U. S. DEPARTMENT OF AGRICULTURE

Office of Information

Press Service

Release - Immediate.

February 15, 1927.

MAJOR R. Y. STUART
GETS FOREST SERVICE POST

Maj. R. Y. Stuart, until recently secretary of the department of forests and waters of Pennsylvania, and previously with a long experience in the Forest Service, has been appointed by Secretary Jardine to head the public relations branch of the Forest Service of the United States Department of Agriculture to succeed Paul G. Redington who becomes Chief of the Biological Survey. Major Stuart has previously spent many years in the Forest Service. He will assume office February 16.

In his new post Major Stuart will direct the educational activities of the Forest Service for the promoting of public understanding of forestry as well as the cooperative work between the Forest Service and the States in carrying out the provisions of the Clarke-McNary Act for forest fire protection on private and State lands, growing and distributing forest planting stock, and advice to farmers in the management of woodlands.

Major Stuart became deputy commissioner of forestry of Pennsylvania in 1920, under Commissioner Gifford Pinchot. He was appointed secretary of the department of forests and waters when the latter became governor. The outstanding accomplishments in forestry in the State under his administration were the large extension of the program for buying land for State forests, enlarging upon fire protective measures by establishing a thorough lookout system throughout the State and organizing fire wardens, and the advancement of reforestation. During his six years in office the production and distribution of growing forest trees from the State nurseries increased from a few thousand to twenty million trees yearly.

Major Stuart was graduated in 1904 from Dickinson College, receiving degrees of A. B. and A. M. In 1906 he received an M. F. degree from the Yale Forestry School and entered the United States Forest Service as forest assistant in timber sale work. For several years he had extensive experience in the western National Forests, especially in the northern Rocky Mountain region, as forest inspector and chief of operation. In 1912 he came to the headquarters of the Forest Service in Washington, D. C., as an inspector of national forest timber sales, later rising to have charge of the entire western division of this work. In 1917 he was furloughed for military service in France with the 10th Engineers. After the war he returned to the Forest Service but resigned in 1920 to take up his forestry work in Pennsylvania.

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There is a wealth of experience and data as to down-stream engineering and works required for navigation, power development and flood control -- levees, large dams, great reservoirs and channel improvements on major streams. But necessary as these are for the safeguarding of those who live in areas subject to destructive floods and of property located therein, it must be remembered that down-stream waters originate largely in up-stream areas. The objects of up-stream engineering are through forestry and land management to keep water out of our streams, to control its action once in the stream and generally to retard the journey of the raindrop to the sea. Thus the crests of down-stream floods are lowered. Sept. 22, 23, 1936

In accordance with your further suggestion I am appointing as a committee to organize and promote such a conference or institute; Hugh H. Bennett, Chief of the Soil Conservation Service, Department of Agriculture; Morris L. Cooke, Administrator of Rural Electrification Administration; and F. A. Silcox, Chief of the Forest Service, Department of Agriculture.

Very sincerely yours,

(Signed) Franklin D. Roosevelt.

A TRIBUTE TO THE MEMORY OF MAJOR STUART

(From the Address by E. A. Sherman, at the Dedication of the Stuart Nursery, Kisatchie National Forest, Louisiana, June 17, 1936)

I can think of no better way to honor the memory of an outstanding forester than to name a forest tree nursery for him. I can think of no better way to honor the memory of Robert Young Stuart than by giving his name to this particular nursery -- the largest in the South, and one of the largest in the world. For Major Stuart, as Chief of the United States Forest Service, was particularly interested in the expansion of forestry in the South, and in the reforestation phase of our national forest conservation program.

Creation of this nursery on the Kisatchie National Forest was decided upon before his untimely passing; it is, then, a fruition of his desire; the sturdy growth from a seed of his planting.***

Through six years, Major Stuart, as Chief of the Forest Service, went through one of the most important phases of governmental forestry. It was a crucial period -- yet a period that caused few headlines in the papers. Glory, fame -- these things were forgotten in his steady, incredibly difficult fight for an expansion of forest conservation throughout a country that badly needed strong leadership to save its vanishing resources. The job that Major Stuart took over as head of the Forest Service needed, cried for, a man of exactly his calibre. Strong, sure, unhurried, unflustered -- and hardheaded in matters he knew to be right -- he kept the Forest Service moving forward, strengthening its position, spreading more valuable information, moving toward that time he must have felt was coming when national attention and national interest would center as never before upon the Forest Service's function for the good of the nation. It is to the end of everlasting Justice that he lived to see our national policy embrace conservation as one of its major programs, in strong, liberal support of the principles he had labored to uphold.

His name lives on; his work lives on; his spirit is far from forgotten among the men of the Forest Service who worked with him, fought beside him, trekked the wildernesses with him. Without being too fanciful, I think we may consider that each of the millions of trees which will grow from the seedlings produced in the Stuart Nursery will bear some part of his indomitable spirit.

It is difficult for me to speak of "Bob" Stuart without personal emotion. I knew him almost as a father knows his son. After his graduation from Yale in 1906 his first regular assignment in the West was as my Forest Assistant at Missoula, Montana, when I was a Forest Supervisor. From our first meeting to the day of his death, ours was an association of perfect understanding. During the first few years of that association he was my subordinate; during the last six he was my chief. I rejoice that no unkind word ever passed between us and that I never knew him to give utterance to an unworthy thought.***

The story is told that early in 1933 one of President Roosevelt's advisors came to Major Stuart and asked him if, within a few weeks, the Forest Service could put some hundreds of thousands of men to work on useful projects in the country's forests. Perhaps Bob Stuart swallowed a little, but he answered simply, "Yes".

"But a hundred thousand men is a lot of men", the advisor said. "Maybe you don't realize what a large order that is."

"You don't know the Forest Service", was Bob Stuart's answer.

It might be added that he didn't know Bob Stuart.

That was the beginning of the CCC. Thus, with the U. S. Forest Service under the leadership of Major Stuart carrying a large share of the load, hundreds of Civilian Conservation Corps camps were established to begin the work of forest rehabilitation and improvement throughout the country, including southern forest lands.***

We of the Forest Service like to consider our jobs as being more important than the men who hold them. Others will carry on as we drop out of the picture. This is necessary, for we are working for the future. Major Robert Young Stuart held this viewpoint strongly; thus it is more than fitting that this nursery, which is growing young trees for future production of timber for sawlogs, pulpwood, and naval stores, should bear his name. The work he started continues; the trees we plant grow, bear seeds, which in turn reproduce the species. It is up to the people of the nation today, and to the future generations as well, to consider themselves as having accepted the stewardship of the forests--with definite obligations to take care of them while they live--and to pass on their ever-productive heritage to future generations.

— Edward A. Sherman

PATH OF RESETTLEMENT A THORNY ONE

By L. F. Kneipp, Washington

The National Forests and Purchase Units include within their boundaries more than 10 percent of the land area of the 48 States and more than one-third of the estimated present timber supply. Within or adjacent to them are scores of thousands of so-called farms, and several hundred thousand people. One of the most vital problems confronting the Forest Service is to bring the forest lands, the forest resources, the related tillable lands, and the dependent population into a harmonious relationship under which each will contribute to the growth and welfare of the others.

At present the relationship of these four elements is discordant rather than harmonious. Due to the vagaries of our economic structure, there are today a startling number of rural communities within the National Forest sphere of influence in which the level of economic security is not greatly above the danger line. Project maps and statistics, where they have been made, bristle with negative showings of symbols denoting suitable workers occupying unsuitably located areas, or families situated on submarginal farms, or families dependent on relief for the minimum requirements of existence. And yet around and about these symbols are soils and trees out of which these people could with proper

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DRAFT 1 STUART

Dan Dildine
History Office/Forest Service

The voice of Nature loudly cries,
And many a message from the skies,
That something in us never dies.
New Year's Day, 1791. Stanza 3

1933

Robert Young Stuart succeeded William B. Greeley as Chief May 1, 1928. The country was teetering on the brink of economic disaster. A new President, Franklin D. Roosevelt, would in a few years institute radical political and economic changes to resurrect an insolvent nation. The Forest Service would be called upon to play a leading role in these changes. But were getting a little ahead of the story; the Service in 1928 was still playing the role cast by William Greeley, Stuart's predecessor. The lumber industry, along with agriculture, both long becalmed in the economic doldrums, were hit early by peripheral forces preparing the brew for a pending national depression. The Service was administering succor to the industry according to Greeley's cooperative recipe. Federal-State cooperation, continued under the Clark-McNary Act. More extensive forest research was fostered by the McSweeney-McNary ~~Law~~ passed April, 1928. ~~Increased emphasis was placed on~~ public ownership ~~of~~ abandoned, tax-delinquent land made unproductive by poor private forestry practices. The aquired land so increased National Forest acreage and provided the Forest Service an opportunity to rejuvenate abused land, thus educating the lumber industry to the benefits of proper forest management. Cooperation with the States in Farm-Forestry extension and tree planting was proving successful.

The normally cooperative, advisory stance of Forest Service inherited by Stuart was peculiarly reinforced by the accession to the Presidency of Herbert Hoover in 1928. Single mindedly opposed to government funding

or economic activity linked directly to individual or public welfare, Hoover relied on a laissez-faire economic bulwark to stifle encroaching economic woes. A policy of restricted federal spending and government activity in general was to become modus operendi for all federal agencies during most of Stuart's tenure. Geared to a low profile administrative policy under Hoover, the Forest Service was then forced to make an abrupt and wrenching reversal in policy under the expansive federally financed policies of Franklin D. Roosevelt.

Stuart saw the Forest Service as a reservoir of forestry knowledge, its most important contribution being the development of sound principles and practices of public forest-land management to be emulated by private forestry. In the Chief's Report of 1928, the first year of his tenure, he states, "Right use, however, can not be brought about by fiat", rather it was a gradual complicated process. He further maintained, "the precise acreage of lands under bonafide systematic forest management (private forest management) was at (that) time less important than which way the land was headed." The Forest Service role, in Stuart's view, was to act as dispensor and exemplar of the ~~vast~~ body of knowledge ~~laboriously~~ gained since that first report in 1876. ~~by the newly created Division of Forestry.~~

Stuart was well equipped to apply the poultice of acquired knowledge. ~~A pennsylvanian~~ of Scotch-Irish descent, he was born in South Middleton township, Cumberland County, Pennsylvania. He was educated in the public schools of Harrisburg and Carlisle, and graduated from Dickinson College in 1903 with an ~~receiving the~~ A.M. degree. In 1904, he entered the Yale Forest School, receiving his Master of Forestry degree in 1906. Upon leaving Yale he entered the Forest Service as Forest Assistant. His first assignment,

undertaken with his new bride Janet M. A. Wilson of Harrisburg, ~~Pennsylvania~~, involved forest management work in Montana, Idaho, and Wyoming. Upon the formation of District organizations by the Forest Service, he was assigned to District 1, Missoula, Montana, his duties first being connected with fire, personnel, improvement, and organization work. Later he became Chief of Timber Sales and Planting activities of the District. In 1912 he was transferred to Washington, DC, and made Forest Inspector in the Branch of Management, an assignment that included all timber and planting work on the National Forests, and similar projects undertaken in cooperation with other Federal departments, the States, or other agencies. He served in the Washington office until the entry of the U.S. in World War 1.

Placed on military leave, in September, 1917, he was commissioned Captain in the 10th--or Forest--Engineer Regiment. He was sent to France immediately and assigned to the A.E.F. headquarters at Paris, and later, tours, to assist in the acquisition of timber for the 10th and 20th (Forest) Engineers. He was promoted to Major in October, 1918, and assigned to General headquarters at Chaumont to assist in the project of producing cordwood for the A.E.F. in the Advance Section. In February, 1919, he was made Commanding Officer of the 5th Battalion, 20th Engineers, and District Commander of forest troops of the Gien District, returning to the States with his battalion in June, and to the Forest Service in July, 1919. He received a citation from General Pershing for his Service with the A.E.F.

In May, 1920, Major Stuart resigned from the Forest Service to accept the position of Deputy Commissioner of Forestry in Pennsylvania, under Gifford Pinchot as Commissioner, whom he succeeded in 1922. On June 15, 1923,

after Pinchot's election as Governor the previous November, Stuart was appointed to the newly created position of Secretary of Forests and Waters, with a seat in the Governor's cabinet. From 1923 to 1927 he served also as a member of the Tri-State Delaware River Treaty Commission, and in 1926 was chairman of the Pennsylvania Sesquicentennial Committee in charge of the Exposition of that year.

At the expiration of Governor Pinchot's term of office Major Stuart reentered the U.S. Forest Service as Assistant Forester in charge of the Branch of Public Relations in February, 1927. On May 1, 1928, he was appointed Forester and Chief of the Forest Service, succeeding Colonel William B. Greeley. Thus Stuart brought to the job the expertise of a professionally trained forester and long experience with forestry on the State and Federal levels.

Major Stuart's service as Chief has been characterized as dedicated, loyal, and above hard-working. Henry Klepper, a noted forest historian, refers to him as the "Indefatigable Worker". Under Stuart the massive and comprehensive Copeland report was prepared, a survey of the forestry situation with concise recommendations. It urged an acceleration in public ownership of forests and more intensive management of forests already in the public domain, goals long supported by Stuart. An aggressive advocate of artificial reforestation programs, particularly in the South where growing conditions were favorable, Stuart increased forest nursery production of seedlings. After his death in Louisiana the Stuart Nursery on the Kisatchie National Forest was named in his honor.

~~gory of extra-curricular duties during his term of office were~~ service on the National Capital Parks and Planning Commission and ~~service~~ as chairman of the Forest Protection Board, made up of representatives of the various federal bureaus directly or indirectly concerned in the protection of federal timbered lands.

With the inauguration of Franklin D. Roosevelt, March 4, 1933, the Forest Service was called upon to give its all in the battle against the dread economic monster draining the life blood of the nation. The "Alphabet soup" cooked up by Roosevelt and his Brain Trust included a large measure for the Forest Service. Hearsay has it that early in 1933 one of President Roosevelt's advisors came to Major Stuart and asked him if, within a few weeks, the Forest Service could put some hundreds of thousands of men to work on useful projects in the country's National Forests. Bob Stuart's answer, a simple "yes".

"But a hundred thousand men is a lot of men", the advisor said. "Maybe you don't realize what a large order that is".

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Passage of the Emergency Unemployment Relief Act cleared the way for creation of the Civilian Conservation Corps. The CCC was designed to provide a widespread program for unemployment relief through the performance of useful work in the forests. Vast sums of money, $40,000,000 for road, trail, improvement construction, and maintenance, $20,000,000 for the resumption and acceleration of land acquisition, were allotted to the Forest Service. The possibilities for advancing forestry and the public welfare were tre-

mendous, as was the responsibility. Robert Stuart's untimely death Monday, October 23, 1933, was an unfortunate capstone to the truly outstanding career of a man dedicated to the cause of forestry.

May 1928.

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February 21, 1928.

For the HAPPY DAYS

Stuart 3-26-34

OUR NATIONAL FORESTS

Forest Service Forefathers - Robert Young Stuart

It should be said of Robert Young Stuart ("Bob Stuart" to his associates) as of Henry Solon Graves and William Buckhout Greeley - "once a forester, always a forester." He lived and died a forester, from the beginning of his career to the accident which brought it to an untimely end.

Graduating from Yale Forest School as Master of Forestry, he immediately entered the Forest Service as Forest Assistant, and was successively thereafter Forest Inspector, Assistant Chief of Operation in the Washington headquarters office, Assistant District Forester of the Montana-Idaho District; Forest Engineer with the rank of Major in the A. E. F.; Deputy Commissioner, Commissioner, and Secretary of the Department of Forests and Waters for Pennsylvania; Chief of the Branch of Public Relations for the U. S. Forest Service, and Chief Forester for four years, ending October 23, 1933, on which day occurred the fatal accident which made him the first martyr to the forestry cause.

