BRIEFER ARTICLES AND NOTES

The Variance of Western Yellow Pine Crown Lengths or Widths and Stand Density

It has been found in a study of slash disposal on the Colorado Plateau[1] that the amount or volume of brush debris originating from the tops of felled trees varies with the merchantable volume of western yellow pine stands.

As volume per acre increases the amount of brush debris decreases per thousand board feet.

In connection with this study, fifty-

Table 1

THE RELATION BETWEEN STAND VOLUME OF WESTERN YELLOW PINE (ARIZONA) AND CROWN WIDTH OR LENGTH

Volume per acre Board feet	Crown width Feet	Crown length Feet	Per cent crown length of total tree length	Per cent crown width of total tree length
100	27.8	28.5	84.5	54.9
500	27.4	29.4	83.5	53.5
1,000	27.1	30.3	82.9	52.0
2,000	26.5	32.1	81.2	50.4
3,000	25.9	33.8	79.8	48.7
4,000	25.3	35.6	78.1	47.0
5,000	24.7	37.2	76.6	54.1
6,000	24.2	38.4	75.0	43.4
7,000	23.7	40.3	73.6	41.7
8,000	23.3	41.8	72.2	40.0
9,000	23.0	43.2	71.0	38.2
10,000	22.7	44.5	69.9	36.9
11,000	22.4	45.8	69.0	35.3
12,000	22.2	46.9	68.1	34.0
13,000	22.1	48.1	67.2	32.9
14,000	21.9	49.2	66.6	31.7
15,000	21.8	50.3	66.0	30.6
16,000	21.7	51.3	65.8	29.8
17,000	21.7	52.3	65.5	29.0
18,000	21.6	53.2	65.4	28.1
19,000	21.6	54.1	65.4	27.6
20,000	21.6	55.0	65.4	27.0
21,000	21.6	56.0	65.9	26.5
22,000	21.6	56.8	65.4	26.0
23,000	21.6	57.7	65.4	25.9
24,000	21.5	58.5	65.4	25.5
25,000	21.5	59.3	65.4	25.3
26,000	21.5	60.2	65.4	25.1
27,000	21.5	61.0	65.4	25.0
28,000	21.5	61.8	64.4	25.0
29.000	21.5	62.6	65.4	25.0
30,000	21.5	63.4	65.4	25.0

Average deviation of crown width from interpolated values $\pm$ 1.63 of crown length $\pm$ 9.08.

[1]McIntvre, A. C., Brush Disposal in the Western Yellow Pine Type of the Southwest, Unpublished Manuscript. U. S. Forest Service.

four sample plots were layed out and crown widths and lengths of all trees over six inches d. b. h. were secured. The plots varied from two and a half to ten acres in size and were selected on a basis of tree distribution. Only areas that appeared to be normally stocked were selected, excepting four plots which were layed out in very open stands found at low elevations on the edge of the type. Here crown width was about the same as crown length.

The accompanying table shows the variance in crown length or width as stand volume increases, and percentage relationship between crown length or width and average total height of trees.

The deviation of the crown widths was less than two and a half times the standard deviation (S. D.±1.36). Three plots with average crown length more than three times the standard deviation (S. D.±4.93) were rejected.

The data were plotted and average curves drawn, from which the data in the table were read.

It has been suggested by Chapman[2] that crown width might be used as a criterion of yield.

That a correlation exists is apparent but for western yellow pine crown length would prove the better index. Table 1.

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[2]Chapman, H. H., Forest Mensuration; John Wiley & Sons, 1921, p. 423.

Comparative Rates of Growth Per Acre of Southern Pine and Douglas Fir[1]
Site Class: 70 feet in height at 50 years

Age In years	Loblolly Table 38 (Cu. ft.)	Longleaf Table 70 (Cu. ft.)	Shortleaf Table 102 (Cu. ft.)	Slash Pine Table 134 (Cu. ft.)	Douglas Fir Wash. & Ore. Table 2 (Cu. ft.)	Douglas Fir California Table 7 (Interpolated) (Cu. ft)
20	2,300	2,000	2,120	3,250	730	——
30	3,400	3,000	3,900	4,250	1,930	——
40	4,450	3,950	5,290	5,000	3,020	3,650
50	5,200	4,800	6,300	5,650	4,080	5,025
60	5,700	5,600	7,030	6,100	5,010	6,200
70	6,000	6,200	7,600	——	5,820	7,125
80	6,250	6,800	8,030	——	6,530	7,875
90	——	7,200	8,400	——	7,120	8,475
100	——	7,600	8,660	——	7,620	8,950
110	——	——	——	——	8,050	9,350
120	——	——	——	——	8,410	9,675
130	——	——	——	——	8,720	9,925
140	——	——	——	——	9,020	10,225
150	——	——	——	——	9,280	10,400
160	——	——	——	——	9,500	10,550

[1]References:

Rate of Growth of Second-Growth Southern Pines in Full Stands. U. S. Dept. Agri. Circular 124, 1930.

Volume, Yield and Stand Tables for Second-Growth Southern Pines, U. S. Dept. Agri. Misc. Pub. 50. 1929 (Tables cited).

The Yield of Douglas Fir in the Pacific Northwest (Table cited). U. S. Dept. Agri. Tech. Bul. 201, 1930.

Yield, Stand and Volume Tables for Douglas Fir in California (Table cited). Univ. of Calif. Bul. 491, 1930.

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Capital and Interest[1]

The article which follows is by the Hon. Nigel A. Orde-Powlett, and is reprinted from the *Quarterly Journal of Forestry,* London, October 1930. It is of interest because of its presentation of the compound interest fallacy:

In any business concern, that is to say, in any undertaking the object of which is to make a profit, it is necessary to have capital. Capital may consist of money invested in the business by the owners or by the public, it may consist of machinery, buildings, labour, railway trucks, etc.; or it may consist of brain power. Capital in fact, is a possession of any sort whatever which is utilised for the acquisition of wealth by the possessor. A man who, after years of study and expense, goes into practice as a doctor, is capitalising his brain in order that it may bring him in a reasonable rate of interest for the rest of his life. A furniture remover owns lorries and employs labour, and these constitute his capital, by means of which he carries out the work which produces his interest. Anyone who invests his money in stocks or shares does so with the expectation of receiving interest on his money annually. The brains of the doctor and the lorries of the furniture remover are capital in exactly the same way that the money of the investor is capital, since the income of the possessors is dependent on them, and their loss or withdrawal from business would result in a cessation of interest.

For a business to produce the highest possible financial return a proper realisation of what constitutes capital is essential. In the simplest case, that of money invested in stocks and shares, the position of capital is well defined and admits of no misunderstanding. The owner knows that his capital must remain intact until he reconverts it into cash, when it will cease to produce interest and in consequence ceases to be capital. If the furniture remover reduces the number of his employees or of his lorries below the minimum necessary for the execution and development of his business the reduction of capital will entail a reduction of interest. If the doctor applies his brain for a considerable part of each day to affairs unconnected with his practice he is withdrawing capital from his business and his income will be reduced. Capital of one sort or another in fact, is absolutely essential to the production of profit, and no business can be said to be well managed unless the capital invested in it is maintained at that precise level which will ensure the highest possible rate of interest. If too little capital is built into a business the greatest possible income cannot be returned and intensive development is impossible, while if a business is over capitalised the rate of interest is disproportionately small, and the surplus capital is idle and unproductive; furthermore, in those businesses where capital consists of material rather than actual money, over capitalisation may bring about a risk of bankruptcy during years of depression which would be safely tided over by a similar business that had not become unwieldy. In every business there is a limit as regards immediate expansion, and capital must be limited in proportion.

