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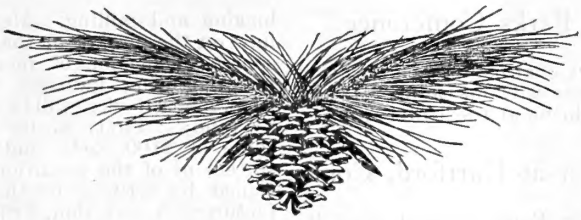

September, 1927

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UNITED STATES DEPARTMENT OF AGRICULTURE

CONTENTS

Announcements

Ohio Valley State Parks Conference

The third Ohio Valley regional conference on State parks will be held in Cincinnati, Ohio, October 18–20, inclusive. Headquarters will be at the Hotel Alms.

State Foresters to Meet at Hartford, Conn.

The Association of State Foresters will hold its annual meeting at Hartford, Conn., October 3–6, inclusive, under the auspices of State Forester Hawes, who is president of the association.

Hearing on Rosin Standards

A public hearing on proposed standards for rosin in which the predominating color is red will be given by the Food, Drug, and Insecticide Administration, United States Department of Agriculture, on November 1, 1927, at 10 a. m. The proposed standards consist of two combinations of Lovibond glasses assembled in a form similar to the existing official standards for rosin. The color combinations of the proposed standards are as follows: No. 1—15 yellow, plus 100 red, plus 1 blue; No. 2—20 yellow, plus 165 red, plus 2 blue.

The hearing will be given at 216 Thirteenth Street SW., Washington, D. C.

Waste-Prevention Prize Contest

The National Lumber Manufacturers' Association announces another waste-prevention contest, to close March 1, 1928. Persons engaged in or connected with the manufacture of lumber and other sawmill products, and employees of timberland owners, are invited to submit devices and methods for preventing waste in logging and milling. Methods and devices that are now on the market or that are serving as a secondary source of income of men employed in the lumber manufacturing industry are barred. For the first time, safety devices will be admitted. Prizes are offered as follows: First, $750; second, $500; third, $250; three of $100 each; and four of $50 each. A full statement of the conditions of the contest can be obtained by writing to the National Lumber Manufacturers' Association, Transportation Building, Washington, D. C.

Forest Ranger Examination

The Civil Service Commission announces an examination for forest ranger to be held the latter part of October in Arizona, California, Colorado, Idaho, Minnesota, Montana, Nevada, New Mexico, Oregon, South Dakota, Utah, Washington, and Wyoming. Vacancies in the Forest Service in these States, and in positions requiring similar qualifications, will be filled from this examination. The law requires that rangers shall be selected, when practicable, from among qualified citizens of the State in which the forest is situated, and preference will be given accordingly in certifying eligibles from the list of those who pass the examination. The entrance salary ranges from $1,620 to $2,000 a year, according to the economic conditions in the locality, the character of the activities conducted on the ranger district, and the degree of responsibility.

Applications to take the examination should reach the Civil Service Commission, Washington, D. C., not later than October 14, 1927. The examination will be held on October 25 at the national forest headquarters in the States named. Those interested should write to the Civil Service Commission for an announcement of the examination and for Form 2600 on which to make application.

Because the edition of this periodical is necessarily limited, its free distribution outside of the Government service is restricted to such persons and organizations as State forestry and conservation officials, State agricultural extension directors, faculties and libraries of forest schools, and forestry associations. Others desiring to obtain copies of the Forest Worker can do so by sending 5 cents for a single copy or 25 cents for a year's subscription to the Superintendent of Documents, Government Printing Office, Washington, D. C. Foreign subscriptions: Yearly, 35 cents; single copies, 7 cents.

Material offered for publication in the Forest Worker should be addressed to the Editor, United States Forest Service, Washington, D. C.

FOREST WORKER

Washington, D. C. SEPTEMBER, 1927 Vol. 3, No. 5

State Forestry

The 1926 Fire Score

Forest fires caused damage amounting to $26,912,295 in the United States last year. This immense loss is the result of 91,793 fires which burned over 24,316,133 acres of the lands of the country.

More than 72 per cent of the fires are known to have been caused by man, and 12 per cent by lightning; the causes of a little over 15 per cent are unknown. Smokers lead all others as starters of forest fires with a known total of 5,625, or over 16 per cent of all, railroads come next with 13 per cent, and brush burning third with 12 per cent.

The State of Mississippi, with 23,170, suffered more fires than any other State. Alabama was next with 14,953, and Georgia was third with 6,446. At the other end of the scale, Delaware had but 37 fires, Rhode Island 43, and Vermont 73.

The Southeastern States as a group—the Carolinas, Georgia, Florida, Alabama, and Mississippi—had the most fires, 54,200. The West Mississippi States, which include Missouri, Arkansas, Oklahoma, Louisiana, and Texas, came next with 10,657 fires. The Northeastern States had 6,251 fires, the Appalachian States 4,827, the East Mississippi States 1,747, the Lake States 3,326, the Rocky Mountain States 3,877, and the Pacific States 6,842.

Where protective systems were functioning in 1926 nearly 61 per cent of all fires were confined to areas of less than 10 acres, and less than 2 per cent exceeded 1,000 acres. Within the protected areas as a whole the average fire burned over 140 acres, as against an indicated average of 337 acres per fire on lands without protection.

In the protected forests of Arizona the average fire covered only 2.4 acres, in Colorado 7.9 acres, New Mexico 10.3 acres, Vermont 12.4, Wyoming 13.4, New Hampshire 16.7 acres. In Florida, with only a very small protected area, the average fire burned over 373 acres. The Wisconsin average for protected area was 355 acres, Minnesota 354, and California 333. Pennsylvania held the average fire to 77 acres, New York to 56 acres. Virginia's fires averaged 161 acres, Maryland's 116, and West Virginia's 53.

Within the areas under protection the 33,867 fires reported burned over about 1,040,000 acres of merchantable timber, 1,682,000 acres of nonmerchantable or immature tree growth and 1,394,000 acres with no tree growth at the time, the total area of forest land burned thus reaching 4,116,000 acres. Including the unprotected regions 24,316,133 acres of forest land were scourged by fire during the year.

Wisconsin Changes Conservation Organization

The office of commissioner of conservation of Wisconsin has been replaced by a State conservation commission of six members empowered to employ a director for the State conservation department. Greatly enlarged powers and duties in regard to forest fire protection are given to the new body.

An interim committee composed of members of the legislature has been created to investigate the forestry situation in the State. Under the constitutional amendment ratified this spring, a measure has been adopted making land devoted to the growing of timber subject to a specific annual tax, which is to be paid to the town treasurer, the State advancing 50 per cent of the amount. The timber on the land remains free from taxation until it is mature, when a severance tax is paid to the State. Other recent laws of Wisconsin empower county boards to acquire lands and administer them as county forest reserves, and increase the authorization for the acquisition of lands within the State for national forests from 100,000 acres to 500,000 acres.

Maryland Organizes Forest Districts

The Maryland Department of Forestry has apportioned the State into three forest districts and on October 1 will place a district forester in charge of its activities in each. Districts 1, 2, and 3 comprise the western, central, and eastern parts of the State, respectively, and have their headquarters at Cumberland, Upper Marlboro, and Salisbury. The men who will take charge as district foresters, in the same order, are: C. Cyril Klein, now district forest warden, Maryland; Walter J. Quick, jr., district forest ranger, Shenandoah National Forest; and Alfred A. Doppel, extension forester for Connecticut.

Fire Protection and Forestry Study Measures Passed in California

California has taken an important step in forest fire protection by cutting off the first 15 days of the open season for deer in the Sierras from the Tehachapi north to the Siskiyou and Lassen County lines. The opening of the season is thus advanced to September 16. Other measures adopted by the State for forest protection make the building of fires on posted lands a misdemeanor and give the director of the department of natural resources authority, with the governor's consent, to declare any area in any State park or forestry tract closed to camping.

Another new law of California authorizes boards of school trustees and city boards of education to institute courses in forestry in the public schools. The expenses that may be incurred under this authority include not only the employment of instructors and supervisors and the purchase of equipment but the lease or purchase of lands for school forests, which may be outside the district boundaries. It is provided that in connection with forestry work the school authorities may enter into contracts and agreements with the governments of the United States, the State, and any political subdivision thereof.

Forest Planting in Nebraska

Forest planting still proceeds at a good pace in Nebraska, native State of Arbor Day and home of the Halsey nursery. Extension Forester Watkins reports that 2,736,000 forest trees were planted in the State this spring, of which 186,000 were distributed under a Clarke-McNary agreement and 200,000 under the provisions of the Kinkaid law. The United States Forest Service planted 1,500,000 on the Nebraska National Forest, commercial nurseries of Nebraska furnished 750,000, and native stock and nursery trees brought from outside the State made up approximately 100,000.

California Counties Appropriate Funds for Fire Protection

Santa Barbara County, Calif., has pledged $10,000 to the construction and maintenance of forest fire protection improvements in the present fiscal year. This represents an increase of $3,000 over the amount expended for this purpose during the previous year. In this work the county cooperates with the United States Forest Service.

San Diego County this year is extending its plan of cooperation with the Forest Service to include reforestation work. For this purpose 1 cent on each $100 valuation will be added to the tax rate. This tax for reforestation work will be in addition to the 2-cent levy already in effect for forest fire protection.

Clarke-McNary Cooperation in Planting Stock Distribution

Thirty-two States, Hawaii, and Porto Rico are now cooperating with the Federal Government in the production and distribution of forest planting stock under section 4 of the Clarke-McNary law. One new State, Montana, was added to the list during the past fiscal year. It is anticipated that agreements with Tennessee and Mississippi will soon be executed and that the previous agreements with Delaware and Minnesota will be renewed. State and Federal funds budgeted for this work during the fiscal year 1928 amount to $320,000, which is $35,000 more than the total made available for the purpose in the preceding year.

New Forest Reserves in Hawaii

Additions to the forest reserves of the Hawaiian Islands amounting to 34,957 acres have been made by proclamation of the Governor. They include 4 new reserves on the island of Hawaii, 4 additions to existing reserves on the same island, 3 additions to the reserves on Oahu, and 1 addition in Kauai. These new reserves and additions to the old ones bring the total of forest reserves in the islands up to 916,976 acres.

Pennsylvania Appropriates Funds for New State Forest Park

An appropriation of $450,000 has been provided by the Pennsylvania Legislature toward the purchase of the Cook Forest, a tract of 7,219 acres of which between 500 and 600 acres are virgin forest. This money is to be so expended only if $200,000 of private funds is paid into the State treasury as a contribution toward the purchase. If the land is bought by the State it will be used as a State forest park.

Northern New York Association Plans Reforestation Work

Representatives from the 19 northern counties of New York State recently met in Ogdensburg and formed the Association for the Utilization of the Natural Resources of Northern New York. The purpose of this body is to work out systematic plans for "the proper development, wise utilization, and extensive advertisement" of the region's natural resources. It was agreed that the first step in this direction should be reforestation of idle and waste lands. A plan was adopted for planting forest trees on 100,000 acres a year for 10 years, and the financing of this plan was assured.