In Stuart's first year as Chief Forester, a new Forest District was established, the Lake States District, in which region the need for forest practices had become insistent. Forest-fire studies were carried forward at the forest experiment Stations in California, the South, the Lake States, the Northwest, and the northern Rocky Mountains. At the Southern Forest Experiment Station also, naval stores studies were pursued by Forest Service specialists. Soil erosion investigation was another major research project.

The fire season of 1929 was one of major diaaster. Unfavorable conditions - even more unfavorable that those of 1910 ahd 1919 - put 1929 in the same severity class. The fire seasons of these three years have given abundant proof of the necessity for constant vigilance in the detection and suppression of fires. As direct evidence of the value of preparedness for fire-control, the 1933 fire season was one of the best in national-forest history, although burning conditions were much above normal in the Lake States and the Northwest. Much of the success in keeping down the fire danger was due to the Civilian Conservation Corps. Not only did the C. C. C. do good work in catching fires while still young and disposing of them promptly, their very presence on the national forests, and adjacent lands emphasized the importance of the forests and the need for care with fire and acted as a deterrent to incendiarism.

During 1930, farm forestry made rapid advances under the terms of the Clarke-McNary Law. Better forestry practices were adopted on 21,350 farms. During the winter of 1929-30, local unemployment was brought forcibly home to field officers of the Forest Service and some relief was afforded by hastening construction programs already financed. Opportunities for providing employment were greatly increased when the Act of December 20, 1930 appropriated three million dollars for the construction of roads and trails for protection and utilization of national forests. Also during the fiscal year 1931, special appropriations were made for insect-control work and administative and range improvements on the national forests, and portions of the 1932 appropriations were made immediatel

available on passage of the agricultural appropriation bill, for thecontrol of white pine blister rust, construction and maintenance of improvements on public camp grounds, and for other improvements. The number of temporary employees put to work by these funds increased more than fourfold from January to June, 1931, in which latter month there were 21,568 relief employments on the national forests. Then, too, the recreational use of the national forests increased ten-fold from 1916 to 1931.

The fiscal year 1933 was rich in forestry accomplishment. It saw the publication of "A National Plan for American Forestry", a report prepared in compliance with the so-called "Copeland Resolution" calling upon the Secretary of Agriculture to advise the Senate as to the desirability of Federal aid to the States "in the utilization for forestation purposes of those areas in the United States suitable for forestation only."This report embodies the results of the most comprehensive survey of the entire field of United States forestry possibly within the time and with the resources available.

Soon after this monumental task of the Forest Service had completion, reached, the Emergency Conservation camps entered the kaleidoscopic scheme of things, anrolling 300,000 men. Allotment for road, trail, and improvement construction and maintennnceas a part of the publoc works' program to provide employment and to stimulate recovery amounted to $40,000,000. The President also allotted by Executive Order $20,000,000 for resuming and accelerating the acquisition of lands in the East for national forest purposes. Thus did the government forest work get a threefold impetus in one year, the effedts of which can not yet be measured in renewal of man power and improvement of forest conditions.

As a result of the Clarke McNary law of 1924, nearly 157,000,000 trees had been distributed to farmers in the 9 years including 1932. During 1933, 23,500,000 trees were distributed. Thus the ten years of this cooperation averaged more than 18,000,000 trees a year.

Outstanding progress in farm-forestry extension through 4-H Club activities was made during 1933. The enrollment of boys and girls conducting forestry projects totaled 15,732, and 11,416 projects were completed. This junior activity on farms was then being conducted in 39 States and 1 Territory.

In this last year of his administration, Chief Forester Stuart inaugurated the establishment of "experimental forests" as training grounds for national forest investigators and of "natural areas" as outdoor laboratories for scientific collaborators — research workers.

In terms of varied accomplishment, therefore, Robert Young Stuart left a splendid record. In the words of an appraiser of his work and character: "All in all his leadership of the Forest Service was a leadership of poise, vision, and competence."

(To be continued)

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FORESTRY IN A NEW ERA[1]

By R. Y. STUART

Chief Forester, U. S. Forest Service

The forestry profession has failed if its accomplishments were to be measured by the extent of private forestry instituted on private lands. However, in a span of 30 years it has changed the country from forest indifference to forest concern; from unorganized effort to nation-wide public forest policies; from practically no protection to protection of over 55 per cent of the Nation's forest land; from a narrow conception of forestry as tree culture to a realization of its import as a momentous land-economic problem; from a dearth of scientific knowledge of forestry to highly organized, efficient forest research institutions; from a handful of pioneers to a large group of experienced, resourceful and competent foresters of unquestioned integrity. The present era presents new challenges—to effect the practice of forestry among private owners, and to work out the right use of lands suited only to forests, particularly those acres being abandoned because too poor for farms, and the cut-over lands dropped for taxes. Professor Mulford, whose comments on this paper follow it, believes that in this new era, the forester needs "a new, easily understood public declaration of faith, to become gradually a part of America's matter-of-course thinking."

WERE the success of forestry in the United States to be measured by the extension of sound forest practice on privately-owned forest lands, or by the curtailment of degraded forest acreages, it would make a sorry showing. Were the success of foresters to be gauged by the acreage of privately-owned land under planned and successful forest management, their records would not be enviable. What then sustains forestry and foresters?

We learned in school that forestry is a science and an art. Experience has taught us that it is that, and more. It is a complex, vital economic, social, and political problem. Its field of concern is not alone forests, but the economic, social, and political aspects of forests and forest lands as well, in their effect upon man's livelihood, standards of living, and happiness. Forestry is more than trees. It encompasses soil, water, climatic, biological, and other influences. The expression of its realization is in productive forests and protected watersheds, well managed range for game and domestic stock, safeguarded outstanding scenic and recreational values, and utilization of a complex of interlocked resources under coördinated plans to accomplish these results. Forestry is sustained order and good trusteeship in the forest.

I have no intention to become fanciful in thus treating of forestry. Far from it. In no science or art is plain common sense more called for. I simply wish to point out that forestry is still being appraised: that its full compass and import have not been spanned: and that accomplishment from it must be based upon and gauged by its broad moment and influence.

While admitting, therefore, that, narrowly conceived, forestry and foresters have demonstrated little of accomplishment in the forest compared with what remains to be done, I assert that the science, art, and profession of forestry are attaining a progressively higher plane in the solution of America's forest problem. In a span of thirty years we have brought the country from a state of forest indifference to one of forest concern; from completely unorganized forest effort to nation-wide provision for public forest

[1]Presented at the 32nd annual meeting of the Society of American Foresters at San Francisco, Calif., December 14-16, 1932.

policies: from practically no forest protection to a protection coverage of 55 per cent of the Nation's forest land: from passivity toward public responsibilities and benefits in forestry to unchallenged recognition of those responsibilities and benefits: from a narrow conception of forestry as tree culture to a realization of its broad import as a momentous land economic problem: from a dearth of scientific knowledge of forestry to highly organized, efficient forest research units and educational institutions well equipped and competently manned: from a handful of professional pioneers to a substantial group of experienced, resourceful, and competent foresters of attainment and unquestioned integrity. Can it be that, with such accomplishments, forestry and foresters should be thought of as unsuccessful or as unequal to the growing task of meeting the Nation's forest problem?

The task is not merely one for those of us who are in public employ: it rests upon the whole profession. The profession of forestry is outstanding in its recognition of public responsibilities. Every true profession has responsibilities of a public character. For every lawyer the law must be more than a means of livelihood, or of gain, or of attaining distinction. He is a part of the machinery for the administration of justice. The legal profession as a whole has a collective responsibility. Medicine imposes upon the practitioners special responsibilities to humanity, and the profession of medicine collectively has a function and obligation of its own, in connection with the general welfare. As between our profession and such professions as law and medicine, the difference is not that we give recognition to special responsibilities and they do not. The difference is that with foresters, as a body, whether publicly or privately employed, the responsibility more intimately shapes our thought and action. Our fundamental concern is to have forestry fit into the place that belongs to it, in the national scheme of sound land use.

Private ownership of land, private development of the great national resources, and private conduct of every kind of business undertakings have been deeply grounded in our American spirit, traditions, institutions. As a Nation we distrust the capacity of government to do things efficiently, discriminatingly, and far-sightedly. We want independence for the individual and a free scope for private initiative and energy. And so for a long time our public policy, national and state, had as a basic principle the private ownership of all sorts of land. How it should get into private ownership seemed much less important than to get it there, so that it might be put to use. It was assumed that, once title to it had passed from the public, individual self-interest and the play of economic forces would assure its best use, in the long run.

The first breakdown of this principle came when the West grew solicitous about its water supplies. Individual self-interest found no account whatever in maintaining forests or other vegetative cover for the benefit of distant water users. Private use of the public domain range lands did not have to wait on their acquisition. They were open to all, as public commons. To the government the public domain was just land waiting for an owner, not resources needing to be conserved, still less managed. But to the people of the West they were much more than just land; and the prospective arrival of a private owner afforded them no promise of relief from their concern. The national-forest policy was primarily due to the anxiety of the West about water. But for that, it certainly would not have come about when it did. The West was preponderantly convinced, in spite of its strong preference for American individualism, that to obtain the best use of its mountain lands where diverse and conflicting interests

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We of the Forest Service should never forget this fact—that what moved the West to support the national-forest policy was, first of all, desire for water conservation. We have not always remembered the order of words in Secretary Wilson's letter of instructions to us on the day that we took charge of the forests, bidding us see to it that "the *water*, wood, and forage" are conserved and wisely used.

We Americans do not choose to make sweeping changes merely to carry out a principle. Nearly sixty years ago Carl Schurz, as Secretary of the Interior, proposed a new principle for the timberlands of the public domain—the principle of permanent public ownership and administration, in place of reliance upon private ownership to bring about their most satisfactory use. The American Nation was not ready for it.

In matters of public policy we much prefer to go a step at a time and to be circumspect about taking the first step. We lean to conservatism, not revolution. And so when, in 1891, Congress finally decided to do something about the public domain timberlands, it made no attempt to apply a principle; it did not even prescribe that anything at all be done; it merely bestowed permissive authority upon the President to set aside forest reservations. And to this day, the principle that all the public domain timberlands still remaining in Federal ownership should be held and put under national forest administration has never been carried all the way through. What was done initially was to pass the buck by giving permission for a small-scale try-out.

The law of 1891 did not restrict the authority of the President in the matter of how far he should go, but when Cleveland used the authority, near the close of his second term, to increase from around 20,000,000 to around 40,000,000 acres the sum total of the reservations, Congress barely missed abolishing the whole experiment before it had had any try-out at all. For the try-out did not begin until after the law of 1897 authorizing administration and regulated use of the forest resources was passed. When Roosevelt a few years later, with the West still doubtful whether the experiment was going to work out successfully, used his authority to the full, Congress called a halt. First in six states, and later in two more, it took away from the President all power to go further. Gifford Pinchot and Theodore Roosevelt together had the daring, and fortunately together had the power, to convert what undoubtedly, had it not been for them, would have remained a relatively small-scale experiment in federal policy into a gigantic experiment. But its very size made it vulnerable. It had to show results quickly, or be thrown into the discard. The West would not have been willing to stand aside and wait for thirty or forty years to have determined whether in the long run public ownership and administration would be more beneficial than private resource ownership.

What happened was little short of a miracle. We ran a race against time, and won. It can not be said that the national forest enterprise was thoroughly established in public confidence and approval until well after 1920. During President Harding's administration there was a real showdown. Nor is the enterprise secure, past all danger, even now. Its continuance is being fought for, and will have to be fought for, in one way or another, many more times. But we have the public with us, and we shall continue to have the public with us, provided we do not lose its confidence through incompetence—

incompetence to conduct a difficult, exacting national enterprise with a high degree of devotion, integrity, vision, and skill.

The marvelous constructive work of organization which devised and installed a suitable machinery of administration, selected and trained its personnel, and laid down sound, farsighted basic policies which have stood the test of the years, was of course the work of a single man—Gifford Pinchot. But I do not think even he could have built up the organization of the Forest Service without the help of great good fortune as well as of his own genius. It could not have been done without the help of the Civil Service law and the development of its application, which by 1905 had reached a point that provided a safeguard for the nascent enterprise against political racketeering. It could hardly have been done anywhere else in the federal establishment than in the Department of Agriculture. It could not have been done there without the free hand and the intelligent, consistent support all along the line given Pinchot by Secretary James Wilson. I doubt if it could have been done at any other time in the history of the Department, then still young, relatively small, and uncentralized. But after allowing for all these things, the story is not complete. Men and circumstance in happy combination gave the enterprise the chance to succeed. From that point on, it was up to the profession of forestry. Could the profession rise to the responsibility, and seize the opportunity to make good?

The profession—including no less fully the men who learned on the job than those who came from the schools—can well be proud of the system of national forest administration and of the point which it has now reached. The road traveled has been long. Many obstacles have been surmounted, hard battles have been fought and won. What has been accomplished will avail, however, only as it tends to greater service, because new tasks are to be undertaken and a new set of conditions is to be reckoned with, no less challenging to us professionally, than those confronted when our work began.

Most foresters have concluded from their studies and experience that the United States ought to have a considerable fraction of its forest area—say from 20 to 40 per cent—in public ownership. I doubt whether this argument for public forestry makes any particular impression on the public mind. The great majority of Americans approach the question of how far public ownership should be carried from a quite different angle. They want the question settled on the basis of specific conditions and areas. Preferring private ownership, they place the burden of proof on public ownership. Instinctively they hold back from the idea of public ownership, except where a strong case can be made out for it. This is a sound position to take and suggests the angle of approach for foresters, at least for the present. To win acceptance our program should be formulated on the basis of encouraging private forestry wherever the private owner can be induced to engage in it. Present trends indicate that after every effort has been made to induce the private owner to apply forestry, there will remain a public responsibility far greater than public agencies will be prepared to redeem.

The new era emphasizes the need for solidarity in the profession of forestry. Whether in public employ or in private practice, we are working out the solution of a public problem of vital importance—to bring about the right use of the vast land area in the United States which can only be used for forest purposes. We should not allow ourselves to lose sight of this as the fundamental problem, while we are engaged in such necessary but auxiliary inquiries as just how much wood we shall need, or the precise weight

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to be given the various forest influences, or how to bring about healthier conditions in the lumber industry. The most difficult part of the problem at present concerns not publicly owned forest lands but privately owned lands acquired because of the value or expected value of the grown timber on them, but which, unless the private owner can be shown he can afford to grow more timber on, will come back into public ownership—in fact is already coming back, at an appalling rate. The forester also has the responsibility, but recently thrust upon him, of planning for the large amount of land which the agricultural requirements of the country and the quality of the land will not permit to remain in use for growing agricultural crops. Just as our profession at its beginning in this country had to undertake the then gigantic task of making forestry administration a practical success on the huge area of the western national forests, so now the profession, grown mature, must determine the future condition and form of use of the 396,000,000 acres of forest land now in private hands, and of the unknown millions of acres more of land which agriculture is going to give up.

It was but a few years ago that the Forest Service believed the inauguration of private forest management on an extensive scale was on the verge of realization in this western country, and threw the weight of its example and influence behind the movement. But the pressure of economic forces and the disinclination of private enterprise to undertake continuous forest production was too great. The belief proved insufficiently grounded. Essentially, the problem has remained the same.

We face a very different problem from that of making national forest administration a practical success in forestry. In that case the principle of private land ownership was to be departed from through reserving from disposal areas where it was believed public administration might bring about greater benefits. It was not a question of finding a use for land which no private owner would wish to acquire. It was rather the regulation of use along lines that would realize maximum returns in public benefits of all kinds—a problem of coördination, plus the application of adequate technical knowledge and skill in the handling of each resource, to make the most of it. What is now before us is to give productive value to land which the private owner is preparing to abandon, or likely to abandon, because he can see no probability that holding it will be worth while; of land that has become a private liability, and which if abandoned to the public may be a public liability; which further is in the nature of a community liability whether privately owned or abandoned to public ownership.