[1]This article was referred to in the March issue, but was inadvertently omitted.

It follows, therefore, that for the rational development of any business the paramount importance of capital must be realised and its nature understood. In the case of cash investments, as has already been stated, there can be no difficulty in determining what part of the business comprises capital. In concerns, however, whose capital consists wholly or partly of material other than money the comprehension of capital becomes infinitely more difficult, and in no other concern is it more difficult to understand than in forestry.

Forestry is as much a business as banking, shop keeping, or any other concern the object of which is profit making, for silviculture is, or should be, the cultivation of trees for profit. It is true that few British estates would show a profit on their woods if the average was taken on a number of years, but this is due to the fact that few owners make any serious attempt to run their woods on business lines. The ordinary British estate resembles, so far as its woodlands are concerned, an antique shop, the owner of which is himself a connoisseur and lover of *objets d'art*, and cannot bear to part with any of his stock; both woodlands and antique shop are run at a loss, but either might show a profit if organised on business principles. The owner, therefore, who intends to organize his woodlands on business lines must determine in the first place what will constitute the capital of his business. This determination is rendered unnecessarily difficult owing to the fact that estate woodlands are seldom managed as a separate and self-contained business undertaking, but are treated as an item in general estate accounts; money that is required for the payment of labour, purchase of trees, etc., is taken from the general account, while money realised by sales of timber or from other sources is paid into the general account, or even into the private account of the owner. If rational management is to be carried out with success the woodland business must be organised as an individual concern having its own books and bank account, and (for purposes of management) isolated from other activities on the estate. Without such isolation a true comprehension of the business is impossible, and the most intensive development cannot be attained. If, however, the woodlands are organised as a self-contained and individual business the determination of capital becomes comparatively simple.

The capital consists of: (a) The land under woodland, (b) Saw yard, plant, roads, timber wagons, horses, light railways, tools, and any improvements instituted for the successful extraction and marketing of the timber; (c) Labour; (d) Nursery, or purchase of young trees; (e) Wood capital; (f) The brains of the forester.

All of the above are capital inasmuch as they are necessary and instrumental in producing income from the forest. Furthermore, an excess or deficiency of any one of them will have an injurious effect on the net income. On most private estates (a)—the land under woodland, is more or less fixed and defined. It is usually quite apparent what acreage should be wooded, and we know that the whole of this area should be occupied by trees; (a), then, may be

taken as fixed capital which cannot be altered without drastic reorganisation of the scheme of management. (If hitherto unplanted areas are brought into the scheme the work becomes one of afforestation, and no such undertaking ought to be set on foot by private estates until existing woodlands have been developed, *i.e.*, at the end of the first rotation).

(b) Saw yard, plant, roads, etc. Little need be said on this subject since it is obvious that, if the arrangements for exploitation are under developed (*e.g.*, insufficient roads), the highest price will not be obtained for the forest produce, while, if they are over developed, the amount of money invested in them will not result in a proportionate increase of income.

(c) Labour. Is an item of forest capital which is very frequently over or under developed. The cause of this, however, lies in the fact that the woodlands are almost invariably treated as a mere part of the estate and not as a separate money-making concern. The woodmen are frequently taken off the woods at a time when they are most needed, and it is often difficult to ascertain just how much labour has been employed in the woods during any one year. It is admitted that, on a private estate, the labour should be transferable from one department to another, but if the woods were recognized as an individual concern and a definite number of men were employed by the woods as whole-time woodmen then they could be "hired out" to other departments *when not required in the woods* and *not* when required by other departments. If this method were practised it would be easy to determine what amount of labour capital was necessary.

(d) The nursery. Should be of a size adequate to provide the trees necessary in order to keep the woodland area fully stocked.

(e) Wood capital. This is by far the most important constituent of forest capital and that which is the most frequently neglected or misunderstood. It differs in some respects from any other form of capital, and is in consequence difficult of comprehension, but since it is the wood capital which must produce wood interest—the fundamental of forestry—a proper understanding of its nature is vital. If we regard each plantation or stand of trees on an estate as separate entities it is impossible to arrive at a true understanding of the meaning of the term wood capital; but if we are working the woods under a rational scheme of management, and consider every square yard of ground and every stick of timber as indissolubly associated with every other square yard and stick of timber for purposes of management, then the definitions of wood capital and wood interest become more easily understood. Take in the first place the case of a single tree. At the commencement of any year the tree consists of a certain bulk of timber contained in the trunk; during the growing season this bulk adds to itself by the addition of a sheath of new growth from top to bottom; the bulk at the beginning of the year, then, is the wood capital, and the new growth which is added is the wood interest for that particular year, the wood capital and wood interest being identical in nature to all other forms of capital and interest, this apply-

ing to every tree, of whatever age, over the whole woodland area. If we were to apply the ordinary rules of finance and reaped our interest, while leaving our capital intact we should have to strip the current year's growth from every tree on the estate, leaving the wood capital or bulk of the tree standing, but as this is an obvious impossibility some other method has to be adopted whereby the interest is secured without interference with the capital. Instead, therefore, of securing the individual interest from every individual tree, a number of trees are felled whose total volume is equal to the total wood interest of all the trees over the whole woodland area, and of every age. If, for example, it is ascertained that the annual increment of all the trees on the estate amounts in total to 5,000 cubic feet then that number of trees will be felled whose total cubic contents amounts to 5,000 cubic feet, and by this means the legitimate interest will be secured and the amount of the capital will remain intact although, theoretically speaking, we are neglecting to secure the real interest and are depleting the capital. The fact that the trees realised have passed their maximum rate of increment and are, therefore, comparatively speaking, capital lying idle, does not affect the theoretical question, though recognition of its necessity is essential for the maintenance of wood capital at its highest possible level.

This method of reaping the interest, produced by the annual increment of every tree on the estate, by the clear felling of an equivalent block of mature trees each year, is the only method practical in this country, and the necessity for it demonstrates a further point that is of the highest interest and importance when the question of woodland profit or loss is considered. This point is the inevitable and close relationship that must exist between the individual units, whether number of trees or area of ground, constituting any particular forest scheme with which we may be concerned; for it becomes clear that in making an annual felling we are, in reality, not so much felling the block of trees planted sixty, seventy, or a hundred years ago (whatever the length of rotation may be) as securing the interest from our whole wood capital and land capital over the whole woodland area. Each of the trees in our annual coupe, therefore, is virtually representing the interest from a definite acreage of ground on some other part of the estate. Thus, supposing on an estate containing 500 acres of woodland it had been ascertained that the mean annual increment was 10,000 cubic feet, or 20 cubic feet to the acre. Then, if our annual coupe for the year was an area of 8 acres, containing 1,000 trees averaging 10 cubic feet each, each tree is the interest representative of half an acre of land, and is as much the product of that half-acre for purposes of management and estimation as if it had been grown upon it. Indeed, it would be possible to picture certain circumstances under which the annual interest would be secured from isolated trees over the whole area, for it is only the administrative difficulties that would be entailed, and the impossibility of securing natural regeneration in this country, that necessitates the practice of clear felling. It is true that in countries where natural regeneration

is possible the interest is not secured from over the whole area, but the systems practised in such places approximate much more closely to the theoretical ideal, and the modifications that arise are due solely to considerations of regeneration and simplification of handling, and do not detract in any way from the truth of the principle.