Experimental Plantings at University of Virginia

Experimental forest-tree plantings were made this year on the grounds of the University of Virginia, under a plan of the Virginia Forest Service that calls for such plantings in various parts of the State. Every species that seems to have economic value as a forest tree in the State is to be used. Groups of quarter-acre plots, each plot in a group being planted with a different species, are to be so located as to permit comparison of the growth of each species under a variety of environmental conditions.

Larger Forestry Appropriation in Texas

Appropriations made by the Texas Legislature for the State's forestry work during the two years beginning September 1, 1927, are about $30,000 larger than those of the preceding biennium. They total $130,700. An item of $25,000 is provided, on condition that it be matched by private subscription, toward the purchase of a tract of virgin longleaf pine timberland to be used as a State forest park.

California Traffic Officers to Fight Fire

The 200 traffic officers of California have assumed the duties of preventing and reporting forest fires, under an agreement between the State forester and the chief of the State motor vehicle department. The traffic men will fight grass fires along the highways and will report forest fires to forest officers. They will pay special attention to persons who throw burning tobacco or matches from moving vehicles.

State forest officers of Massachusetts are now authorized to take entire charge of fires that get beyond the control of local forest wardens, engaging all necessary help and equipment. Expenses incurred in fighting such a fire after the State officer takes charge are to be divided equally between the town and the Commonwealth.

Tax homestead lands in Michigan that are suitable for State forests and other public reservations may be withheld from homestead entry and sale, under authority of a law enacted by the legislature at its session of 1927.

The Legislature of Washington has authorized the acceptance by the State for State forest purposes of suitable lands acquired by any county through foreclosure of tax liens or otherwise.

More Municipal Forests for Vermont

The number of the municipal forests of Vermont has now swelled to 38, and their area to 8,000 acres. The city of Rutland has approximately doubled the area of its forest by a recent purchase of 1,500 acres. The town of Woodstock has received land for a forest as a gift from ex-Gov. Franklin S. Billings. Forest plantings by 18 of the cities, villages, and towns this spring called for 269,000 trees.

Interim Commission Studies Minnesota Forestry Needs

The interim commission created by the Minnesota Legislature at its 1927 session to study the State's forestry needs devoted the period August 12–20 to an observational trip through the northern part of the State. They visited lumbering operations, the Cloquet Forest Experiment Station, and virgin timber, second-growth, and burned-over areas. The commission includes one senator and one member of the house from each congressional district and one member at large, and is headed by W. I. Nolan.

A survey of the resources and industries of North Carolina is being made by the State department of conservation and development. Park Mathewson, formerly head of the budget bureau of New York City, is in charge of the work. In considering the subject of natural resources the survey will cover raw materials, labor, water power, climate and health, highways, education, taxes, and transportation.

Exceptionally bad fire weather in Vermont this spring led to a proclamation by the governor forbidding the building of fires on or near forest land. The issuance of this order on April 16 was followed by a marked decrease in the number of fires. The woodlands of New Hampshire were closed for 10 days in April by proclamation of the governor, the warning being given to the public by radio.

New Hampshire Forests, the quarterly news letter of the New Hampshire Forestry Department, now appears in print and with illustrations. The printing is paid for through the sale of advertising space. The periodical's chief purpose is to supply forestry news and information of value to the department's employees. In addition it carries material of interest to lumbermen, including lumber prices.

Education and Extension

Bogalusa Camp of Louisiana Forest School Dedicated

The camp buildings of the forest school of the Louisiana State University were dedicated July 2. The camp is located 10 miles from Bogalusa, La., on the 1,000-acre forest given to the school by the Great Southern Lumber Co. J. K. Johnson, forester for the Great Southern Lumber Co., presided at the dedication. A crowd of about 1,000 attended the exercises and was addressed by officers of the university, the State, and the forestry organizations of the United States, Louisiana, and Mississippi. Among the guests was Dr. Heinrich Hesselman, director of the Swedish Forest Experiment Station.

This camp is not intended for summer use alone, but will be used off and on throughout the year. For example, Professor Markworth plans to have a number of students there this fall collecting longleaf pine seed, of which a heavy crop is promised. In the spring students will use the camp while engaged in planting work on the school forest.

Western Business Advertises Forest Fire Prevention

Reports from the Western States indicate that he who runs there this year can hardly help reading, and being convinced, that forest fires should be prevented. Corporations and commercial houses are joining with energy in the effort to spread this idea. Scattered instances of their cooperative work are the following:

The Richfield Oil Co. has issued for use in the street cars of San Francisco, Oakland, San Diego, and Portland a large colored poster showing a burning forest, with the legend "Help Prevent This—Be Careful." This company has also issued an advertisement "In the Path of a Match," to be run in color on the back covers of Pacific coast magazines and in black and white in coast newspapers.

The Southern California Edison Co., in cooperation with the supervisor of the Santa Barbara National Forest, has issued a windshield sticker consisting of a 3-inch Forest Service shield in green overlaid with the legend "Help Prevent Fires" in white and bearing smoking and camp fire rules on the reverse side. The company planned to use these stickers on its 1,200 automobiles operating in southern California, and offered to lend its plate to any other company.

The Pacific Telephone Co., in cooperation with the California Development Association, distributed 50,000 copies of a five-color poster entitled "Sentinels of Forest Safety," featuring a forest ranger and calling on the public to report fires.

The Standard Oil Co. of California in cooperation with the Forest Service issued a new 13 by 20 inch "Save the Forests" fire poster in red, white, and blue. Two thousand copies of the poster were issued for display at service stations and 20,000 copies of a 3 by 6 inch reproduction, with fire rules on the back, were printed for distribution to motorists.

The Southern Pacific Railway has arranged to run fire slogans on its menus, changing them several times each month.

The Santa Fe Railroad has decided to continue throughout the year the fire-prevention display in its time folders which it has heretofore carried during the summer.

McCredie Hot Springs, Oreg., at the suggestion of forest officers of the Cascade National Forest, this year runs a red shield and fire warning on its writing paper and envelopes, and a slogan in red on its advertising cards and hotel rate cards.

The Daly-Seegar Co., hotel printers and advertisers of San Francisco, this summer printed a large supply of cards, 5 by 11 inches, carrying three Forest Service photographs showing timber, a fire, and a burned-over area, and a forest protection plea. These cards were to be sent out to all summer resorts in California, Washington, and Oregon, in special envelopes reading "Do your bit—Tack 'em up."

Minnesota Training Course for Boy Scout Leaders

The eighth session of the University of Minnesota's training course for Boy Scout leaders was completed on August 12 with the granting of certificates to about 40 men. This course is carried on at the summer quarters of the university's division of forestry in Itasca Park. The students are executives, scoutmasters, and assistant scoutmasters of Minnesota and of North and South Dakota; the teachers are national and regional scout officers and members of the faculty of the forestry division. Half of the work of the course is in scouting and half in forestry and woodcraft.

The scientific library and personal herbarium of the late George B. Sudworth have in accordance with his wish been given to the School of Forestry and Conservation of the University of Michigan. The gift includes between 800 and 900 books and pamphlets and more than 1,000 mounted specimens.

New Hampshire Boys Get Prizes for Forestry Work

In efforts to interest farm children of New Hampshire in forestry work the Society for the Protection of New Hampshire Forests and the Agricultural Extension Service are working side by side, with excellent results. The Four-H clubs of the State, which in 1926 had 40 forestry workers, now have 250. This year the children have planted 166,000 pine trees, and in addition have taken an active part in improving their home woodlands and in protecting them from fire and from white pine blister rust.

In each of about 20 counties a series of gold, silver, and bronze medals provided by the society were awarded this year to individual boys and girls for outstanding results in establishing forest plantations and improving woodlands. In each of the counties, also, the club that did the best forestry work as a group was rewarded by the society with the privilege of having two of its members taken to a forestry training camp held in August in connection with the State university's farmers' week. In this way 40 boys went to Durham, as guests of the society, and had instruction in forestry from Professor Woodward of the university and Extension Forester Barraclough.

The boys of the East Jeffrey club, which won the prize for Chester County, worked for 50 cents a day thinning and improving a second-growth white pine woods on the outskirts of the village. A boy near Wolfboro won a gold medal for thinning and pruning nearly an acre of growing pine during the winter, and a silver medal for planting 2,000 white pines on an abandoned field with some help from his father. Another prize-winner thinned and pruned more than 2 acres of growing pines and planted 3,000 trees.

Essay Contest Open to Georgia School Children

All children in the grammar and high schools of Georgia are invited by the Georgia Forestry Association to enter a forestry essay contest that will close on Thanksgiving Day, 1927. The essays are to be based on information contained in or suggested by the Forestry Primer published by the American Tree Association. Prizes will be awarded just before Christmas. Seventy-nine high-school pupils will receive prizes of from $1 to $50 and 43 grade pupils will receive from $1 to $25 apiece.

County fairs in 23 counties of New York State this fall will have exhibits showing reforestation. A standard exhibit has been prepared by the State conservation department.

Planting Campaign in New Jersey

Extension Forester E. L. Scovell, of New Jersey, made his plans six months ahead of time for this spring's forest planting. Through the fall and early winter months he carefully studied the land use situation in Morris, Warren, and Sussex Counties, in cooperation with the county agents, and assembled silvicultural information applicable in these counties. On this basis a planting campaign was arranged for each of the counties, including the appointment of local committees, essay contests, exhibits, meetings, and demonstrations, and leading up to the proposal to individual landowners that they pledge themselves to a certain amount of planting. The effectiveness of the early-matured plans may be judged from the planting reports of the three counties for 1926 and 1927:

County	1926		1927	
	Number of planters	Number of trees planted	Number of planters	Number of trees planted
Morris	25	126,000	39	186,000
Warren	5	23,000	27	58,000
Sussex	12	76,000	28	99,000
Total	42	225,000	94	343,000

The totals for the three counties show an increase of 124 per cent in the number of planters and an increase of 52 per cent in the number of trees set out.

Farmers Study Forestry at County Leader School

Twelve farmers of Carlton County, Minn., took a course in forestry as a phase of farm management at a county leader training school held during the past winter. One day a month for four months, from December through March, they met with William Cavert, extension specialist in farm management and economics, and Parker Anderson, extension forester. Each of these farmers carried back what he learned to a group of his neighbors.

In the first lesson Mr. Cavert discussed the plan for the farmstead, bringing out points in the arrangement of fields and location of buildings that facilitate the work of the farm. Mr. Anderson followed with a description of windbreaks and shelter belts as features of the farm plan. In the second lesson the farm-management specialist discussed field arrangement and crop rotation and the extension forester gave a talk on the growing and planting of trees and some of the principles of landscape arrangement. In lesson three Mr. Anderson presented woodland management, and in lesson four the utilization of farm timber.

The work of this school was so successful that Mr. Anderson hopes during the coming year to repeat it in several other counties.