The only possible owner of land for which there is no profitable form of use is the public. No one will permanently hold and pay taxes on land that has no present or prospective value. Our American assumption has been that, as the Nation grew, private initiative would find ways to make land profitable. It has not reckoned with the possibility that private enterprise might operate to rob the land of its usefulness and then abandon it, worthless, to the public again. Neither has it reckoned with the possibility that declining requirements for land use might become a cause of extensive land abandonment. Now, with contracting agricultural requirements for land and with a rapidly increasing accumulation of cut-over forest lands that, in their present condition, offer little incentive to continued private holding, we are faced with a very disconcerting prospect. Very large compulsory increases of public holdings through tax delinquency and title forfeiture seem inescapable.

Some states are meeting the situation

forehandedly. Pennsylvania's approximately 1,600,000 acres of state forests are made up in large part of tax-sale lands bid in by the state for permanent ownership and administration. New York inaugurated a policy of reservation and administration of tax-reverted lands in the Adirondacks as a state forest preserve about 50 years ago, and is now entering upon the purchase of lands which agriculture cannot make pay, to bring them back to productiveness through reforestation. Michigan makes all tax-reverted lands available for extending her system of state forests, in the discretion of the State Conservation Department, and has reserved nearly 800,000 acres of these lands for permanent state ownership. Wisconsin encourages the establishment of county forests through the retention of tax forfeited lands, title to which in that state passes to the county. And so on. But while wealthy states like New York and Pennsylvania are financially strong enough to handle their land use problems by themselves, it is a question whether the Lake States will be able to do so, and for most of the Southern States the burden may be wholly beyond their strength to carry. In spite of the tremendous help afforded all the western states by the national forest system, some at least face land-use problems which are certain to impose a heavy strain on them.

Here lies the new challenge to the profession of forestry, and its second great opportunity. It calls for the best that we can give, unitedly. The task is twofold. Part of it is to discover and demonstrate all the possibilities of forestry as a means of inducing private owners to hold and employ land for timber growing, and to give all possible encouragement to the practice of private forestry. Part of it is to discover and make clear the measures necessary, in the public interest, to meet the conditions created as and where private ownership breaks down. No profession has ever faced a greater challenge and opportunity for enlarged public service. Forestry and foresters have entered a new era.

COMMENTS[1]

By WALTER MULFORD

Professor of Forestry, University of California

LABOR declares boldly and clearly for what it sincerely believes should be national policy—the thirty-hour week. Business declares for what it sincerely believes should be national policy—less government in business. This is even more bold than labor's stand, at this period in the development of the world's thinking and the world's impulsiveness, when insistence on freedom from governmental control is so likely to lead either to anarchy or straight to complete governmental control of everything, through Communism akin to that of the Soviet republics, or through Fascism akin to Mussolini's. With the spectacle of two such completely bureaucratic national reactions before us, one would think that American business could hardly have chosen a more dangerous time at which to try to break down the strength of government and the respect for government, even though successfully camouflaged for the moment under the necessary move for economy. Labor and business have spoken. So have the voters of

[1]Presented at the 32nd annual meeting of the Society of American Foresters at San Francisco, Calif., December 14-16, 1932.

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The National Forests Today

Amer. For. & For. Life July 1932

By R. Y. Stuart

ALMOST forty years have gone by since the first of the National Forest reserves were created. More than thirty years have passed since the basic law making possible the development of the present system of National Forest administration was enacted. The Forest Service, organized for the purpose of bringing about that development, is beginning its second quarter-century. What is in evidence as the outcome of the years? And what still remains to be done?

If we glance at the map we see that the National Forests are mainly in the West. A second glance shows that they mainly occupy the mountain sections. They cover the Cascade and Sierra ranges, outline somewhat less definitely the main masses of the Rocky Mountains, mark the Black Hills and Bighorns rising from the Great Plains, show where the Wasatch Mountains front the Great Basin, locate the Coast Ranges, and elsewhere distinguish various less important or familiar bodies of hill country. In the East, too, the National Forests coincide for the most part with rugged topography—the Ozark region, the southern Appalachians, the White Mountains in New England; but they leave out much more than they take in.

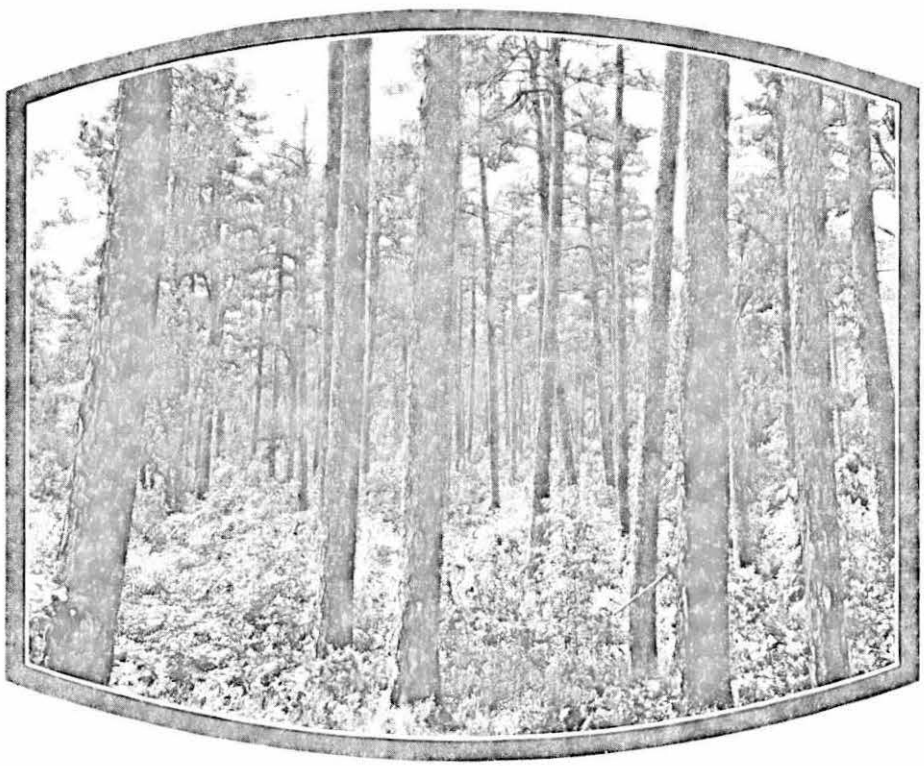
Of all the forest land in the West more than seven tenths is in National Forests; of that in the East, about one per cent. The distribution seems illogical from any point of view. Why not more National Forests in the East, or fewer in the West?

It is true that the present system of National Forests falls considerably short of constituting a symmetrical or entirely rational provision for taking care of public-forest needs. Anybody sitting down to devise an ideal scheme for the country as a whole would work out a plan different in many particulars. But in a practical world that is not the way most things are done, or can be done. And conditions in the two parts of the country are not altogether comparable. Public ownership ought to embrace a considerably greater percentage of the western forest lands than of the eastern.

In spite of three hundred years of forest misuse the East remains predominantly a wooded country wherever the white man found forests, except as land is kept open through continuous use and care or in some regions through persistent burning. Abandoned fields and pastures soon begin to revert to tree growth. Forest depletion and deterioration diminish the timber supply and lower the value of the growth, often to virtual worthlessness; but complete and permanent denudation is relatively infrequent. The eastern forest problem is primarily a problem of preventing forest abuse and of remedying the consequences of past abuse. The western problem is less chronic, and more acute.

Typical red fir forest in Washington. Of all the forest land in the West, seven-tenths is in the National Forests

With anything like the same treatment that the eastern forests have had, those of the West would be almost non-existent. They are very much harder to protect from fire, and they suffer more severely when fire passes through them. At the same time, their function as watershed cover on the mountains from which the semiarid West draws its irrigating streams and its hydroelectric power makes them even more basic for the public welfare than are the eastern forests. The latter are primarily valuable as a rule—though the rule has some very substantial exceptions—as sources of wood supply.



Southern shortleaf pine in the Ouachita National Forest, in Arkansas

From the standpoint of wood needs also, perpetuation of the western forests is imperative. Mining requires timber in large quantities; railroads are constant consumers; and the lumber industry is itself one of the greatest western industries. Permanent forests are required because the failure of local timber supplies would terribly handicap the region. Even though its needs could be met by drawing on eastern supplies, the cost would be prohibitive for many uses.

So there were the strongest reasons for beginning National Forest administration in the West. The primary reason, however, was that the policy of federal administration was originally a public lands policy pure and simple and was not initiated until after the eastern Public Domain timberlands were practically all gone. It began, in short, as a policy of reservation. In the West the National Forests are still often spoken of as reserves. To understand the National Forest system as it exists today it is necessary to make this the starting point.

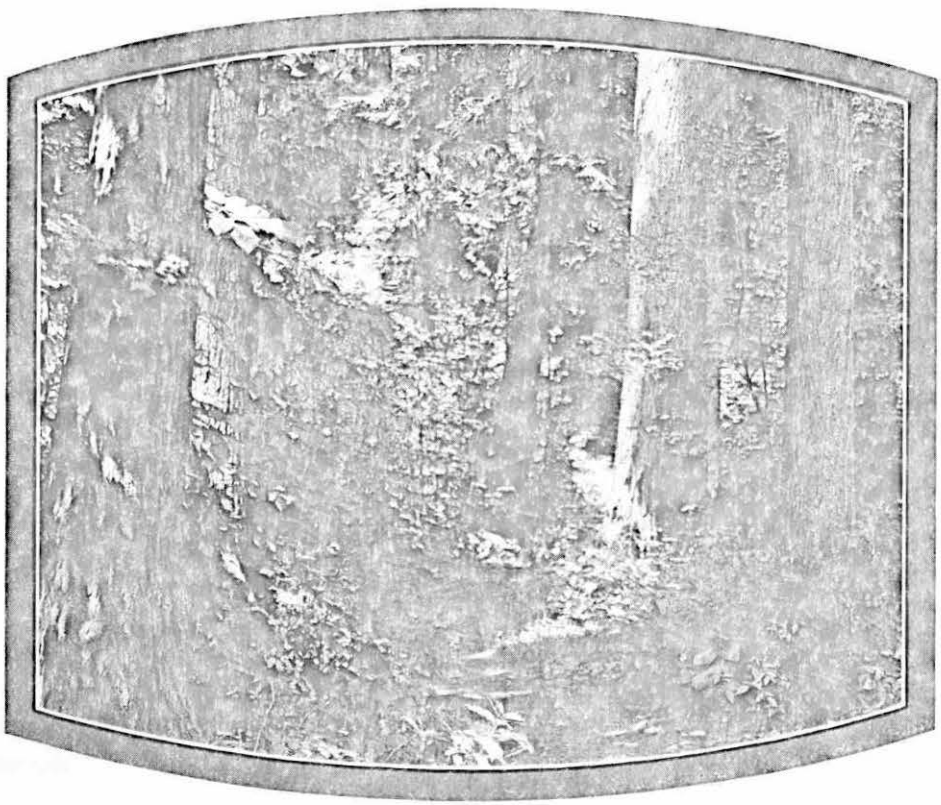
A rounded, adequate public policy of forestry for the United States is far too great a thing to become an actuality in any other way than by slow upbuilding. It is still a half-finished structure. In the West it has risen far enough so that its main outlines are clearly discernible. In the East not even its foundations are fully laid. Conditions profoundly unlike necessitate big differences in the character of the foundations, and will cause considerable differences in the completed building.

The reservation and federal administration of all the unappropriated Public Domain timberlands was first proposed by Carl Schurz, as Secretary of the Interior, in 1877. Instead of giving heed to this recommendation Congress passed laws opening still wider the door for those seeking to obtain the land. Fifteen years of persistent effort on the part of the conservationist group to obtain a law carrying out Schurz's recommendation was in some degree rewarded by the law of 1891, authorizing the President to set aside forest reservations. For a number of years this authority was sparingly exercised. Meanwhile, of course, millions upon millions of acres of the public timberlands—which in Schurz's day included extensive areas in the Lake States and the South—were passing into private hands. During Roosevelt's presidency forest reserves were rapidly created in an effort to convert all that was left of the Public Domain timberlands into National Forests. This soon caused Congress to curtail the authority of the President to add to the National Forest area. While some additions have been made of late years by Congress itself, complete attainment of the policy originally advocated by Schurz in 1877 has not even yet taken place. Nevertheless, roughly speaking, the western National Forests of today contain that part of the Public Domain timberlands which remained in the ownership of the government a little more than twenty years ago. In addition, they contain large areas of watershed lands on which sparse tree growth or brush constitutes, with other vegetation, a protective cover.

But the line that seemed to have been established marking off public timberland ownership from private is showing symptoms of dissolving. There is good reason to believe that a great deal of the private ownership will prove temporary, not permanent. The land will not stay put. It was taken up not because its claimants under the public-land laws wanted

the land itself, but because they wanted the valuable standing timber on it. After that is cut off the land often becomes a liability instead of an asset. Naturally, the owner of valueless land is indisposed to pay taxes on it indefinitely. He prefers to abandon title. A distinct drift of cutover forest land back into public ownership is beginning to show itself, in several Western States. Like the prodigal son, it returns impoverished; but its return receives considerably less welcome. And it comes back not to the federal government—its father's house, as it were—but to the unwilling state or county whose tax bills have not been satisfied. It goes, one might say, to the poorhouse, its substance wasted, to become a public charge.

To some extent the Forest Service is able to avert this drift of pauper land out of private into state or county ownership, through the limited authority conferred by the so-called land exchange laws. It can acquire private lands forming interior holdings within the forest boundaries, and in many cases outside lands nearby, giving in exchange for them National Forest timber. To be considered for acquisition through exchange the lands must of course not have been reduced to worthlessness. Under the exchange provision the western National Forest area is slowly increasing. This process of exchange, however, affords the possibility of meeting only to a very minor extent the land abandonment that appears impending. The plain fact of the matter is that, extensive as were the reservations for the National Forests, the carrying out of the policy was too long delayed. How far the states will be able to handle the land-abandonment situation is uncertain. How far it will be possible to induce the private owners, by lightening tax burdens and other forms of public aid and encouragement, to retain their forest lands and use them for permanent timber growing is also uncertain. The point is that, even with three-fourths of the forest lands of the West in federal and state ownership, a considerable forest land-use problem remains to be worked out. In the East the same problem looms on a much larger scale. New York and Pennsylvania are forehandedly grappling with it through extensive state forest ownership. The Lake States are moving in the same direction. In the South, state forests are as yet insignificant in size and number, while the prospect of land impoverishment and abandonment is staggering. The richer and more populous states can much more easily assume the financial burden of land acquisition, reforestation, and administration than can those of smaller resources. Under the Clarke-McNary law, enacted in 1924, a limited policy of federal acquisition in the Lake States and the South has taken shape. It is certain that private forestry will not for a long time to come, if ever, undertake the restoration to productiveness of the more badly depleted and poorer areas. Private forestry will begin first where the conditions are best, and gradually extend; meanwhile forest abuse and destructive lumbering of the less productive privately owned lands will proceed unless brought under some form of public control. Thus the pauper acres will tend to multiply.



Virgin white pine in the Allegheny National Forest, in Pennsylvania

To what degree National Forest extension will be adopted as a tool for working out the ominous eastern forest problem no one can say at present. Federal finances seem to preclude the likelihood of any early move towards a purchase policy of scope adequate to contribute materially to a solution. The public has not yet waked up to the nature of the problem. The awakening will begin at the bottom, not at the top; in the communities and the states pinched by the decline in local resources, industries, population, and land values, not among the leaders of national thought, whose attention is turned in other directions. When the awakening really comes, things will begin to happen.