This essential relationship between all parts of a forest is of the very highest importance when one is considering which of the innumerable methods for determining profit or loss should properly be adopted, for it would appear to render any question of compound interest unnecessary and misleading for practical purposes. For the exponents of compound interest consider each unit of the forest on its own merits; they take each plantation, its cost of establishment, ground rent, and any other charges, and say that the sum to which these amount must accumulate at compound interest until the trees attain maturity, when the money realised by their sale must attain the amount to which the sum has accumulated if a profit is to be secured at the rate of interest decided upon. But this method, and all associated methods, is accepting the mature timber as both capital and interest, and the money realised by its sale as the capital invested in the establishment of the crop together with the interest which has come into being and been added to it throughout all the years of the rotation. They are, in fact, mistaking for the capital invested in a few acres a great many years ago, what should be considered as income arising from the whole woodland area during the current year, and any conclusions founded on these premises are necessarily misleading. If it is accepted that the trees felled in any one year are, in actual fact, representative of the increment over the whole area, and that the money realised by their sale is the income from the land and growing stock, then the only logical method of determining profit and loss is to take the woodlands as a whole and make a comparison between the annual income and the annual expenditure; for, though it is perfectly true that a large part of the expenses are incurred by undertakings such as planting and establishment which cannot of themselves be expected to produce income during the current year, yet they are essentially undertakings that are incurred for the maintenance or enhancement of the productivity of the whole area. The thinking forester, in establishing a young plantation, does so not only to ensure that the particular piece of land that he is planting will produce a crop of trees in the distant future, but, far more, to ensure that the productivity of the woodlands as a whole will not be interfered with in a specific year in the future. He is attending to the efficient maintenance of his business and though, by the nature of forestry, his plantation will not in itself realise an immediate profit, yet it is putting on increment every year, and that increment (interest) will be realised every year by sales of timber in other parts of the estate. If we admit this fact—namely that the annual increment of every plantation, of whatever age, on the estate, is converted into cash annually, then no question of compound interest, or even simple interest, can arise, and the question of whether the woods are being run at a profit or at

a loss is answered by an examination of the income and expenditure for the year under consideration. Not only does this appear to be the logical method from the point of view of economics, but it is also the only method by which the owner can obtain a definite and accurate answer to the vital question of whether his woods are bringing him in a net income, or whether they are leaving him out of pocket.

The William H. Walker Forest and Wood-Using Industry

The impending submersion of several thousand acres of forest in central Massachusetts to provide flowage for the new Swift River reservoir has occasioned two recent articles on the forest of William H. Walker at Greenwich Village. One appeared in the November 8 issue of the *American Lumberman* by a representative of that magazine, and another in the December number of *American Forests and Forest Life* by A. C. Cline.

The Walker Forest with its permanent sawmill and wood-working shop has long been known among foresters as one of the few cases in the region where a long established wood-using industry has been backed by a sustained yield forest, and, withal, has made a handsome profit for the owner. The marked success of the enterprise has been due to a rare combination of conservative cutting in the woods, skilful sawing and finishing in the sawmill and finishing shop, and the selling of finished products only,—all under the direct supervision of one man. Mr. Walker was his own forester, millman, and salesman. He made every log count.

Starting about fifty years ago with a few hundred acres handed down by his father, Mr. Walker gradually built up the forest to its present size of 1,100 acres. Nearly one-half of the area is in white pine on the light soils of the Swift River valley, and the remainder is in mixed growth and hardwood on the heavier soils of the uplands. It is the handling of the pine stands which is of particular interest. Mr. Walker early learned about "thinning" from his father, and from the beginning has kept his pine stands well opened up and growing at a rapid rate. Actually many of his cuttings more nearly approached selective logging than thinning, but their purpose has always been increased growth rather than reproduction. Each stand was worked over every 10 to 15 years, and enough of the largest trees were removed to equal in volume what was considered to have been the amount grown since the previous cutting. Average annual growth per acre was estimated to be about 400 board feet, equivalent to a total of 200,000 board feet for the entire acreage in pine. Mr. Walker's thinnings would be considered heavy by most foresters, but they were purposely made so in order to prevent any appreciable slowing down in growth. But, effective as his cuttings were in increasing growth, the maintenance of the growing stock might well have been a failure had it not been for the fact that the pine was on pine land,—a light, sandy soil where hardwoods were both scanty and slow growing. Instead of filling up with hard-

woods, the openings made in logging came in to more pine. Unquestionably, the handling of the pine stands was greatly simplified by the permanency of the white pine type on the light soils.

But regardless of the low costs of silviculture the enterprise as a whole would never have borne fully matured fruit without the little, water-powered sawmill and finishing shop which stood near the center of the village, and which worked up the annual cut of logs from the forest, together with an equal amount hauled in by neighboring farmers,—all told about 400,000 board feet annually. Among its products were flooring, clapboards, door and window casings, woodwork for the Yankee horse rake, silo staves, chair stock, picker sticks, cloth boards, wagon and truck body stock, and general house finish. Nothing was sold "rough". By selling only finished products Mr. Walker obtained retail prices ranging from $40 to $75 per thousand board feet for material which, if sold in the rough at wholesale, would have brought only from $25 to $30. In one instance a single, unusually fine white ash tree yielded products totaling over $100. Mr. Walker admits that the great influx of cheap lumber from the West and South during the past decade has seriously affected his business, and that, furthermore, several items in his old line of products are no longer in demand. Whether a young man starting in now, where Mr. Walker is leaving off, could develop a new line and maintain the business at its old time level is open to question. There is little doubt, however, that just this sort of a set-up will in time again come into its own, but not until the East ceases to be a dumping ground for the "distress" lumber of other regions.

New England has had enough of the "cut-out-and-get-out" methods of the portable mill which has left in its wake untold thousands of acres of slash and "brush" which in most cases none other than the public treasury can possibly afford to rehabilitate. That vastly greater benefits are to be derived from forests kept continuously productive and from wood-using industries established for permanency, has always been the belief of foresters, but to date there have been few cases where such benefits have actually been demonstrated. The outstanding success of the Walker enterprise in commercial forestry has been a source of convincing proof which will be greatly missed.

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Timber Conservation Board Organizes and Starts Work

With the conservation of the timber resources of the United States as its principal objective, the National Timber Conservation Board, established in December by President Hoover, held its first meeting in Washington, January 7, setting up a working organization and outlining its general program. The Board met at the Department of Commerce, under the chairmanship of Robert P. Lamont, Secretary of Commerce.

The announcement of the selection of members of an advisory board, with R. Y. Stuart, U. S. Forester, as chairman, to assist in assembling data out of which a definite policy of conserving

the nation's forest resources may be formulated, and the appointment of Ripley Bowman, of the Department of Commerce, as administrative secretary, were made.