Forestry Exhibit at Transcontinental Highways Exposition

An open-handed friend of forestry enabled the San Francisco office of the United States Forest Service to put on an unusual exhibit at the Transcontinental Highways Exposition in Reno, Nev., this summer. W. A. Shepard, California commissioner at the exposition, footed the bill of about $800 for an exhibit occupying a space 37 feet long and 20 feet deep facing the main entrance of the California building. Half the set was a green forest scene with living trees, needle-covered floor, a waterfall, and a lake. A painted background of forests and mountains and a foreground realistically arranged with ferns, moss, old logs, rocks, and pine cones completed the picture, which was enlivened by a mallard duck and ducklings and a flock of quail. The other half of the exhibit gave a glimpse of a burned-over forest, featuring blackened stumps and a floor of bare rocks and ashes, the skeleton of a deer, and a fragment of a "Help Prevent Fires" sign. The walls of an aisle leading from the exhibit bore large fire signs variously worded. Cooperators in addition to Mr. Shepard were the fish and game commissions of California and Nevada, the Nevada State Highway Commission, and the Hobart Estate Co.

North Dakota Farmers Prepare for Shelter Belt Planting

Sixty farmers of Mountrail County, N. Dak., are planning to add to the appearance and comfort of their homes by planting shelter belts next spring. In most cases the land has lain fallow all summer. Practically every one of the plantings will be located on the north and west side of the farm buildings, not less than 100 feet from them. According to the usual plan the trees and shrubs will be placed 6 feet apart, in 10 rows 10 feet apart, and the shelter belts will be 100 feet wide and from 300 to 400 feet deep on each side. In many cases it is planned to have orchards and gardens just inside the shelter belts. Four of the 60 farmers, as a reward for the best work in selecting and preparing sites, will have their planting done without charge by the North Dakota School of Forestry, Bottineau.

The Erie branch of the Pennsylvania Forestry Association this spring offered to supply every rural school in Erie County with tree seedlings to be planted on Arbor Day. Thirty-eight schools accepted the offer and received 7,800 trees.

Forest Service Notes

The Part of Forestry in Flood Control

(Excerpts from an address by W. B. GREELEY, United States Forest Service, at the Mississippi Flood Control Conference, Chicago, June 3, 1927)

The first thing needed in trying to stop floods by tree growth is to drop all exaggerations about it. It is not true that serious floods are due to deforestation. They occurred when the virgin timber on the Mississippi basin had scarcely felt an axe. It is equally untrue that forests have no bearing upon stream flow. A deal of concrete evidence shows that they have.

The Mississippi basin contains about 89,000,000 acres of forested or denuded land which has little or no utility except in growing timber. No one can assert that the condition of this vast land surface, or the degree of care or of neglect which it receives, have no bearing upon the flow of the Mississippi River.

We must approach this question with sanity and common sense. Forests do hold back flood discharges; but they can not prevent large floods when heavy rains occur. Any reservoir overflows when it receives more water than it can hold. Likewise, forested land overflows after it has become fully saturated with rain. Furthermore, any benefits derived from reforestation can not be secured over night. They will come about only through a long space of time.

Hence forests can not be substituted for the engineering structures upon which our main reliance must be placed for controlling heavy flood discharges. They can supplement dams or levees, but can not take their place. In dealing with this problem, forestry should be the handmaiden of engineering; but as a handmaiden it has a valuable service to offer.

In the first place, forests cause a more gradual melting of snow. Forests moderate both extremes of temperature. They are warmer than open land in winter and cooler in summer. As spring comes on, snow melting may begin earlier in the woods. On the other hand, it usually lasts longer in the woods than on exposed ground. The common effect of forest cover, borne out by many observations, is to retard the melting of snow after warm weather sets in.

Because of their moderating effect on extremes of both heat and cold and their mulch of ground litter, the soil freezes less readily under forests than in open spaces. Hence in the colder regions forest soils are kept more mellow and better able to absorb water released during the first warm days of spring.

In the second place, forests reduce erosion. Any vegetative cover tends to reduce erosion. But forests usually perform this function more effectively and permanently than any other type of vegetation. This is because of the thick mulch of leaf litter and branches

which they drop upon the ground. Furthermore, they are constantly feeding humus into the soil itself, increasing its porosity and binding its mineral constituents. And the mass of roots of the trees and shrubs have an enormous binding power of their own.

The actual effect of forests upon erosion can not be gauged without considering other factors, particularly the character of the soil and topography. The streams of the northern Lake States, for example, largely drain porous soils containing much sand and fine gravel. These soils have a high humus content, thanks to the stands of pine and spruce and hemlock which once covered them. Their drainage basins contain much lake and swamp storage and receive a heavy snowfall. All these facts tend to keep them clear, regardless of the presence or absence of forests to-day. Hence the Mississippi River above St. Paul, with a basin of 19,585 square miles, carries a yearly silt discharge of only 117,000 tons.

The Tennessee River, on the other hand, with a catchment area less than twice as great, carries an annual silt burden of 11,000,000 tons. The Appalachian region which it drains is a country of light snowfall and of irregular and often concentrated rains. It contains few lakes, but is made up chiefly of heavy, compact soils which easily erode. On such basins, forests exert their maximum influence in reducing erosion. And what is true of the Tennessee applies equally to many of the middle and lower tributaries of the Mississippi which drain the Appalachian and Ozark regions and the lower hills around them.

The Mississippi receives an enormous flow of water also from the eastern slopes of the Rocky Mountains and from the Great Plains. The mountain tributaries of these rivers are mainly clear. They are partly forested and fed chiefly by springs or melting snow. But, with their inflow from the treeless plains, these rivers undergo violent fluctuations between high and low water stages. From the plains they gather in an enormous volume of silt, causing channel bars, meandering currents, and constant undercutting of the banks. The Missouri River, above Ruegg, Mo., carries a yearly load of 176,000,000 tons of silt. No possible forms of vegetative cover could overcome these conditions; but the extension of forests and better conservation of range plants would somewhat moderate them.

The gullying of abandoned fields and of logged-off and burned-out woodlands on the slopes of the Appalachians has been striking. So was the washing of soil from the forested area in Tennessee that was killed out years ago by the Ducktown smelter fumes. The cutting off of forest cover on a small watershed in Colorado, although in a region of coarse, permeable soil, increased the volume of silt discharged eight and one-half times and increased the flood silt load twelve times. The burning out of a small brush-covered canyon in southern California in 1914 was followed by a silt discharge in a single year of 100,000 cubic yards of soil from a basin containing little more than 1 square mile. Disastrous erosion has followed every forest or brush fire in the rugged gorges of southern California.

Aside from slowing up the melting of snow and reducing erosion, forests do, in some measure, create a surface reservoir that holds back part of the rain and feeds it into the streams more slowly. The trees and bushes themselves intercept some of the rain and delay its progress to the earth. The mat of litter found under thrifty, unburned forests, sometimes only a few inches deep, sometimes a foot or more, acts like a sponge. It absorbs water until it can hold no more. The water-absorbing capacity of the soil itself is greatly increased by the constant accretions of decaying humus. And innumerable little drainage tubes into the subsoil are formed by the roots of trees and brush.

The storage capacity of forests can not be measured in exact terms. Yet there is ample proof that such an influence is exerted by tree growth as well as by other forms of vegetation.

Several years ago a disastrous flood at Pueblo, Colo., was caused by local cloudbursts. In the canyons most completely denuded, the crest of this flood occurred within six hours from the start of the storm. In the forested canyons which received the same rain, the flood crest was not reached until from 18 to 48 hours after the beginning of the storm, and the damage resulting was materially less.

A study made by the Forest Service in southern California showed that within three years after the brush cover on a canyon drainage was destroyed by fire, the soil lost 45 per cent of its water-absorbing capacity. This was due partly to the direct loss of humus and litter and partly to the rapid erosion of the surface soil, exposing the more compact and impermeable subsoil. The value of forest and brush cover to stream flow is so well recognized in southern California, where stored water is the life blood of agriculture, that all agencies, Federal, State, and county, have joined with the water users in a $2,000,000 program for protecting and extending the vegetative cover on their watersheds.

A study made by Professor Bode in Iowa in 1921 showed that even small woodlots in a prairie region have a decided influence upon the absorption of water by the soil beneath them. Not only the average but the maximum and minimum water contents of the woodlot soils were found to be greater than those of soils of the same character and slope in open prairie and farm land.

Now what can be done to bring the protecting and conserving influence of forests to bear most effectively upon the Mississippi floods?

Every forest fire in the Mississippi basin tends, sooner or later, to augment flood conditions. Every abandoned or neglected piece of poor hillside farm land has the same tendency. Destructive lumbering and overgrazing, which leave naked soil behind them, are

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sure to contribute, at one time or another, to some flood crest. Some of these conditions can only be remedied by the type of educational extension in agriculture and forestry now being conducted by most of the States in cooperation with the Federal Department of Agriculture. Some of them can be remedied by more direct means.

In the main, the existing Federal laws are adequate. We have a law under which the National Government cooperates with any State in the systematic protection of forested and denuded areas from fire. The law is all right; but we need more actual protection under its terms.

We have a law under which the National Government cooperates with any State in promoting tree planting on farms, by furnishing the planting stock. This is precisely what is needed—for flood control—on a large acreage of abandoned or worn-out hill farm land in the Mississippi Basin. The law is sound, but we need a great deal more timber planting under its terms.

We have laws under which national forests may be created anywhere on the drainage of a navigable river. These laws are adequate. The Government has established and is extending national forests on several watersheds within the Mississippi Basin. But we need many more of them. And we need many more State forests to supplement those in national ownership. They will pay good dividends in timber growth and forest industries, aside from their benefits to flood control. But public forest ownership is particularly urgent and warranted on critical areas of denuded or eroded lands which are direct sources of destructive floods.

On the western tributaries of the Mississippi, there is an enormous acreage of grazing land in the open public domain. Grazing on these areas is wholly uncontrolled and usually excessive. An experiment in Utah made by the Forest Service showed that the run-off from rainstorms on overgrazed land was seven times as great as on adjacent areas that were moderately and conservatively grazed. Reduction of erosion is one of the clearly recognized aims of grazing control in the national forests. The Secretary of the Interior has strongly recommended that grazing on the open public domain be also placed under regulation. It should directly benefit the conservation of forage and the stability of the livestock industry. And it can not be left out of our present consideration of ways and means for reducing floods.

Nor should we overlook the natural storage afforded by swamps and overflow bottoms on the upper tributaries of the Mississippi. The drainage of swamps and overflowed lands, destroying natural water storage for the sake of precarious and often unsuccessful farming, has gone too far. Some of these areas should be restored to their natural storage function and their additional service as breeding grounds for fish, water fowl, and fur-bearing animals. Let us have fewer attempts at ill-advised agriculture and more swamp-land fish and bird reserves like the Winishik bottoms along the Mississippi.

All of these elements in the problem, forestry included, bring us down to the bed rock of rational and productive use of land. It offers many public benefits aside from flood control. It offers a future supply of timber, the conservation of forage, the saving of soil fertility, the profitable use of idle land, the preservation of valuable wild life, and a more diversified and stable agriculture. Flood control may, if you please, be regarded as a by-product of other national benefits from the effective use of land.

Let us see the picture in its true proportions. As checks upon big floods, forestry and its allied forms of natural storage take a secondary place. They belong "upstage." Immediate relief must be sought through the skill of the engineer. But behind and supplementing the levees or other structures that must be built, we get back to the land. And we should not fail to restore, as far as it may be done, the natural storage and protection from erosion that may be derived from common sense and practical wisdom in our everyday use of land.