The most outstanding contribution of the National Forest policy hitherto towards the eventual solution of the country's forest problem has been its development of sound principles and practices of public (*Continuing on page 476*)

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(*Continued from page* 407)

forest-land administration. The National Forests make up a great system of public properties, in process of development. From reserves of wilderness lands the western areas have been converted into managed enterprises constituting a tremendous national asset. The eastern National Forests are not yet so far along, having been under administration a shorter time and having been at the outset in worse condition; but they too are being built up in value and are steadily increasing in present as well as potential usefulness.

What have the National Forests cost to date? The difference between the total outlay for administering, protecting, developing, and improving the forests and the cash receipts from them has been equivalent to an average net outlay of only a very few dollars per acre on the 160,000,000 acres of land now owned. For the 3,000,000 acres of eastern forests acquired by purchase an average price of $4.70 an acre has been paid. The other 157,000,000 acres, as part of the Public Domain, of course cost the people of the United States something originally to obtain; but its prospects as a revenue earner for the Treasury had it remained open for disposal would not seem to justify putting much of a value on it as a government asset when it was given forest reserve status. On the basis of cost, therefore, the National Forests represent at the present time an investment of very moderate per-acre book value.

But the forests are no longer, as they were when their administration began, undeveloped wild land. They are equipped—though still far from sufficiently—with a system of improvements to facilitate their administration and use—37,601 miles of telephone lines, for example; 8,921 buildings of various kinds, in addition to 913 lookout towers or houses; 10,728 miles of boundary and drift fence to control the movements of livestock; 2,286 developments of watering facilities for livestock using the range. Roads and trails have been built that have cost more than $100,000,000 all told.

Yet this is a relatively unimportant part of what the government has to show for twenty-five years of administration by the Forest Service, in addition to the land itself. The National Forests are a going enterprise, manned by a personnel of capable trained executives and technical experts, organized for efficient performance, guided by experience and functioning systematically. It is this structural organization and development, out of nothing, of the complex technic of resource management and of right relationships between the resources themselves and those who use them that is the greatest result of the expenditures annually made for the care of forests and conduct of business connected

National Forest Timber

For Sale

Sealed bids will be received by the Regional Forester, Forest Service, Milwaukee, Wis., up to 2 P. M., September 2, 1930, and opened immediately thereafter, for all the merchantable dead timber and the marked or designated live timber on two adjacent units, totalling about 34,000 acres in T. 146 N., 147 N., and 148 N., R. 28 W.; T. 147 N. and 148 N., R. 27 W.; T. 147 N. and 148 N., R. 28 W.; and T. 147 N., R. 29 W., 5th P. M., Chippewa National Forest, Minnesota. The estimated amounts to be cut are: On Block I, east of Pigeon River, 11,860,000 feet b. m. of sawlogs (including 9,950,000 feet of aspen), 5,920 cedar and tamarack ties, 1,100 cedar poles, 90 cords of spruce pulpwood, 860 cords of balsam pulpwood, and 100 cords of jack pine pulpwood, and, to be taken at the option of the purchaser unless otherwise bid for, 380,000 feet b. m. of elm, maple and ash sawlogs, 4,260 cedar posts, 1,650 cords of aspen pulpwood, and an unestimated amount of balm of Gilead; on Block II, between Third River and Pigeon River, 40,250,000 feet b. m. of sawlogs (including 40,180,000 feet of aspen), 18,560 cedar and tamarack ties, 4,280 cedar poles, 5,440 cords of spruce pulpwood, 3,700 cords of balsam pulpwood and 110 cords of jack pine pulpwood, and, to be taken at the option of the purchaser unless otherwise bid for, 1,620,000 feet b. m. of elm, maple and ash sawlogs, 28,100 cedar posts, 4,800 cords of aspen pulpwood, and an unestimated amount of balm of Gilead. Agreement, as part of any bid, to take all, or specified species, or specified quantities of specified species of the optional materials, or to utilize certain hardwood species to less than 9 inches in the tops, may be considered in making awards.

The lowest bid prices which will be considered for the timber on either or both blocks are: for sawlogs, Norway pine, white pine and oak, $5.00 per M feet, log scale; jack pine and spruce, $3.75 per M feet, log scale; ash, $4.00 per M feet, log scale; balsam, white and yellow birch and basswood, $2.75 per M feet, log scale; aspen, maple, elm and balm of Gilead, $1.00 per M feet, log scale; for pulpwood of spruce and balsam, $1.40 per cord, and for other species 50c per cord; for ties, 10c each; for poles, 13½c per linear foot; for posts, 5c each. A cooperative deposit of 25c per M feet for all sawtimber, in addition to the prices bid for the stumpage, will be required.

A deposit of $2,000 must accompany each bid for the timber on Block I, of $3,000 for the timber on Block II, and of $5,000 for the timber on both blocks combined, to be applied on the purchase price refunded or retained in part as liquidated damages according to the conditions of sale.

Bids may be submitted for either or both Block I and Block II, but the right is reserved to award on any basis that may appear most advantageous to the United States, or to reject any bid for either block, or to reject all bids.

Before bids are submitted, full information concerning the timber, the requirements concerning rates of cutting, the deposit with bid, the financial showing required of bidders, and other conditions of sale should be obtained from the Regional Forester, Milwaukee, Wis., or the Forest Supervisor, Cass Lake, Minnesota.

The National Forests

(*Continued from page* 476)

National Forest development is still incomplete. Much more will need to be spent before they will be properly made ready for maximum public service. Much will need to be spent for tools and machinery of various kinds; much for research; much for reforestation and other measures to increase and improve the growth of timber, the yields of forage and water, the value of the forests for public recreation. The need for many of these things is crying. Not to provide them as rapidly as possible is poor economy. But whether or not the annual expenditures are raised to provide for them, it will remain true that a large part of each year's outlay in a very real sense is invested in developing a great national enterprise, of wide beneficence, of brightest promise, and of tremendous value as a working out of the possibilities of public forest ownership in connection with the whole national problem of land use.

Uncle Sam—Greatest Forester

(*Continued from page* 437)

vals through the forest from section lines or established control lines. The diameter and merchantable height of the individual trees on these strips are measured and recorded and the results applied to volume tables. This gives an estimate on a certain percentage of the area and it is then a simple matter to obtain the volume for the total area.

A timber sale appraisal is then made which establishes the exterior boundaries of the tract to be logged and estimates the cost of the different operations necessary before the timber can be delivered in the form of logs to the mill. These operations consist of felling the timber, including disposal of slash and diseased trees, cutting the timber into logs and skidding them to some point where they can be transported by stream driving, fluming, auto or horse truck, or railroad. The amount of timber involved and the character of the topography are largely the deciding factors as to the means of transportation which will be used. It is then necessary to determine the milling costs and the average value of the lumber when ready for market. The sum of the logging costs, milling costs, and a reasonable margin allowance for profit and risk deducted from the average selling price of the lumber determines the stumpage value a thousand board feet.

The applicant is then advised of the stumpage found and, if he still desires to purchase, a sample timber sale agreement is prepared, its terms fully discussed with him, and the timber advertised for sale for a period varying from thirty to ninety days. Sealed bids are received for the timber and award is made to the highest bidder. The successful bidder is then required to post a bond and sign the agreement. When the purchaser begins the construction of his improvements a forest officer is assigned to take charge of the sale. He works with the purchaser in the location of the logging improvements, and approves the general scheme of logging, the fire protection plan and the sequence of cutting. In advance of actual cutting operations he must see that sufficient timber is marked to avoid any possibility of delay in the operation.

The man in charge of the sale is responsible for all activities on the sale area and for the work of the men assigned to help him with the marking and scaling. He is responsible for seeing that all the conditions of the agreement are complied with—that the trees are felled so as not to injure the reserved timber, that no unmarked timber is cut, that no unnecessary damage is done by the logging method used, that the slash and defective trees are disposed of properly, that no timber is removed from the sale area prior to scaling, that the timber is utilized properly, with particular reference to cutting low stumps and complete utilization in the tops, that fire-fighting equipment is ready for instant use and that everyone use the greatest care to keep fire out of the woods.

The estimated stand of timber on the National Forests today is 552 billion board feet, representing about one-fourth of the standing timber in the United States. The annual receipts from sales of National Forest timber have grown from $85,000, in 1905, to $4,109,000 in 1929. The timber cut for 1929 was 1,502,000,000 board feet. It is estimated that the National Forests can be made to produce a permanently sustained cut of from five to six times as large as is now being removed from them. This will mean an annual production of about 8,000,000,000 board feet. The Forest Service as custodian of Uncle Sam's big forest now employs a personnel of 2,700 and of this number about 650 are technically trained.

And so with the coming of increased appropriations for timber inventories and salaries of technical assistants it has been possible to make intelligent progress towards putting the timber lands of the National Forests on a sustained yield basis. Sustained yield means nothing more than that the forest will not be cut any faster than it grows and that there be markets available to utilize this yield. In other words, sustained yield means permanency. There develops around any manufacturing industry a dependent community. If this industry has the earmarks of permanency, there is an incentive on the part of the individuals of the community to establish permanent homes. Permanent homes demand churches, schools, amusements, stores, garages and all those things which are essential to the happiness of our present-day American family. Sustained yield is therefore far-reaching and has much more behind

AMERICAN FORESTS

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THAT 250,000-MAN JOB

By R. Y. STUART, Chief Forester
U. S. Forest Service

THE passage of President Roosevelt's unemployment relief bill affords the opportunity of putting 250,000 men promptly to work. In view of the prominent part our forests have played in the economic life of the American people, it is especially fitting that in the present economic crisis we should turn to those forests as a source of work with which to employ in healthful occupation our large number of idle men.

President Roosevelt decided upon work in the forests as the first form of employment in his relief program, largely because of the unusual opportunities it offers to men from all walks of life to take a fresh start in a healthful occupation in the open. While the work which will be accomplished is much needed and will be largely self-liquidating, the primary object of the plan is to put men to work immediately. To quote from President Roosevelt's message, "more important, however, than the material gains will be the moral and spiritual value of such work. The overwhelming majority of men who are walking the streets and receiving private or public relief, would infinitely prefer to work. We can take a vast army of these unemployed out into healthful surroundings. We can eliminate to some extent at least the threat that enforced idleness brings to spiritual and moral stability. It is not a panacea for all the unemployment but it is an essential step in this emergency."

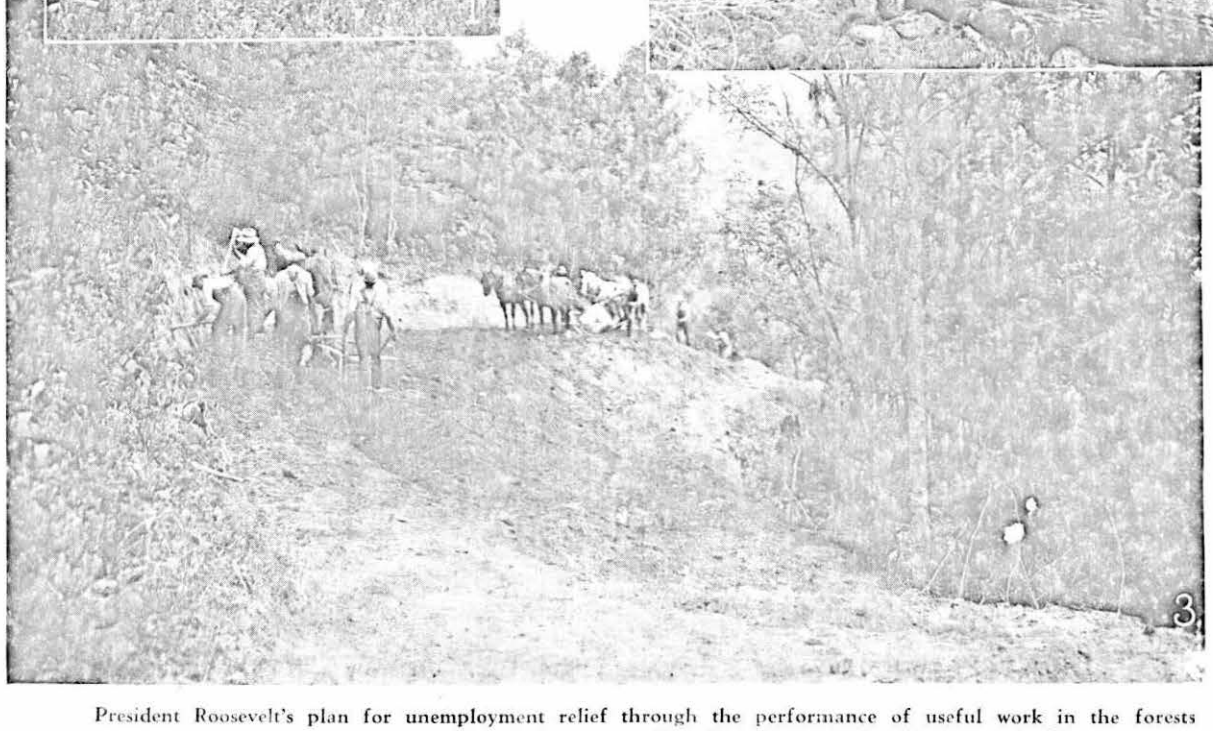
The plan, broadly stated, calls for putting into effect a wide spread program for unemployment relief through the performance of useful work in the forests. As those of us who will carry it out envision it, its effects will be far-reaching. It will help to lighten the burden of local relief agencies; it will provide a stimulus to business through the increase of purchasing power and the supplying of wholesome food and necessary equipment for the thousands of forest workers. At the same time it will be accomplishing some enormously important public work much needed for the rehabilitation and improvement of our forest resources. It will be building for future national wealth. The labor performed in the forests will render a vital public service by helping to put the forests of the country in a productive condition which would have taken years to attain under ordinary circumstances.

With 25,000 unemployed men already in conditioning camps, preparatory to work in the forests, camps similar to the one pictured above are rising in many forest regions. In these comfortable and healthful tent cities, equipped to take care of as many as two hundred men and more, the conservation corps will be quartered.

Large numbers of men throughout the country will be given a better understanding of land uses, of restoration and protection of land values, and of the possibilities for building up the country's natural resources. All recesses of this country will be entered by these men who will know their "America First." For many, it may lead to new, permanent occupations in fields of public usefulness.

And beyond all that, the

THE WORK OF THE CONSERVATION CORPS IN BUILDING MEN AND FORESTS



President Roosevelt's plan for unemployment relief through the performance of useful work in the forests will render a far-reaching service to men and country alike. To thousands it will mean valuable trainin,, in useful, healthful work, physically beneficial and morally uplifting, while providing work much needed for the rehabilitation and improvement of forest resources. The above pictures illustrate some of the types of work the conservation corps will perform: (1) Construction of telephone lines for fire protection, (2) forest insect control, and (3) the development of roads and trails for the protection and administration of forest areas

forest work program will render far-reaching service to the men. To thousands of men it should mean valuable training in useful, healthful work, physically beneficial and morally uplifting. To thousands of men it will mean a chance to get away from discouragement and distress, to face the world with a renewed purpose.

The details of just how the plan will be put into effect are being worked out as this is written, but the primary lines of action have been decided upon. The administration of the Act will be by a director of Emergency Conservation Work, Robert Fechner, acting for the President. Funds will be allotted to the Federal departments concerned with the execution of the projects. The Department of Labor will enroll the men for work. They will then be transported to assembly camps maintained and operated by the Army and will be furnished with food, shoes, clothing, and necessary medical attention. After "conditioning" at these camps they will be sent to the forest work camps from which the forest work to be done is to be manned.