It was pointed out that chronic over-production is the chief obstacle to the preservation and conservation of the nation's timber resources. In view of this situation, the Board plans to compile the important facts of production conditions and trends in the forest industries, analyse and interpret them in order that such policies and programs of public and private action as will safeguard the public interest may be developed, leading to the perpetuation of the forests and stabilization of the industries based on the use of timber.

Among the specific topics which the Board plans to consider are included problems of taxation of timber and forest lands; sale and use of publicly owned timber, especially national forests, Indian timber reserves, and state forests; economic causes of the prevailing condition of over-production of forest products and consequent waste of timber, depletion of forest resources, and insecurity of employment in the forest industries; proposals to divert submarginal agricultural lands to commercial forest growing, and appraisal of relative importance of forestry projects.

Initial funds to finance the survey have been secured from private sources. It was announced at the meeting that the Board's headquarters will be in the Department of Commerce.

Members of the advisory committee as set up by the Board include E. T. Allen, Forest Economist, Western Forestry & Conservation Association, Portland, Oregon; Hugh P. Baker, Dean, New York State College of Forestry; Wilson Compton, Manager, National Lumber Manufacturers Association; William L. Cooper, Director, Bureau of Foreign and Domestic Commerce; S. T. Dana, Dean, School of Forestry, University of Michigan; Fred R. Fairchild, Professor of Economics, Yale University; Henry S. Graves, Dean, School of Forestry, Yale University; W. B. Greeley, Secretary-Manager, West Coast Lumberman's Association, Seattle; Charles T. Herty, Consulting Chemical Engineer, New York City; D. T. Mason, Consulting Forester, Portland, Oregon; George N. Ostrander, President, Finch, Pruyn and Co., Glens Falls, N. Y.; Charles James Rhoads, Commissioner of Indian Affairs; George W. Sisson, Jr., Director, American Forestry Association, Potsdam, N. Y.; R. Y. Stuart, U. S. Forester and Vice-Chairman of the National Committee on Wood Utilization, and J. W. Watzek, Jr., Crossett-Watzek-Gates, Inc., Chicago.

At its meeting on February 11, 1931, the Advisory Committee, by formal motion, adopted the following program for conducting the study "For the purpose of developing sound workable programs of private and public effort with a view to securing and maintaining an economic balance between production and consumption of forest products and to formulating and advancing a deliberate plan of forest conservation, that the following projects be undertaken with the aid of appropriate sub-committees":

1. Economic situation of forests and timber industries, including present and prospective timber supply; and present and prospective timber needs.

2. Privately owned timber, logging, manu-

facturing plants, and distributing facilities.
   a. Extent and character of timber ownership.
   b. Trends in timber values.
   c. Financial pressure for liquidation, esp. in West.
   d. Small mill situation, esp. in South.
   e. Producing capacities; operating efficiency; conditions of utilization.
3. Publicly owned timber.
   a. Extent and character of commercial timber under public ownership.
   b. Policies governing acquisition of timber and timber lands.
   c. Policies governing sale, cutting, and use.
   d. Revenues from national forests as timber conservation funds.
4. Economy, stabilization and diversification possible through centralized operations:
   a. In timber ownership, and production.
   b. In assembly and distribution of forest products.
5. Distribution and marketing methods; possibilities of diversification and expansion of markets and uses; and promulgation and/or methods of enforcement of standards for forest products.
6. Federal and state laws and policies in relation to timber conservation.
   a. Taxation.
   b. Other.
7. (a) Possible scope, method and form of continuing public and private coöperation for timber conservation, stabilization of industry and security of employment, including—
(b) Possible means of promoting economical perpetuation of forests and forest industries through sustained yield forest management, and otherwise.

COLORADO

EVERGREENS TURN DECIDUOUS

Foresters who would determine past drought periods by the width of growth rings in trees may find it difficult to distinguish between summer drought and winter killing injury if recent observations on the Pike National Forest in Colorado have any particular significance. Trees of Douglas fir and Engelmann spruce forty to sixty feet in height were so severely injured last winter as to cause the loss of all needles, leaving the appearance of a tree deadened by a light crown fire. Trees growing in groups or singly are at this time, November 1, 1930, entirely devoid of green needles. Trees without needles on one side but green and bright on the other, stand adjacent to one which pulled through the winter with practically all its leaves, while another is stark naked. Examination indicates that these trees, bleak and bald as a deciduous tree in winter, are still very much alive. Though no new growth was put on during the past summer season, the cambium is apparently bright and very much alive. Buds too, very much alive, are set and ready for a new start when the spring and summer season of 1931 approaches. The leaf buds which should have burst and made leaves the past season were nipped by a late spring frost. Evergreen trees turned deciduous! "Never see'd anything like it afore", an old timer told me.

The weather conditions are unquestionably responsible for this widespread damage. From the northern to the southern limits of the Forest along the front range come requests for information and expressions of grave concern regarding this unusually severe winter injury. Roughly, all Douglas fir, Engelmann spruce and Colorado blue spruce above the 7,500 foot contour were so severely injured, either by the severe winter or late spring frost, or both, that little or no new growth was put on lateral and terminal branches. Occasionally a bud escaped injury. Such buds, bursting, made abnormal branches or shoots twice the normal length and size with needles in proportion. Buds on lateral and terminal branches that

were frosted severely make up from 75 per cent to 100 per cent of all the buds on all the trees above the 7,500 foot contour except the pines. Bud clusters have developed during the past season—new buds for the 1931 season two to eight in number. Many forked trunks and branches are certain to result.

Casual weather observations may contribute something in the way of explanation as to just why the winter killing was so noticeably severe.

Water mains four and five feet below the surface froze up in Colorado Springs, Manitou, Castle Rock and other towns adjacent to the front range. In Manitou and Colorado Springs there were many days with low-lying frost clouds during zero and sub-zero periods which completely obscured the sun, while on the summit of Cheyenne Mountain (elevation 9,000 feet), Lake Moraine (elevation 10,000 feet), and the summit of Pikes Peak (elevation 14,000 feet), the sun was shining brightly. Reports from the top of Cheyenne Mountain gave temperatures of from 10 to 40 degrees higher than at Colorado Springs, 4,000 feet lower. Autoists coming down through Ute Pass would report warm and sunny skies at Woodland Park (elevation 8,250 feet). These reports occurred throughout the winter. They indicate great extremes in temperature and probably very sudden changes in the higher regions. Cold, calm air, seemingly, would settle over the plains adjacent to the foothills while the warm prevailing southwest winds blowing above and over this cold air caused the formation of frost clouds. These warm winds were dry, low in humidity, and licked up every bit of moisture from branches and needles except those which, due to shade or shelter, remained continuously frozen throughout the winter and were not influenced by these frequent warm winds. This alternate freezing and thawing with dry winds during the periods of thawing weather were too much for these sturdy old spruce and fir trees, and when spring and summer came, their entire crowns turned brown. A severe June frost nipped the buds that would have put out new needles. So, many of these trees heretofore evergreens are going into the winter as bald and free from leaves as does an elm.

This injury may yet result in death to many trees, but those which survive will record weather—perhaps the most severe winter known in Colorado. Future foresters fifty to one hundred years hence, finding the narrow rings or rings corresponding with about 1930 A. D., will likely say that that was a bad summer drought rather than a severe winter. How many so-called drought periods as told by the trees were in reality injury or late spring frosts?