Federal Court Enters Decree in Kaibab Deer Case

In a recent decree the United States District Court for the District of Arizona, northern division, permanently enjoined State and county officials of Arizona from interfering in any way with forest officers and other agents of the Federal Government in carrying out the regulations and orders of the Secretary of Agriculture for reducing the number of deer upon the Kaibab National Forest and the Grand Canyon Game Preserve. The only limitation placed upon the Federal Government by the decree is that private hunters can not be licensed by the Secretary of Agriculture to kill the deer, except in conformity with the special requirements of the State's game law. However, this limitation does not apply to forest officers and other agents of the United States.

This case dates from the fall of 1925, and arose because of interference or threatened interference by State and county officers with those engaged in reducing the deer herd under orders from the Secretary of Agriculture and the Forester. Representatives of the State claimed that the local game laws must prevail over such orders.

The United States filed a bill in equity asking the district court to enjoin county and State authorities from carrying out their announced purpose or in any manner interfering with the Government plan through the enforcement of State laws or otherwise. Judge Ross, in delivering the opinion of the court, said that regardless of whether the deer are the property of the State or of the United States "there can be no doubt of the right of the Government of the United States to do whatever is necessary for it to do upon its

own property to protect it from the depredations complained of, including the killing or removal of whatever number of deer as may be necessary, without any regard to the game laws of the State of Arizona."

At the time when the Grand Canyon National Game Preserve was created in 1906 the Kaibab deer herd numbered approximately 3,000 head, but in 1925 it had increased to more than 30,000 head. Through extended investigations it was found that the deer were overstocking the range and consuming a large part of the forage best adapted for their winter feed and were also injuring and damaging the national-forest lands by overbrowsing and killing young tree growth, shrubs, bushes, and other forage plants. Prior to the issuance of the decree by the district court it was the belief of those most familiar with the situation that regulated hunting on the area afforded the most feasible means of reducing the herd and thus preventing starvation of the deer and injury to the forest.

Hunting by private persons will be permitted during October of this year under a cooperative arrangement recently entered into between the State game warden and the district forester, Ogden, Utah. Each hunter who obtains a State license and pays the United States $2.50 to reimburse the Forest Service for the cost of administration will be permitted to kill one buck deer. The State and Federal authorities will exercise joint administrative control of the hunting.

Experiments in Tapping Jeffrey Pine for Heptane

The California Chemical Corporation, under a recent agreement, is tapping Jeffrey pine timber on the Lassen National Forest, Calif., for heptane. The work is being superintended by E. C. Shaler, formerly a forest ranger on the Sierra National Forest. In connection with this operation the Forest Service will make studies of the results of different methods of tapping, the forest products staff of the San Francisco office investigating their effect on yield and the California Forest Experiment Station their effect on the health and growth of the trees. The Forest Products Laboratory at Madison, Wis., will cooperate, especially in the analysis of oleoresin. The experimental work will be under the direction of N. C. Tihomiroff, a young Russian experienced in similar work.

The experimental area is located on the east side of the Sierras, about 40 miles from Susanville, on the sale area of the Fruit Grower's Supply Co.

A difficulty in cupping for heptane for which no counterpart exists in turpentine operations arises from the fact that information is lacking as to just where, in the intergrading tree forms between the typical Jeffrey pine and the typical western yellow pine, the heptane characteristic of the former gives way to the terpenes characteristic of the latter.

Douglas Fir Has Long Seasonal Seeding Period

Recent investigations by Leo A. Isaac of the Pacific Northwest Forest Experiment Station have shown that the period during which the seed of Douglas fir is disseminated is much longer than has generally been supposed. Douglas fir seed becomes thoroughly ripe early in September. The cones begin to open about the middle of September, and within that month there occurs a heavy dissemination that has usually been supposed to be complete. It is now found that the cones, which for the most part cling to the branches for a year or more, may still be scattering viable seed many months after they first open in September.

A series of rodent-proof seed catchers were set near a body of green timber near Scappoose, Oreg., in the fall of 1925, and the seed caught in them were collected at fortnightly intervals. It was found that only 65 per cent of the seed fell from the trees before the first of November, and that sound seed fell as late as the following June. In the fall of 1926 another series of catchers were placed near a body of green timber at Wilark, Oreg. In spite of the fact that the seed crop was light and this forest less dense than that in which the previous trial was made, good seed were found to be flying in January.

This study of seed fall was supplemented with an examination of cones periodically collected from certain trees in the same general region. Cones collected January 15 showed eight seeds to the cone, of which 16 per cent were viable; and it was found that as late as April 15 two seeds to the cone remained, of which 14 per cent were sound.

Seed retained in the cone of Douglas fir is well protected from the weather. Under each scale of the cone is a pocket containing two seed. The pocket is covered with a light coat of resin, which when the seed ripen becomes dry and hard. This resinous coat is so smooth and glossy that water runs off it promptly without wetting the seed. Besides, the thin tips of the cone scale during rainy or foggy weather absorb water from the air and thus swell, causing the cones to shut. Practically impervious to moisture in this condition, the cones retain the seed until the air again is dry.

As a result of this seeding habit of the Douglas fir some of its seed spend a part of the winter in a dry pocket that may well be considered a better storehouse than the alternately wet and dry surface of the ground; are kept safe from late summer or early fall slash fires and also from birds and rodents; and are released under a variety of wind directions. These facts indicate the great value of seed trees on Douglas fir lands recently cut over or burned.

The forest experiment station recently established by the Federal Government in cooperation with Ohio State University at Columbus, Ohio, is to be known as the Central States Forest Experiment Station.

On the Trail of the Vanishing Longhorn

By Will C. Barnes, United States Forest Service

When the first Spanish adventurers set foot on this American continent they found neither horses nor cattle. Both are exotics. The nearest approach to cattle was the bison, mistakenly called "buffalo." "Hump-backed cows," the Spanish called them.

The first cattle to set foot on America's shores were swum ashore near Vera Cruz, Mexico, in 1521, from some ships under the command of Gregorio Villalobos, a governor-general sent to rule "New Spain." The written report of Villalobos's voyage says clearly: "He brought a number of calves (oviese ganado) from San Domingo, he being the first to bring them to New Spain."

The Spanish have never been interested in improving their livestock. If they had any ideas on this subject where cattle were concerned it was to produce a leggy, active animal with keen horns, an aggressive disposition, and a nature suitable for their national pastime. Beef production undoubtedly came second.

These Spanish calves were the progenitors of the millions of longhorn cattle that spread rapidly fanwise from Vera Cruz, over the coastal plains of Texas and the Great Plains region of the far West. In forage and climatic conditions these cattle found themselves in a region very like that they left in Spain, and they thrived from the first.

Texas at the close of the Civil War was overflowing with longhorn cattle. With the end of hostilities this overflow surged northward across the plains until from the Gulf to Canada this hardy breed pressed the buffalo and the Indian back until the whole country was theirs.

They were the pioneers, but like pioneers they had to give way to the demand for improvement. "Too much legs, horns, and speed, and not enough beef," came to be the general opinion of the range men. The longhorns had had their day. They were driven from the ranges, not by force but by the simple process of evolution—the survival of the fittest.

Thus within comparatively few years this breed of cattle, so closely tied up to the history, romance, and adventure of the Southwest, was about to become extinct. To some men who had known the longhorns for nearly half a century this seemed almost a tragedy—a national misfortune. For years, however, appeals to Congress for money to buy a few from those still left fell on deaf ears. "Cui bono?" the law makers asked in the old school-boy phrase. "No economic values are involved. They have served their day. Let 'em become extinct. Forget them." "Listen," said the old-time cattlemen to the solons, "Congress spent $25,000 to save the buffalo, that never were anything like as near complete extinction as are the longhorns, and quite as much in 1906 to save the remnant of the old Morgan horses. Massachusetts is spending this year more than $10,000 to save the heath hen, and the whole country applauds the act." Eventually, this year, a small sum was granted for the purchase of a few cows and some bulls, and two very much pleased forest officers went down into Texas in search of longhorns—and adventure. They found both.

At Fort Worth, San Antonio, and other points the general feeling was that their quest would be unsuccessful. "A few old cows might be found," they were told, "away down in the 'prickly pear' country of the lower Rio Grande, in the dry resacas or the cottonwood bosques along the river or in the dense mesquite thickets of the plains." But bulls! Well, that was something else again. Everybody doubted the possibility of finding them.

John H. Hatton, from the Denver office of the Forest Service, and I first plunged into the prickly pear country between Laredo and Brownsville on the Rio Grande and Corpus Christi on the Gulf. We hunted out every nook and corner of this region on every imaginable kind of transportation. We had to invent a standard type by which to make our selections. We talked longhorns to every human with whom we came in contact. From all this and from our own experiences in the past we built up in our minds a picture of the old-time longhorns from which we developed a standard or type.

In two weeks we had spotted 10 cows and 1 bull in that corner of Texas as meeting our requirements. We found one here, one there. We hired a cattleman who knew the country to gather them at a central point of shipping. This was done mostly with auto trucks carrying huge crates. The truck was backed up against a corral, holes were dug into which the hind wheels would drop, and the cow coaxed or dragged into the crate or cage and hauled across country to the railroad.

Having exhausted this end of Texas we moved up into the great coastal plains section between Houston and Beaumont. Here was an entirely different country—vast open prairies with some "piney woods" and scattering mesquite. Ten thousand acres in a single rice field. A hundred and fifty thousand acres in one cow pasture. One of the great range cattle sections of the State. We were told to go there because the longhorn steers for the "North of 36" movie were gathered from these ranges. We combed the region thoroughly. Ninety per cent of the cattle were carrying the blood of the sacred Hindoo or Brahma cattle. We gathered 10 excellent longhorn cows and 2 good bulls in this section.

Inasmuch as the steers are the ones that develop the extremely long horns, we bought three glorious animals with good-sized horns to be kept as an exhibit of what a longhorn should be. They are all young and their horns will probably grow at least 18 inches more in the next three or four years. They will fill out the picture until we can raise some ourselves.

The two shipments were concentrated at Fort Worth and dipped three times at seven-day intervals

to free them of the deadly Texas-fever tick. Then, because Oklahoma requires all breeding cattle entering the State to be tested for tuberculosis, they were crowded into a long narrow chute and a veterinarian of the Bureau of Animal Industry injected into the tail of each animal a dose of tuberculosis "medicine." Three days later they all went through the chute again to see if there were any "reactors." There were none. Then the whole bunch were put through a branding chute and branded "U. S." on the left hip.

The horns of the three big steers would not pass through the "dip" so the animals had to be roped, tied up to a post, and sprayed just as a gardener sprays his rosebushes. To this operation they objected most strenuously, and we were in an agony lest in their struggles some of those precious horns should be broken. Fortunately no accident occurred.