Enrollment will be for a period of six months, but the period of employment can be terminated upon the request of the employee for good cause. The government will dismiss any employee who shows inability or unwillingness to do reasonably satisfactory work for which he is suitable or may be trained, or for failure to comply with the reasonable rules and regulations prescribed by those in charge. Men sick or injured while on the job will be cared for at Government expense. The relief allowance will be at a monthly rate of $30. Arrangements are made at the time of enrollment to have a portion of the compensation due paid direct to dependents. Except for emergency work to prevent the destruction of life or property, the hours of work will not exceed forty a week. In emergencies the men will be subject to call for forest fire-fighting. As with all other forest work, any fire-fighting work done will be under the direct supervision of experienced men who are thoroughly qualified to look after the safety of the men in their charge.

Every effort will be made to obtain the necessary personnel for supervision and technical direction from the enrolled force. When it cannot be obtained from that source it will be supplied from the ranks of foresters and other forest workers of proven experience and ability to supervise the

The whole project is primarily a relief measure and in taking advantage of it any man should be willing to serve to the best of his ability in any capacity. It is expected that just as rapidly as the need for relief dissipates and the opportunity offers, men will leave the camps, take their place in the field of commercial occupation for which they are best suited or capable of filling, and give way to those less fortunate.

At this writing a first contingent of 25,000 men is being assembled from sixteen cities. Members of this first unit, selected by the Labor Department, are men with dependents, between the age limits of eighteen to twenty-five, unmarried, physically fit, and with the expressed willingness to assign a major portion of their compensation to their dependents. The work on the forests will be of such variety that any man of reasonable physical fitness should be able with some training to give a satisfactory account of himself.

Work on the National Forests has already been planned in furtherance of an establishd program, which will provide more than 1,600,000 man months of work. One of many activities is that of tree planting on lands devastated by repeated forest fires, of which there are more than 2,000,000 acres in the National Forests alone.

Supervision of the work on Federal lands will be given by the Department having jurisdiction over the lands. Work on National Forests will be directed by the Forest Service, Department of Agriculture, and on National Parks and Indian Reservations by the Department of Interior. Work on state, county, municipal and private forests will be supervised, in most instances, by the states. No distinction will be made in the scope of the work done on National and State Forests. Some of the activities contemplated on the National Forests are the construction of telephone lines, fire breaks, fire protection structures, administrative structures, public camps, range fences, water development and truck and foot trails. In connection with those activities directly related to the growing of trees there will be forest planting, timber stand improvement, insect and blister rust control. Work on the National Forests has already been planned which could provide more than a million and a half man months of work that needs to be done and would be done sooner or later. No projects are included in these plans which would be classed as "made-work." All of the work is in furtherance of an established National Forest improvement program looking to the development and protection of vital public resources.

The Act limits the character of work which can be done on county, municipal or private forests to such kinds of

gress in preventing and controlling forest fires and the attacks of forest tree pests and diseases and such work as is necessary in the public interest to control floods. Among these authorized activities will be the construction of fire breaks and improvements for strictly fire protection purposes, assignment of men to fire prevention and fire suppression work, and to assist in practical measures for the control of tree diseases and insects and of floods.

Plans are already under way to provide feeding and housing facilities for the men who will work on the National Forests. By the time the men have been assembled, equipped and "conditioned," camps convenient to the work to be done will have been established and be ready to take care of the men as rapidly as they are needed. The work camps will be equipped to take care of groups of men up to 200 in number, and will be maintained in an orderly and sanitary way. Constructed by the Army, these camps will also come under Army maintenance. Commanding officers of the various Army Corps Areas have been ordered to assign officers to the camps and to arrange for their supply, administration, sanitation, welfare, medical care and hospitalization. The order authorizes the drawing on the Army Reserve Corps, in necessary cases, to carry out the plan. As set up at this time, it is planned that each forest camp be supplied with three line officers.

In New England, the Lake States and the West, one important activity will be the control of the blister rust disease which threatens to wipe out the nation's valuable forests of white pine. Currant and gooseberry bushes, alternate host to the disease, must be eradicated.

Actual work projects and their technical planning and execution will, as proposed at the beginning, be under the immediate control and supervision of the Forest Service on the National Forests, the various state forest or conservation agencies on state forest lands, the National Park Service on National Parks and National Monuments, and other federal departments concerned in the work. The Army will be assisted by the Red Cross and other organizations in carrying out active welfare work.

The first fifty camps to be approved are in the eastern National Forests and affect thirteen states. They are located as follows: Alabama, one camp; Arkansas, four camps; Georgia, one camp; Maine, one camp; New Hampshire, three camps; North Carolina, six camps; Oklahoma, one camp; Pennsylvania, five camps; South Carolina, one camp; Tennessee, five camps; Vermont, one camp; Virginia, ten camps; and West Virginia, five camps. As soon as feasible, camps will be established on the western National Forests and in a large number of state forests.

There is no reason to believe that any man cannot be perfectly comfortable in one of these camps, even though he be city bred. With the variety of work needed to be done on the National Forests it is reasonable to expect that many of the men can be placed in types of employment suited to their abilities or that they can adapt themselves through training and practice to the necessary requirements of the jobs to which they may be assigned. There will be need for a wide variety of skill, such as carpenters, cooks, pick and shovel men, teamsters, powder-men, farriers, ax-men, tractor drivers, woodsmen and others. Surely most of the men given this relief, if they be sincere, can fit into one of the available occupations.

In emergencies the conservation corps will be subject to call for fighting forest fires—under the direct supervision of highly trained and experienced leaders.

Exit Greeley: Enter Stuart

A Personal Letter from Washington

By DIXON MERRITT

I THINK that natural ease of manner is probably artificial. Perhaps no man can have it unless he has cultivated it.

I am thinking generally of Washington officialdom and particularly of the governing force of the Forest Service.

Gifford Pinchot, the first Chief Forester, had naturalness and ease. Despite his added academic degrees and political decorations, he still has—or had last spring when I sloshed through the flood with him in Louisiana.

Henry Graves, who succeeded Pinchot, had it or not, as he liked. I had almost said that it depended upon the suit of clothes he happened to be wearing, but that would not be true, because the suit was tailored to the exigencies of the occasion.

Then Greeley. I suppose Greeley has a first name. He must have had something of the kind before he acquired the title of Colonel, and he got that as late as 1917. But I have never heard him called by a first name. In print Greeley is preceded by the symbols W. B., but in conversation he is Greeley with no suffix, or the Colonel with no suffix. Or he is the Forester. If we had acquired in this country the Scotch instead of the English vernacular, he might have been The Greeley. He has been the high hat in the tall timber.

But that is not "front." It is Greeley's quite as natural as, if not more so than, the naturalness of another man. And that is the point. Put a peg in there.

Now Greeley goes, as of May 1, and Stuart comes, as of the same date, the fourth Forester in the line of succession. I had never seen Stuart until yesterday. He was out of town for seven years, and I have been out most of the last months since he returned. But he wears the title of Major. Rather, he does not. He has it hanging on a hook in his closet. But I did not know that matter fact, and so went to a subordinate to have an appointment arranged. That subordinate picked up the inside telephone. Without any wait for the flurrying of flunkies, he called, "Say, Bob—this Merritt wants to come down to see you."

I went down to see him—just to see him. We smoked. And swapped memories of Rufe Maddux planting black-locust sprouts on a gully bank. And of other things. And that is enough to say personally of Major Robert Y. Stuart, the incoming Chief Forester of the United States.

Except for the fact that he is eminently qualified for the position, I do not know how Major Robert Y. Stuart came to be appointed Chief Forester to administer the Government's 150,000,000 acres of forest (and other) land. It was not ordered that way when, three years or so ago, it became likely that Colonel Greeley would be leaving to join the lumber industry. Paul G. Redding-ton was brought in from the post of a district forester in the West and made heir-apparent to the empire.

Stuart was then with Pinchot in Pennsylvania—one of the few States that has done something in the way of State forests—where he served for almost seven years, first as assistant to Pinchot, and then, when Pinchot became Governor, as chief of the Department of Forests and Waters.

I do not know what happened in the Department of Agriculture, or why. But Reddington was side-tracked from the empire by being given a principality—the chiefship of the Bureau of Biological Survey. Stuart came back into the Forest Service and was placed in charge of public relations.

And now he succeeds to the empire.

There is to be no change in policy. Everybody about the Forest Service says that. Did not Pinchot lay down the policies at the outset? And has not everybody carried them out? True!

But there will be changes in practices. I say that on no authority whatever. I read it in the faces of the outgoing and the incoming Chief Forester.

Greeley, I guess, thinks in terms of forests. Stuart, I surmise, thinks in terms of trees. There is a difference. For instance: You can plant trees. But who can plant a forest?

Greeley has rendered a service to the National Forests that perhaps no other man could have rendered. He has had his faults, but every set of virtues has its accompanying particular set of vices. Stuart will render a service to forestry distinct from that which his predecessor has rendered.

Not all of the lumber that America will need can be grown in forests, certainly not in National Forests. Theoretically, our timber acreage should be 470,000,000. The empire of the National Forests contains but 150,000,000 acres, and a great deal of that is grazing land, and desert, and bald mountain-tops. The 320,000,000 acres must be in State forests, municipal forests, farm wood-lots—very largely in that last. And the National Forests must do their part by growing trees.

In short, unless the United States is to become a treeless country, it must become tree-minded. And that is where Stuart's peculiar service will come in, I think.

I do not believe he will ever make an emperor. But I think it is in him to be a great practitioner and teacher of forestry on a National scale.

And Greeley, not lost to forestry because he leaves the Forest Service, will doubtless help a great deal. He goes to the West Coast Lumber Manufacturers Association in a capacity not yet announced. Presumably, his job is to make the big lumber companies practice forestry. The great fir forest fits his flare. If he is more the lumberman than most foresters are, he is also more the forester than most lumbermen are. And when the sawmill stops converting into ashes what it cannot convert into lumber the permanent forest area of the United States will have been increased by a couple of hundred million acres or so.

I guess that the practice of forestry in the United States has made a distinct advance. And I guess that, by its advance, it has gone back pretty close to where it was at its inception.

The fact that all Foresters of recent times have had military titles may be rather a surprise to most readers. Nevertheless they came by their titles honestly. Graves, Greeley, and Stuart were all officers in the American Expeditionary Forces, commanding sawmill and timber troops in France.

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I. 10—RECENT APPLICATIONS OF SCIENCE TO FORESTRY

By R. Y. Stuart

Chief Forester, United States Forest Service, Washington, D.C., U.S.A.

Twenty years ago, Colonel Henry S. Graves, then head of the Forest Service, delivered an address before the Washington Academy of Sciences. His talk on "The place of forestry among natural sciences" emphasized the fact that foresters have to base their work upon scientific facts and premises. He prophesied that, as forestry developed, foresters would more and more use the facts developed by scientific endeavour in the basic sciences. As time has passed, the sciences have been more and more applied in forest practices.

Forest trees are living plants and they require for their growth and development the same elements required for all green plants. Just as the agronomist and horticulturist must study the influence of mineral elements, temperature conditions, moisture conditions, and light conditions on the growth of field crops and small fruits and vegetables, so also must the forester study the effects of these factors on the growth of timber crops.

Many research agencies have been engaged in a study of the growth of our forests and the proper methods of handling them. Many of their methods of approach depend directly upon the biological sciences. Some of the results serve as an excellent illustration of the use and application of the biological sciences to forestry.

Seeds of northern white pine give very unsatisfactory germination when planted in the spring. If sown in the fall germination is usually quite satisfactory. Recent studies have shown that if northern white pine seeds are stored in moist sand or sawdust for a period of two weeks to one month, at 33 to 50° F., they will germinate promptly and completely. The chemical changes which occur during this storage treatment are almost identical with the changes which occur during the early stages of germination in untreated seed. These changes, which involve a marked transformation in the nature of the proteins together with a considerable absorption of water, are thus a part of the germination process. Spring sowing of white pine is now a feasible and practical operation which will give equally satisfactory results with fall sowing.

Our pines tend to be irregular in their production of seeds. It is, therefore, highly important that suitable methods be devised for keeping the seeds over a period of two to three years. Seeds stored at low temperatures and having a very low moisture content at the time of storage will maintain their vitality for a comparatively long period, whereas seeds with high moisture content stored at fluctuating temperatures tend to lose their vitality within a year or two.

Forest trees of North America have been growing for many forest generations under the climatic conditions prevalent in a particular district. Seedlings from seed collected in a number of climatic districts show a great variation in their resistance against drought, frost, and other unfavourable conditions. A study of the relative hardiness of seedlings from different climatic districts promises to have a considerable

bearing on effectiveness of nursery operations and field plantings by pointing out the strains best adapted to local conditions.

When young trees are well supplied with moisture, they appear to grow best with full sunlight. In an aspen stand, young pines had attained a height of nine inches in three years where the light intensity was 20 per cent. of full sunlight, as contrasted with 18 inches in the open.

Many forestry problems are those of silvics or applied ecology. The effect of the environment, either in itself or as modified by human action, enters into all reforestation practices, cutting methods, and management plans. Vegetative succession following the removal of timber may prevent, and has prevented in many places, the quick and ready establishment of natural reproduction of desirable species. The vegetative succession following fire and logging in such regions as California results in the establishment of dense brush-fields that practically inhibit the growth of seedlings, either natural or artificial.

Ecological investigations are showing the very great changes that have occurred in the California region in the relatively few decades since the white man has occupied the region. The pine forest has been so generally abused by cutting, fire, and overgrazing that the fertile top soil has been eroded away and the site greatly deteriorated. In some sections of the forest, the lower altitudinal limit is from 1,000 to 2,500 feet higher and from 10 to 30 miles further distant from the valley than it was 75 years ago. Native and highly nutritive grasses and other forage plants have been all but eliminated from thousands of acres of foothills and their place taken by unpalatable and practically worthless introduced species, many of European origin.

In the eastern United States, it has been observed repeatedly that pure, even-aged northern white pine stands slow up quite suddenly in growth when about 60 years of age. They show a rapid growth rate for 30 to 40 years, and then a gradual slowing up until, at the age of about 75, growth has virtually ceased. In pure stands, white pine often has a "sickly" appearance. Red rot (caused by *Fomes pini*) begins to appear at about 50 years and the stands show a loss in merchantable lumber of from 10 to 15 per cent. by 70 years. This is ascribed to the lack of an understorey of such leafy trees as the birch, maple, elm, *etc.*, to protect the soil and maintain its fertility. When pine and hardwoods are grown together, the stand gives promise of maintaining its health and vigour for well over a hundred years, making possible long rotations and the production of high-quality wood.

The study of the mycorrhiza of tree roots might not seem to have much in common with silvicultural practice, yet it has been found that in nurseries tree seedlings do not develop as they should without them. In one instance, sprinkling seed-beds with litter and humus from the spruce forest inoculated the spruce seedlings with the needed soil fungi, increasing their growth rate and general vigour.

Among the notable applications of pathology to forestry is the concept of "pathological rotation" or age at which trees become highly susceptible to wood-destroying fungi. This pathological rotation age has now been worked out locally for such species as the Douglas fir (*Pseudotsuga taxifolia*), white fir (*Abies concolor*), and incense cedar (*Libocedrus decurrens*).

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rust. Its life-history has been ascertained, the relative susceptibility both of the pines and of the alternate *Ribes* hosts has been determined, and a method of control has been developed that will enable us to continue to grow the valuable five-needled pines.

Like pathology, applied entomology is taken as a matter of course in forest management. The control of the various bark beetles and defoliators has now been so well worked out that the elimination of huge losses to our forests depends almost entirely upon the amount of money that can be spent. Entomology, however, has not only worked out methods of control, but it has shown that certain classes of trees, especially mature trees of slowest growth, are most susceptible to attack. Such slow-growing trees are now seldom retained as seed trees.

