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United States Department of Agriculture,

FOREST SERVICE.

HENRY S. GRAVES, Forester.

FOREST FIRE PROTECTION BY THE STATES

AS DESCRIBED BY REPRESENTATIVE MEN AT THE WEEKS LAW FOREST
FIRE CONFERENCE.

Edited by J. GIRVIN PETERS,
Chief of State Cooperation, Forest Service.

PURPOSE OF THE CONFERENCE.

On January 9 and 10, 1913, there was held at the Forest Service, Washington, D. C., a conference of forest officials of States with which the Federal Government is cooperating in the protection from fire of the forested watersheds of navigable streams under the provisions of section 2 of the Weeks law, forest officials of other States, representatives of timberland owners' protective associations and forestry associations, private foresters, and others interested in forestry, in addition to members of the Forest Service charged with the administration of section 2 of the Weeks law.¹

The States represented include all of New England, New York, New Jersey, Pennsylvania, Maryland, Virginia, West Virginia, North Carolina, Ohio, Michigan, Minnesota, and those of the Pacific Northwest. Those States with which the Federal Government has cooperated under the law are Maine, New Hampshire, Vermont, Massachusetts, Connecticut, New York, New Jersey, Maryland, Wisconsin, Minnesota, Washington, and Oregon. The heads of the fire protective systems of these States, in addition to the chief fire wardens of certain timberland owners protective associations, hold Forest Service appointments as collaborators.

The objects of this conference were (1) to provide for an informal discussion of the administration of the law and of the various methods of fire prevention which have been adopted by the States, (2) to determine the results of the cooperation, and (3) to encourage States which can not fulfill the requirements of the law to enact legislation enabling them to do so.

¹A roster of attendance is given in the Appendix, p. 77.

The most striking feature of the conference was the tremendous emphasis placed on the value of cooperation between all protective agencies and of educating the public in general of the need of preventing forest fires.

H. S. GRAVES, Forester, United States Department of Agriculture, opened the conference with the following address:

THE POLICY OF THE FEDERAL GOVERNMENT IN ASSISTING STATES TO PROTECT THE FORESTED WATERSHEDS OF NAVIGABLE STREAMS.

GENTLEMEN: We have called this conference to discuss that section of the Weeks law authorizing cooperation by the Federal Government with the State in protecting from fire the forests situated on the watersheds of navigable streams. We have before us for consideration not only the details of carrying out this law, but also the results which have already been accomplished as bearing on the wisdom of the appropriation which has been made and the desirability of extending the policy through subsequent appropriations by Congress.

The appropriation of \$200,000 for Federal assistance in fire protection initiated a new policy. When the Weeks law was under consideration it was maintained by some persons that greater results from a given expenditure of money would be accomplished by annual appropriations to aid the States in fire protection than by the establishment of National Forests by purchase. The appropriation of \$200,000 was, in a way, an experiment to test the efficacy of this kind of Federal aid. While making this appropriation, Congress at the same time adopted the policy of acquiring National Forests in the eastern mountains where none had existed. It recognized, however, that this appropriation or any other which might be made later on would not be large enough to acquire all of the mountain areas which ought to be under public control, or at least to acquire them within such period as would enable the establishment of public control in time to accomplish the purposes of forest protection. There was recognition of the principle that there is a national interest in these great areas of forest lands, and that there is not only a justification but a duty on the part of the Federal Government to see to it that these national interests are protected.

It is unnecessary for me to emphasize the importance of forestry from the public standpoint. It is unnecessary for me to repeat that the public must not permit the forests to be handled in a way to result in direct public injury by the effect on water resources or indirect injury through the stoppage of forest production. I do wish, however, to make the point that these public interests are in a great many cases not confined to the State in which the forests lie. There are many problems of forestry involving interstate considerations in which our Federal Government can not participate on account of constitutional limitations, or at least unless there is a different interpretation of these limitations than heretofore has been made. For example, a State which has under consideration the making of certain requirements on private owners in the matter of fire protection, or

perhaps in the methods of cutting in order to bring about better practice of forestry, immediately meets the difficulty that the operators, on account of increased cost of logging, are placed at a disadvantage in competition with those of other States where no such restrictions exist. The reason for this trouble is that the products of the forest go into the general market, and so far it has been exceedingly difficult to secure uniform State laws which are really effective in meeting the requirements of our problem.