During the time the animals were in the Fort Worth yards five different movie outfits took shots at them, during which time the senior forest officer was chased up the fence several times by angry and excited steers that did their best to help him up with their long keen horns. An unfeeling observer remarked that the proceeding reminded him strongly of an alley cat hustling up a city shade tree just about one jump ahead of a lively fox terrier. The principal actor can recall that, like some airplanes, he seemed to lack speed and climbing ability. It was a red-hot day and he remembered later the fact that considerable shirt tail fluttered in the breeze as he mounted the fence. Also that he had a weak heart and his doctor had warned him against any violent exercise. He survived, however.

While he was inspecting one steer at a ranch in a mesquite thicket away down near Laredo, another hasty fence-climbing took place, with the long keen horns of a surly old steer playing a regular tattoo on the soles of the man's shoes. There was also a short but very interesting foot race just before the fence was reached that undoubtedly broke the record for a 50-foot sprint. While the man was perched precariously on the top board of the fence with the aforesaid surly steer still on the job, his pet Panama blew off and landed in the center of the corral. With a mad bellow the steer jumped for the hat. What he did to it was a plenty. He stamped on it, slobbered over it, pawed at it, and finally managed to impale it on one of those rapier-like horns. Then he pranced excitedly around the corral, snorting and bawling and wearing in triumph that head covering from the Tropics. Eventually the hat came off and the steer, apparently highly pleased with himself, backed off into one corner and watched the taking of his picture without further action on his part.

It was like old times to one of the men to sit in the caboose of a long freight train with a car of cattle ahead, and crawl out "over the top" of the train in the dark night to make sure his cows were all there. Cache and the Wichita Forest were eventually reached and the cattle placed in the pasture provided for them. Swarms of people came out from surrounding cities to look them over and the old-time cowmen of the region all agreed that the bunch we had collected were really fine specimens of the old longhorns—perfect types with which to build up a modest herd of 250 or 300 head and thus preserve the breed for future generations of Americans to admire.

Like the buffalo, the longhorn will not become extinct.

Stockmen Indorse Federal Range Research

At the third biennial field day of the Great Basin Experiment Station at Ephraim, Utah, August 16 and 17, the attending stockmen passed a resolution indorsing the range research program of the Federal Government and favoring continued Federal control of the public domain. About 200 persons attended the meeting and examined the studies under way at the station. Camp-fire discussions were also held on range problems, the place of research in the solution of those problems, and what better range management means in bringing about more stable and profitable livestock production, watershed protection, and community welfare.

At the Uintah Basin Industrial Convention at Fort Duchesne, Utah, August 3 to 5, stockmen "assembled in convention ten thousand strong" passed similar resolutions, with the addition of indorsing Federal regulation of grazing on the public domain. The registered attendance at this meeting was 14,000. Two two-hour periods each day were given to discussions and lectures on range, livestock, field crops, foods and nutrition, home management, and clothing, and exhibits on these subjects were shown.

National Forest Receipts

The income from the national forests during the year ending June 30, 1927, was $5,166,609. These receipts exceed those of any preceding year except 1923 and 1924. Timber sales and settlement brought in $104,815 less than in 1926. Grazing fees totaled $112,562 more than in 1926, largely because for that year grazing fees were remitted in the drought-stricken region of Arizona, New Mexico, and Utah. Turpentine sales brought in practically identical amounts in the two years. Special uses and waterpower receipts showed substantial increases in 1927.

The number of national forests was diminished by one on June 29, 1927, through the rescinding of the Executive order of April, 1925, that created the Upton National Forest of 6,154 acres on the area of Camp Upton, N. Y. The War Department has classified Camp Upton as surplus property and obtained authority from Congress to sell the area. In view of the real estate values involved the Forest Service did not oppose this action of the War Department.

General Forest News

Providing for Second Cut Increases Present Profits

By W. W. Ashe, United States Forest Service

By some changes in milling plans, but chiefly by ceasing to cut any trees below 15 inches in diameter, the Crossett Lumber Co. of Arkansas has reduced its operation costs by more than $1.50 per 1,000 feet. To a company operating three pine mills with a cut of about 70,000,000 feet a year, this means a very important saving.

The new woods and milling policy of the Crossett Co. is based on the results of an investigation of its operation which I was employed to make, analyzing logging costs, milling costs, the relationship of logging and milling costs to overhead and other similar charges, and the relative profit or loss in handling logs of different sizes. The company is planning for a permanent cut. This analysis of its operation has enabled it to estimate closely the cost to the present operation of leaving any number of trees of any given size as a basis for a second cut, and how far it can go in that direction without impairing present profits.

The statement of John Watzek, jr., vice president of the Crossett Co., that the company's operation costs have been reduced by $1.50 per 1,000 feet is based on a comparison of logging costs during the first month following the adoption of the new plan with those of the preceding six months. This was a net reduction; in figuring it, account was taken of the increase in railroad construction cost, the increase in overhead, and the increase in the cost of fixed charges due to curtailment of cut.

In addition to lowering the cost of logging, the new plan effected material saving in sawing costs. It also brought about an improvement in the grade of the lumber produced and an increase in its ave age selling value. These savings more than make up for the decrease in the amount of timber cut.

It must be understood that the diameter fixed as giving approximately the maximum profits in this case can by no means be accepted as applying to the conditions of every other operation. To attempt so to apply it would be like taking the prescription given for a case of typhoid fever and applying it in a case of double pneumonia. The conditions that determine the cost factors in different lumbering operations are essentially no more alike than the conditions of these two diseases.

In May and June of this year more than 800,000 wild and 360 cultivated gooseberry and currant bushes were destroyed in the counties of York, Cumberland, Oxford, Androscoggin, Sagadahoc, Kennebec, and Lincoln in Maine. Through this eradication work 10,000 acres of white pine are protected.

Preventing Termite Damage to Buildings

By Thomas E. Snyder, United States Bureau of Entomology

Forty-two different kinds of termites or "white ants," practically all native, occur in continental United States. Damage by these insects to the woodwork of buildings is especially serious in the Southeast, Gulf, Central West, Southwest, and Pacific Coast States. In the tropical possessions of the United States much more serious injury is caused by different and more destructive termites. As an estimate of the damage done by termites each year to timber used for various construction purposes in the States and in the tropical possessions, the Bureau of Entomology believes that $15,000,000 is a conservative figure.

The termites that damage buildings are of two habits, subterranean and nonsubterranean. The subterranean termites require much moisture, which they obtain from the earth. They must always maintain contact with the earth, and so attack wood only indirectly. The nonsubterranean termites, on the other hand, require so little moisture that they can live in wood having a moisture content of less than 10 per cent. Damage to buildings by subterranean termites occurs in every State of the Union; damage by nonsubterranean termites occurs only in the area south of a slack line drawn between Norfolk, Va., and San Francisco, Calif.

Termite damage to buildings is due to man's disturbance of the balance of nature. Under primitive forest conditions termites performed a necessary function as scavengers. When the clearing of the forests from large areas deprived them of their natural home and food, it was inevitable that they should be diverted to wood that had been taken from the forests and used in building operations.

Contrary to a widespread popular impression, wood is by no means the only construction material subject to termite damage. Substitutes for wood are also attacked—fiber boards, plaster boards, mortars, and plaster—and so are improperly constructed buildings having foundations of masonry, brick, and concrete.

Termite damage to buildings can be prevented in most cases through certain methods of construction. The way of prevention lies not in the choice of type or kind of construction material, but in the manner of utilizing the material. Wood, masonry, concrete, brick, hollow tile, stucco, and even rammed earth can all be used in such ways as to ward off effectively the attacks of the insects. Prevention is much simpler and cheaper than any remedial measures, because after termites are once established in a building they may be very difficult to eradicate. A few hundred dollars added to the initial construction cost of a building may save thousands of dollars in later repairs and replacements made necessary by termite damage.

The Bureau of Entomology is recommending that a few simple measures for excluding the insects be incorporated in city building codes, and is suggesting these measures to home builders and owners in rural communities through the county agricultural agents. The recommended measures are: (1) Insulation from the ground of all untreated material, either by the use of stone or concrete foundations and of the most impenetrable grades of mortar and plaster or by the use of timbers impregnated with coal-tar creosote; and (2) the use of termite guards or shields of sheet copper over foundations of any type to prevent the subterranean termites from extending their earthlike shelter tubes over the surface of the foundations to untreated material above. These copper shields are inserted over the foundations with the projecting edges turned down at an angle of 45°. They need not be unsightly, and may even be made decorative.

An additional point in favor of these construction methods is that they prevent the entrance of many annoying and injurious household rodent and insect pests.

In close cooperation with the Forest Products Laboratory at Madison, Wis., the Bureau of Entomology is experimenting with various wood preservatives to determine which are most effective in preventing termite attack. The tests are being carried on both in this country and in the Canal Zone, Panama. On Barro Colorado Island, Canal Zone, on which 30 species of destructive termites occur, the bureau is conducting experiments in cooperation with the American Wood Preservers' Association. Here woods impregnated with different preservatives have been buried in a plot, or "graveyard," and in August, 1926, a model termite-proof building was erected. All the wood for this building was impregnated with such standard preservatives as coal-tar creosote and zinc chloride. Both the full and empty cell pressure processes of impregnation were used, the treatment varying according to the position the lumber was to have in the structure. At the same time several buildings of heartwood redwood from the Pacific coast were erected on the island for the purpose of testing thoroughly the resistance of untreated redwood to the attacks of both subterranean and nonsubterranean termites.

Tests of mortars and concretes of various different combinations are being conducted by the Bureau of Entomology to determine what composition for foundations below the surface of the ground is most effective in preventing penetration by termites. At Falls Church, Va., 16 test walls or panels were completed in August, 1926. Similar test walls have been built at Urbana, Ill., by the State entomologist in cooperation with the Bureau of Entomology.

Heretofore, adoption of the practices recommended for the prevention of termite damage has been limited by the nonavailability of adequate supplies of treated lumber. Through a recent action of the National Committee on Wood Utilization, a continuous supply of lumber chemically preserved in accordance with the standards of the American Wood Preservers' Association, both as to methods and as to materials, is to be made available in the territory included within a circle of 50-mile radius centering in St. Louis. The merchandizing program adopted by the committee, which will be put into operation immediately, will be adequately supported by advertising and publicity. Plans are on foot for gradually increasing the radius of the territory served and for arranging similar operations elsewhere until treated lumber becomes available to the small consumer in all parts of the country.

Spark Screens of Pines for Rights of Way

The Pennsylvania Railroad this spring planted 11,500 pine seedlings along four stretches of main-line tracks in the Logan forest district, Pennsylvania, where fire hazard is high. The trees were placed at intervals of only 3 feet, and it is expected that within a few years their interlacing branches will form a screen that a live spark can scarcely penetrate. The seedlings, of Scotch pine, pitch pine, and Norway spruce, were supplied by the Pennsylvania Department of Forests and Waters, and the planting was done under State forestry supervision. Two of the plantings are on State forest land at the Spruce Creek Tunnel and two on private land south of Birmingham station.

Wood Pulp for Dentists' Dams

Invasion of a field until recently held by the cotton linters is seen in the use of wood pulp for making the little cylindrical rolls or "dams" which dentists place in the mouths of patients. The new dams apparently are made of very soft paper rolled to the desired form. Some are slit lengthwise for adaptation to clips which hold them in place. They show widely varying degrees of density and absorptive power.

