as chief of the Bureau of Operations under Pinchot, and rose to deputy commissioner in January 1923. From that position he became state forester in the new Department of Forests and Waters.

There was considerable growth in federal funding during Staley's tenure, and growth in the size of the state forests. The June 7, 1924, Clark-McNary Act passed by Congress directed the secretary of agriculture to "cooperate with appropriate officials of each State in the protection of timber and forest producing lands from fire." The ensuing federal cost-sharing substantially increased fire protection organizations of all states, including Pennsylvania's.

Almost thirty years after the beginning of state forestry, Staley and his staff had more resources, better communications, and more-mature forests to manage and protect than did their predecessors. They worked with forests growing from the cut-and-clear, cut-and-move-on legacy of previous times. A description of the Rothrock State Forest District in the June 1924 issue of *Forest Leaves* indicates the size and condition of forest land at the time:

The Rothrock Forest District comprises seventeen Townships in southern Huntingdon County, four in western Juniata County and five in southern Mifflin counties. It covers 538,979 acres of land of which 301,000 is strictly forest land not suitable for agriculture. The commonwealth owns 33,167 acres of forest in the district. The district forester is located at Mount Union.

A main line of the Pennsylvania Railroad extends through the forest, affording ready shipping of products in both directions. The district is part of and east of the Seven Mountains which form a series of waves of high steep, narrow-top mountains and valleys, some valleys are quite narrow; others more than two miles wide. The district was heavily forested at first. Much of it was cleared for agriculture. Then cutting for iron charcoal followed, then rock oak and hemlock were cut for tannin in the bark. Coal mine timbers were cut next. The area has been cut and recut; burned and reburned.

In April 1927 Staley resigned with the close of the Pinchot administration. He served for a time as state forester of South Carolina; then in January 1931, in Pinchot's second term as governor, he returned to Pennsylvania and was appointed Pinchot's secretary of the Department of Forests and Waters. Staley held that position until the end of Pinchot's second term as governor in early 1935; then he became administrator of the Florida Forest Service.

Joseph S. Illick, 1927-1931

Joseph Illick, Pennsylvania's sixth state forester, was a graduate of the Biltmore Forest School in 1912. This school had grown from the early forestry project in North Carolina started by Pinchot for George Vanderbilt's Biltmore estate. The German forester, Dr. Carl Schenck, had taken charge of Biltmore estate forestry from Pinchot and had developed the Biltmore Forest School into a globe-trotting (by steamship) forestry school. He took his "students" across America and Europe to study forestry on the ground. Illick was well traveled from attending this school. Born in Easton, Pennsylvania, September 16, 1884, Illick first attended Muhlenberg College, then Lafayette College, graduating in 1907 with a bachelor of science degree in biology. He accepted what he regarded as a temporary assignment, as instructor of biology at the Mont Alto Forest Academy, intending to study medicine after a few years. Three years at Mont Alto sold him on forestry and he enrolled at the Biltmore Forest School in 1910. His

two years of study included time at the University of Munich specializing in forest pathology.

He returned to Mont Alto as professor of forestry in 1912, and then served as acting director of the academy from 1917 to 1919. Pinchot brought him to Harrisburg as chief of silviculture and research in 1920. Illick researched and wrote many of the forestry speeches made by Pinchot as commissioner and as governor. He became deputy secretary and state forester in 1927 and remained until February 1, 1931. He was particularly successful in pushing the growth of the state forest system, including one legislative appropriation, as the Great Depression was deepening, of one million dollars for land purchases. He continued the expansion and improvement of the state's fire protection and service forestry activities-increasing services to private forest owners and wood industry.

Governor John S. Fisher reorganized the Department of Forests and Waters in 1929 and formed a Bureau of Parks within the forestry agency, recognizing the growing importance of recreation on the forest lands acquired by the department.

Illick returned to forestry education after leaving the Forestry Department in 1931, becoming acting dean of the College of Forestry at Syracuse, New York, in 1943, and dean of the college in 1951. He was a prolific writer. At Syracuse and during his time with the Pennsylvania Forestry Department he was author and co-author of twelve books, including the classic *Pennsylvania Trees*.

John W. Keller, 1931-1935

In Pinchot's second term as governor, starting January 22, 1931, Lewis Staley returned from South Carolina to serve as secretary of the Department of Forests and Waters; John Keller was appointed deputy secretary and state forester. Keller was the second Mont Alto Forest Academy graduate to become state forester. He was born in 1887 at Mifflintown in Juniata County. His college experience started at Susquehanna University in Selinsgrove; then he attended Mont Alto Forest Academy, graduating with the fifth class in 1910. After graduation, he worked as a forest reserve forester at Lloyd in Tioga County, then moved to Centre County in the same capacity.

During Pinchot's term as commissioner in 1920, Keller moved to Harrisburg as chief of the new Bureau of Extension established by Pinchot. In 1928 he transferred to the Pennsylvania Department of Highways and organized a strong program of roadside tree and shrub planting for the miles of new highway under construction. He returned to the Department of Forests and Waters in 1931 as state forester.

Keller served during the years of the Great Depression. President Franklin Roosevelt and Congress moved massive waves of legislation and money to put people back to work across the nation. Much of the money and effort went into conservation work and was heavily weighted toward forestry. Pennsylvania had land, foresters, and plans so it was able to take advantage of the CCC funds and manpower coming from Washington. The state received much more than the normal complement of camps and projects. With Keller in charge and "now or sooner" Governor Pinchot pushing, CCC workers were recruited and projects were started at a furious pace. When Keller left in 1935, at the end of Governor Pinchot's second term, CCC programs were well underway all over Pennsylvania.

CCC - Roosevelt's Tree Army

President Franklin Delano Roosevelt called the 73rd Congress into session March 9, 1933, to work on his plan to pull America out of the Great Depression by putting people

to work. The Emergency Conservation Work Act (ECW)-commonly known as the Civilian Conservation Corps (CCC)-was enacted quickly. The time from Roosevelt's inauguration on March 4, 1933, to the induction of the first enrollee on April 7 took only thirty-seven days-a record for fast federal action. The legislation put together two wasted resources: young men with no work, and land-also not working. Nearly three million people were eventually employed. So much of the work involved forests that the CCC workers came to be called "Roosevelt's Tree Army."

Logistics were an enormous problem. Most of the labor force was in the East and much of the work needing to be done was in the West. The U.S. War Department was used to organize, move, and set up the CCC camps. The Agriculture and Interior Departments were responsible for organizing and planning the work. The Department of Labor, through I§ state and local relief offices, selected and enrolled workers.

The national director of the CCC, Robert Fechner, had to coordinate four federal agencies and a host of state-level organizations. He was a union vice president picked by Roosevelt to head the CCC Council which was composed of the secretaries of war, labor, agriculture and the interior. The only rule was: Move fast! Organized labor opposed the CCC at first, seeing it as a loss of union jobs, but opposition faded as the program went into gear.

The CCC was on firm ground by April 1934. It was entering its second year and was wildly popular. Workers were fed and housed and paid \$30 per month. A mandatory \$25 per month allotment check was taken out of this and sent to each worker's family. In this way money was infused into the economy all over the country. The purchase of goods and material helped business near the camps at the rate of about \$5,000 monthly. More than \$72 million per year in allotments to families made life easier for them and put money into the workers' home towns and cities. In the prime years of CCC all states wanted and all states got camps. By the end of 1935 there were 2,650 camps in operation in all the states, with more than 505,782 workers in the camps. Advisors and administrators brought the total employed up to six hundred thousand people. The CCC was a population mixer. In the 1930s many young men had never traveled beyond their hometowns. The CCC moved them to new places where they found new experiences and new relationships. Many eventually settled in the areas around the camps. An education component was added, and more than forty thousand people learned to read and write at CCC camps. Modifications added employment for Native Americans, and the 1933 Second Bonus Army march on Washington led to the president's executive order number 6129, adding the enrollment of veterans of the Spanish-American War and World War I, with no age or marital restrictions. Altogether, nearly 225,000 veterans were hired as a result.