The discussion of the new policy of acquisition of National Forests in the East early brought out the fact that in stream protection the States are helpless where the streams flow from one State into another. A given State will not make large expenditures for public benefits which inure primarily to the people of another State. It was decided by Congress that it was unconstitutional to purchase forest lands merely to produce timber and for certain other public benefits which were fully recognized as having an interstate character. I think the debates during that time show clearly that nearly every one recognized the interstate character of a great many of these problems, in addition to the navigable feature.

In administering the cooperative clause of the Weeks law the Forest Service has clearly in mind the principles which I have indicated. It has been the effort so to distribute the money that it would last through about three seasons and to expend it under sufficiently diversified conditions to insure conclusive results.

The question comes before us now of what has been accomplished during the two seasons of cooperation which have already passed. Has it resulted in the stimulus to the States to meet their responsibility in forestry? Has it resulted in securing better protection than otherwise would have been the case of the forests on navigable streams; and if so, have the results from this standpoint alone justified the expenditures of the \$200,000? In securing such protection, have other national and interstate interests been secured aside from mere protection to navigation? In short, before we go to Congress and request an extension of this appropriation we must be able to show that this new policy, which was in a measure inaugurated as an experiment, has produced certain definite results which justify the nation in continuing the work.

I want to emphasize over and over again this national feature of the work, because we are asking the National Government to provide the money, and while the protection of navigation is the constitutional reason for the appropriation, the general national and interstate interests are a tremendous additional justification. I think that was fully recognized by Congress when it passed the law, if I may judge by my interpretation of the records of the debates and by my discussion of the whole subject with the men who were responsible for putting this measure through Congress.

Mr. Peters has many facts which demonstrate to my mind that the results obtained are of an importance even greater than could have been anticipated. We want to know, and Congress wants to know, what the experience has been in the States, both from the viewpoint of the State and from that of the Nation.

REQUIREMENTS IN THE ADMINISTRATION OF SECTION 2 OF THE WEEKS LAW.

J. G. PETERS, chief of State cooperation, Forest Service, was called to the chair and led the discussion on this subject.

GENTLEMEN: The fact that there are representatives here from distant States, from the extreme Northeast, from the South, from the Lake States, and from the Pacific Northwest shows the interest and the importance which have been attached to this conference.

The conference has been called primarily for the purpose of securing an informal interchange of opinions and suggestions concerning cooperative protection from forest fires under section 2 of the Weeks law. It is hoped that each and every one of you will participate freely in the discussions which will take place.

I feel that this conference is particularly timely, coming as it does at the moment when we are about to ask Congress for a further appropriation for cooperative protection, in order that the cooperation may be continued after the close of the present calendar year.¹

In the discussions to follow let us keep in mind the requirements of the law, namely, (1) the cooperation must be confined to the forested watersheds of navigable streams; (2) the State must have provided by law for a system of forest fire protection; and (3) the Federal Government will not expend more than the State in a single year.

In the administration of the law by the Forest Service certain other requirements must also be met. It is these requirements that I wish to present to you for discussion. I do not consider it necessary to cover all of them, and I shall take up only the more important ones. However, I do not mean to restrict the discussion of any requirement.

Let us first consider the question of navigability. There is a map, compiled from the annual report for 1907 of the Chief of Engineers, United States Army, which shows the tonnage of the navigable rivers of the United States. It is the most recent map of its kind. This, in addition to Army reports, is used as a basis for determining whether or not streams are navigable. Some streams actually navigable are not shown on the map as such, which may be due to the fact that their tonnage in 1907 was negligible; for information on their navigability the reports are consulted, the conclusions of which we consider as final. If no Federal report has been made on a given stream, the information desired as to its navigability is secured from a State report or by a field investigation, and the question of its navigability is decided by the Forest Service itself. We are disposed to interpret the meaning of navigability in a broad way. However, streams which can float only logs, rowboats, or canoes are excluded, although certain States may have declared such streams navigable.