E. S. KEITHLEY,
Forest Supervisor, Pike National Forest.

AN OCCUPATIONAL STUDY OF GRADUATES IN FORESTRY FROM THE UNIVERSITY OF IDAHO

My interest in the occupational study of graduates in forestry from Cornell University, made by Prof. C. H. Guise, published in the JOURNAL OF FORESTRY in December, 1929; also the report by Prof. Emanuel Fritz on this question, from the University of California, published in the JOURNAL for May, 1929,

has led me to make a similar study of the graduates from the School of Forestry, University of Idaho, the results of which are given in Table 1.

The table shows that of the 103 living graduates in forestry from the University of Idaho, 81 or 79 per cent are still engaged in some phase of forestry work. This percentage coincides with that for the University of California and is rather a high average for any profession.

Of the 74 men receiving only the bachelor degree, 70 per cent are still in forestry work, while of the 29 taking the master's degree either at the University of Idaho or elsewhere, 100 per cent are engaged in work connected with forestry. The larger percentage of master degree men than of those taking only the bachelor degree remaining in forestry is doubtless due to the fact that men are reasonably sure that they want forestry as a permanent objective before they decide to take advanced work in it.

Of the 81 graduates remaining in forestry, it will be noted that 65 per cent are with the federal government. Most of these are in the Forest Service, though the Indian Service and the Biological Survey each claims a few. Twenty per cent are in the employ of private lumber companies, 6 per cent are on faculties of forest schools, 5 per cent are in the service of foreign countries, while 2 per cent are employed as state extension foresters, and 2 per cent are doing postgraduate work.

F. G. MILLER,
Dean, School of Forestry,
University of Idaho.

SECOND PHASE OF FOREST SURVEY GETS UNDER WAY

The second phase of the nation-wide

TABLE 1

OCCUPATION OF LIVING GRADUATES IN FORESTRY

UNIVERSITY OF IDAHO

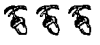
September, 1909, to September, 1930

	All Graduates					
	Master's degrees at U. of I. or elsewhere		Bachelor's degree at U. of I.		Total	
Line of work	Number	Per cent	Number	Per cent	Number	Per cent
Forestry	29	100	52	70	81	79
Other	0	0	22	30	22	21
Total	29	100	74	100	103	100
	Graduates remaining in forestry					
Federal	17	59	35	67	52	65
State	1	4	1	2	2	2
Private	3	10	13	25	16	20
Teaching	3	10	2	4	5	6
Postgraduate	2	7	0	0	2	2
Foreign	3	10	1	2	4	5
Total	29	100	52	100	81	100

forest survey has been inaugurated with the initiation of preliminary work in the hardwood bottomlands of the Mississippi Delta. C. M. Granger, director of the forest survey, and James W. Girard, logging engineer for the forest survey, arrived at the Southern Forest Experiment Station January 10 to assist in the preparation of working plans for carrying on the inventory phase. This work will be under the immediate direction of G. H. Lentz, Silviculturist at the Southern Station.

Lentz was transferred December 1 from his work on soil erosion to take over the hardwood survey. He will be assisted by J. A. Putnam who is an experienced hardwood operator and timber estimator. J. A. Cruikshank, a Junior Forester, will also be on the survey.

There are approximately 25,000,000 acres of land in the alluvial bottomlands of Missouri, Arkansas, Louisiana, and Mississippi to be surveyed under the present set up.



States Receive Share of National Forest Revenues

Twenty-eight states, Alaska and Porto Rico will share to the extent of $1,677,559 in the receipts of the national forests for the fiscal year 1930. This amount represents 25 per cent of the total net receipts, and checks have been mailed from the Treasury Department to the individual states, according to an announcement by the Forest Service.

Net receipts of the national forests last year increased in the aggregate nearly half a million dollars over the preceding fiscal year. The 25 per cent return to the states is allotted in proportion to the receipts realized from national forests within each state. A state's share of national forest receipts represents a federal payment in lieu of taxes. As provided by federal statute, the funds are turned over to the counties containing national forest lands, to be used for schools and roads.

Besides the 25 per cent fund, an additional 10 per cent of forest receipts is set aside each year to be used for forest roads. The 10 per cent fund this year will provide $671,023.72 for building roads and trails within national forest boundaries, supplementing the regular appropriation made by Congress for this purpose.

As the national forests are administered on a permanent yield basis, their revenues are expected to increase in the future as the resources develop says the Forest Service. The states bear no portion of the expense of protecting, administering, and developing the national forests.

Distribution among the states containing national forests of their share of the receipts for 1930 is as follows:

State	25% Fund	10% Fund
Alabama	$ 190.52	$ 76.21
Alaska	27,576.88	11,030.75
Arizona	92,082.37	36,832.95
Arkansas	57,445.87	22,978.35
California	406,877.02	162,750.81
Colorado	141,242.40	56,496.96
Florida	11,481.49	4,592.59
Georgia	4,005.28	1,602.11
Idaho	165,521.20	66,208.48
Maine	1,822.90	729.16
Michigan	1,845.11	738.04
Minnesota	12,340.05	4,936.02
Montana	76,193.88	30,477.55
Nebraska	2,375.04	950.02
Nevada	26,250.48	10,500.19

New Hampshire	25,103.29	10,041.32
New Mexico	35,252.89	14,101.15
North Carolina	10,074.04	4,029.62
Oklahoma	2,110.07	844.03
Oregon	191,772.64	76,709.06
Pennsylvania	3,804.80	1,521.92
Porto Rico	164.77	65.91
South Dakota	44,197.64	17,679.06
South Carolina	1,490.44	596.17
Tennessee	3,467.18	1,386.87
Utah	57,806.17	23,122.47
Virginia	12,308.97	4,923.59
Washington	166,441.10	66,576.44
West Virginia	2,485.53	994.21
Wyoming	93,829.28	37,531.71
Total	$1,677,559.30	$671,023.72

Expansion of Forest Highway Program

Apportionment of $9,500,000 in forest highway funds this fall to 29 states and 2 territories is making possible more rapid road construction on the national forests, according to the U. S. Forest Service.

In most of the regions receiving forest highway funds, the allocated amount will be more than double that of the last fiscal year. For five years the annual federal appropriation for forest highways has been $4,500,000. Under provisions of the Oddie-Colton law, an additional fund of $5,000,000, became available for the first time last July, to be used in the current fiscal year.

Division of these funds for construction of highways within and adjacent to national forests is made on the basis of area and value of the forests. Half the amount is apportioned according to the ratio of the national forest area in a given state to the total area of all the national forests. The other half is divided in proportion to the value of the national forest lands in each state.

This road-building activity, more than doubled this year, is part of a continuing program. An equal amount of federal funds has already been appropriated for the work in the fiscal year 1932.

In addition to the expanded program of forest highway construction, the Forest Service is continuing, with funds from other appropriations, the construction and maintenance work on secondary roads, and on protection roads and trails in the national forests.