A Washington, D. C., dentist states that these rolls are preferable to the cotton dams, because the relative shortness of the wood fiber permits their being broken at any desired point so as to fit into the place where the work is being done. The short fiber also gives a smoother surface. The old style dams were covered with fuzz which frequently became entangled in the revolving drills, with the result that the dam was pulled out of place. With the wood pulp roll this does not happen.

A 60-year-old second-growth redwood forest at Powder Mill Flat, in Santa Cruz County, Calif., according to observations carried on for the past 10 years by the University of California, is growing at a rate of nearly 2,000 board feet per acre per year. The trees average about 30 inches in diameter and 140 feet in height.

Gum Yields on Burned and Unburned Land

By Harry Lee Baker, United States Forest Service

N. G. T. Simerly, manager of the woodlands belonging to the Tennessee Coal & Iron Co., Stapleton, Ala., gives the following instance in support of his theory that gum production is lowered if fires are prevalent. A neighbor, who had been successful in keeping fire off his property for a number of years, leased his turpentine trees with the understanding that light burning was not to be practiced during the turpentining operations. The operator was successful in keeping fire out, and at one dipping obtained 2½ barrels of gum from 1,300 cups. At the same time, on an adjoining area that had been burned over repeatedly and that was burned in advance of turpentining, this operator obtained 2 barrels of gum from 2,000 cups. On the basis of 1,300 cups it appears that the yield on the burned ground for one dipping would have been about 1.3 barrels, or approximately one-half as much gum as the same number of trees produced on the unburned area. In another case cited by Mr. Simerly, the operator estimated that yields in gum were 25 to 33 per cent greater where fire had been kept out.

This information is based upon casual observations, not upon careful investigations of all factors influencing yields. There might have been some difference in methods, site quality, age, spacing of the trees, etc., but Mr. Simerly is of the opinion that conditions were sufficiently similar to prove that light burning prevents maximum yields in gum.

Mr. Simerly does not favor burning on his company's property except to create firebreaks throughout the property or protective strips along roads. In 1926, when 16,000 acres of the land under his charge was given organized protection, only 2½ per cent of this area was burned over; and during the first half of 1927 only 0.6 per cent of the protected area was burned.

This year's annual meeting of the Allegheny section of the Society of American Foresters, held in the last week of July, consisted in a three-day tour through the anthracite section of Pennsylvania. Industrial operations including industrial wood utilization and industrial forestry were seen under the guidance of A. C. Silvius, forester of the Philadelphia and Reading Coal & Iron Co.; A. C. Neumiller, forester for the Lehigh Coal & Navigation Co.; and W. W. Scranton and G. R. Taylor, president and forester, respectively, of the Scranton Gas & Water Co. A party of 41 members and 34 guests made up the largest attendance the section's summer meeting has ever had.

The Pine Institute of America has moved its headquarters to Jacksonville, Fla., where it now has offices in the Barnett Bank Building.

National Research Program Indorsed

A resolution adopted by the Legislature of Wisconsin urges that Congress pass the bill introduced by Representative McSweeney proposing an adequate national program of forest research. The legislature advocates passage of this bill on the basis that "the future prosperity of Wisconsin is bound up in maintaining and restoring the productivity of forest lands and the effective utilization of their forest products as well as the related recreational, game and fish, and other resources.

"* * * The efficient development and use of forests and the products therefrom is dependent upon a permanent enlarged program of forest research * * * not only for Wisconsin but also for the entire United States."

Another voice raised in advocacy of the McSweeney bill is that of the National Lumber Manufacturers' Association. At its annual convention in April, in Chicago, the association adopted a forestry resolution indorsing the bill as a means toward "bringing about sound conditions for perpetuating our forest resources and our forest industry."

A Champion Tree Planter

A. J. Hummel, a lumberman of Millville, Columbia County, Pa., some 30 years ago planted a few walnuts along a fence on his father's farm. The farm was sold soon afterward, but Mr. Hummel continued to watch the growth of the walnut trees and was more and more impressed with their rapidly increasing value as contrasted with the general unproductiveness of the farm. In 1916 he began tree planting in earnest, with 5,000 Scotch pine and larch from the State nurseries. These trees grew much better than he had expected, and encouraged him to plant on a larger scale. So far as the records of the State forestry organization show, he now holds first place among Pennsylvania's individual forest planters. He has planted 439,000 trees obtained from the State, 10,000 seedlings obtained from commercial nurseries, 300 bushels of walnuts, and 40 bushels of red oak acorns.

For the last few years Mr. Hummel's tree planting has cost less than $6 an acre. His method of preparing the ground is to plow furrows about 4 or 5 inches deep. This takes less time than digging holes with mattocks, and largely does away with the competition of weeds and grasses for at least two years.

Forest products made up approximately 12 per cent of the total purchases of fuel, materials, and supplies made by the railroads of the United States in 1926, according to a bulletin of the committee on public relations of the eastern railroads. During the year the railroads spent $186,291,234 on forest products, including 93,759,913 cross ties.

Hard-Hearted Trees

In several recent instances foresters in the West have been greatly mystified by the discovery of a chunk of rocklike substance in the heart of a burning tree. In one case a dead tree near Priest Lake on the Kaniksu National Forest, in northern Idaho, had been set on fire by lightning. When the burning tree was discovered by a forest ranger the top had already been consumed, leaving only a 30-foot stub. The ranger put out the fire in the top of the stub with water carried up a ladder, and was digging around in the charred and hollow top to make sure it was extinguished when his shovel struck the rocklike mass. Various theories were advanced as to the nature of the substance, the one most popular with local residents being that it was a meteor that had set fire to the tree. Chemical analysis in the laboratory of the University of Illinois, however, showed that the material was 30 per cent potassium oxide, 22 per cent calcium oxide, and about 20 per cent or more calcium carbonate. Appreciable quantities of permanganate, phosphorus, magnesium, and sodium were found, with smaller amounts of other materials. The mass weighs about 30 pounds. Foresters believe that it is a clinker formed in somewhat the same manner as those that appear in a furnace under certain forms of draft and with certain kinds of coal. The tree in which this clinker was found was rotten at the center. Apparently the heat concentrated the mineral elements in the wood just below the smoldering flame, where when suddenly cooled with the water they formed the clinker.

Two other very similar instances were reported at about the same time; one from the Coeur d'Alene National Forest in Idaho and one in the Cascades of Washington. The first instance was in western cedar and the latter two were in western hemlock. Similar cases have been reported in times past from various portions of the West but have not been fully analyzed.

The First National Bank of Henderson, Tex., distributes forestry publications and forest fire warnings to farmers and regularly includes forest fire warnings and forestry slogans in its advertisements in county papers.

A 17-acre woodlot on a farm near Hollis, N. H., was cut over in 1894. The owner, Mr. Hill, paid the choppers a bonus of $20 to leave the small growth. Mr. Hill's son has since cut 50,000 board feet of pine from the lot, and two years ago refused an offer of $2,000 for all trees over 8 inches in diameter. For lumber sawed at a near-by mill and delivered at Nashua the elder Hill collected $11 and $9 per thousand. During the winter of 1925 logs piled at the roadside on the lot were sold by the son for $18 per thousand.

Lumber Companies Making Cooperative Study of Brush Disposal

Six lumber companies of north Idaho are cooperating this year with the research department of the Western Forestry and Conservation Association in trying out different methods of disposing of the slash fire hazard in the mixed woods type. The syndicate includes the McGoldrick, Winton, Panhandle, Blackwell, Rutledge, and Potlatch companies. The experiments are expected to require at least two years. The director is Norman C. Jacobson, who is conducting similar work for the Boise-Payette Lumber Co. in south Idaho and for the Brooks-Scanlon and Shevlin-Hixon companies in eastern Oregon.

The Tennessee Coal, Iron & Railroad Co., of Birmingham, Ala., is growing timber for its own use on 50,000 acres of cut-over land in Baldwin County, in the southern part of the State. The land was cut over about 40 or 45 years ago and again from 17 to 20 years ago. Much of it has an unusually full stand of longleaf pine, and some slash pine saplings and poles up to 30 years of age. Through the cooperation of the people of the vicinity and through an intensive system of firebreaks that has been established on a portion of the land, the company has succeeded notably in preventing fires.

Redwood blocks are being used in southern California as flooring material for factories and other buildings in which floors receive hard use, the California Lumber Merchant reports. Nine hundred thousand feet of redwood lumber have gone into the floors of the Sears, Roebuck & Co. building in Los Angeles, in the form of blocks 2 inches thick, 4 inches wide, and 6 inches long. In the Wilshire Country Club, Los Angeles, floors of redwood blocks are giving excellent service, the Merchant says, showing no damage whatsoever from golf shoe spikes and "getting better every day with use."

Charles F. Emerson, a furniture dealer of Milford, N. H., began gathering and planting white pine seed in 1907 and 1908. He has now set out on his farm more than 25,000 trees, practically all of which he raised from seed of his own collecting.

Nine high-school boys of Walton, N. Y., this spring planted on their home farms 8,700 forest tree seedlings ordered for them from the State conservation department by Representative John D. Clarke.

Foreign Notes

New Figures from Switzerland on Forests and Run-off

(From an article by H. BURGER, Swiss Forestry Journal, March, 1927)

In two small watersheds in the Canton of Berne, Switzerland, measurements have been taken which indicate very definitely the effect of the forest cover on run-off. These two watersheds are similar in altitude, exposure, slope, and character of soil. They are 3 kilometers distant from each other. One (the Sperbelgraben) is entirely wooded, the other (the Rappengraben) is only 35 per cent wooded. The entirely wooded basin has an area of 56 hectares, the other 70 hectares.

On June 22, 1926, at 5 p. m., a violent storm took place, during the course of which 28 millimeters of rain fell on the wooded basin and 29 millimeters on the other. The maximum flow from the partly forested basin was 1,079 liters a second for each 100 hectares and the crest occurred half an hour after the beginning of the rain. The maximum flow from the completely forested basin was only 240 liters a second and the crest occurred about five hours after the storm began.

The total run-off per square kilometer during the period from the beginning of the storm until June 23 at 6 a. m. was 7,696 cubic meters on the partly forested basin and only 4,720 cubic meters on the completely forested basin. By subtracting the amount of normal flow, observed just before the storm in each case, the run-off due entirely to the storm is obtained. This is 6,184 cubic meters for the partly forested basin and 2,970 for the completely forested basin. On the partly forested basin 21 per cent of the storm water ran off; on the completely forested area only 10 per cent.

Is the Sahara Drying Up?

"In the whole of North Africa the forests are retrogressing," according to Inspector Lavauden of the French Forest Service. In substantiation of this statement he cites, in an article in the Revue des Eaux et Forêts, examples of the disappearance of forest growth, the drying up of waters, and the steady encroachment of desert conditions. At Kaufra forests and pastures covering 17,000 square kilometers disappeared in less than 50 years. Forests that surrounded Laribus near Kef in Tunisia, other forests in the center and south of Tunisia, the forests at Cap Cantin and those in Tripoli near Lebda, Colline des Graces, and Cap Misrata, mentioned in the writings of ancient historians, have entirely disappeared. On the southern edge of the Sahara, a country formerly of fertile fields west of Timbuktu was found in 1914 to be one of the most desertlike regions in Mauritanie. Streams and marshes of former days have disappeared and the water table has lowered.