All forested watersheds of navigable streams where forest fires may cause erosion, and in consequence irregularity of stream flow and loss of navigability, may be included in the cooperative area. Watersheds of tidal streams, lakes, or artificial waterways may also be included; in short, all watersheds on which the forest cover may have a relationship to navigability.

¹ Congress subsequently appropriated \$75,000 for the fiscal year ending June 30, 1914, and at the same time made the balance of the original appropriation of \$200,000, which was available until expended, available until the fiscal year ending June 30, 1915.

Mr. HAWES. Would it be possible, in getting a further appropriation from Congress, to have the law so worded that the money which the State spends on all watersheds for the purpose of fire protection could be used to offset the Federal expenditure on navigable watersheds only?

Mr. PETERS. I doubt if Congress would consent to have the law changed in this respect. The Federal appropriation was made primarily for the purpose of protecting navigation, which is the basis for the law's constitutionality, and the cooperation authorized by the law is for the purpose of encouraging States to protect the watersheds of their navigable streams.

Next let us take up the subject of Federal allotments. Our aim has been to disburse the original fund of \$200,000 as widely as possible and to help as many States as can fulfill the requirements of the law, especially the States which have difficulty in providing protection of their own. In some States where the appropriation is small we have gladly duplicated it. The allotment to any State in a single year has been limited to \$10,000. Briefly, our policy has been primarily to consider the educational value of protective work and to allot the funds so that this value may as nearly as possible be equalized in the different States.

All unexpended balances of allotments at the end of the calendar year revert to the Federal Treasury, and no balance is carried over or made available for expenditure in the following year. However, a State can always count upon receiving an allotment which will at least equal any balance remaining unexpended at the end of the previous year.

The total expenditures to date—that is, for the calendar years 1911 and 1912—have been \$89,407.48, leaving an unexpended balance of \$110,592.52. The allotments already made for the coming season total \$74,000. (See Table 1.) Additional allotments to certain States which may, through their legislatures meeting this winter, fulfill the requirements of the law will probably amount to at least \$15,000. The allotments will therefore total about \$90,000, leaving a balance of approximately \$21,000, which we shall reserve as an emergency fund available to be drawn upon by any State in case of a bad fire season. We believe that it is extremely desirable to hold in reserve a fund of this amount, and in order to do so it has become necessary to reduce the maximum allotment to \$8,000. While the necessity for this reduction is a matter of regret to the Forest Service, still, after all allotments have been made and we are well into the coming fire season, it may be possible to increase the allotments which it has for the time being been necessary to reduce.

FOREST FIRE PROTECTION BY THE STATES.

TABLE 1.—Cooperative fire protection with States under section 2 of the Weeks law, basis of allotment of Federal funds, calendar year 1913.