The apportionment by states for the current and preceding fiscal years follows:

State	Year Ending June 30, 1931	Year Ending June 30, 1930
Oregon	$1,334,195	$632,638
Washington	669,555	332,614
Idaho	1,036,524	491,648
Montana	837,355	397,999
California	1,428,063	667,175
Alabama	7,558	3,465
Alaska	969,811	460,509
Arizona	599,307	282,288
Arkansas	89,146	41,917
Colorado	692,324	328,044
Florida	28,572	11,436
Georgia	16,570	7,605
Illinois	823	391
Maine	2,880	1,365
Michigan	14,820	3,581
Minnesota	63,078	29,268
Nebraska	9,817	4,659
Nevada	198,858	94,463
New Hampshire	45,171	21,399
New Mexico	425,414	202,401
North Carolina	27,271	12,782
Oklahoma	4,176	1,982
Pennsylvania	16,906	7,403
Porto Rico	1,123	533
South Carolina	3,184	1,474
South Dakota	83,581	39,481
Tennessee	25,175	11,853
Utah	350,105	166,445
Virginia	31,846	14,997
West Virginia	14,809	6,673
Wyoming	441,983	211,512
Totals	$9,500,000	$4,500,000

Game Value Big Factor in Income from Forest

Estimating that the wild life of a single state, South Caroline, is worth approximately $13,000,000 annually, Paul G. Redington, at the South Carolina Commercial Forestry Conference at Columbia, on January 22, emphasized that the wild-life conservationists of the country—professional, organized, and individual—have a direct interest in promoting the forest welfare of State and Nation.

In his dual capacity as chief of the Bureau of Biological Survey, of the United States Department of Agriculture, and president of the Society of American Foresters, Mr. Redington presented important phases of the relation of animals and birds to the forests and the value of forest homes in the perpetuation of useful and interesting species of wild life. He mentioned the early influence of the large and small game of the forests, the fur bearers, and the many species of wild birds in drawing the pioneers out beyond the early frontiers, and discussed the present importance of wild life in increasing land values generally. Forested and uncultivated areas, in particular, produce crops of game and fur annually, he said, while the main forest crop is developing to maturity.

The increasing need for forest-fauna research is being recognized, and the U. S. Biological Survey has been enabled through the McSweeney-McNary Forestry Research Act to assign trained biologists to forest experiment stations to study the interrelations of wild life and forestry, useful as well as injurious. The results of such studies, Mr. Redington said, should be highly beneficial not only economically but esthetically, and should react favorably upon the wild life itself. He announced that he had recently assigned T. D. Burleigh, a forest naturalist of the Biological Survey, to coöperate with the Forest Service at the Appalachian Forest Experiment Station, at Asheville, N. C., his territory to include South Carolina. Commenting on the progress of this work, Mr. Redington said that as both an experienced forester and a careful student of wild life, Mr. Burleigh has already developed significant and valuable information regarding the deer, fur bearers, predators, rodents, and the game birds and other birds of the region. The program of research is designed to develop fundamental facts underlying the relationships of wild life to its environment and to determine the proper relations of wild life and forest production throughout adjacent states.

An estimate of the actual value of the wild life of a state, Mr. Redington said, is arrived at through a consideration of various factors, some definite but others, of which must be approximated. The basic elements, he said, are "the flesh, fur, and feather value; the value of insectivorous habits, as of birds; the recreational value to hunters, tourists, and naturalists; and the commercial value, as it affects expenditures for hunting licenses, clothing and camping equipment, weapons, ammunition, transportation, food and lodging, and a variety of personal services. For example, considering area, topography, and other conditions in South Carolina, the wild life of the state, on its nearly

20,000,000 acres of land and water, is to be estimated as having a direct economic value of more than $8,000,000, and recreational values of probably half as much more.

"Such enormous figures are not mere guesses but are approximated on the average acreage value of wild life. This for the eastern part of the country is arrived at by allowing a meat and fur value of 14 cents an acre, and for South Carolina this would be nearly $2,750,000; the value of birds in destroying insects and other pests (at 26.6 cents an acre), approximately $5,200,000; and the fish production (at 44 cents an acre of water surface), approximately $140,000. To this total of more than $8,000,000 is to be added recreational values arrived at from hunters' license fees (1928-29), $142,026; expenditures of 90,781 hunters (averaging $25 each for equipment, transportation, lodging, and other expenses), about $2,250,000; and the share of the average expenditures that may be attributed to the drawing powers of wild life (at an acreage rate of 13 cents each), more than $2,500,000.

"Thus, with the wild life of South Carolina approximating a value, as nearly as can be worked out, of more than $13,000,000 annually, we have a natural resource of no small magnitude, and one well worth conserving and enlarging. Sane administration of the wild life of forest, field, and stream will develop more fully an appreciation of their great economic value, and this in turn will be reflected in the resulting values of the land and water areas on which the species make their temporary or permanent homes."

In considering the relation of the landowner to the value of the annual crop of wild life, Mr. Redington mentioned the owner's very material interest in determining and employing means for increasing the production of game on his holdings so as to make them attractive to sportsmen able and willing to compensate him for his time and effort through payment for hunting privileges. The landowner, he said, thus becomes directly interested in preventing poaching and forest fires, in repressing other destructive agencies, and in adopting constructive measures for increasing game protection.

Mr. Redington concluded with the prediction that influential organizations, state game wardens and commissioners, and state sportsmen's associations, through a pooling of finances with the agencies of the federal government will make effective the programs of research into problems of wild life and forestry.

417,000 Acres of Forest Land Acquired by United States Last Year

The United States obtained title to 417,064 acres of forest land and the National Forest Reservation Commission approved purchase of 538,048 acres in the fiscal year 1930, according to a report transmitted to Congress by Secretary of War Hurley, chairman of the commission.

Acreage approved for purchase last year exceeded that in any previous year. The area approved, since 1912, amounts to 4,258,564 acres, and purchases completed total 3,413,293 acres.

The commission, in conformity with its general program of national forest purchases, last year approved the establishment of four new purchase units—the Cumberland purchase in Kentucky, the Kiamichi unit in Oklahoma and Arkansas, the Homochito unit in Mississippi, and the Evangeline unit in Louisiana. The total acreage of these newly established units is approximately 1,325,200 acres, and the general program contemplates the eventual acquisition of approximately 1,176,450 acres within these units.

Areas of forest lands approved for purchase by the National Forest Reservation Commission in the fiscal year 1930, and cumulative acreage approved for purchase to June 30, 1930, are as follows:

	Acres approved fiscal year 1930	Total net acres approved to June 30, 1930
Alabama	6,425	109,866
Arkansas	37,118	294,061
Florida	83,796	177,598
Georgia	55,082	319,557
Louisiana	49,860	86,041
Maine		33,482
Michigan	50,071	229,946
Minnesota	29,418	106,887
New Hampshire	4,734	487,505
North Carolina	13,398	395,658
Pennsylvania	9,500	354,711
South Carolina	2,762	47,648
Tennessee	8,729	389,907
Virginia	7,450	608,953
West Virginia	17,795	330,380
Wisconsin	161,910	161,283
Total	538,048	4,133,483

Changes in Pennsylvania State Forestry Chiefs

Governor Gifford Pinchot has appointed Lewis E. Staley to succeed Charles E. Dorworth, who was Secretary of Forests and Waters under Governor Fisher's administration. Dr. Joseph S. Illick, State Forester, has also resigned and is succeeded by John W. Keller.