The entomologists have recently discovered the close relationship that exists between bark beetles and a group of fungi. Their investigations indicate that possibly the bark beetles do not kill trees, as has been commonly thought, but that the fungi, which they carry with them when they enter the bark, attack the cambium and sapwood, causing a physiological wilting. This interrelationship has prompted the development of toxic preparations for injection into the sap stream to kill both fungi and insects. The practical application of the latter has not yet been fully worked out, but the method appears to hold great promise.

Forestry is now applying biometric methods to a wide variety of field data. Biometry, scarcely known ten years ago, now has become an indispensable tool in all work where measurements are involved. In forest surveys, in growth determination, in preparing stand or volume tables, in practically every branch of forest activity, statistical methods are needed. The use of these methods has shown us how many measurements are needed for a reliable sample, how much of an area must be covered to give results within an error of a given percentage, how to compare stands, *etc.* It might also be remarked in passing, that forestry has very materially contributed to this phase of mathematical science, through the development of alinement charts and through showing the possible use and application of multiple curvilinear correlation in statistical work.

The physical sciences are applied in forestry, and, perhaps, most notably in the field of forest protection. The physics of the air influence markedly the behaviour of forest fires and the effectiveness of man's action in suppressing them. The interrelationship between fire behaviour and air moisture has resulted in the widespread use of relative humidity and of duff moisture as an index of the inflammability of the forest fuels. During the fire season, diurnal changes in humidity are anxiously followed and weather behaviour noted by many foresters who little think how greatly the physics of the air affects their daily life.

Lately, physics has entered into another phase of fire control. Haze and smoke, as well as the position of the observer with reference to the sun, all affect the efficiency of the lookout personnel. Outdoor optical tests, similar to those used by opticians, have been devised to eliminate the employment of men with defective eyesight for lookout duty. A careful study of lenses in the effort to cut down interference due to haze has resulted in the adoption of standards for lookout binoculars.

Soil physics has helped to explain the high rate at which water percolates into a litter-covered soil and the slow rate at which it percolates into a bare soil. It has been found that soil particles lying on the exposed

soil surface are so moved about by beating rain or running water that they cap or seal the numerous pore spaces which normally exist in the undisturbed and litter-covered soil. This discovery is now used in a practical way in road construction in regions of serious erosion. By covering the overcast an fills with a layer of litter and other vegetable matter, erosion is materially checked.

Chemical fire extinguishers are still within the realm of practicability. The various materials that have been used, either dry or in combination with water, have so far not yet fully proven their worth for actual forest conditions. As yet, either the chemicals are not sufficiently effective or the cost is too high. If the right combination can be found, there will undoubtedly be a real place for it.

Chemistry is usually not considered as playing much part in silvicultural practice. However, chemical weed-killers are being used in forest nurseries. The first of these were destructive alike to trees and to weeds, but as the reaction of seedlings to the various chemicals became known, compounds were evolved that have wide application.

It is, however, in the field of utilization that chemistry has rendered its most signal service to forestry. It has helped to make new species usable for pulp, thereby assisting in silvicultural practice. Improvements have been made in standard chemical pulping processes, thus making them more efficient or bettering the quality of the product. A notable example of this is the development of strong, white paper from pine wood. Other products with new uses have been developed including specially purified pulps for making rayon and cellophane.

Much of the application of chemical science to wood utilization has been indirect; it has not been concerned so much in making chemical products out of wood as in developing chemicals as accessory materials to be used with wood, and in improving the methods of applying these chemicals to wood. Glues, preservatives, paints, varnishes, moisture-proof coatings, and fire-proofing and anti-shrinking chemicals are examples of such accessory materials. The first of these have been closely connected with important commercial uses for wood for a long time, and chemical science has aided in recent improvements in the quality of the accessories and in efficiency of methods for their use.

There are ways even more indirect in which chemical science is applied to wood utilization. It has been found that the chemicals naturally occurring in certain species are responsible for the resistance of the wood to decay or to termites, and for the attraction of certain insects to the standing tree. It is this same class of chemical wood constituents, the extractives, that in many species affect also the density, strength, odour, colour, and other wood characteristics commonly considered as chemical properties.

In the seasoning of wood, applied engineering has developed and perfected the modern forced circulation and ventilated lumber dry kilns to a comparatively high efficiency. It has developed kiln-drying schedules for varying species of wood, which permit the drying to be done in the minimum of time and with the minimum of degrade. It has developed and perfected methods of air-drying wood of various species, thereby permitting the most satisfactory results to be secured. It has developed improved methods of determining the moisture content of wood. It has determined many of the use requirements of lumber, to

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Of these, the development of the modern lumber dry kilns is, perhaps, the most tangible and has, perhaps, had the most far-reaching results. The last ten years have witnessed radical changes and improvements in lumber dry kilns. The superiority of forced circulation for many classes of drying has been firmly established and commercially accepted. Several types of forced circulation dry kilns have been developed and have been sold in large quantities. Their field of application is steadily spreading. A number of improved types of ventilated dry kilns has been developed to meet the industrial requirements for faster and more uniform drying.

Although the natural and physical sciences are widely and generally applied in forestry, far more so than appears upon casual observation, it seems desirable to point out at this time that the more abstract and less tangible sciences are inseparably linked with forest development. Two particularly are important, economics and sociology. Economics dominates our manner of silviculture, our protection, our annual cut, and the utilization of timber. The financial aspects of forestry dominate the whole forestry structure. More and more foresters are coming to recognize this fact, and, where a few years ago costs were of only moderate concern, now they are vital.

The human or sociological aspects of forests are, of course, in the minds of all of us. Too often, however, they are subordinated to other more material things. It may not be amiss here to mention the greatest experiment in human rehabilitation through forestry ever undertaken. This year, we are endeavouring to give the youth of our land a new outlook on life. Under the leadership of our President, we expect soon to have some 275,000 young men, largely from our cities, engaged in woods work. Regardless of what they learn of forestry, of engineering, and of other activities in which they may be engaged, they will learn something of outdoor life, and will acquire something of the inspiration that work in the woods gives.

Thus it is that forestry, like its companion in land use, agriculture, brings to bear upon its problems and incorporates into its daily activity, many of the sciences. Forestry owes much of its distinctive character to its ability to use and to apply these sciences. They are, however, only auxiliary to the resultant science—forestry—which rests upon a knowledge of the life of the forest and of the place that the forest occupies in the economic and social life of the people.

RELATION OF THE NATIONAL FORESTS TO A POLICY FOR THE UNAPPROPRIATED PUBLIC LANDS[1]

By R. Y. STUART

Chief Forester, U. S. Forest Service

The Chief Forester contrasts briefly the benefits derived from administering the national forest lands according to a sound policy and the problems created by the lack of policy toward our public domain. Under the basic policy in effect for national forest administration the permanent usefulness of the lands is safeguarded, while the unappropriated public lands are greatly depreciated by abusive practices. The test of jurisdiction to be applied to unappropriated public lands is whether or not they serve a national purpose so distinctive as to warrant their retention by the federal government, or in the absence of such benefit how they can best be brought to their highest use. The Forest Service sees in the unappropriated public lands a stewardship to be redeemed.

THE CONSERVATION movement in this country had its origin in forest conservation. It was conceived in the spirit of good stewardship to fellow and future citizen. It was given life with the vigor of a fixed conviction—to accomplish public good. Its most marked impetus was the setting aside of forest reserves by the federal government, later crystalizing in the designation of these tracts as national forests and in provision for their protection and administration.

The national forests have been forest conservation's proving ground. Every conceivable method has been tried over the years to test the soundness of their public purpose and worth. Veritable battles have been waged against the principles and methods of their administration. While large contributory support came to the movement from other agencies, federal and state, which in increasing number exemplified or sustained forest conservation, the failure of the national forests would have been a serious setback.

Constructive work on the national forests had its beginning in 1905, when well defined objectives of administration were laid down. Legislatively the mandate of Congress in the Act of June 4, 1897, was simply to protect these forests from fire and depredations and to provide for their controled use while preserving the forests. Concerning the forms and methods of use to be permitted the law said very little, while concerning objectives of control nothing was indicated beyond the broad objectives of improving and protecting the forest, securing favorable conditions of water flow, and furnishing a continuous supply of timber for the use and necessities of citizens of the United States. The administrative authorities, therefore, were vested with very wide discretion to regulate use and determine purposes. The vision and sagacity of the early administrators of the national

[1]Presented at the 30th annual meeting of the Society of American Foresters at Washington, D. C., December 29-31, 1930.

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All that the law said was that the forests were to be preserved from destruction and their occupancy and use was to be regulated. Obviously regulation for one thing, prevent the destruction of the forests, and uses irreconcilable with preservation of the forests had to be stopped. Uncontrolled grazing had done great damage to the forest. Many people believed that at least the grazing of sheep on the reserves was inconsistent with forest preservation. What course should be taken, and at what should regulation aim?

The Secretary of Agriculture's letter of February 1, 1905, gave the answer. All the resources of forest reserves were for *use:* all land was to be devoted to its most productive use for the permanent good of the whole people; the water, wood, *and forage* of the reserves were to be conserved and wisely used; and where conflicting interests must be reconciled the question was always to be decided "from the standpoint of the greatest good to the greatest number in the long run". The objectives of control were thus laid down. It was to seek the largest net total of public benefits, present and future, to the people of the entire United States, through public management which alone could insure harmonized development of all the resources involved.

Because the national forests were going enterprises, regulation had to be applied in advance of the accumulation of knowledge and experience adequate to guide and govern use most wisely. The two outstanding administrative problems thrust upon the Forest Service at the outset were fire control and range management. Both were virgin fields. Obviously without protection the management of the forests would be hazardous or of little avail. The protection task was so large that, with the limited number of men and crude facilities available, it absorbed the bulk of forest officers' thought and effort. Over the years there have developed on the national forests and elsewhere techniques in dealing with the forest fire problem. With no background of experience and accomplishment upon which to draw, it has been necessary in this country to

build up in a short time and on a gigantic scale systems of forest protection which are giving increasing measure of security to national forests and other forest investments. A similar development has gone on in the technique of timber management and range management. Both of these have of course involved watershed management. From the standpoint of the relation of the national forests to a policy for the unappropriated public lands, the development of range management has the greatest significance.

As with the development of fire protection technique, the Forest Service had to tackle its job barehanded. There was little to go by. Range use had always been a form of wild-lands use. The idea of scientific range management had not been born. The plant associations making up the range, the life history of the numerous species, their relative palatability and nutritional value, the effects of interference through grazing of various degrees of intensity and at different seasons upon their rate of growth, reproduction, and ability to compete with other plants, the nature and significance of plant successions, the relation of the vegetative cover to run-off and erosion, the suitability of various types of range to use by the several classes of domestic stock—in short, the entire body of knowledge essential to an intelligent judgment as to how many and what class of stock to put on a given range, when to admit them, when to take them off, and how to handle them on the range was still to be brought to light. Our early workers were like explorers on uncharted seas.

The pioneers led the way to the new division of science which has been established—the science of range management and range livestock management. Chairs for its teaching have been created in universities and agricultural colleges; systematic research to develop it further has been provided for. Progressive western livestock men are keenly alive to its value and are conforming their practices to its conclusions. All this you know. The principles of range management form a part of the regular course of instruction in many schools for the training of professional foresters. As you are fully aware, the technique of range management and the technique of forest management have many points of similarity. Both require specialized training, experience and sound judgment for their successful application. If national forest administration has proved anything it has proved that range administration is a technical task, to be handled by experts. Any policy for the unappropriated public lands that does not insure the future use of such lands as are most valuable for grazing in accordance with the principles of sound management will fail to provide adequately for the public interest in their best utilization.

Technical education in forestry began in this country a comparatively short time before the national forests were placed under administration. Broadly speaking, the American profession of forestry and the administration of the national forests had their beginnings about the same time. In consequence what had been done was a mere beginning in forest management, forest utilization, range management, game management, and in the allied fields of forest entomology and forest pathology. Much remains to be done. To sketch the

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and of private owners may be, there re-
mains a distinctive national interest to
be served and a national responsibility
to be met. One of the questions that needs an answer in formulating a policy for the unappropriated public lands is whether in their case also important national interests are to be served and a national responsibility is to be met.

The operation of liberal public land laws has not brought these remaining public lands into private ownership for development and use. In the main they are admittedly greatly depreciated by abusive practices, adversely affecting not only the resources used and the citizens dependent upon these resources, but contributing to serious erosion problems. In recognition of a need for constructive action applicable to them, study is now being given by the President's Commission on Conservation and Administration of the Public Domain to determine the most appropriate disposition to be made of them and the resources they contain.

It is generally conceded that such of these lands as are actual or potential forest lands, adjacent or in close proximity to existing national forests, should be added to the national forests for protection, administration and development. These lands present practically the same problems as do their neighboring national forest lands. In most cases both are subject to common use or benefit as for timber supply, watershed protection, livestock, game or recreation. Frequently one area supplements the other in use, as for seasonal range or for the rounding out of a timber operation. It would consequently be advantageous for both proprietor and user to have them administered by the same agency.

A more difficult problem is that inherent in those lands which do not bear timber and are not adapted to timber growth, but whose highest use lies in

their watershed or forage values. Here also are resources to be conserved and values to be safeguarded. Range investigations have shown conclusively that under proper control similar areas have been used for grazing with more beneficial results to resource and livestock than under uncontrolled grazing. These investigations have also shown that under proper control similar lands, with but minor exceptions where exclusion of use is necessary, can be grazed without detriment to watershed values and without inducing destructive erosion.

The degree of control necessary to protect watershed values varies greatly. Under some conditions it is perhaps no greater than the self-interest of an intelligent landowner would naturally cause him to impose upon himself for the protection of grazing values. Under some conditions no watershed values of appreciable importance may be involved. But it should be remembered that the lands now in question have not been esteemed as worth enough to cause their private acquisition, under liberal land laws. Indiscriminate use has greatly decreased their productive capacity as well as lessened their soil holding qualities. Their recuperation and sustained productivity are contingent upon a proper adjustment of use to resource; and from the standpoint of highest use, or (what is the same thing) of the best public welfare, the first question is: What form of ownership will in the long run bring about the form and degree of control of use necessary to restore these lands to their full potential economic value?

The rehabilitation of overgrazed range necessitates a management directed by experts trained in the new science of range control. It is far from being an ordinary or simple matter. In some cases decades will be required to rehabilitate the land. Whatever may be true in the future after rehabilitation has been accomplished and as the range livestock industry assimilates and applies generally the new and improved methods, the development of the full economic value of the present public domain ranges for grazing purposes is in my judgment not to be hoped for without the setting up of some agency of public control of a thoroughly stable and highly competent character, directed by technicians.

It must be borne in mind that the character and amount of use must be adjusted to conditions which are constantly changing. For example, there are the inevitable periodic years of drouth that must be faced. It must be borne in mind also that the interests of the range user are affected by many outside matters, such as market conditions or financial obligations to be met. Except in rare instances the character of control of range use needful to bring back to productiveness the overgrazed and depleted public lands will not be obtained consistently through dependence upon private initiative. The individual is naturally responsive to periods of stress which create the alternative of the sacrifice of personal advantage or the sacrifice of the range. Under such circumstances the decision is customarily against the range. Adverse shocks can best be borne by a national or state agency acting in the interest of the long-range productivity of the resource.

The test of jurisdiction to be applied to these lands would seem to be whether in whole or in part they serve a national

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purpose so distinctive as to warrant their retention by the federal government or, in the absence of a national benefit to be nationally developed, how they can best be brought to their highest use. Due to the scattered location of a material part of these vast areas, their varying worth and varying susceptibility of effective administration, no blanket-wide treatment of them seems practicable. It is clear from the character of them and the functions they can fill that they would not appropriately be designated as national forest lands. They are largely of both watershed and grazing type. The main consideration, however, is that they involve, as do the national forests, the need for good stewardship if they are to escape abuse and serve their highest purpose.