State.	Total area of State.	Net area of National Forests in State (protected by Federal Government).	Approximate area of State and private lands.		Last annual appropriation by State for forest fire protection.	Amount available for expenditure per acre by State on area protected (including cooperative watersheds).	Approximate area of watersheds requiring protection.	Amount available for expenditure per acre in a watershed as established by protective associations.	Federal allotment, 1913. ^a	Amount available for expenditure per acre by—	
			Requiring protection.	Actually protected by State.						Federal Government.	Federal Government, State, and private protective associations.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Maine.....	<i>Acres.</i> 19,132,800	<i>Acres.</i>	<i>Acres.</i> 15,000,000	<i>Acres.</i> <i>b</i> 9,500,000	<i>c</i> \$7,900	\$0.007	<i>Acres.</i> <i>b</i> 6,000,000	.....	\$8,000	<i>b</i> \$0.001	\$0.008
New Hampshire.....	5,779,840	.....	4,600,000	Entire area.	16,000	.004	4,000,000	.....	6,000	.002	<i>c</i> 0.10
Vermont.....	5,889,360	.....	3,600,000	Entire area.	3,500	.001	1,500,000	.....	1,500	.001	.002
Massachusetts.....	5,144,960	.....	2,500,000	Entire area.	25,000	.010	1,250,000	.....	2,500	.002	.012
Connecticut.....	3,084,800	.....	1,500,000	Entire area.	2,000	.001	750,000	.....	1,500	.002	.003
New York.....	30,498,560	.....	12,000,000	7,200,000	75,000	.010	7,200,000	.....	7,000	.001	.011
New Jersey.....	4,808,960	.....	2,350,000	Entire area.	15,000	.006	1,000,000	.....	2,000	.002	.008
Maryland.....	6,362,240	.....	3,050,000	Entire area.	4,000	.001	1,000,000	.....	2,000	.002	.003
Kentucky.....	27,715,840	.....	15,000,000	Entire area.	5,000	.0003	10,000,000	.....	5,000	.004	.001
Wisconsin.....	35,363,840	.....	15,000,000	Entire area.	35,000	.002	1,250,000	.....	5,000	.003	.003
Minnesota.....	51,749,120	800,000	27,000,000	20,000,000	75,000	.004	15,000,000	.....	8,000	.004	<i>d</i> 0.19
Montana.....	93,296,640	16,000,000	3,000,000	1,700,000	<i>h</i> 3,500	.002	1,700,000	.010	3,500	.002	.014
Idaho.....	53,618,560	18,000,000	6,000,000	4,000,000	45,000	.004	6,000,000	<i>f</i> 0.256	7,000	.003	<i>j</i> 0.31
Washington.....	42,775,040	10,000,000	15,000,000	Entire area.	38,000	.003	5,000,000	.017	8,000	.002	.012
Oregon.....	61,188,480	14,000,000	15,000,000	Entire area.	30,000	.002	10,000,000	.010	8,000	.001	.013
Total.....	.....	.....	.....	.....	.....	.....	.....	.....	74,000	.....	.....

^a All expenditures will be for the salaries of lookout watchmen in the Maine forestry district, in Massachusetts, and in the forest preserve counties in New York, 25 per cent in the three northern districts of New Hampshire, and 100 per cent in the southern district; and 25 per cent each in Connecticut and New Jersey. In Maine, not to exceed \$3,000 is available for expenditure in the forestry district; in New York, not to exceed \$4,000 in the forest preserve counties; and in Idaho, not to exceed \$45,000 in the panhandle.

^c Maine forestry district.

^c State appropriation is obtained from a timberland tax.
^d In the three northern districts.
^e In the three northern districts \$0.01; in the southern district \$0.006.
^f Forest preserve counties.
^g State expenditure on the cooperative watersheds is \$0.015 per acre.
^h Available from land-grant income funds.
ⁱ In the panhandle.
^j In the panhandle, \$0.031; outside the panhandle, \$0.005.

Mr. HUTCHINSON. May I ask why Pennsylvania has received no Federal allotment for fire protection?

Mr. PETERS. Pennsylvania has never requested one. I think there is no question that the State can fulfill the requirements of the law.

I wish now to take up the expenditure of Federal funds. In order to simplify the fiscal operation of the law and the inspection of the work, we have limited the expenditure of Federal funds to the salaries of lookout watchmen and patrolmen, preferably the former. It is felt that where lookout stations are feasible they constitute one of the most effective means of fire prevention; moreover, in many cases the watchmen are on continuous duty throughout the fire season, and thus expenditures limited to their salaries tend still further to simplify the cooperation. It is for these reasons primarily that this limitation has been imposed wherever it has been possible and practicable to do so.

Mr. COX. I hope this policy of limiting the expenditures to the employment of lookout watchmen only will not be extended to include the whole of the cooperative territory, because in Minnesota it will only work well in the northeastern part of the State, which is a mountainous country, where the conditions are practically the same as in the Adirondacks in New York. In northern and western Minnesota, however, the conditions are very different, the country being fairly level. Fire protection there must be done by patrol on an extensive scale. The protective force has a large territory to cover, and the men have to keep on the move; they have to hunt for the fires, which, as a rule, do not spread rapidly. Generally, fires can not be seen far enough off from a lookout for it to be effective even if a man is stationed there permanently.