Mr. Dorworth is a publisher of Bellefonte, Pennsylvania. Mr. Staley goes to Pennsylvania from South Carolina where for several years he had been State Forester and organized that state's forestry department. Mr. Staley is not new in Pennsylvania, he is a graduate of Mont Alto Forest Academy (1906) and was in the state's forest employ until 1927. He served in various capacities under Gifford Pinchot when the latter was Commissioner of Forestry, and later during his first term as Governor.

Dr. Illick had been in the employ of Pennsylvania's forestry department since his college days. He is the author of several books and a number of bulletins, and is nationally known for his work and interest in forestry. It is reported that Dr. Illick has accepted a position on the staff of the New York State College of Forestry at Syracuse University.

Mr. Keller, who succeeds Dr. Illick, had been in charge of roadside beautification and protection in the State Highway Department. He was graduated from the Pennsylvania State Forest School in 1910 and has served in the state's forestry department in several capacities. He is to continue his high-

way beautification program as State Forester.

South Carolina Commercial Forestry Conference

The forest interests of South Carolina assembled in a Conference at the Jefferson Hotel, Columbia, S. C., on January 21 and 22, 1931. In a statement on the organization and purpose of the Conference, it was said that the meeting was "called by representatives of commercial, industrial, educational, recreational and civic interests, who have formed a General Committee and arranged a program with the assistance of the Chamber of Commerce of the United States. This Conference is for the development of commercial forestry as a means of perpetuating South Carolina forest resources and is dedicated to the public interests".

More than 120 persons registered at the meeting, which covered a period of two days. Four major phases of the forestry problem in South Carolina were covered by 25 speakers. Under the heading of Forest Wealth, the basic problems as they relate to railroads, farmers, banks, recreationists, county government, the press, women's clubs, public health and power companies, were succinctly discussed by state authorities on those subjects.

The relationship between forest and industry was brought out by such nationally prominent speakers as Mr. Axel Oxholm of the U. S. Department of Commerce, and Dr. Charles Herty, an advisory member of the National Timber Conservation Board.

Private timberland owners discussed the growing and handling of our forests, and the possibilities of increasing forest revenue through proper game management was described by Mr. Paul Redington, Chief of the U. S. Biological Survey.

Forest protection and taxation were covered by presentations by the former State Forester of South Carolina, Mr. L. E. Staley, now Secretary of Forests and Waters of Pennsylvania, and Mr. H. A. Smith, successor to Mr. Staley.

An able presentation on the subject of forest taxation by Mr. R. B. Herbert, an attorney in Columbia, S. C., concluded the Conference.

Exhibits in the meeting hall were both interesting and striking. A display of the forest products manufactured in South Carolina included the two extremes of mankind activities. There was on one end a cradle and at the other end a very well constructed cypress casket. A women's organization presented an exhibit of more than 100 native evergreens to be used for garden and decorative planting.

The complete proceedings of the Conference will be published by Clemson Agricultural College.

Resolutions of the meeting briefly covered the following:

1. A statement of appreciation of the service rendered by the retiring state forester, Mr. L. E. Staley.

2. A request that the state legislature increase the funds available for protection activities.

3. An appreciation of the southern educational project as supported by the American Forestry Association.

4. A request that the U. S. Depart-

ment of Commerce study wood waste in South Carolina.

5. The organization of the South Carolina Forestry Association.

6. A request that the Clemson Agricultural College of Clemson, S. C., institute a course on Game Production.

7. A request that Congress pass a bill providing for erosion study and control in the Appalachian Region.

8. A plea for increased federal support of forest research in the Coastal Plain region.

ALFRED A. DOPPEL,
Chamber of Commerce of the United States.

GRADUATE STUDENT ASSISTANTSHIP AVAILABLE AT FOREST PRODUCTS LABORATORY

The Forest Products Laboratory at Madison, Wisconsin, has an assistantship available for a properly qualified graduate student interested in research in wood technology. The specific research subject pertains to the relationship between wood structure and shrinkage. The research work may be used as a subject for a thesis for a master's or doctor's degree at the University of Wisconsin. The student will be expected to spend about 21 hours a week directly on the research problem. The scholarship carries with it a stipend of $40 a month, and exempts the student from the non-resident fee of $100 per semester.

Further information may be obtained from the Laboratory.

CORNELL RECEIVES GIFTS

Two gifts in support of the work of the Department of Forestry at Cornell University have recently been announced.

Mr. Archer M. Huntington of New York City has biven $5,000 to be used to advance research work on the Arnot Forest, near Ithaca, N. Y. A part of this money is being devoted to investigations of the rate of growth of second-growth hardwoods typical of the region of central southern New York.

In the early autumn of 1930, Mr. Huntington also donated $400 to be given in prizes to the members of the senior class making the best record at the Cornell Forestry Summer Camp.

Shortly before his death Mr. G. Frederick Schwarz of New York gave to Cornell $1,000, to serve as the nucleus of a building fund for a foresters' lodge on the Arnot Forest. It is anticipated that activities on the Forest will be greatly strengthened when a headquarters building, containing living accommodations, an office, and several small laboratories, is available. It is estimated that the simple structure which is needed can be erected for around $5,000.

ERRATUM

In the article "The Effect of Ultra Violet Light in Germination of Seeds and Growths of Seedlings of *Ribes rotundifolium* Michx" in the January, 1931 issue, the following error should be corrected: On page 132, Table 1, last line, *for* Aug. 30, 1929, *read* Aug. 30, 1928.

Three New National Forests Proclaimed

President Hoover recently brought into being three new national forests—the Marquette, the Hiawatha, and the Ottawa—all in Michigan. As a result the United States now has a series of three national forests extending across the Upper Peninsula of Michigan. The Marquette lies near the Straits, the Hiawatha back of Munising, midway of the Peninsula, the Ottawa toward the west end. Within the Marquette, with a gross area of 275,986 acres, the United States owns or is in process of acquiring 109,223 acres. Of the total area of 270,071 acres within the Hiawatha, 95,668 acres is now or soon will be owned by the United States. Less progress has been made in the Ottawa, where out of a gross area of 252,551 acres only 53,379 acres has passed or is in process of passing to the federal government. The program, however, contemplates the eventual acquisition of all the remaining lands chiefly valuable for timber production within the units. This will take place as rapidly as agreements can be reached with the owners and funds are made available by Congress. There are now 152 national forests.

In announcing the creation of the new forests a Forest Service press release reports that: "These lands originally were exploited for their timber. Then followed programs of colonization for agricultural development. It is now evident that the highest use of the lands is for timber production and the government's program is in furtherance of their restoration to that economic purpose. Many of the original residents have moved away, and much of the land is reverting to the state through tax delinquency.

"Several thousand acres of non-producing land within the three new National Forests have already been planted with white and Norway pine and the present program contemplates further planting at an average rate of 2,000 acres per year.

"The Ottawa National Forest was formerly composed largely of privately owned cut-over tracts. In completing this unit the effort is being made to acquire enough mature and second-growth timber of various age classes to make possible an early start on continuous cutting operations. The Forest Service's sustained timber cropping method will aid the maintenance of permanent industries in the region and will bring in a steady revenue, part of which will be turned over to the State for roads and schools.