The 1936 election year brought budget-cutting proposals. The resulting confusion meant that there were only 500,000 workers in camps that year instead of the 600,000 quota. A furor ensued and budgets were reinstated. The program began to change in 1940 as war reemerged in Europe. A new CCC director, John McEntee, and Harold Ickes, secretary of interior, were not getting along. The president's attention had shifted to war preparation. In 1940 and 1941, there were only 300,000 workers in camps. A congressional review in late 1941 recommended that the CCC be abolished. The program was never actually abolished, it was just refused funds. In June 1942, \$8 million was appropriated to liquidate the agency and the program ground to a halt as war-related employment shot up.

By the end of the program in 1942, Roosevelt's "Tree Army" had built 3,470 fire towers and 97,000 miles of truck roads, devoted 4,135,000 man-days to fighting fires, saved more than twenty million acres of land from erosion, and performed 7,153,000 man-days of other conservation work, from planting trees and wildlife food shrubs to building fish ladders in streams.

CCC in Pennsylvania

When the CCC entered Pennsylvania in 1933, the key state leaders were director of the State Emergency Relief Board, Eric Biddle, and secretary of Forests and Waters, Lewis Staley. Gifford Pinchot was governor and he regarded the program as high priority. All the necessary policy makers were strong supporters of the program. Even the Pennsylvania news media loved CCC. The *Warren Times Mirror*, May 26, 1933 said,

Some people have the idea that forest camps are of little value-that their main purpose is to provide room and board for idle men, this is not true. They are making forests-preserving one of our greatest national resources.

Pennsylvania CCC camps were among the first in the nation. A camp at Cowan's Gap was one of the earliest working in Fulton and Franklin Counties. In the spring of 1933, many Pennsylvania state forests were being used as CCC camp sites. Ten districts had been set up with a district forester in charge of each and reporting to the chief forester. By September 1933, eighty-eight camp sites had been designated and most were in operation. The people employed first were unmarried men, aged eighteen to twenty-five, from families on relief. Enrollees were sent to "reconditioning centers," most of them to Fort Meade in Maryland, for ten days to two of weeks training.

A standard day at a CCC camp started with reveille at 6:30, followed by physical training, then a hearty breakfast. Workers were trucked out to the day's work assignments, which might be road building, tree planting, or fire tower construction. Crews were frequently used to fight fires and do other emergency work. After-hours entertainment was often baseball. Baseball scouts followed CCC teams looking for talent. Many camps had their own newspapers and also contributed to the national CCC newspaper, *Happy Days*.

Pennsylvania CCC camps were set up primarily in state forests. Once the camps were established, projects were at a white heat from 1933 to 1939. Thousands of people were employed in changing the face of the state forests. They built new roads, fire towers, picnic sites, trails, reservoirs, and phone lines, and planted millions of trees. In the last quarter of 1939, Pennsylvania led the nation in CCC activity with 6,462 young men enrolled. From 1933 to 1941, the CCC established about one hundred Pennsylvania camps and put more than 160,000 people to work. The work done by the CCC in Pennsylvania include roads, trails, fire towers, tree plantations, forest campsites, and many other facilities. Many are still in place and still in use.

The nine-year record of the CCC showed that the federal government and the states could work together effectively. A summary of the work done in Pennsylvania by the CCC states that hiring 160,000 Pennsylvanians for the CCC not only supported the workers, it supported almost half a million family members (based on an average of four family members per worker).

The projects accomplished in Pennsylvania over the life of the program were the planting of 50 million trees; the building of more than 6,300 miles of roads and trails with

numerous bridges, 98 small dams, 86 fire lookout towers; disease control on 450,000 acres (such as blister rust control); and more than 65,000 man-days spent fighting fire. Picnic areas and campsite facilities were built, miles of stream bank were stabilized, and in 1939 the first intensive inventory of tree growth on state lands was completed under the supervision of the Department of Forests and Waters with manpower from the CCC.

Recollections

In *A Brief History of CCC 1* by the National Association of Civilian Conservation Corps Alumni (Arlington, Virginia, 1983), John H. Graham recalls his time in the CCC in the Allegheny National Forest:

I was twenty [in 1933] when my father must have signed me in. I took the train to Fort Meade, Maryland where we got shots, physicals and exercise programs for three weeks. Then we boarded trains for Frost, Pennsylvania, an all day trip. We were given a bologna sandwich with mustard and a little apple. Most of us got sick, the mustard turned green and all we had to drink was ice water. In them days they put a block of ice on the trains and it would melt into a tank for drinking.

We got to Frost at four PM, got on a school bus for camp three miles away, the bus got stuck in a ditch after we turned onto a dirt road. We all got out to push. There was a foot of snow on the ground, quite a change from warm Maryland. We stepped off the bus later that night in mud up to our ankles at a tent city. There were six of us to each tent. We had a funnel stove in the center of each tent. A slit in our tent dripped water on me all night. It took me two days to get the flu. We did have a doctor and a dispensary tent. I lay there three days with pills and orange juice.

The camp was run by the army. We were up at 6 to exercise, then chow, then make our bunks and stand out for roll call at 8. Then the army turned us over to the forestry department. A forester would assign us to a project, then we got on a truck and went on our way to work. Back at camp at end of the day we were turned back to the army. We were counted each time to make sure no one got lost in the woods.

At work, one man was in charge of coffee for each crew with a copper boiler and a pound of coffee. We made coffee with water right out of the handiest stream. We would build a fire for coffee and our lunch.

For projects we built roads, culverts, bridges, dams picnic areas, and cut brush. We were assigned once, 6 of us, to poison porcupines- they were killing trees. We used a tablet of strychnine and salt. We saw lots of rattlesnakes.

The forester who worked with us was a big man from Yale. He would catch insects and tell us which ones were good and bad at lunch. We planted thousands of trees on a burned out area, fought forest fires (one bad one near Warren that lasted for days) .In those days a forester had the right to stop anyone on the highway and make them fight fires. If it ruined their suit-too bad!

The first day of deer season it was like Gettysburg, cross firing from all the hills. We stayed in our barracks. We got K.P. about once every two months. Saturday we cleaned up the barracks; scrubbed the floors with sand from the creek, cleaned the sinks and showers and filled the coal bins for the stoves. We had inside toilets consisting of two holes per with garbage cans under each. Two men were assigned each day to empty

them, twelve at a time with a wheelbarrow that could haul one can at a time to a cement vault 200 feet away; then wash them out and return the same.

Our camp was named Pebble Dell, one near Marionville was called Seldom Seen. Our camp had 5 barracks, officer quarters, a mess hall and a rec. hall. Our foresters lived in town.

I enjoyed every minute of it except for the cold days. It was really interesting, one could learn a lot from this experience.

The Pepper Hill Fire

While the CCC was of great benefit to the land, and to the workers and their families, there were some tragedies. Eight CCC workers from Camp Cameron 8-132 died fighting a forest fire in Grove Township, Cameron County, in the fall of 1938. The fire, known as the "Pepper Hill Fire," started the morning of October 19 in mountainous terrain near Sinnemahoning. Two crews totaling forty-nine men were sent to the fire from Camp Cameron. The weather was very hot. Forest fuels were extremely dry from an extended drought and an early frost which had killed foliage, so the fire moved rapidly uphill.

The men were tired from fighting another fire the previous day. They hadn't returned to camp until 5:30 a.m. During an investigation after the fire, enrollee leader Edward Sofchak testified, "When we were called back out at 1:00 I looked at the men, and a couple of them were not fit in my mind for any further work- Bogush and Stephanic were pretty tired. They almost fell asleep on the truck." Other testimony at the investigations found a lack of training in fire fighting for most of the men.