Mr. PETERS. I am glad you brought up that point, because it raises the question as to why we include some sections of country and exclude others. Our policy has been to limit Federal expenditures to the salaries of lookout watchmen only in country whose topography is such as to make the establishment of lookout stations practicable, provided at the same time the effectiveness of the State's protective plan is not lowered by such limitation. It has worked no hardship in some States—for example, as Maine, Massachusetts, and New York. In others, where the establishment of lookout stations on a comprehensive scale has not been possible, the restriction has been imposed only in part. In Connecticut and New Jersey but 25 per cent of the Federal expenditures will be for watchmen's salaries. In New Hampshire a unique situation exists, in that a special appropriation is made by the State for the maintenance of lookout stations, and it can not be used for any other purpose. For this reason, although the northern part of the State is covered by an extensive system of lookouts, we have estimated that but 25 per cent of the Federal expenditures would be a fair proportion to require the State to devote to watchmen's salaries. In Vermont the law practically makes the State itself liable for all watchmen's salaries.

In the States where protective work on a comprehensive scale is just being started, as, for example, in Maryland and Kentucky, we would not be justified in limiting the Federal expenditures to the salaries of lookout watchmen; and in the Lake States and the Pacific Northwest the topography is such that lookout stations equipped for

continuous operation are usually not practicable. However, while the restriction is not being imposed upon these States, we are requesting our collaborators to place on the Federal pay roll the lookout watchmen employed on the cooperative watersheds.

Mr. ELLIOTT. In Oregon we are equipping some of our lookouts with telephones, and we expect to keep the patrolmen on these lookouts as much as possible, but we, of course, want to be able to use the men on trail or patrol work whenever it becomes desirable to do so. We would not want to be restricted as regards their employment in a year like the past one, which was very favorable for protection work. We did not allow the men to sit around in the lookouts, but we used them in building trails. We got some 58 miles of trail built and 178 miles of old trail opened up by these men.

Mr. PATTIS. Mr. Peters, do you have any regulation with regard to the maximum salary of the Federal employees?

Mr. PETERS. No; we leave that to the collaborator, with the understanding that the normal wage rate in the region will be paid.

Let us now consider the amendments to last year's agreement,¹ which have been proposed: The first amendment is an entirely new section, No. 5, which reads as follows:

5. This agreement contemplates the employment under ordinary conditions of fire hazard of not to exceed ——— Federal patrolmen, or in case of emergency of not to exceed ——— Federal patrolmen in the discretion of the collaborator, provided that in case of serious emergency the latter number may be increased with the approval of the Forester.

By requiring the number of patrolmen which will be employed at any one time to be specified, this amendment provides for a definite program of Federal expenditure for the State to follow throughout a normal fire season. It is designed to prevent the Federal allotment from being used up within a short period, but rather to insure its distribution throughout the entire danger season. We are endeavoring to secure permanent protection in this work. While we are anxious to help every State meet the emergency of a particular season so far as our funds will permit, we are aiming higher than that; we are aiming at developing and assisting the States to develop a permanent protective system that shall, so far as our side goes, measure up to the needs of that State and the practical conditions on the ground. For that reason we are encouraging the use of our funds, in some cases, for a permanent lookout system, and through the amendment I have just read we are asking the States, so far as the use of our funds is concerned, to outline a permanent basis of protection.

The next amendment is the last sentence of section 7; which reads as follows:

This agreement contemplates an expenditure of State funds of at least ——— dollars (\$———); and in the event of such expenditure falling below said amount the Federal expenditure will be decreased proportionately.

The purpose of this amendment is to cause the expenditures of Federal and State funds to be made in the same proportion. The State specifies the amount of its own funds which will be available for expenditure on the cooperative watersheds; if, owing to favorable conditions, this expenditure is not reached, then the Federal allotment will only be expended in the same proportion. The outlay by the

¹A copy of the agreement as amended is contained in the Appendix, p. 78.

State may include the approximate charges for administration, as well as for preventive measures, such as patrol, lookout work, telephone construction, and trail building, and for fire fighting.

The third and last amendment of importance is the first paragraph of section 13, which reads as follows:

13. This agreement shall become effective on the — day of ———, 191—, and shall continue in force thereafter, subject, nevertheless, to the availability of funds appropriated by Congress by the act of March 1, 1911, for the purposes herein mentioned, and to any amendments which may be made thereof by mutual agreement of the parties; and it is expressly understood that this agreement or any modification hereof may be terminated by either party upon thirty (30) days' written notice to the other.