Inspector Lavauden comes to the conclusion that the future of the whole region is menaced by a steady drying out that has been going on for a long time and in recent years has speeded up. The causes of this drying he believes are threefold. Man is responsible for a good deal of it because of the abuse and destruction of forests. The lay of the land has a powerful influence. The Sahara plateau has a slope toward the Atlantic, which is gradually turning the courses of rivers from north to south. He cites the case of the Niger, which formerly reached the region of Taoudeni more than 600 kilometers from Timbuktu, but which has now made a turn to the south to flow more directly to the Atlantic. At the present time the Logone River is in process of changing from a tributary of the Chari to a tributary of the Benoué. When this is accomplished the flow of the Chari will be cut in half and the drying out of the region will be greatly accelerated. The most important influence, however, is the destruction of the equilibrium between precipitation and evaporation. This is due, Inspector Lavauden believes, to the diminution of precipitation.

The last and most important influence, insufficient precipitation, is beyond the control of man; but something can be done about the other two. And Inspector Lavauden suggests a number of what he calls localized remedies. In the north reafforestation wherever possible, defense measures against desert encroachment in certain mountain zones, and regulation of grazing are the means suggested. In the south the primitive conditions under which the natives live make such measures impossible. There, and in the central Sahara, he recommends the building of dams at strategic points to retain the water from the infrequent storms. These would permit the forming of watering places and facilitate communication across the desert. Some of them would suffice even for irrigation and power. The amelioration of conditions in the south and central Sahara is of importance in the protection of the remaining forests of the north; for the drying up process in the south has already resulted in the exodus of nomadic tribes to the north and these tribes are sometimes accommodated in the north at the expense of the forests.

Yugoslavia, with 7,374,973 hectares of forests, has 62 hectares to every 100 inhabitants. The normal annual cut is about 15,000,000 cubic meters, which is 1,000,000 cubic meters more than the estimated annual growth. About 1,000,000 cubic meters a year is consumed as fuel. Of the forest products exported, which amount to more than 1,500,000 tons a year, about 70 per cent goes to Italy.

Summer Forestry Course for Australian Boys

In an effort to teach the public to value the nation's forests, the Education Department of South Australia each summer sends 250 boys into the Forest of Kuitpo to study elementary forestry. The boys come from the high schools in all parts of the State and from St. Peter's College and the training college for teachers. Twenty-five boys are admitted at a time. The course lasts 10 days, and is given ten times each season. The boys pay £1 apiece, and receive free transportation.

The course of study was planned by Prof. H. H. Corbin, now of Auckland University College. The boys study the characteristics and uses of the different forest tree species, and get a taste of such subjects as the principles of nursery practice, forest planting, forest protection, and forest influences. Two hours of each afternoon are given to the use of surveying instruments, estimating heights and volumes of trees, and pruning. Advanced work is provided for students who attend the school a second time. One morning is spent in a sawmill.

Ground for a cricket pitch and a tennis court was cleared by the boys attending the first school, in 1921, and has been improved by succeeding classes. Another attraction of the camp is the neighboring swimming hole.

Swedish Experiment in Preventing Rot and Fungi in Stored Logs

Experiments carried out in central Sweden by the Swedish Institute of Experimental Forestry with various ways of storing logs that are to lie in the woods for a year or so showed that it is impracticable to dry the logs to such a degree that rot fungi will not develop. This left the alternative of keeping the logs too wet for the development of the fungi. The institute recommends that the bark be left on logs that have not been scarred, since it protects them against both blue sap stain and rot fungi. The unbarked logs should be piled directly on the ground, parallel and preferably in the shade, and should be covered with duff and litter. Rock salt strewn in the pile gives further protection to logs on which the bark has been injured. Logs that have been badly barked should be piled in the same way, but covered with spruce limbs instead of duff and litter.

In regard to the storage of pulpwood the institute reached the opposite conclusions. Because of their small mass pulpwood billets are easily dried to the degree necessary to keep fungi out, and there is no danger of their depreciating from drying checks. Therefore the institute recommends that pulpwood being left to lie in the woods for a year be barked completely. It points out also that short lengths are able to dry out faster than long ones and that pulpwood is less liable to storage rot when "straw-piled" or cross-piled than when piled in "cordwood" form.

Forest Products Research in India

The forest products laboratory of the Forest Research Institute at Dehra Dun, India, established in 1906, now employs a staff varying from 250 to 300 men and is operated at an annual expense of more than £30,000. The laboratory has made a variety of contributions to the country's industrial practice. The section of timber testing has provided the departments of public works and military works with grading rules and working stresses and has carried out extensive work with wood for railroad ties in behalf of the Indian Railways. Valuable data on air seasoning have been collected through experiments in nearly all the provinces of India, and kiln seasoning has been demonstrated with the result that this method has been adopted by a number of factories. Railway companies have been interested in the preservative treatment of wood. Through the activities of the laboratory's paper pulp section a new industry has been started in India—the manufacture of pulp and paper from bamboo. Bamboo is now used almost exclusively as raw material for a large pulp and paper plant in Calcutta. The section of minor forest products has put the Palamrosa or Rosha oil industry on an entirely new footing by the introduction of up-to-date methods of distillation. The section of wood technology has prepared macro and microphotographic slides of most of the important timbers of British India, and has well under way a treatise on the structure, seasoning, working qualities, and uses of some 350 timber species.

In addition to the central laboratory, there are in India five provincial organizations for research in wood utilization.

The town of Hanover, in western Ontario, this spring set out 35,000 pines on municipal land around Ruhl Lake, the source of the town water supply. St. Marys, in the same part of the Province, planted 17,000 trees on a 16-acre plot of rocky land. The township of Mono, in Dufferin County, started a municipal forest on 50 acres of land that came into the township's possession in a tax sale. The provincial department of lands and forests supplied 13,000 trees free of charge and also looked after the planting.

The receipts from French Government forests for 1926 for timber and turpentine amounted to 347,956,966 francs. This does not include special uses of any kind, such as hunting permits and concessions on the forests.

Polish shipments of sawn softwoods to England in the first five months of this year were more than twice as great as those of any other country, totaling 333,675 loads. The next largest total shipments were sent in by Latvia and Sweden.

A Radio Fire Warning

At La Ciotat, Bouches-du-Rhône, France, a new method of fire warnings by use of the radio has recently been demonstrated, according to Bois et Résineux (June 26, 1927). Radio waves sent out from a lookout tower on the Pic de Bretagne released an alarm bell at La Ciotat and the information about location of the fire, etc., was then given by radio in the regular way.

One of those present at the demonstration expressed the opinion that "thanks to this apparatus, the protection of the forests has made an immense forward step * * *. Proprietors themselves will receive the alarm in the depths of the forest and the guards and turpentine workers, and the operators, who are the victims of the scourge, will be able to fight the fire when it starts instead of being, as now, often the last to know about its existence because of the density of the stand and underbrush, the topography, the direction of the wind, or the fewness of the inhabitants."

The apparatus for sounding the alarm by means of radio waves has been patented by M. Duzéa, a professor at the Electrical School of Saint-Barnabé.

New Zealand Woods to be Tested for Paper Making

The New Zealand Forest Service has sent Alex R. Entrican, engineer in forest products, to the United States with two carloads of woods grown in New Zealand which are to be tested at the United States Forest Products Laboratory for paper-making qualities. Six species, both native and introduced, are to be tested. The purpose is to find uses for thinnings from the extensive forest plantations that have been made necessary by the slow rate of growth of the New Zealand native woods.

The forest school of Zurich in Switzerland, founded in 1855, has just come into possession of a school forest. The new school forest is in the commune of Albisrieden, in the immediate vicinity of Zurich, and has an area of 170 hectares.

Personals

The first State board of forestry of Florida includes H. J. Wicker, Coleman; A. A. Payne, Panama City; E. E. Tharpe, De Funiak Springs; S. Bryan Jennings, Jacksonville; and Simon Williams, Jacksonville.

The recently appointed State forestry commission of South Carolina includes H. L. Tilghman, Sellers, chairman; B. S. Meeks, Florence, acting secretary; Paul Moore, Spartanburg; W. H. Andrews, Andrews; and E. W. Sikes, Clemson. The new forestry law of the State requires that the commission be made up of two practical lumbermen, one farmer who is a landowner, one representative of the public at large, and the president of Clemson Agricultural College.

Those who will serve, with Gov. Robert P. Robinson, as the Delaware Forestry Commission are Dr. G. Layton Grier, Milford; J. C. Darby, Frederica; Williard Springer, jr., Wilmington; and George W. Butz, jr., Wilmington. The commission includes two technically trained foresters, Mr. Springer and Mr. Butz being graduates of the Yale Forest School and the Biltmore Forest School, respectively.

Fred G. Stevenot, of Calaveras County, Calif., has accepted appointment as director of the newly created California Department of Natural Resources.

Benjamin K. Ayers has been appointed to membership on the New Hampshire Forestry Commission, filling the vacancy caused by the expiration of Admiral Murdock's term. Mr. Ayers is a lumber operator and consulting forester of Concord.

D. E. Lauderburn has accepted the position of extension forester for Mississippi. Mr. Lauderburn has had wide experience as a consulting forester both in the United States and in Canada. H. G. Mitchell, whom he will succeed in Mississippi, plans to enter the School of Forestry and Conservation of the University of Michigan this fall as a candidate for the master's degree.

R. R. Fenska, professor of forest engineering of the New York State College of Forestry, has accepted the position of forester for the Massachusetts Forestry Association for his year of sabbatical leave, beginning September, 1927.

The Vermont Commission on Conservation and Development appointed in accordance with an act of the legislature at its 1927 session are Wallace H. Gilpin, chairman; Mrs. G. C. Robinson; Horton D. Walker; Linus Leavens, fish and game commissioner; and Robert M. Ross, commissioner of forestry.

J. D. Rue leaves the Forest Products Laboratory about September 15 to take the position of director of research for the Champion Fibre Co. of Canton, N. C. Dr. Rue has been in charge of the laboratory's pulp and paper section since 1921.

J. L. Alexander is leaving the research department of the British Columbia Forest Service to join the faculty of the College of Forestry, University of Washington. He will have charge of the work in silviculture and dendrology, and will continue his research along silvicultural lines.

R. G. Wheaton has resigned his position as district forester of North Carolina to join the staff of the Northeastern Forest Experiment Station as assistant silviculturist.

C. L. Stevens, who has completed his residence work for the degree of doctor of philosophy at Yale University, had charge of this summer's camp of the Forestry Department of the University of New Hampshire and is returning this fall to his old position as assistant professor of the department.

Irvin W. Gleason, of Williamsport, Pa., has been appointed chief of the bureau of lands of the Pennsylvania Department of Forests and Waters. Jacob M. Hoffman, of Johnstown, has been appointed chief of the department's bureau of parks.

David A. Kribs, for the past two years instructor in wood utilization at the University of Minnesota, has resigned to accept a fellowship at the Yale Forest School. He will work under Prof. Samuel J. Record on the classification of South American woods.