The combination of tired, untrained men and fast-moving fires in hilly terrain was fatal. Tired, confused crew members got ahead of the fire and uphill from it, a serious mistake in firefighting. The fire moved more rapidly uphill than the men could and eight were burned to death. The *Pepper Hill Fire* report by Warren A. Ely in 1979 stated,

These men (most of them boys really) deserve to be remembered. Their names, ages and hometowns are listed here:

Foreman -Gilbert Mohney, age 38, Ridgeway, Pa.

Enrollee -Basil Bogush, age 19, Conemaugh, Pa. Enrollee -John Boring, age 19, Johnstown, Pa. Enrollee -Ross Hollobaugh, age 18, Rimersburg, Pa. Enrollee -Stephen Jacofsky, age 17, Johnstown, Pa. Enrollee -Howard May, Age 18, Erie, Pa.

Enrollee -Andrew Stephanic, age 18, Twin Rocks, Pa. Enrollee -George Vogel, age 17, hometown unknown.

A bronze plaque memorial to the men lost in the Pepper Hill fire is located south of Emporium along route 120 at the Wayside Memorial. Ely's report states that more-exacting firefighting rules and training were adopted after the tragedy at Pepper Hill; since then no forest fire fighters have bumed to death in Pennsylvania.

CCC at Winter State Park

R. B. Winter State Park is an example of a facility owing much to the CCC, according to *Notes for the Fiftieth Anniversary Celebration of the CCC*, by R. R. Thorpe, director of the Pennsylvania Bureau of Forestry. Thorpe's notes, prepared for the anniversary celebration at Winter State Park, June 4, 1983, indicate that the park was originally known as Halfway State Forest Park. According to Thorpe, the area was the halfway

point through Brush Valley on the fourteen-mile Narrows Road, now called the Sand Mountain Road. The original road, laid out in the eighteenth century, was used primarily to move farm produce from Centre County to the Susquehanna River for further transport on the barge canal system. In those times, the Half-way House tavern, where teamsters stopped for meals and overnight stays, was near the present location of the park interpretive building. According to Thorpe

After 1870, logging of the area began in earnest. There was a lumber camp and sawmill on the site. Fine white pine trees six feet across the stump and two hundred feet tall were cut, each one containing enough lumber to build a good size home. Old stumps from this cutting are still visible in Pine Swamp. By the turn of the nineteenth century, most of the trees were gone, and fires had burned the remains.

The Commonwealth purchased the site in 1905, but in the drought of 1909, thousands of acres burned again. In many places, even today, nothing is left but bare rocks and mineral soil. In some cleared areas and to the north, trees were saved, yielding the beautiful forests present today. By 1910, the old timber dam from the lumber camp was mostly gone. The road that is now route 192 was built in 1900, and in 1911 the county road was improved and a stone-arch bridge was built.

Thorpe reported that in 1933, the Bald Eagle State Forest operated four CCC camps of *[two hundred] men each, with one camp assigned to the Halfway Park area. He said, "One campground project here involved clearing seven acres of brush and stumps; then building the first cement and stone dam ever built by the CCC-on the site of the old log dam; making a beautiful lake. Stone fireplaces and picnic tables were built and water lines and roads were put in. Most of the work was done with hand tools.*

The renaming of Halfway Dam State Park in honor of R. B. Winter in 1955 memorialized this forester who started work in the park area and surrounding state forest in 1910. Winter dedicated forty-five years of his life to state forest work. (Some of his letters and experiences are included in this book on page76)

R. Lynn Emerick, 1935-1947

Lynn Emerick, known to friends as "Swapper," was born at Wolfe's Store, Centre County, Pennsylvania, November 15, 1885. He was a graduate of the Mont Alto Forest Academy in the fourth graduating class of the school in 1909. Commissioner Conklin assigned him to Cross Fork State Forest Reserve in Clinton and Potter Counties. This was a large block of new state forest land in 1909. It had been cut and bummed numerous times and presented a considerable challenge to fire control and reforestation. Emerick worked here until 1921 when Pinchot's reorganization assigned him as district forester for the new Lackawanna Forest District in the northeastern corner of the state, with an office in Scranton.

The district was a challenge. Anthracite coal mining dominated the economy between Wilkes-Barre and Scranton. Fires were almost constant. A new volunteer system of fire wardens was still learning and expanding

Emerick, a widower, lived in a room at the Hotel Casey in Scranton. It is reported that, to show fire prevention movies to any group he could gather, and lacking a movie screen, he often used a bed sheet from his room as a substitute. There were large acreages of private forest lands in the district and Emerick worked vigorously to introduce them to modern forestry methods.

Emerick moved to Harrisburg to become chief of the Bureau of Information and Research succeeding Joseph Illick, who became state forester. Upon the election in 1935 of Governor George Earle (the first Democrat to capture the Pennsylvania governor's seat in decades), John Keller departed as state forester. The political patronage system was still in effect and he was apparently of the "wrong" party. Lynn Emerick replaced Keller as state forester supervising the department's forestry activities. Emerick was not appointed a deputy secretary under the new secretary of the Department of Forests and Waters because the deputy secretaries at this time were not foresters.

In 1935 Emerick managed the installation of the first two-way radios for forest fire control in Pennsylvania. The first installations were in the Harrisburg district, and linked two fire towers and the district office. By 1939 almost all districts were linked by radio, a tremendous advance in communications for forestry.

State agency consolidations in 1937 added a new Navigation Commission on the Delaware River and Navigable Tributaries to the Department of Forests and Waters. This commission was moved out of the department to the Transportation Department in 1970.

Deer, Beavers, Turkeys, and Such

New problems came with the department's successful reforestation and fire protection programs. Deer flourished too well in the young forests. They became so numerous in many areas that they ate all the tree seedlings and sprouts, threatening the reproduction of forests.

Deer had become scarce in Pennsylvania toward the late nineteenth century. Excessive, uncontrolled hunting and the lack of forest food and cover due to extensive cutting and fires had decimated the deer population. In response to the scarcity, bucks-only hunting laws were passed to favor increased reproduction from more females. As forests were increasingly protected from fire, starting in the early years of the century, millions of acres of cut and burned forests sprouted and began to grow back. The sprouts and seedlings and thick new forests provided ideal conditions for deer, and they multiplied enormously. Henry Clepper working at the department's Research Institute at Mont Alto wrote one of the nation's first reports on the affects of deer overpopulation on forests.

The combination of ample food and forest cover and increased protection from hunting created a deer herd estimated at one million by the late 1930s-too many deer for the land and trees available. Forest reproduction began to show extensive signs of over-browsing by deer. Many tree seedlings were malformed from being munched on by the hundreds of thousands of deer; planted and natural seedlings were eaten before they could grow into saplings. Deer starved in masses and the surviving deer were smaller and in marginal health.

Game and forest managers had campaigned for expanded hunting seasons since 1920, realizing that the size of the deer herd was a problem for the forests as well as the deer. The first statewide "antlerless only" deer-hunting season was authorized in Pennsylvania in 1938. Confirmed buck hunters have fought these "antlerless" seasons vociferously, thinking that they would cause declining deer herds. In fact, deer populations have continued to increase in numbers, even with the changes in hunting seasons. Deer are still a problem in reforestation areas.

As the amount of forest increased in Pennsylvania and as trees grew larger, it was possible to reintroduce some wildlife species that had almost vanished. *Forest Leaves* reported in December 1921 that,

Beavers have been successfully reintroduced in our more remote streams. There is a colony on the Rothrock Reserve in Mifflin County. Beavers had been practically trapped to extinction in Pennsylvania because of their considerable role in the fur trade in early settlements.