This clause provides for a continuous agreement which may be amended in any particular at any time. The making of a new agreement each year will thus be obviated, while the calendar year feature of the old form of agreement has been preserved in section 7, line 1. The amount of allotment and any other figures will remain the same from year to year unless the agreement is amended.

We will now pass to the subject of employment of Federal men. We wish in the administration of this law to limit the employment of these men to patrol or lookout duties primarily, and we do not want them to be employed chiefly for the construction of improvements. When in the judgment of the collaborator the danger season has begun, he may employ Federal men for patrol or lookout purposes throughout the entire season if necessary. If at any time during the season lookout or patrol work is not necessary, he may employ the men in the construction of improvements, such as lookout stations, telephone lines, cabins, trails, or other fire-preventive measures. If Federal men are paid for continuous work, they must be employed continuously in order that there may be no criticism by the public that these men are not working steadily. We feel, therefore, that the States in which Federal men are paid continuously should supply the Forest Service, in advance of the fire season, with a definite plan of improvement work, showing as nearly as possible how the men will be employed during the periods when lookout and patrol duty may not be necessary. The statement will only have to be in enough detail to show that the work proposed will be sufficient to keep the men busy during the favorable periods of an average fire season. This requirement will apply primarily to the work of patrolmen; the lookout watchmen, especially those stationed in the rougher regions, will ordinarily be kept busy repairing the lookout property and clearing trails.

I would like to ask the collaborators whether the restriction of employing Federal men primarily for lookout or patrol duty prevents our getting the most out of this law, or should that restriction be modified?

Mr. Cox. I do not think that it interferes seriously at all. In Minnesota we sometimes have long periods when patrol is not necessary or when the lookout watchmen can leave their posts; there is plenty of construction work to be done to which they can be transferred.

Mr. ELLIOTT. It has not interfered with us in Oregon at all. We have not only used them on improvement work during the rainy season, but also during short rainy periods in the extremely dry season.

In case of a drying east wind they were put on patrol again in half a day's time. I keep what I call a supervising warden looking after them and directing their work, and whenever there is the opportunity we put them on trail or telephone work. Again, we also use them in slash burning. This restriction has not been any detriment to us.

Mr. PETERS. Gentlemen, is there any objection to the policy of the Forest Service in requiring that Federal employees be given written instructions concerning their duties? This requirement has been very thoroughly tried out in the two years' administration of the law, and has proved generally effective by giving the men a definite idea of the work they are to do.

Are there any questions as to the authority which has been given the collaborators? We wish it to be clearly understood that they are to have as much authority as possible. We have aimed to give them considerable latitude, and at the same time to hold them accountable for results. We have endeavored to eliminate red tape wherever it has been possible to do so.

Regarding cooperation from private owners, we feel that where private lands are being protected the owners themselves should supply a reasonable amount of active assistance through the hire of patrolmen, the construction of lookouts, or other protective measures.

In the prevention of railroad fires it is felt that Federal funds should not be used for the purpose indefinitely, and that the Federal Government should withdraw from protecting the railroads as soon as it can consistently do so, without decreasing the efficiency of the State's protective work. We do not insist upon this immediately, but we ask the State to secure active cooperation from the railroads as soon as possible. The Forest Service might assist some of the States in getting more action from the railroads themselves, or in securing better railroad legislation, by making it known that the service will not permit the expenditure of Federal money indefinitely on work which the railroads ought to do themselves. That is our only object in this matter. We do not want to prevent the best returns in actual safety for the use of Federal money. If the demands of certain States at present require that it shall be spent in patrolling railroads, we are willing to have it done. Sooner or later the railroads all over the country ought to be doing what some of the more progressive ones are now doing voluntarily, or what some of them are doing in States where there is stronger legislation on this subject. I would like to know if it is going to work out that way.

Mr. Cox. I should think that would be a pretty good plan. You will remember last year you sent out some instructions in regard to cooperation by lumber companies. I think there is far more reason for enforcing restrictions on the part of the railroads because, with us, the lumber companies have cut their valuable timber and a great many of them own stumpage only. Since they have no interest in the land, they can hardly be expected to get busy on a large scale patrolling it, but the railroad companies certainly can, because it can be easily proven that it is a profitable proposition for them right from the start.