Having to do for many years with similar lands within the exterior boundaries of the national forests, the Forest Service has found it necessary in the interest both of the resource and the beneficiary to have applied to such lands measures of control which will adjust and coördinate the time, character and extent of use to the perpetuation of the resource. It believes that short of some form of public control by nation or state, more particularly for lands having a watershed protection influence, these areas will not only fail to fill their highest function but continue subject to abusive practices detrimental to the resource and to the public interest. It believes, with its national forest experience as a background, that constructive processes must be set to work, through the application of range management, in order to have both owner and user of the lands derive the maximum benefits consistent with the protective values they can afford against erosion. Their recuperation and sustained productivity are contingent upon proper adjustment of use to resource, with such inevitable conditions of use as constitute control or regulation.

The Forest Service sees in the unappropriated public lands a stewardship to be redeemed. It believes that the actual or potential resources on these lands should be safeguarded and developed. This is especially the case with those lands having a watershed protection influence. It follows that should the federal government retain these lands it should bring them under administration of the type which will, through the application of expert management, adjust use both to perpetuity of their resources and to the principle of the correlated development both of the range and of the water resource. On the other hand, should the federal government pass jurisdiction to the states for control it should do so with knowledge and pronouncement of the constructive purpose the lands can fill, nationally as well as locally, and with the announced willingness to assist the states in all practicable ways in their conservation of these resources, accompanied by stipulations that will be actually effective to insure conservation by the states. Transfer of jurisdiction will not change the problem or needs of the situation. The unappropriated public domain is a land problem to be solved. From the character, location and extent of the areas and from the public purpose they can be made to serve, the public is in a better position to solve the problem than private intiative. This has been amply demonstrated in connection with national forest administration of similar lands.

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THE NEXT TWENTY-FIVE YEARS[1]

BY R. Y. STUART

Forester, U. S. Forest Service

THE groundwork for forestry has been laid. We cannot claim more.

In retrospect we see the national forest system well entrenched with a steady advance in the protection, administration, and development of the national forests and yet markedly lacking in capital investments and in their influence upon the general forest situation. We see state forest organizations functioning in practically all forested states, grappling with the fundamental needs of the state forest requirements. We see private owners of forest lands increasingly conscious of the exhaustibility of the forest resources but for the most part indifferent or claiming impotence, without public assistance, in applying necessary safeguards against destructive forest practices. We see the acreage of non-productive forest lands increasing and augmented by an expanding acreage of marginal and submarginal agricultural lands with forest potentialities. We see the general public slowly responsive to the urge for more and better forest practice.

Forest administration and protection will undergo a severe test in the next twenty-five years. So will professional foresters. Notwithstanding the marked advance steps taken in national and state forest organization, in organized forest protection and comprehensive plans for forest research, and in the coöperative relationships between public and private agencies for the promotion of forestry, nothing short of a decided trend toward balancing the forest budget of the nation will satisfy the public need and expectation. It is inconceivable that as a nation we progressively accumulate extensive areas of non-productive land. It is also inconceivable that we shall continue ruining land productivity by abusive forest practices over extensive areas.

As we enter the second cycle of organized public forestry, foresters face the test not only of efficient administration and protection of public properties but also of the success with which they cope with the curtailment of land spoliation through abusive forest practices.

[1] Written following the celebration on February 1, 1930, of the twenty-fifth anniversary of the creation of the Forest Service. —ED.

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tered on the Deerlodge National Forest, which contains the most accessible National Forest timber to Butte, and arrangements have been made by the Forest Service to meet the demand through sales of timber to local operators. The largest existing sale was made in 1910, involving a cut of 100,000,000 board feet in five years. Owing to the need for the smaller sized mining timbers and cordwood, it has been possible to secure thorough utilization, the contract stipulating that the timber shall be cut to a minimum diameter in the tops, of 2½ inches. Not all of the material, however, goes into the Butte market, some of it not being in demand there, or suitable for mining purposes. This surplus is sold locally as sawtimber and cordwood and such mining timber as can not be absorbed by the Butte or other local mines finds a market in the coal mines of Utah and Wyoming. The contract further provides that at least 55,000 stulls 8 inches and over in diameter at the small end and not more than 90,000 stulls of this size shall be cut each year. The established minimum serves as a protection to the mining industry in insuring it a large portion of the cut from this sale in stulls, and providing for a maximum prevents a monopoly of the Butte stull supply to the operators from this sale. The maximum limitation can, however, be waived in any one year in the discretion of the District Forester. In addition to the sale mentioned, there are a number of sales on the Forest to smaller operators who compete successfully with the larger operators in entering the Butte market.

At the time the first sales on this Forest were made there was insufficient data at hand with which to determine whether the Forest produced sufficient timber annually to meet the Butte demand for mining timbers. To determine this point reconnaissance projects have been conducted and from the data secured it is estimated that there is produced on the Deerlodge National Forest sufficient timber annually to furnish a constant supply of timber to the Butte mines in addition to meeting the needs of local settlers and residents. Provision to meet this demand is one of the main features of management in the proposed forest working plan.

The life of timber in all underground settings is short at most. The danger incident to breaking timbers and the expense attending their replacement have led to investigations to determine ways and methods by which their period of service and usefulness could be extended. Those mines with sufficient ore in prospect to warrant extensive improvements and preparations for permanency have been mostly concerned, not only from the standpoint of cost, but to avoid the necessity for replacement. In addition to the strain from weight sustained, timber in mines is subjected to rapid deterioration through wear, breakage and fire, waste, decay and insect attack. It was found in a recent study‡ conducted by the Forest Service that the greatest damage (50 per cent) results from decay and insects, 25 per cent from waste, 20 per cent from breakage and fire, and 5 per cent from wear. The study pointed conclusively to the need for preservative treatment of timbers used in all permanent gangways and tunnels, and its economy not alone in increasing the life and usefulness of the timber, but in eliminating the great cost of replacement and maintenance. A further factor, not usually considered, is the extent to which the available timber supply is conserved by methods adopted for the preservative treatment of timbers used. Various projects have been started by the Forest Service in coöperation with mining companies for the preservation of the timber used by them in underground work. In addition to those handled by coöperation, there are a number of mining companies operating such plants independently.

WHAT THE FOREST SERVICE HAS DONE.

In conclusion, let me briefly review the attitude of the Forest Service toward the mining industry and its efforts to make the relationship beneficial.

1. It has supplemented the legislation passed by Congress in the interest of the mining industry with a very liberal policy in supplying prospectors and miners with timber from the National

‡ David T. Day: "Statistical Relation between Forestry and Mining."

Forests for the development and improvement of their claims free, or at reasonable cost.

2. It has given every encouragement within its power to legitimate mining.

3. In the administration and protection of the National Forests, it has prevented the acquisition illegitimately, of public lands within the National Forests for purposes other than mining under the guise of the mining laws.

4. The needs of the mining industry for timber for the present and future are always considered in formulating plans for the management of the National Forests.

5. The Forest Service in its studies of the preservative treatment of mining timbers is furnishing information of great value to the mining industry.

6. In common with other users of National Forest resources, the miner is directly benefited by the National Forest administration in protection from forest fires and in the insurance of a constant supply of water through the protection of watersheds within the National Forests by the regulation of the cutting of timber from them.

CO-OPERATION ESSENTIAL.

The National Forest administration can be strengthened through assistance from the mining industry in giving its support to the position taken by the Forest Service of encouraging legitimate projects and discouraging illegitimate projects and speculations; in conserving the timber supply by economic use; and in the protection of the National Forests from fire.

Thorough coöperation between the mining industry in the West and the Forest Service is highly desirable, and it is gratifying to observe that the spirit and material accomplishments of such coöperation are becoming more and more realized. I know of no better instance of this coöperation than that displayed at the time of the disastrous fires of 1910. At that time I was associated with the District Office in Missoula, Montana, the district in which the greatest loss in life and property was sustained. The great services rendered by the prospectors and miners in that catastrophe are typical of the stoutness of heart and purpose of the class of men who search for minerals. With a coöperative spirit of the character then displayed and a common desire to promote the public good, the Forest Service and the mining industry will become more powerful factors in the conservation of our National resources.

COMING MEETINGS

March 4—Northern Forest Protective Association, Marquette, Mich. Annual meeting.

March 6—Northwestern Iowa Retail Lumbermen's Association, New Hotel Martin, Sioux City, Iowa. Annual meeting.

March 6-7—Southern Retail Lumber dealers' Association, Jackson, Tenn. Annual meeting.

March 20—North Carolina Pine Association (Inc.), Monticello Hotel, Norfolk, Va. Annual meeting.

March 6-7—Annual meeting of the National Wholesale Lumber Dealers' Association, at the Chelsea Hotel, Atlantic City, N. J. E. F. Perry, secretary, 66 Broadway, New York City.

March—Last week—Quarterly meeting Board of Directors of the American Forestry Association at Asheville, N. C.

April—Utah Retail Lumber Dealers' Association, Salt Lake City, Utah. Annual meeting.

April 8-9-10—The twenty-seventh annual meeting of the Lumbermen's Association of Texas, at Beaumont, Tex. J. C. Dionne, Houston, secretary.

April 10—Lumbermen's Exchange of Philadelphia, at Philadelphia, Pa.

April 10-12—National Supply and Machinery Dealers, American Supply and Machinery Manufacturers, Southern Supply and Machinery Dealers' Association, Claypool Hotel, Indianapolis, Ind.

May—National Lumber Manufacturers' Association, Kansas City, Mo. Annual meeting.

June 5-6—National Hardwood Lumber Association, Hotel Sherman, Chicago, Ill. Annual meeting.

THE PLACE OF FORESTRY IN A BALANCED AGRICULTURAL PROGRAM

By R. Y. Stuart
Chief, U. S. Forest Service

Address before the 34th Convention of the Association of Southern Agricultural Workers, New Orleans, La., February 1, 1933. Presented for Major Stuart by J. C. Kircher, Regional Forester.

The place of forestry in a balanced agricultural program must be assigned on the basis of the importance of forestry as a means of bettering the condition of the individual farmer, and of strengthening and stabilizing the economic situation of the rural community.

Timber - An Important Farm Crop

Do we realize the present importance of timber as a farm crop? We may not be in the habit of thinking of the matter in that way. It may be thought that my purpose is to urge making timber a farm crop; to advocate an innovation in farm economy. But there is nothing new about timber as a farm crop. There are few Southern farms on which it is not now growing. I doubt if any farm product is more universal, at least in the eastern half of the United States. The innovation would be if farmers generally would undertake to consciously grow it, instead of just letting it grow itself.

In the 11 Southern States, from Virginia to Texas, there were at the time of the last census in round numbers 291,000,000 acres in farms. Of this, 70,000,000 acres, nearly one-fourth, were classified as woodland. The present timber stand on the farm woodlands of these States, according to our Forest Service estimates, includes 48 billion board feet of sawtimber, 172 million cords of cordwood, and an unknown but certainly very large quantity of smaller growth. For example, it is estimated that 12,000,000 acres of farm forest land not supporting stands of sawtimber or cordwood are fairly to satisfactorily restocked or restocking with small trees. Altogether, there is decidedly a good sized timber crop growing on the farms of the South today.

Almost one-fourth of all the sawtimber left in the 11 States is on farms, and more than one-third of all the cordwood. Much of the cordwood is of course on the way to becoming sawtimber; the word denotes size, not quality. From that part of the farm timber crop which has matured sufficiently to be salable, the southern farmer is currently obtaining a substantial part of his money income.

Forest Products Yield Large Cash Income to Farmers

The cash incomes of farmers from sales of forest products in the year 1930 are significant. Forest products are listed by the Bureau of Agricultural Economics along with some 30 to 40 leading crops. Considering the 12 southern States - including Tennessee with the group - forest

(Over)

products brought to the farmers more than $82,000,000. Forest products ranked in second place among all crops as a source of cash income in Alabama, Mississippi, and Arkansas, preceded only by cotton (lint and seed together), third place in Georgia, North Carolina, South Carolina, and Tennessee, led by cotton and tobacco in Georgia and by cotton and potatoes (both Irish and sweet together) in the other three States. In Florida, Louisiana, and Texas seven field crops outranked forest products, and in the relatively little forested State of Oklahoma eight, yet in these four States the money returns aggregated more than $10,000,000. In North Carolina, the farmers received for their forest products more than $14,000,000, the largest amount in any southern State and in fact the largest in the United States. For the 12 States combined, forest products cut and sold from farms in 1930 ranked fourth in comparison with the various field crops as a source of cash income. The order, beginning with the highest, was cotton, tobacco, potatoes, and forest crops. There is further significance in the fact that the price trends of timber have been more favorable than of cotton. This is indicated graphically on diagram #1.

Farm Woods Aid in Crop Production and Meet Home Needs

But that is by no means the whole story. Part of the farm wood crop goes to market in the form of other crops. The farmer who cures his tobacco with wood cut on his own place gets something for the wood. Had he burned coal instead, its cost would have cut down by just so much his net tobacco money income. In North Carolina alone nearly 1,500,000 cords of wood go into tobacco curing each year. All the farmer's wood that he uses for fencing, farm building purposes, and the like becomes a part of his equipment for production - his capital investment, on which he is fairly entitled to expect a return. All that he cuts for use in his home is a contribution to the support of his household. The value of the forest crop to the farmer is only in part measured by the money that goes into his pocket when he sells some of it directly.

The farmer can ill afford to overlook the values to be had from his farm forest crop. Particularly now, when the need of diversification is being so forcibly evidenced; when the money income from the staple field crops has become so diminished; when the problem of sound land utilization is more pressing than ever before - the desirability of making the most of the farm woodlands, instead of letting them run down for lack of attention, is evident.

Unwise Cutting Reduces Earning Power of Woods

A good farmer takes pride in raising big crops - a field of cotton, corn, or tobacco, which shows a full stand of well developed, vigorously growing plants. A scattering stand of stunted or spindly growth means poor returns. Does he look at his woodlands the same way? Bad methods of cutting leave the forest in a damaged condition, such as insufficient or badly distributed growing stock, perhaps the wrong kinds of trees. Many of the trees develop a poor form that will not produce a high grade quality of product. One all too frequently sees farm woodlands growing only partial or poor-quality crops, or both. The longer the forest is

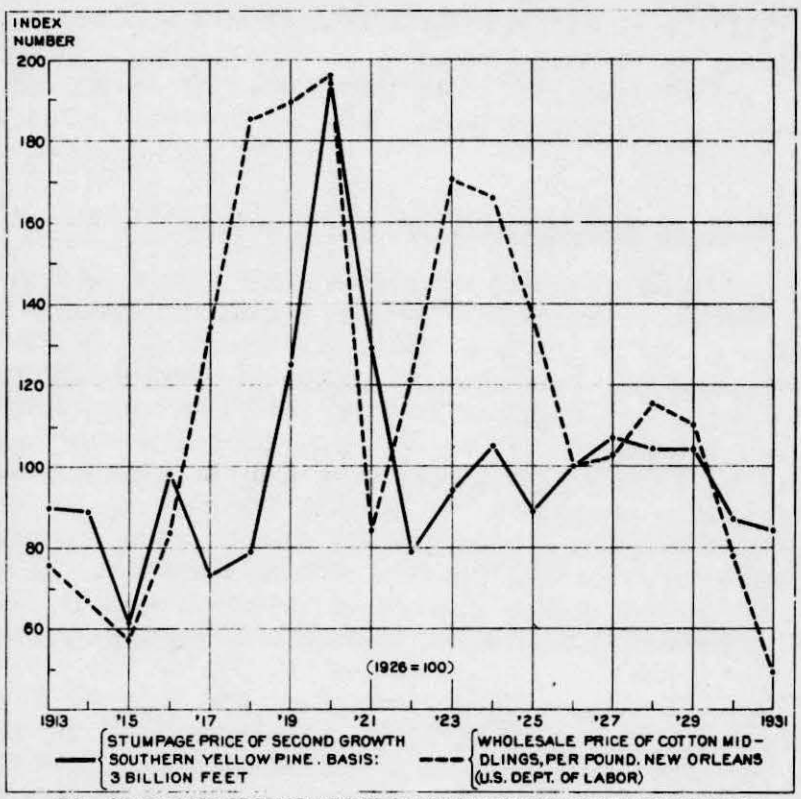


FIG. COMPARISON OF PRICE INDEXES OF COTTON AND SECOND GROWTH SOUTHERN YELLOW PINE STUMPAGE

DIAGRAM 1

subjected to bad methods of cutting, the lower its productiveness sinks. Thousands of acres of farm woods have had their stands so changed in character by unwise cutting practices that they are growing no timber of commercial value; they are like run-down fields growing ill-tended, feeble-looking cultivated crops.