The beavers turned out to be a mixed blessing. They multiplied quickly, and only three years after beaver reintroduction, *Forest Leaves* reported in a June 1924 article by Raymond Winter,

The four pairs of beavers that remained on Bald Eagle Forest have multiplied so extensively since they were planted here that there are about 100 beavers on the district. They have built 22 major dams, and 30 minor dams, flooding about 12 acres and killing 10,000 board feet of lumber and 50 cords of wood. The beauty of the streams is affected. One stream is almost taken over and the forests are converted to marsh land and beaver meadows. The beaver is not a conservationist, he cuts much more than he uses and floods the rest. He is a rover, constantly flooding new areas. At the present rate of increase, the District will be over-run with beavers in ten years. We need beaver controls and an open season.

Clearly, forester Winter was not a fan of beavers.

With the reforestation of Pennsylvania, many forest animals have increased naturally. Others have been reintroduced and have flourished, as in the case of beavers and wild turkeys. Unlike deer and beavers, increased numbers of turkeys show little affect on forests, but the lesson in the case histories above is that natural balances are not static and not automatic.

CHAPTER SEVEN

World War II-

Modern Times

World War II

Republican Governor Arthur James took office in 1939 in the midst of austerity measures in state government. There were staff reductions and program cuts for economy, although much of the large staff turnover appears to have reflected the political patronage system in action. As the administration changed from Democratic to Republican department staffers of the "wrong" party once again were fired. Starting in 1940, the CCC program was phased out as the war in Europe escalated and America prepared for the Second World War. The depression was ending as war preparations created jobs.

America entered the war after the bombing of Pearl Harbor, December 7, 1941, and many forestry employees entered the armed services. Those staff members left in the department focused on efforts to help provide the massive need for wood products for

war. With labor shortages, new woods workers had to be trained. The Pennsylvania Timber Production War Project was initiated to accomplish this and coordinate wood industries. Timber sales were increased on the state forests on a diameter-limit basis to provide needed raw material. This basis for cutting (removing only trees of specified sizes) was used because forestry staff was not available to supervise more-complex harvesting systems. From 1942 until the end of the war in 1945, harvests from state forests yielded more than 100 million board feet of timber. Pulpwood was considered a strategic material and pulpwood cutters were much sought after. Besides the need for large amounts of conventional paper from wood pulp, the troops needed cellulose nitrate, also derived from wood pulp. The material was the base for nitrocellulose that became smoke-less powder for explosives, and clear, strong lacquers and plastics for everything from airplane windshields to military map containers.

A World War II motto, "Use it up, wear it out, make it do, or do without" indicates the strain on American resources created by the Second World War. Allied countries in Europe had exhausted their resources in World War I. As far as forests were concerned, as mentioned earlier, European forests had been used to supply the wood needs for the First World War. Now American forests would have to supply the war effort. Pennsylvania would do its part. The July-October 1944 issue of *Forest Leaves* reported, "Increased timber cutting continues, necessitated by war needs. Pennsylvania continues to lead the northeastern states in lumber production." (Wartime restrictions on civilian use of paper and other materials probably accounts for the long time period- July to October-of this issue of *Forest Leaves*.)

The push during the war years to produce lumber and other wood products brought lumber production back from its decline. According to *Forest Leaves*,

There had been a long downward decline from the tremendous harvests, peaking in 1899 when Pennsylvania produced almost 2.5 billion board feet of lumber. State timber production hit bottom at 73 million board feet in 1932. The trend was reversed after 1932. After the war is over, production will probably drop again, as it did in 1920-after the First World War. There is no reason though, why the state's 15 million acres of forests couldn't grow and produce 2.5 billion board feet of timber per year on a sustainable basis.

Many wood and paper products were classified as vital war products. Because of defense needs and high wages at defense plants in the cities it was very difficult to get labor for woods work, so in 1944 prisoners of war were employed to harvest wood in the forests of many states including Pennsylvania. The CCC camps that had recently closed were reopened to house and train the prisoners to harvest wood. Three camps were established on abandoned CCC camps in the Allegheny National Forest. Forty prisoners arrived in April 1945 at Lyman Run camp and soon after another camp was opened at Bark Shanty campsite. The army provided guards and interpreters and paper and lumber companies hired the prisoners at prevailing rates. The fees were paid to the U.S. Army. A total of 250 prisoners were interned at these camps. A large facility was also operated at Michaux State Forest with more than fifteen hundred prisoners-German naval officers, prisoners from Rommel's Afrika Corps, and some Japanese prisoners as well.

Germany surrendered in May 1945 and Japan in August, and the prisoners were sent back to their home countries. Some prisoners chose to stay in Pennsylvania and settled near Coudersport. Most facilities were abandoned after this and poorly maintained buildings were taken down. By 1951 only a few buildings in the camps remained.

Although the war made demands on Pennsylvania forests by requiring large harvests of wood, it contributed some useful technology to forestry. For example, in 1944 aerial photography techniques improved in the war were first used to tabulate the forest area of the state by county and township.

There were many staff changes in the top levels of the department during the war years and considerable losses of forestry staff for war needs {and political wars at home). Emerick continued as state forester under Deputy Secretaries Charles Baer and William Montgomery until he retired in 1947.

World War II was a major factor in stepping up the rate of urbanization and industrialization in Pennsylvania. The forest policies of Pennsylvania {and most states) from here on would be dictated by a population that, for the most part, no longer made a living by working the land.

Oliver Benjamin Gipple, 1947-1952

Pennsylvania's ninth state forester, O. Ben Gipple, was born August 15, 1890, in Huntingdon, Pennsylvania. He received his forestry degree from Pennsylvania State College in 1915 and promptly was hired by the city of Harrisburg as city forester. As World War I began, he enlisted in the Army as a private in the 10th Engineers Forestry Unit and was shipped to France to work in war- related forestry there. He was discharged in June 1919 as a first lieutenant. Gipple worked for a time after the war as a forester for the Endeavor Lumber Company, then returned to Harrisburg as city forester. From 1925 until 1943 he owned and operated his own tree nursery, explored for oil and gas in New York, worked again for Harrisburg, and served a term on the Pennsylvania Game Commission.

On December 13, 1943, Gipple was hired by the Bureau of Forestry as chief of the Division of Management. During World War II he directed efforts to increase timber sales from state forests. After the war, on December 15, 1947, Gipple was promoted to state forester. It was his role in that position to deal with the surging economy at the end of World War II and the returning soldiers' need for jobs, houses, and public facilities. Many foresters who had served in the war returned to the department at this time.

In 1948 the statewide radio system was completed, linking together the department's 150 forest fire observation towers, the head- quarters, and district forester offices. This was a giant advance in communications. The first radios had arrived in fire towers in the late 1930s. The "portable" models then weighed more than twenty-five pounds. To get a workable antenna, the procedure was to tie a string to the antenna wire; tie a rock to the string; throw the rock over a branch high in a tree; and then raise the antenna wire by pulling the string.

During his time as state forester, Gipple also initiated the first detailed management plans for the state forests. Aerial photos were used to gather much of the information needed for these plans. Five regional offices were established as administrative units overseeing groups of forest districts. In 1951 Samuel S. Lewis replaced Admiral Milo Draemel as secretary of Forests and Waters. Gipple resigned from the department on December 31, 1952.

Forestry for Private Owners

There was considerable growth in the department's role as an advisor for private forest owners during Gipple's time as state forester. Encouraging private owners to use forestry services is very important in Pennsylvania because almost 70 percent of the forest land belongs to private individuals. The advisory programs were called "Farm

Forestry" or "Service Forestry." In 1950, the Cooperative Forest Management Act was approved by Congress allowing the federal government to pay up to half the cost of providing technical services to private landowners, forest operators, wood processors, and public agencies, with respect to the multiple-use management and environmental protection and improvement of forest lands, the harvesting, marketing and processing of forest products and the protection, improvement, and establishment of trees and shrubs in urban areas, communities and open spaces.