I was wondering just how far you are willing to go in expending money for the inspection of railroad fire protection. We have used

some of our patrolmen more as inspectors of patrols than as patrolmen, and very often they look after railroad patrolmen.

Mr. PETERS. I believe that to be a thoroughly justifiable use of Federal funds. If the railroad is doing the work and cooperating with you, there is no reason, in my judgment, why our money can not be spent for the inspection of that work.

Mr. FILLEY. In Connecticut it was brought to the attention of the railroads this past fall that Government funds had been used on what should be railroad work, with the idea of showing them what they could do not only to help the State but to save money themselves. As a result the chief engineer of the New York, New Haven & Hartford Railroad has asked me to present a report of the patrol work in the past year, showing what the patrols accomplished, how much the work cost, and my recommendations for similar work on the part of the railroad. I think the railroad company will take it up next year on these grounds. It seems to me we could consult with the Forest Service to advantage on railroad legislation, and also make use of the Forest Service statistics in regard to railroad fires and railroad work in other States. I have just learned of railroad work in other States which I did not know of before, and which, I think, if brought to the attention of the railroads in Connecticut, might be of considerable assistance in securing their cooperation.

Mr. HAWES. I would like to be able to spend money on railroad patrols for a year or so longer, for our railroad officials have not become fully educated, and perhaps are more backward than those of some other States. We persuaded the Central Vermont Railroad to furnish passes for our Federal patrolmen last year so that they could go over the dangerous portions of the road as much as they needed. I hope that other railroads will make similar provision this summer, and that in this way we can gradually educate them to the value of a patrol. The railroads have thus far effectively opposed any legislation looking toward requiring spark arresters and similar devices.

Mr. BESLEY. In Maryland we have a great many railroad lines going through the State, and we have been collecting statistics for some time to convince them that they are responsible for a great many of the fires. I think we have convinced them that they are a great source of danger, for they assured us of their desire to cooperate. A year ago last fall one railroad went to the extent of establishing a patrol along its line, and I think it was well satisfied with the result. Others have instructed their men to put out any fires that occur anywhere near the right of way, regardless of whether they started the fires or not. We told the railroads, after we had collected our statistics, that they were responsible for a great many fires and it was up to them to reduce the danger by having fire lines constructed or by employing a patrol. We also told them that if they did not do this, we would feel it necessary to keep a pretty close watch along their lines with the idea of showing exactly how far they were responsible. We have kept in touch with those whose property has been damaged by railroad fires, calling their attention to the fact that the forest law offered them redress, and encouraging them to use this law to the fullest extent.

The Pennsylvania Railroad has in some parts of the State constructed fire lines; that is to say, they have cleared back from the track quite a distance. They are carrying on that work, I understand, in all places where there is no objection on the part of the landowners to having the debris cleaned up and burned. So I think as far as Maryland is concerned we have the railroads with us, and I do not think that it will be necessary to have any further legislation on that subject.

Mr. PETERS. Is there anything further to be said concerning co-operation with private owners or railroads?

Mr. MOWRY. I would like to know the nature and extent of private cooperative work required.

Mr. PETERS. We do not require it; we only feel justified in encouraging it. It may include the hire of patrolmen, the construction of lockouts and trails, or other effective protective measures. Take your own State—Rhode Island—as an example, where the forests are largely in woodlots. The owner in going the rounds of his property, whether a farm or an estate, is at the same time protecting his woodlot. That is a phase of patrol work by the private owner, unconsciously done to be sure, which we will recognize.

Mr. HOLMES. Would you prefer that the Federal money be used in counties where the sentiment is strongly against forest fires than in counties where the people are indifferent?

Mr. PETERS. By no means. I believe that would be a very short-sighted policy to adopt. We want private owners to cooperate, and we feel that it is up to the collaborators to secure cooperation from them, if possible. But we certainly do not want to enforce the requirement to the extent of decreasing the efficiency of the State's protective work.

Mr. HOLMES. Where there is any question about using the money, would it be preferable to expend it where the owners are anxious to have us do so and are at the same time willing to do their share of protecting their own property, other things being equal?