This deterioration of the stand is generally the result not only of unwise cutting methods but also of uncontrolled fires, and, in the longleaf belt, of the razorback hog. Where these enemies of reproduction are turned loose to work havoc on the young forest crop, they may bring it to ruin. Together, they work far and away the greatest impairment to the future earning power of Southern woodlands that the landowner has to reckon with. To bring them under reasonable control should be a part of the agricultural program of the South.

It is true that the forest crop will grow itself, after a fashion, if given half a chance. So will wild hay. But the way out for the farmer is not through chance crops and chance methods. True, the vigor of the southern forest, its capacity to endure abuse, to keep up the fight for possession of the ground, is really astounding. No one can travel far in the South, if his eyes are open, without wonder at the tenacity and reproductive power of its timber growth. This capacity of survival in the face of the highly adverse conditions with which human occupancy has often compelled it to struggle, makes the maintenance of a forest crop a relatively simple matter in most of the South.

That, however, does not suffice. The forest may cling to the land which it succeeds in holding, yet decline in productive capacity through abusive practices in handling and harvesting its crop. No farmer expects to get heavy yields from crops that are left to shift for themselves. One reason why the farm forest crop is not producing more cash is because instead of working with nature, so that nature may give him what he wants, the woodland owner is too often abusing his forest.

Just as abusive practices wear out a farm, impairing the fertility of its fields, diminishing its output, and lowering its value, so abusive utilization makes the woodland less and less productive. If the farm woodlands are to pay their share of what the farm can yield, they must have full stands of the right kinds of trees, with right conditions for healthy rapid growth in quantity and quality. This is impossible if the timber crop is harvested without regard to the condition in which the land and the remaining timber are left.

Sustained Yield Key to Successive Crops of Timber

Sustained yield, a basic principle in forestry, should be the aim of the farmer as well as the large timberland owner. Just as you can not have your cake and eat it too, so you cannot continue to take from the forest larger crops than the forest replaces through growth. If you do that, you are depleting the forest; reducing the capital, instead of utilizing the income. To make inroads on the forest capital is to live on the principal instead of on the interest of the investment. Living on the principal is timber mining - not timber harvesting. The farmers of

the South taken in the aggregate have not only been harvesting and selling their annual timber crops; they have been in part disposing of their capital.

Selective Cutting is Farmer's Method

Perhaps several diagrams will help to make my point clear. Diagram #2 is an ideal representation of how a sustained yield is obtained when clean cutting is practiced. The diagram assumes a forest suited to a large commercial forestry enterprise but not to Southern farm forest conditions.

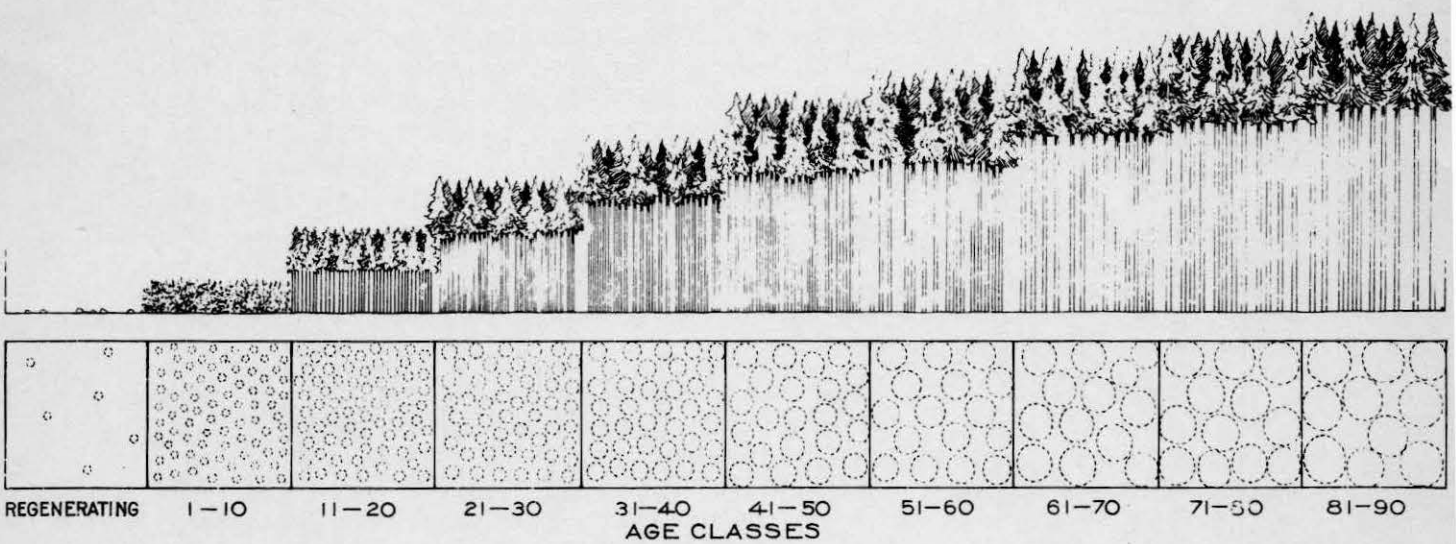
Diagram #3 shows how the same result can be obtained by a selective method of cutting. This is the method for the farmer in the South. His timber is well adapted to this form of management. By this method he is able to harvest a timber crop every year.

For most farmers the wood crop is like a savings bank in which he can gradually accumulate a surplus to draw upon when special need arises. In years of hard times for farmers, if there is any market at all for lumber and other forest products which they can get out, and there usually is, a truly surprising volume of shipments appears in localities where it was supposed that little available timber was left. When hard times come and money must be raised somehow, men can not be called improvident in their fight to live and hold on to the farm if they sacrifice future values and deplete their forest capital. But they should not lower their resources unnecessarily, to their disadvantage.

Overcutting and Fire Reduce Returns

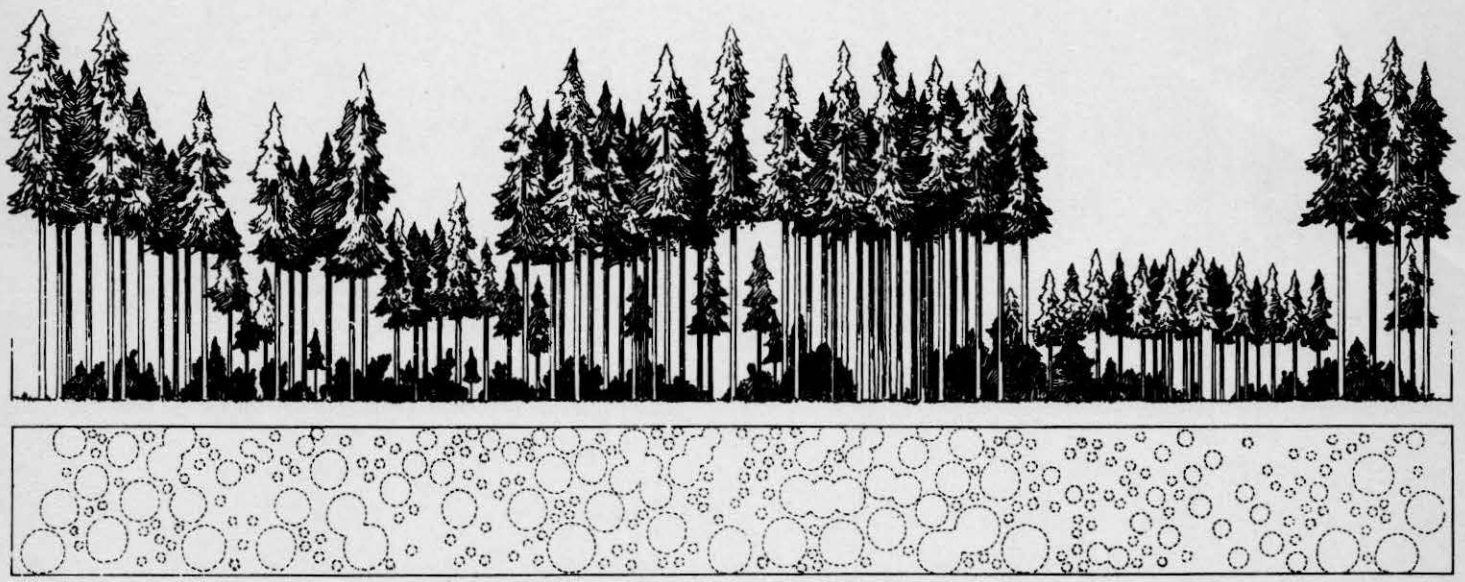
Overcutting is general. While one swallow does not make a spring, I might cite the example of Lee County in Alabama of which a special study was made by the Forest Service (and the county was selected as typical for its region). The cut in this county in 1929 was three times the growth. Again, there is evidence of past overcutting in the unduly large proportion of the southern farm woods with stands which have not yet reached cordwood size. The Forest Service estimates indicate that 42 per cent of the farm woodland area in the 11 States is in this condition; and further, that more than half of this 42 per cent is either seriously understocked with small trees or not restocking at all. Beyond this, the census figures seem to show that the area of farm woodland has been diminishing over a period of years. This leaves out of the reckoning, however, the millions of acres of submarginal lands in the South for which place must be found in our land economy and use.

Altogether the farm woodlands of the South are becoming less of an asset to the farmer and to the community. On the one hand, productive capacity is being lowered through bad practices, uncontrolled fire, and other causes of deterioration, which will mean declining harvests. On the other hand, salable timber is being disposed of faster than the supply is replenished through growth. Thus the farm is made poorer both ways. It is like pumping more water out of the well than runs into it, while



FOREST WITH SERIES OF EVEN-AGED STANDS

DIAGRAM 2



SELECTION FOREST

DIAGRAM 3

cutting off the spring that feeds it. The result is increasing instability. This is not as it need or should be. The process should be one of building up forest values and forest production.

Extension Forestry Assists Farmers with Timber Problems

Assisting farmers with their forestry and timber problems is a part of the broad extension programs of the various State colleges of agriculture in cooperation with State Forestry Departments and the United States Department of Agriculture. The contacts with farmers are made by the county agents with the assistance of the State extension foresters and local leaders. In the 12 Southern states during the year 1931, 5,812 farmers were assisted in woodland management on a total acreage of 542,919 acres, 561 farmers planted forest trees on a total of 9,848 acres, and 6,670 farmers assisted in some other phase of timber production; 1,686 4-H Club boys and girls completed forestry projects. State foresters aided in the distribution of the small seedling trees for planting. Many thousand pieces of literature were distributed on how to manage farm woods for increased returns, protect woodland against fire, and what, when, and how to plant forest trees for utilizing idle and eroding farm lands.

Adjustments Needed to Meet the Situation

Adjustments on the farm are needed in order to better meet the present economic conditions. In the care of woodlands -

1. Protect the woods from fire and other sources of injury.
2. Cut the timber crop carefully.
3. Utilize farm timber to the best advantage:
    a. Burn wood and keep the cash at home.
    b. Use farm timber for construction at home.
4. Plant pines to use idle lands and check erosion and soil washing.

Drawing upon the facts, I have shown both bright and dark sides to the farm woodlands problem of the South. The lasting impression I should like to leave is that, if all shoulders are put to the wheel, these woodlands can be made of much greater and lasting value not only to the farmer but to the community, State and Nation as well. They are part and parcel of our land utilization problem which Agriculture and forestry must jointly work out constructively. Agricultural workers and foresters have the responsibility and opportunity to bring to the farmer and to the problem, the best information and thought they can command. Extension workers, Agricultural colleges, National and State foresters, and other competent agencies should unite in their efforts to spread a knowledge of sound farm woodland practices among the farmers. In addition to using direct contact with the farmers as a means to this end, there can also be effective work done among agricultural and forestry students, agricultural workers and foresters generally. It is a worth while undertaking with great promise to the Southern farmer and to the public. It will properly place forestry in a balanced agricultural program.

ROBERT Y. STUART

Forest Service career officer

Fourth Chief Forester, 1928-33

McSweeney-McNary Law enacted - Authorized research program. Growth of forest and range experiment stations began.

Knudsen-Vandenberg Law enacted - Expanded tree planting and silvicultural improvements on National Forests.

Comprehensive forestry survey completed; Report published.

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ROBERT Y. STUART 1928-1933

Mr. Stuart, a Forest Service career officer, became Chief Forester in 1928. He was destined to spend his energies battling obstacles and conflicting forces during the five years of his tenure. The conflict was caused by the Depression with its pressures for curtailment of programs; followed by the New Deal years with pressures for greatly increased participation in American life by government agencies.

Noteworthy contributions made to American forestry during Mr. Stuart's administration include:

--In 1928, passage of the McSweeney-McNary Act, which authorized a program of research in forestry and range management, and provided for a timber survey. The way was thus opened for the growth of America's great system of forest and range experiment stations.

--In 1930, passage of the Knutsen-Vandenberg Act. The Act provided funds for reforestation, and authorized the Forest Service to add cost of reforestation and silvicultural improvement to the price of stumpage on timber sales. Much needed timber stand improvement has been effected with these "KV" funds.

--In 1933, the Forest Service published a report of the most comprehensive survey yet made of the forestry situation in the United States. The report, entitled "A National Plan for American Forestry", strongly influenced federal forestry policies, legislation, and appropriations for the next decade.

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MESSAGE DISPLAY FOR JERRY WILLIAMS

To Jerry Williams:R6/PNW

From: STAN MCDONALD:R04F10A
Postmark: Feb 04,98 9:07 AM Delivered: Feb 04,98 8:06 AM

Subject: Reply to: Books & Articles

Reply text:
From: STAN MCDONALD:R04F10A
Date: Feb 04,98 9:07 AM
On a slightly different subject I'm wondering if you could point me towards biographical information on one of our former chiefs from 1928-1933 Major Robert Y. Stuart. We are renovating a historic ranger station by the name of Stuart--which I believe was named after the former chief. I've got some information from Steen's book "The US Forest Service: A History", but would like to know where I search for additional info. If you could direct me to appropriate archives and contact persons, it would be much appreciated! If we can confirm that the stattion was named after the former chief, we'd like to include appropriate biographical info in interpretive displays. Thanks much!!

Preceding message:
From: Jerry Williams:R6/PNW
Date: Jan 29,98 1:23 PM
Several new items have come across my desk that you should be aware of. One is a book edited by Char Miller (a Pinchot historian) entitled "American Forests: Nature, Culture, and Politics." This book of readings/articles on the National Forest System is great! Authors such as Pisani, Reiger, Steen, Wolf, Rothman, Bolle, Robbins, Roth, and Langston have filled this paperback book by the University of Kansas Press (1997). 289 pages. Cost $17.95. Worth reading. The other reference is two articles on the FS that were recntly published in "Forest History Today" (1997) from the Forest History Society. The two articles are: Chief William Greeley writing in 1927 an article "Shall the National Forests be Abolished." The other article in the same journal is entitled "Minutes of the 1057th Meeting of the [Forest] Service Committee, March 27, 1924." This

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