This increased funding for "Farm Forestry" programs, allowed Gipple to increase the number of foresters available to advise private owners. A dispute with the U.S. Forest Service regarding management of the program led to the withholding of federal cost sharing funds for a time, but the department persevered and continued its advisory program. A major role as comprehensive forestry advisor to private owners was new for the state. Previously, the state had concentrated on acquiring and managing its own land for public forestry purposes. The state's initial relationship with private owners was as a purchaser of their lands, or a fire law enforcer and fire protector. The state next became a provider of tree seedlings and planting advice. Comprehensive advice was issued to only the most interested owners on a time available basis. Now state employed foresters were knocking on doors offering free advice on everything from tree planting to thinning, weeding, harvesting and marketing. The initial progress of landowner advisory programs was slow but has become significant over time with fifty resource management professionals presently (1995) engaged in farm forestry-type programs.

As states like Pennsylvania were expanding advisory programs for forest owners, forest industries were also becoming involved in advising private owners. National leaders in the forest industry had started a private forestry program called the Tree Farm System in 1941, just as America was about to enter World War II. The program started in the West when the Weyerhaeuser Company asked neighboring landowners and government leaders in Washington State to join it in a pledge to protect forests from fire and manage them as sustainable crops. The lands of private owners who joined the effort were "certified" as *Tree Farms* (a copyrighted term). The owners received special certificates and signs to mark their property. State committees were formed to operate the program and publicize the progress of tree farming. An organized national program was created by the major forest industries through an organization known as American Forest Products Industries, Inc. The organization created national and state standards for "Tree Farms" and operated the system.

In 1947 the industry-sponsored Tree Farm System was instituted in Pennsylvania to encourage better forestry practices on privately owned lands. The new program served as a cooperative link among all the various interests in improved forestry in private forests. All foresters working with private owners, whether they were employed by the state, forest industry or worked as private consultants, were invited to certify their landowner clients as tree farmers.

The Pennsylvania Forestry Association became the state sponsor of the program in cooperation with forest industries and the state forestry agency. Cooperative state and private programs also started at this time in forest fire prevention. In the spring of 1949 the "Keep Pennsylvania Green Program" was inaugurated in the state to establish joint private/public efforts to educate the public regarding forest fire prevention. The program's stated purpose was to "acquaint every person in the state with good forest fire prevention practices." The national sponsor was American Forest Products Industries, Inc., of Washington D.C., the same industry which sponsored the Tree Farm System.

The Keep Green program had been introduced into twenty-four states by 1949, having spread East from its beginnings eight years earlier in the West.

The Keep Pennsylvania Green executive committee was comprised of six representatives from government, professional, civic and industrial groups. The Pennsylvania Forestry Association served as statewide sponsor. County committees were being put in place in 1949 to operate special programs regarding fire prevention. The system supplemented state and federal fire prevention efforts by adding private funds and manpower to the public programs.

Perhaps it was the experience of industry leaders and government agencies working together through the war years that spurred increased cooperation between the private sector and state agencies; perhaps it was the years of public criticism of the industry's "cut and run" treatment of land and the threats of national legislation; whatever it was, starting around 1947, cooperative industry/government programs multiplied, both nationally and in Pennsylvania.

Ralph C. Wible, 1952-1966

Like so many of Pennsylvania's state foresters, Ralph c. Wible was a graduate of the Mont Alto Forestry School, graduating in the fall of 1927. He was born at Gettysburg on October 13, 1904. Wible was employed immediately by the Pennsylvania Department of Forests and Waters upon graduation from Mont Alto, and spent his first five working years surveying and doing title searches for the continuing purchases of state forest land. He became assistant district forester in the Bald Eagle District in Mifflinburg in 1934. He was dismissed in 1938 during the organizational upheavals from the change of political parties, unleashed by the election of Governor George Earle. He then worked for the U.S. Forest Service in New Hampshire until he returned to Pennsylvania forestry as district forester of the Wyoming State Forest in Bloomsburg in 1940.

Wible improved fire control in his district and was a prime mover in the development of new state lands acquired from the Ricketts estate, now known as Ricketts Glen State Park. In 1949 he became one of five new regional foresters. From an office in Bloomsburg he supervised six eastern forest districts. Wible became deputy secretary and state forester for the Department of Forests and Waters in 1952 when Samuel Lewis became secretary and the regional forester system was dismantled.

In 1955 George Leader became governor and appointed Maurice K. Goddard secretary of Forests and Waters. Goddard, the former director of the Penn State Forestry School, had firm ideas about professional staffing. With Governor Leader's help (through executive order), Goddard pushed through civil service status for the department's professional employees, and abolished the several deputy secretary positions in the department. He retained Wible as state forester and director of the Bureau of Forestry.

Civil service status for Wible's staff offered positive security and professionalism. The Cooperative Forest Management (Service Forestry) program spread statewide, offering needed forestry advice to private forest owners. An internal training program for all bureau employees raised standards and the bureau was reorganized into four functional administrative divisions. More foresters were placed at state forests to improve their management.

In 1953, underground storage of natural gas under state forest land was authorized by the General Assembly. In 1955 the Oil and Gas Fund was established. All revenue from oil and gas leases on state forest land was placed in a fund to be used for conservation,

recreation and flood control. More than \$100 million had been acquired by this fund as of January 1, 1995.

Detailed management plans had been completed for all 1,833,539 acres of state forest lands by 1955. From 1955 until 1965, wood harvests in state forests used uneven-age management (selection method) and group cutting. This technique involved marking trees to be cut individually or in small groups. The goal was to create forests with trees of varying ages. Studies during this period found that this type of forest management was failing to establish desirable young trees in harvest areas to replace those that had been harvested. The concentration on the selection method was changed, after much study and debate, to include even-age (clear-cut) management where timber, wildlife, and watershed management were the primary consideration. With this technique, whole sections of forests were harvested at one time, creating conditions for replacement forests of uniform age.

The threat of fire, of course, would always remain. On April 4, 1960, Pennsylvania firefighting took to the air. A converted Stearman biplane was used to drop water on a forest fire in Woodward Township, Clearfield County. The plane could carry 180 gallons of water and fire retardant. The bureau has added other fixed-wing and rotary-wing aircraft to its fire protection system over the years through contractual (rather than outright ownership) arrangements.

In 1966, a National Neighborhood Youth Corps program was created. Pennsylvania ran the largest program in the nation with more than fifteen hundred young people engaged in conservation work in state forests and state parks.

Ralph C. Wible retired as state forester in October 1966, after thirty-seven years of work for the bureau in various roles.

Airborne Firefighting

Pennsylvania led most states in fighting forest fires from the air. According to forestry bureau reports in *Air Operations on Wildfires in Pennsylvania, 1960-1984*, the first airborne "water bombing" of a forest fire was conducted near Whiteside, Clearfield County, April 1960. The plane that dropped the water was a Stearman biplane. Two Bell helicopters and the Stearman crop-dusting plane were contracted for and used by the state forestry bureau during the spring of 1960.

In the 1962 fire season, the bureau dropped more than ninety-four thousand gallons of water on 326 fires, a quantum jump. By 1963 a Chase air tanker, called "Cloudburst," capable of delivering sixteen hundred gallons per trip was being used. Tremendous gains were made in the ten years from 1960 to 1969. In 1960 54 fires got fifteen thousand gallons from the air-1969, 366 fires got doused with 236, 780 airborne gallons. Retardants were soon being mixed with water to increase effectiveness.

By May 1980, the bureau was reporting the four millionth gallon of fire retardant to be dropped on forest fires. The largest aircraft used was an air tanker C-122 Chase capable of dropping sixteen hundred gallons. The fastest plane used was an F- 7 Tigercat cruising at 242 miles per hour.

From 1950 to 1960, typical annual forest fire statistics were thirteen hundred fires burning thirty thousand or more acres, for an average destruction of twenty-three acres. Air tankers have reduced these losses and have also held down firefighting costs. Since 1970, comparable statistics show fourteen hundred fires annually burning five thousand acres, for an average burn of less than four acres.