W. K. Beichler has resigned as technical assistant on the Pisgah National Forest to become district forester in charge of the first forest district of North Carolina, with headquarters at Asheville.

William Kynoch has resigned as superintendent of the forest products laboratories of McGill University, Montreal, to take a position in the School of Forestry and Conservation of the University of Michigan.

Frank B. Myers, assistant supervisor of the Umatilla National Forest, has resigned to become an instructor in the New York State College of Forestry.

Thornton G. Taylor has resigned as assistant supervisor of the Wasatch National Forest to accept a position on the faculty of the School of Forestry, University of Idaho.

Herbert S. Grenoble, associate engineer in forest products, Forest Products Laboratory, has resigned to accept a position as assistant professor in the extension division, University of Wisconsin.

Henry H. Tryon is leaving South Carolina, where he has served as extension forester for the past three years, to become forester for a large private estate on the Hudson River. He will be in charge not only of forestry work but of sawmills and of developments for the protection of wild life.

Ralph K. Day has joined the staff of the Central States Forest Experiment Station as assistant silviculturist, by transfer from the Coeur d'Alene National Forest.

Lawrence W. Rathbun, of the 1927 class of the Yale Forest School, has been appointed field assistant at the school for the coming year. He will be associated primarily with the work of silvics, and during the spring term will take part in the field instruction in the South.

Clifford H. Foster has been selected as superintendent of the Charles Lathrop Pack Demonstration Forest of the New York State College of Forestry, near Lake George, N. Y. Mr. Foster holds the degree of master of forestry from both the New York State College of Forestry and Harvard University. He has had charge of forestry operations on 12,000 acres of commercially operated timberlands near Winchendon, Mass., belonging to the E. Murdock Co.

S. H. Marsh, for the past 15 years supervisor of the Shenandoah National Forest, will report in Washington, D. C., about October 1 to take charge of State and private cooperation in the Eastern National Forest District as assistant district forester. Under a reorganization of the district office this work is being separated from national forest public relations work, responsibility for which will be retained by Assistant District Forester James E. Scott. Mr. March will be succeeded by R. W. Shields, supervisor of the Nantahala National Forest, whose present post will be taken over by Assistant Supervisor Arthur A. Wood of the Shenandoah.

I. T. Haig, assistant silviculturist of the Northern Rocky Mountain Forest Experiment Station, is taking a year's leave of absence for study in the Yale Forest School.

The membership of the Advisory Council of the National Arboretum has been announced by Secretary Jardine as follows: Frederic A. Delano, Washington, D. C., chairman; L. H. Bailey, Ithaca, N. Y.; Henry S. Graves, New Haven, Conn.; Harlan P. Kelsey, Salem, Mass.; John C. Merriam, Washington, D. C.; Mrs. Frank B. Noyes, Washington, D. C.; Frederick Law Olmsted, Brookline, Mass.; Mrs. Harold I. Pratt, Glen Cove, L. I.; and Robert Pyle, West Grove, Pa.

Henry C. Cowles, of the Department of Botany, University of Chicago, and O. L. E. Weber, of the Watab Paper Co., Sartell, Minn., have been appointed members of the Lake States Forest Research Advisory Council for the next two years. They succeed E. E. Parsonage, Minneapolis, and A. T. Roberts, Marquette, Mich.

C. D. Howe, dean of the faculty of forestry of the University of Toronto, has been appointed chairman of the Ontario Forestry Board, recently created by the provincial legislature to carry on forest research.

Conrad H. Hammar, a graduate of the University of Minnesota with graduate training in agricultural economics, has joined the forest taxation inquiry staff of the United States Forest Service.

The Brown Co., Berlin, N. H., has sent four members of its staff to study forest conditions in Germany, Czechoslovakia, and Sweden. The party includes Gordon Brown, S. S. Lockyer, H. I. Baldwin, and V. A. Beede.

Bibliography

The Problem of the Jackson Hole Elk

By WILL C. BARNES, United States Forest Service

In February, 1927, Secretary of War Davis, chairman of the President's Committee on Outdoor Recreation, designated a commission to consider the future management of the Jackson Hole Elk. The members of the commission, which convened in Washington in March, are Charles Sheldon, Boone and Crockett Club, chairman; W. C. Deloney, representing the Governor of Wyoming, Jackson, Wyo.; Robert E. Miller, cattleman and banker, Jackson, Wyo.; Irving H. Larom, dude rancher, Valley, Wyo.; E. A. Goldman, United States Biological Survey; Will C. Barnes, United States Forest Service; Horace M. Albright, superintendent of Yellowstone Park; F. S. Herbert, United States General Land Office; Seth E. Gordon, executive secretary of the Izaak Walton League; O. H. Van Norden, Campfire Club, New York; Kermit Roosevelt, American Game Protective Association; T. S. Palmer, American Society of Mammalogists; Arthur Ringland, National Conference on Outdoor Recreation. The results of their deliberations have recently been given to the public in a very interesting pamphlet entitled "The Conservation of the Elk of Jackson Hole, Wyoming."

Almost coincidently with the meeting a count of the elk, made jointly by representatives of the Forest Service, the Bureau of Biological Survey, and the State of Wyoming, was furnished. In order that the reader may understand the serious situation which the herd constantly faces, this count and the four previous counts made by competent Government officers are submitted:

1912	13, 528
1916	19, 763
1921	9, 346
1925	19, 493
1927	19, 238

There is but reason for the changes in the figures from year to year, according to the report of the commission, and that is plain starvation. The commission finds that although there is an open season within which the State law allows both sexes to be killed, only about 1,000 animals are taken annually by hunters, who may kill but one elk each. Losses by predatory animals and tusk hunters are not heavy and have been reduced probably to a minimum.

On the basis of the counts and the history of the herd the commission believes a normal maximum of 20,000 can be taken care of year after year with the present hay production on Government-owned hay lands, supplemented by purchases of hay from local farmers. The commission does not approve the purchase of additional hay lands because it would take away just that much taxable property from the State. It recommends that except to fill out certain comparatively small gaps in the hay lands now owned by the Government no new areas of public domain be added to the present refuges in Jackson Hole.

The report states that at the present time 2,760 acres of Government-owned land, a considerable part of it hay land, has been set aside by executive proclamation as a refuge and winter hay-feeding station for the elk. In addition to this, in 1925 the Izaak Walton League purchased and donated to the Government 1,760 acres of hay-producing land, making a total acreage of over 4,500.

"The forage capacity of the summer ranges for the elk and the factors affecting the life of the herd during their occupancy are favorable and constant," says the report. "The summer ranges are capable of turning off a relatively unlimited number of elk. The lack of winter range is the crux of the situation." The report states that for an unusually hard season 7 pounds of hay per animal per day is required, or a total of 4,000 tons. Full feeding is not necessary each winter, and thus the hay produced on the public farms sometimes accumulates from year to year. In 1926 not a pound of hay was fed and the losses were almost negligible. It is the occasional severe winter that causes all the damage. Additional winter ranges under Government control the commission finds are not available.

The commission recommended (1) the definite allocation of duties, authority, and responsibility in regard to the herd among the Forest Service, the Bureau of Biological Survey, and the Wyoming game authorities; (2) the pooling of effort and resources by these three agencies; (3) the creation of an advisory board composed of representatives of several immediately interested bodies, State and Federal; (4) the fixing of the maximum size of the herd, provisionally at least, at 20,000 head; (5) a cooperative and simultaneous winter count of the Jackson Hole herd and those other herds of the region which it is believed intermingle with it more or less on the summer ranges although widely separated in winter; (6) a close and continuous study of all these herds by biologists in order that many peculiar and now somewhat obscure facts connected with the life history of the elk may be better understood; (7) the establishment of the present commission as a permanent body; and (8) more flexible State laws, so that changes in season, bag limits, and kill of sexes may be made quickly if the situation calls for such action.

Timber Growing and Logging Practice in the Central Hardwood Region

Timber Growing and Logging Practice in the Douglas Fir Region

Two more of the series of reports on the requirements for keeping forest land productive and for producing full timber crops have been issued as Department of Agriculture Bulletins 1491 and 1493 with the titles above.

In the central hardwood region it is pointed out that the woodland owner who wishes to grow timber must discontinue pasturing the woods and must prevent forest fires. If these two requirements are met and a few seed trees are left, a fairly good young growth of timber can be obtained; for there is a marked tendency for the forest to reproduce itself vigorously in this region if given a chance. Methods of cutting for the production of full timber crops where there is already a reasonable degree of control over fire and pasturing are suggested in some detail.

The central hardwood region differs greatly from other forest regions of the United States in that three-fourths of its timber-producing acreage is in the form of farm woodlands, generally from 10 to 40 acres in extent. A large proportion of these farm woods could be vastly improved by reasonable care. Because of good soil and favorable climate the region is highly productive of hardwood timber of fine quality. For all the timber that can be grown in the region a good market exists near at hand. The district contains the most important centers of the furniture, veneer, automobile, and farm-machinery industries of this country and has numerous other hardwood industries such as the manufacture of wood handles and flooring, and its farms require large quantities of posts, poles, and cordwood.

In the Douglas fir region the control of fire is the paramount consideration. The principal measures required to produce continuous timber crops on the land are preventing fires during logging, making provision for a natural seed supply, and "fireproofing" the cut-over lands against uncontrolled fires while the new crop is becoming established. These measures are estimated to cost on the average 22 cents for each 1,000 feet logged, over and above the present customary logging charges. If these protective measures are adopted very favorable yields may be expected in this highly productive forest region, where sawmills already are working in timber as young as 40 or 50 years. The "excellent" land will produce more than 1,000 board feet per acre per year, the "good" land about 900, and the "fair" land about 600.

Copies of the two bulletins may be obtained without charge by writing to the United States Forest Service, Washington, D. C.

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Proceedings of the Ninth Southern Forestry Congress

The holding of the southern forestry congress at Jacksonville this year was an omen. In less than three months afterwards Florida had a forestry law. However, although Florida gets a large share of attention in the addresses printed in the proceedings, the status of forestry in nine other Southern States is given considerable space, questions of national, State, and local interest in the country as a whole receive attention, European forestry is discussed by Roy L. Hogue of Mississippi, and the story of the grasslands is told by Will C. Barnes of the United States Forest Service. The volume includes the full text of all but one of the addresses made at the meeting, which was reported in the May number of the Forest Worker.

Recent Publications of the Forest Service

Map Folders: Ouachita National Forest of Arkansas; Fremont National Forest of Oregon; Medicine Bow National Forest of Wyoming; Bryce Canyon National Monument (Utah); Flathead National Forest of Montana; St. Joe National Forest of Idaho.

American Woods Leaflet: Beech.

Forest Products Research in Pictures, No. 76: Treating-Plant Plank Preaches Sermon on Wood Rot.

National Forest Administrative Maps: One-fourth inch, Tusayan, Nezperce, and Uinta; one-half inch, Nezperce, Holy Cross, Lemhi, and Salmon.

An outline of "good naval stores practice" prepared by Austin Cary, United States Forest Service, is available to the public on request to the Washington office of the service. It consists of three pages of rules and suggestions based on studies of the Forest Service and on the experience of successful operators.

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