"In acquiring timberlands and making exchanges, the Forest Service had the hearty coöperation of the Conservation Commission of the State of Michigan, which has also coöperated in perfecting fire prevention arrangements and in moving to bring the contiguous lands back into economic production.

"The three new forests will at present all be under the management of one supervisor, who will have his headquarters at Munising. Ranger stations will be at Munising, Raco, and Kenton".

Connecticut Gives Unemployed Work in State Forests

At the recent annual meeting of the Society of American Foresters, a resolu-

tion was adopted recommending the relief of unemployment by offering work on state forests. Through its State Forester, Austin F. Hawes, Connecticut had already enterd upon such an arrangement and the Governor of the state is recommending an appropriation of $100,000 to continue the project on a larger scale.

An editorial appearing in the January 12, 1921, *Hartford Daily Courant* under the title "The Governor's Forestry Proposal," is worth reprinting. It follows:

"Among the several admirable recommendations made by Governor Cross in his message to the General Assembly is this: That an emergency appropriation be made for thinning the State forests and removing the inflammable debris, thus providing work for the unemployed and rendering the forests less likely to be destroyed by fire. This work would be carried on, of course, under the direction of the State Forester, Mr. Austin F. Hawes.

"Under an appropriation of $7,000 authorized by the Board of Finance and Control, the Forester already has men engaged in clearing the forests of undesirable growths and freeing them of slash. Last week thirty-five unemployed men were hired by the State for this work and twenty others were paid by the city of Waterbury and by private individuals. This week the State expects to put on an additional thirty-five men. The experiment is abundantly justifying itself by the results achieved.

"Care is taken to select heads of families who actually need employment and who have had experience as woodsmen. Among the unemployed there is a surprisingly large number who in their earlier years worked in the woods and have not forgotten how to use an axe effectively. Middletown, Torrington and Willimantic have provided free transportation for these men, and thus the State is under no expense in getting them to and from their work. In addition to those directly paid for their services, the Forester has granted permits to 300 men to cut their own wood in State preserves under the direction of his department.

"All this constitutes a practical method of helping to tide some of the deserving unemployed over this period of distress. It also is a service of estimable value to the State forests. But the $7,000 available to the Forester will be soon exhausted and the work will have to stop unless the Legislature votes the emergency appropriation recommended by the Governor. It is proposed to ask for $100,000, and no similar expenditure could be made by the State to greater advantage. As the Forester says, the 55,000 acres of forest lands owned by the State and variously located are for the most part greatly in need of thinning, and "thousands of cords of wood are going to waste which could be utilized if there were money available for employing choppers and trucks."

"The *Courant* is glad to commend the Governor's suggestion to the favorable consideration of the Legislature. If consideration for the unemployed enters into it, a consideration not to be ignored, there is satisfaction in knowing that the money expended may save the State untold damage from forest fires. The expenditure may be regarded as good insurance if not as an investment. The

people of the State have a commendable pride in their public-owned forests, and anything that tends to preserve them and increase their usefulness is to be encouraged."

How to Judge a House

The National Committee on Wood Utilization has published a very interesting and useful bulletin on judging a house, principally as to the materials and their mode of use and workmanship. The bulletin takes the reader on a tour of inspection from cellar to attic. Such a bulletin has been badly needed. Building standards since the war have been none too high and there seems to be rather general abuse of building materials before and after they are put into a house, by both builder and owner. Many objections to wood and other building materials can be laid at the door of improper use or neglect. For example, every case of decay of wood parts brought to the attention of the editor of the JOURNAL was due primarily to a violation of one or more rules of proper design or construction. The bulletin should be possessed by every owner of a home or other wooden structure, as well as by the prospective builder.

E. F.

Northern Pine Manufacturers' Association Dissolves

At the annual convention of the Northern Pine Manufacturers' Association held in Minneapolis on February 10, the members voted to dissolve the organization.

This marks the end of a pioneer lumber trade association, a pioneer not only as to age but as to setting standards. Many of the problems of later lumber trade associations were worked out by the Northern. The Northern Pine Manufacturers' Association was formed in 1906, a fusion of the Mississippi Valley Lumbermen's Association, formed in 1891, and the Wisconsin Valley Lumbermen's Association. Originally the association had 79 members, and when it voted to disband but five were left; the annual cut, once over two and one-quarter billion feet of lumber, dwindled to a quarter billion feet.

An effort is being made to continue the statistics on northern pine by the National Lumber Manufacturers' Association.

The president of the association at its close was J. A. Mathieu of Rainy Lake, Ontario. W. A. Ellinger has been secretary for a number of years.

E. F.

Forestry Well Represented at Western Scientist Meeting

On December 23, the Pacific Division of the American Association for the Advancement of Science held its annual mid-winter meeting at Stanford University. Forestry occupied a long morning session of the section on Ecology in which it transpired that all of the eight papers were presented by Berkeley men: three from the University of California faculty, four from the California Forest Experiment Station, and one from Aus-

tralia but temporarily established at the Experiment Station.

Dr. W. C. Lowdermilk, of the Experiment Station, discussing the "effectiveness" of rainfall, showed that the total measured catch of rainfull, considered by itself, is not a measure of its effectiveness to vegetation, and is still less an index of the probable yield of water for irrigation and other human uses. Not until the factors which determine the effectiveness of rainfall are isolated and measured can the influence of the surface conditions of watersheds on yield of water be known.

H. L. Sundling, of the Experiment Station, presented the results of tank experiments for measuring erosion from bare soil surfaces as a limiting factor in road gradients. Although *runoff* quantities occurred, roughly, in direct proportion to degree of slope, *erosion* quantities appeared to correspond to intensity of rainfall irrespective of degree of slope.

Emanuel Fritz, of the University of California, told of finding the fruiting bodies, hitherto undiscovered, of the common brown heart-rot fungus of California redwood, and discussed the exacting conditions under which they develop.

Prof. Lee Bonar followed with a paper on the same fungus, describing the sporophores themselves and giving his basis for classifying it as a new species of Poria, for which he proposes the name *Poria sequoiae* sp. nov.

Dr. A. W. Sampson, of the University of California, gave the gist of his report, now in process of publication, on eradication of the Klamath weed, *Hypericum perforatum*, which is vigorously invading grasslands of northern California. Methods of control on small areas have been developed and give promise of checking the plant's spread, if rigorously applied.

A. D. Lindsay, of the Australian Commonwealth Forest Service, at present engaged in studying certain North American conifers in their native habitats, presented an interesting paper on the acclimatization of exotic conifers in Australasia, describing particularly the conditions of favorable rainfall and temperature which account for the rapid growth rates of planted Monterey pine. What is not generally known to American foresters is that a large number of exotic conifers, in addition to Monterey pine, have also been tried in New Zealand and Australia.

C. J. Kraebel, of the Experiment Station, discussed plant succession following fire in the chaparral of southern California. A quick abundant growth of ephemeral herbaceous plants, which are individually weak and insignificant, usually follows chaparral fires and exerts in the aggregate a considerable control upon runoff and erosion. Gradual deterioration of chaparral types results from soil impoverishment caused by erosion following frequent fires.

H. L. Person, of the Experiment Station, in a paper on tree selection by the western pine beetle, summarized the results of investigations into the external characteristics of attractive trees, and gave a theory for their selection on the basis of recent chemical-physiological studies.

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