The bureau doesn't own aircraft, it contracts for them with flying services. Aircraft are also hired under contract to patrol for fires during periods of high fire danger. Airborne fire spotting started on an informal basis in 1932 when Douglas Brown, a state fire warden, was flying his Taylor Cub aircraft from Clarion to Oil City. He spotted a fire near the Plummer fire tower. Since he had no radio communication, he circled and pointed until the towerman spotted the fire and called in a report. Brown used this system for several years, circling fire towers with his engine idling and shouting fire locations to tower operators.

Maurice K. Goddard, 1955-1979

Early in 1954 Dr. Maurice K. Goddard wrote a letter to the new administration of Governor George Leader, suggesting things that needed to be done for forestry, from his perspective as president of the Pennsylvania Forestry Association, Leader was impressed enough to appoint Goddard as his secretary of Forests and Waters. Goddard took office January 17, 1955.

As a provision of taking the position, Goddard had extracted a promise from the new governor to provide civil service status to the professional staff of the department. Civil service would shield staff members from being removed for political reasons, ensuring that a continuity of management and professionalism would be applied to state resources. The legislature would not approve the measure, so Leader used his powers through executive order to give the civil service status he had pledged. Civil service protection wasn't approved by the legislature until years later under the administration of Governor William W. Scranton.

Goddard was born in Massachusetts, grew up in Kansas, then moved to Maine, earning a forestry degree from University of Maine in 1935. He taught at Penn State's Mont Alto forestry school from 1935 to 1937, left to obtain a master's degree in forestry at the University of California-Berkeley in 1938, and returned to Penn State teaching positions at Mont Alto and State College. Goddard served in World War II, winning the Bronze Star and the Legion of Merit. He returned to Mont Alto as director in 1946; then became director of Penn State's School of Forest Resources at State College in 1952. He held that position when he wrote his fateful letter to George Leader.

Goddard brought vision, conviction and action to his new job. He quickly saw as a problem the lack of public land near Pennsylvania cities. Most state forests had been acquired in remote areas and the state parks and recreation facilities were there. In 1955 improved road systems, such as the Pennsylvania Turn- pike advancing from Philadelphia, and the Penn-Lincoln Parkway in Pittsburgh were in operation. Industries were switching from a six- day to a five-day, forty-hour week, giving people more leisure time to use public recreation areas. Although the automobile age was in full swing by now, roads were still rough and narrow. Goddard calculated that a trip of twenty-five miles for a day's visit to parks and recreation areas was practical for most people. He set a goal of a park or forest recreation facility within twenty-five miles of most Pennsylvanians.

Such a goal required money to build facilities on land already owned by the department and to acquire new land closer to population centers. Goddard and Leader pushed through the Oil and Gas Lease Fund-Act 256-dedicating the revenue from oil and gas leases on state lands for land acquisition and recreation facilities.

Oil and gas funds helped tremendously in the expansion of public recreation, but the increase in revenue wasn't enough for what Goddard had in mind. He added two state

bond issues to his agenda. Bond issue proposals for land acquisition had failed in 1928, but by the early 1960s the public was in a more expansive mood. Goddard was reappointed by new Governor David L. Lawrence in 1959. He promptly secured the governor's support for Project 70, a bond issue proposal to raise \$70 million for public lands and facilities. The proposal earmarked \$40 million for the Department of Forests and Waters to acquire property in forty-three urban counties where ninety percent of the state's people lived. The rest of the funds were to go to the Fish and Game Commissions for critical habitat acquisition and to the State Planning Board. Rural residents generally opposed the bill-they already had land nearby-but sportsmen's clubs, travel interests and urban groups supported it. Goddard kept the proposal alive through the Lawrence administration into the administration of Governor William W. Scranton, who reappointed him, and who supported Project 70. The bond measure was approved by the voters in November 1963 and Governor Scranton signed the enabling legislation into law as Act 8 on June 22, 1964.

This was a time of rapidly increasing demand for public outdoor recreation; according to department figures the number of visitors to Pennsylvania state parks had risen to twenty-four million in 1961-up from eight million in 1955. A Bureau of Parks had been established in 1936 but the park superintendents were Bureau of Forestry staff members. In 1962 Goddard separated state park operations from forestry, setting up a Bureau of State Parks to specialize in park management

Goddard was retained by yet another governor, Raymond P. Shafer, in 1966. He and Shafer quickly launched Project 500, another referendum bond issue, this time for \$500 million for land acquisition, recreational facilities, and a variety of environmental projects ranging from strip mine reclamation to sewage treatment plants. The Land and Water Conservation and Reclamation Act implementing Project 500 was signed by Governor Shafer January 19, 1968.

Project 70 had added considerably to the department's land base and facilities, but it had also added maintenance costs and at the same time whetted the public's appetite for more, Project 500 added still more. Throughout both projects there were proposals to charge fees for use of the parks to help pay for staffing and maintenance of the free-access parks. This raised loud opposition from citizens who felt that free access should be a right of all citizens. Goddard also, flintily, opposed the idea, successfully, over and over and over.

Codus State Park in York County was established with Project 500 funds, May 9, 1970. It used an interesting public/private partnership. The P. H. Glatfelter Company needed a large water supply for its pulp and paper mill in Spring Grove. The firm spent more than \$5 million to build a dam creating Lake Marburg on company property. The state was given land for park facilities and state funds paid for parking lots, boat launching areas, and other necessities. Glatfelter maintains the dam and gets the water it needs, the public gets the use of the lake and the land around it. It's win-win for all sides.

Toward the end of his term in the fall of 1970, Governor Shafer signed Act 275 establishing the Department of Environmental Resources (DER). The restructuring took effect January 19, 1971 in the new administration of Governor Milton J. Shapp. The new department merged the Departments of Forests and Waters and Mines and Mineral Industries, and absorbed some duties formerly performed by the Departments of Agriculture, Health, Labor and Industry, and the State Planning Board. Goddard opposed the formation of the new department, and yet he was retained by Shapp as

acting secretary to start up the new department and eventually was appointed as secretary. In January 1975, Shapp, who had been re-elected, under a new constitutional provision allowing two consecutive terms, reappointed Goddard to his sixth term directing the state's forestry programs. In 1977 more than thirty-nine million people visited state parks. Maintenance and operating costs had been problems for some time, but limits in the operating budget finally forced staff layoffs, closing areas and delaying maintenance. It was harder to get funds to maintain and operate facilities than it was to acquire them. This problem continues in state parks and in the state forests which also are used for recreation.

In January 1979 Richard L. Thornburgh became governor. He appointed Clifford L. Jones as secretary of DER. Dr. Goddard retired, having served twenty-four years under five governors of both parties. He brought civil service stability to the state lands and forests agency and tremendously increased public recreation facilities in the state.

Samuel S. Cobb, 1966-1977

Samuel Cobb became state forester in 1966, and served the state of Pennsylvania for thirty-eight years in various forestry positions. He graduated from the Pennsylvania State Forestry School in 1939 and worked for a short period with the U.S. Forest Service in Colorado. Returning to Pennsylvania in 1939 to work for the Bureau of Forestry, he was assigned to District 18 in Pottsville as assistant forester. In that position he made a study of the district's fire problems. In January 1942 he transferred to District 3 in Blain as acting district forester, then moved to District 14 in Warren late in 1943. In January 1945 he entered the army, serving in Japan. He was discharged in 1946 and returned to the bureau. From 1946 to 1949 he served as farm forester in District 16 in Wellsboro. In February of 1949 he was promoted to district forester in District 20 at Bloomsburg. He moved to Harrisburg as assistant chief forest fire warden in 1959. On July 26, 1962, he became chief forest fire warden; in October 1966, he was promoted to state forester and director of the Bureau of Forestry, under Goddard. Cobb supervised much of the development of air tankers and firefighting technology mentioned earlier. He retired as state forester August 18, 1977.

A Long View

In 1970 the State Forest Commission changed its concept of setting aside forest monuments and scenic areas in state forests to a more ecology-based designation of special areas. The commission passed a resolution establishing thirteen "natural areas" and one "wild area" in state forests. A natural area was defined as "an area of unique scenic, historic, geologic or ecological value which will be maintained in a natural condition by allowing physical and natural processes to operate without direct human intervention." Some of the forest monuments and special scenic areas previously established were included in the natural areas. The Forestry Bureau had recognized values other than timber on state lands from the start; the new designations were a continuation and formalization of long-term policies to preserve special forest areas. As early as 1908, a forester working with a new state forest in Bedford County proposed the preservation of an area of uncut timber. These informal set-asides were given legal status in 1921 when the legislature authorized the setting aside of "unusual or historic groves of trees." A commission resolution named these areas forest monuments. The 1970 action recognizing natural and wild areas broadened the monument concept. By 1995, seventy-seven areas totaling nearly 215 thousand acres have been officially designated as natural and wild areas.

Parks were also included in the bureau's long view from the start. The bureau was operating a park on Mont Alto Forest Reservation by 1902, and by 1921, the Pennsylvania Bureau of Forestry was operating seven state parks: Valley Forge, Caledonia, Mont Alto, George w. Childs, Pine Grove Furnace, Buchanan's Birthplace, and Promised land; a dozen more parks were in the making.

The bureau also operated a host of recreational facilities in the state forests in general. The advent of CCC camps in the 1930s added greatly to the available recreational facilities within the established state forests and parks. While the Bureau of Forestry was a major factor in public land acquisition, other state agencies were also purchasing land. By 1986 Pennsylvania had more than four million acres of public forest land: 2.1 million acres in state forests, 1.25 million acres in state game lands, 500,000 acres in federal ownership (mostly in the Allegheny National Forest), and 280,000 acres in state parks. All of these lands are generally open for public recreation.

The 2.1 million acres of state forests have these purposes established by law:

to provide a continuous supply of timber, lumber, wood and other forest products; protect the watersheds; conserve the water and regulate the flow of rivers and streams of the state; and to furnish opportunities for healthful outdoor recreation to the public.

Recreation continues as a major function of the state forests, with 900 miles of hiking trails, 200 miles of cross-country ski trails, 2,400 miles of snowmobiles trails, 2,500 miles of roads, and 28 picnic areas. More than 200,000 acres are in undeveloped and restricted categories in which no motor vehicles or permanent structures are allowed. The restricted areas are composed of sixteen wild areas (143,359 acres) and 61 natural areas (59,182 acres).

There are still private cabins located on state forest lands from past campsite leases. Under this, now discontinued, program, small tracts (100 feet by 100 feet) could be leased for private cabins-forty-two hundred of these leases are still active under strict department guidelines regarding use and maintenance of the structures. The leasing program was discontinued (as far as any new leases) in the early 1970's.

The Department of Environmental Resources

Act 275 establishing the Department of Environmental Resources (DER) was signed by Governor Raymond Shafer on December 3, 1970, to be effective January 19, 1971. The act abolished the Department of Forests and Waters and the Department of Mines and Mineral Industries and transferred their powers to the new Department of Environmental Resources, along with specific powers transferred from several other agencies. As mentioned earlier, Maurice Goddard was retained to direct this new department and Samuel S. Cobb continued as director of the Bureau of Forestry in the new agency.

The DER represents the citizen's and consequently the state's changing view of its lands and forests. The perspective has shifted from the early view of forests as obstacles to be cleared and consumables to be used; to the protect-from-fire and manage-for-timber policies that followed; to the outdoor recreation phase of building state-owned-and-operated facilities. Now the environmental concerns that coalesced with the first Earth Day, April 22, 1970 have become significant. Each new concern has been added like a blanket over the earlier ones, so that today we still have the need to clear forests, consume their products, protect them from fire, use them for commerce and recreate in them, but with new concerns as to how forests affect our whole environment overlaid.

The environmental layer of concern is expressed in Article I, Section 27, added to the State Constitution as the Pennsylvania Environmental Bill of Rights in 1972, stating that,

The people have a right to clean air, pure water, and to the preservation of the natural, scenic, historic and aesthetic values of the environment. Pennsylvania's public natural resources are the common property of all the people, including generations yet to come. As trustee of these resources the Commonwealth shall conserve and maintain them for the benefit of all the people.

In 1974 gypsy moths exercised their "rights" and surfaced again from a temporary low cycle to a temporary epidemic-865, 710 acres of northeastern Pennsylvania forests were defoliated by the insects. The Bureau began a program of raising and releasing parasites, which shows promise. Most recently, spraying with a gypsy moth-specific bacillus called BT is also proving to be effective in keeping tree damage in check.

The Department of Environmental Resources Environmental Quality Board approved and published new expanded definitions and guidelines governing selection and administration of natural areas and wild areas in January of 1975. Board action brought totals to thirteen wild areas and forty-four natural areas covering more than 160,000 acres on state forest land. More recently a DER "flora and fauna" policy states that "State Forest lands should provide habitats that support a " diversity of animal and plant communities and should serve as examples in promoting the conservation of native wild flora." A vigorous wild and native plant conservation program is operating in the DER and the bureau.

Richard R. Thorpe, 1977-1989

On October 20, 1977, Richard R. Thorpe of Mechanicsburg was appointed director/state forester of the Bureau of Forestry in the Department of Environmental Resources. Thorpe was born in Warren, Pennsylvania and graduated from the Pennsylvania State College School of Forestry in 1952. He started work with the bureau as service forester at Norristown, former headquarters of the Valley Forge Forest District, in July 1952. The bureau at this time was in the Department of Forests and Waters. He then moved (in 1953) to the Harrisburg office, preparing forest management maps. Thorpe became staff forester and assistant district forester in the Rothrock Forest District in Huntingdon and remained there until January 1962. From then until July 1964, he was district forester in the Kit tanning Forest District in Clarion.

From July 1964 to November 1970, Thorpe was district forester in the Michaux Forest District at Fayetteville. He moved to the bureau headquarters in Harrisburg in November 1970 as chief of the Timber Management Section-Division of State Forest Management. In March 1971, he became assistant division chief; then chief of the Division of State Forest Management in July 1974. He was promoted to acting director of the Bureau of Forestry August 18, 1977, and served in that position until his promotion to director of the Bureau of Forestry in the Department of Environmental Resources on October 20, 1977.

During the 1980s Thorpe administered a fund of \$15 million to rehabilitate hundreds of miles of state forest roads. Most of these roads had not received major treatment since the CCC days. He also replaced many substandard district headquarters buildings and added new ones using Pennsylvania Conservation Corps program funds and workers. This project was an employment and conservation program created at the state level and was modeled on the federal CCC program. Prior to 1980, money from state forest timber sales went into the general fund. During Thorpe's tenure approval was obtained to deposit timber sale receipts in an " augmentation fund," a restricted account used for Forestry Bureau programs. Thorpe retired as state forester in July 1989.

James C. Nelson, 1989-1993

James C. Nelson replaced Thorpe as state forester in 1989. He is a native of Ludlow, McKean County, Pennsylvania. He graduated from Pennsylvania State College in 1952 with a bachelor of science in forestry. His work with the bureau started in Blain, where he was a research forester studying oak wilt, herbicides, and forest growth. He served in the Third Infantry Regiment in Germany during 1954-1955. In 1960, he transferred from Blain to Harrisburg as forest management specialist and in 1962 developed a computerized timber sales procedure for the state forests. Nelson instituted log grading programs to improve the value of state timber sales and developed a timber inventory system for state forests in 1964. His guidelines were used in making the change from uneven-age to even-age forestry on state lands to improve reforestation success.

In 1971 Nelson became the bureau's forest resource planner, developing timber management zoning criteria, wildlife habitat guide- lines, natural area and wild area programs and the overall formulation of the first Forest Resource Plan for state forest land. He was promoted to assistant state forester in 1982 with responsibility for both inter and intra- bureau planning and as a liaison with other agencies and the federal government. In July 1989 he was promoted to the position of state forester.

Nelson directed a Pennsylvania Forest Stewardship program using federal cost-sharing to implement expanded forestry programs with private landowners, and to inform urban residents as well. The stewardship program broadened previous service-forestry-type programs to include the spectrum of forest functions ranging from aesthetics and wildlife to effects on soil and water. Nelson added communication and education components to the stewardship approach, producing informational videotapes with forestry information for television use and establishing a "peer group" volunteer system of landowners, already using the best forestry information to talk to uninitiated landowners. Stewardship programs continue to promote broad-based forestry plans for private forest owners, using forestry and biological expertise.

State Forester Nelson also developed biodiversity guidelines for state forests to encourage the regeneration of diverse mixes of trees and other plants on state forests and added new natural areas and wild areas. He initiated acquisition of natural areas outside of state forest boundaries. He retired as state forester on December 23, 1993.

James R. Grace, 1993 to Present

Dr. James R. Grace, the present state forester, is a native of New Britain, Connecticut. His professional education includes degrees in forestry from the University of Vermont (B.S., 1970), Yale University School of Forestry and Environmental Studies (M.F.S., 1972), and the Pennsylvania State University (Ph.D., 1978).

From 1976 until 1982, Dr. Grace served on the faculty of the Department of Horticulture and Forestry at Rutgers University in New Brunswick, New Jersey where he taught and advised undergraduate students in forestry. In 1983 he became assistant professor of forest resources at the Pennsylvania State University where he served as Extension Program Coordinator within the School of Forest Resources. He coordinated extension programs in forest and wildlife management, forest products, and water resources, providing educational pro- grams for private forest landowners and forestry professionals.

In 1987, Grace was appointed by Governor Robert P. Casey as deputy secretary of resource management in the DER to direct the natural resources and engineering programs of the department. His administrative areas included forestry, parks, water resources management, soil and water conservation, water projects, dams and waterways management, topographic and geologic survey and abandoned mine reclamation. He also served as the commonwealth's representative on the Delaware and Susquehanna River Basin Commissions and the Chesapeake Bay Commission.

When the department was reorganized in 1991, Grace was appointed deputy secretary of parks and forestry and served in that capacity until his appointment as state forester in February 1994.

Today

The prime mission of the Bureau of Forestry today is found in Article 1, Section 27 of the Pennsylvania constitution "Pennsylvania's public natural resources are the common property of all the people, including generations yet to come. As trustee of these resources, the Commonwealth shall conserve and maintain them for the benefit of all the people.

The bureau operates under these principles:

All forest lands provide public values. Both public and private forest lands provide benefits or values to society. (e.g., aesthetics, clean water, habitats for plants and animals).

The forests and native wild plants of Pennsylvania are socially and economically important to the citizens of the Commonwealth. Humans are part of the ecosystem, and must be taken into consideration in the development of all management strategies.

The Bureau of Forestry encourages public participation and involvement. Bureau policies should be driven by the broad goals, objectives and values of an informed citizenry.

The Bureau of Forestry will provide leadership and oversight in the management and protection of forest and native wild-plant resources. The bureau should serve in an oversight and facilitator capacity to provide expertise and technology transfer, information and education to other government agencies and the private sector.

The Bureau of Forestry will strive to instill a stewardship ethic in the general public. The bureau will take every opportunity to convey a stewardship message to groups such as school children, educators, loggers, the wood industry consulting foresters, local governments and private landowners.

Ecosystem management will guide the Bureau of Forestry's approach to forest-resources management. Ecosystem management is the strategy by which all forest values and functions are maintained at the landscape level. This includes the management of state forest lands as well as bureau programs that deal with private lands.

State forest lands will be managed to retain their wild character, where possible. State forest lands present an outstanding opportunity to provide areas that convey a sense of wild and remote character. Management, including commercial resource extraction, will be conducted with a review of its impact on the landscape and on the ecological integrity of the forests.

A Strategic Plan

As its first hundred years from 1895 to 1995, reach completion, the Bureau of Forestry is finishing a strategic plan titled *Penn's Woods, Sustaining Our Forests*.

Beginning in 1991, agency employees and hundreds of citizens and citizens' groups were consulted regarding their view of the critical issues to be addressed by the Bureau of Forestry in

the future. The over-arching goal of the plan is "to ensure the long-term viability, health and productivity of our forests while providing benefits to all Pennsylvanians."

The State of the Forests -1995

The future of forestry in Pennsylvania looked dim in 1895. The rate of forest destruction seemed far too great for a handful of state officials to reverse. But the state and the foresters persevered, advancing hill by hill as the forests, the people, the times, and every- thing around them changed. Forestry work is never complete but the bureau at this time can proudly say,

Forests are back. There are seventeen million acres of forests covering fifty-nine percent of the state.

Fires are controlled. Due to quick detection and suppression, fires burn fewer than 9,000 acres of forest in the average year. This is a 97 percent reduction from the 350,000 acres typically burned annually before the implementation of systematic fire control.

There are 2.1 million acres of state forests managed by the Bureau of Forestry, and the public owns another two million acres of mostly forested land used for various other purposes.

Forestry expertise is available. The bureau has a staff of foresters, biologists and other forest experts. American universities graduate classes of foresters and biologists annually. Forest industries employ forestry professionals and numerous private consulting foresters practice in the state.

Detailed Forestry information is gathered on a regular basis. Aerial photography, satellite imagery, computer-generated geographic information systems, backed by several decades of forest surveys, provide greatly improved knowledge of the condition of Pennsylvania forests.

Tree seedlings are readily available from state, industrial, and private nurseries.

About 500,000 private owners hold 70 percent of Pennsylvania's-forests. Taxes are still a discouragement, but people don't abandon their land because of them. There is a long way still to go in bringing forestry expertise to the individual ownerships that comprise so much of the state's forest resource.

Forest industries operate on a sustainable basis. The growth-to-harvest ratio of Pennsylvania forests is more than two-to-one, ensuring a sustainable supply of raw material for more than two thousand enterprises employing 100,000 people who make forest products valued at \$5 billion per year.

Forests are regarded as important. but people are still confused about their renewability. The common perception of forests has changed from one where most people saw forests as something to be cut for products or cleared for agriculture to one where most people see forests as a natural feature to be preserved untouched or used for recreation. A new perception gap has replaced the old one. Forests cannot remain untouched in a state with twelve million people. Thus, forests must be consciously managed.

Doctor Rothrock Gets The Last Words

Dr. Rothrock, writing in *Forest Leaves*, June 1922, said,

When you have a modern connected highway from Pittsburgh to the New York line, which will place Warren within four hours of Pittsburgh by auto, it will change and intensify life in the entire valley. There are certain changes that are coming. It needs no prophetic eyes to

recognize them. Life is for living and not wholly for working. The average period of human life is being lengthened and this is because men are learning that greater efficiency during working hours, as well as longer life, comes to those who enjoy life and make it a daily duty to get all the happiness that life offers. Today, along the Lincoln Highway, we find families who have earned a rest and are motoring from Maine to the Pacific Coast.

New remedial agents have appeared, namely, better roads and motors within reasonable rates which are working miracles in daily life-and so it goes. We have learned to fly. Every new invention, instead of leaving us less to learn, simply widens the field of knowledge. Who may tell what is to come from radio power?

Who knows what is to come-from radio power, or the many other new technologies and new ways of living? No one knows. But it appears that we will continue to need forests for many reasons and a state agency to watch, warn, educate, and help us to maintain them.