Mr. PETERS. Yes. You understand that after a State has received a given allotment, the State forester may use his discretion in spending that allotment within the approved watersheds, and this question of the extent of cooperation of private owners will be considered by the Service in making the allotment.

Mr. GREELEY. We have started out with the fundamental idea that the primary purpose of this law is education. We can not expect to stop all the fires in the United States with \$200,000, and of course we would not try to do so. What we are trying to do is to demonstrate what can be accomplished, and to assist the various protective agencies. In order to make this campaign effective, we have felt we should do something to insist that all of the people who have interests at stake should come into line. We can not lay down a definite ground as to just what they should do, but we feel that they should do something. As in the case of the railroads, we have made it our policy, in scrutinizing the plans which each collaborator presents to us, to ask him for a statement as to how much private owners are contributing and what they are doing. We feel that possibly in that way we might help the State in bringing private

owners into line. I would like the judgment of the collaborators as to how far we should go.

Mr. WILBER. It seems to me that is a point which ought to be left to the men handling the work, because you will find one owner coming in gladly on all sorts of work of that kind while others will not. I have in mind one big estate of about 40,000 acres in New Jersey on which we have been trying to put a lookout station for two years. The owners do not see it our way at all, and it seems to me if we must tell them that this help will be withdrawn from their area if they do not cooperate we are likely to stir up antagonism in a way that will injure us more than it will do us good. On the other hand, if we can go on as we have been in the past two years, running a patrol there and stopping 10 or 15 fires a month, I think we can educate them to our point of view. In our territory I would rather have the coercive feature left more as a discretionary one than to be compelled to club the owners into cooperation with us or drop work on or near their property.

Mr. GREELEY. In other words, you hold the school of educating them with love rather than with a switch?

Mr. WILBER. I think it is more effective.

Mr. ELLIOTT. There is another side to that. For instance, in Oregon we have one county in which there is a great fire risk and there are no large timber holders—no one who has enough timber to justify him in hiring a regular patrolman—and there are absolutely no hired patrolmen in that county except those whom the State hires with the State and Federal funds. Last spring we had a letter from the Forest Service to the effect that we should help especially the timberland owners who were helping themselves, so I went to the county court of this county and put the proposition up to the county something like this: I will put three Federal patrolmen in your country and also our State man, the supervising warden, and I want you not only to furnish your road supervisors as patrolmen but I want you to give them authority to put out the fires at the county's expense; otherwise, under the restrictions from the Forest Service, I do not feel justified in putting in these three patrolmen. They took up the proposition, and so we had an agreement there that in case they did have fires the county funds would be used to put them out. I think that is a splendid example of cooperation, and that is something which we decided should be encouraged.

Mr. GREELEY. Regardless of what Mr. Wilbur says, I think the switch is sometimes effective. How does that meet with your approval, Mr. Cox?

Mr. Cox. I do not believe that anything more is needed than we have. I think both methods must be used. In some cases the more peaceable method seems most effective, in others the club is necessary. That instance cited in Oregon seems to me a mighty good one. In Minnesota the local people have frequently taken up this fire problem in a surprising way, and have gone much further than we supposed was possible. In some sections of the State you could not get them interested in it at all. It seems strange there should be such a difference; some communities have practically taken the burden off of our hands and we can readjust our pay roll force for that reason. It is a matter of education pretty largely, and I think it is up to our

patrolmen to devote a good deal of thought and effort to instilling into the local people the whole idea of the thing. Let them see clearly the object of the work and convince them of its value and I think we will save ourselves a whole lot of work.

The session then adjourned.

PATROL.

The afternoon session of the conference was called to order by A. F. Hawes, State forester of Vermont, acting as chairman, at 1.30 o'clock.

The first subject was "Patrol." W. T. Cox, State forester of Minnesota, was called upon to open the discussion.

GENTLEMEN: It is my purpose to tell you briefly of the situation in Minnesota with regard to fire patrol. After the big fire in 1894, Minnesota passed some legislation looking to the better protection of the woods, and rather an advanced law for that time was enacted. It made township officers fire wardens, and the State had for years practically the same system that has been tried out in many other States. However, the system gradually worked into politics, and there were never any adequate appropriations made for its support. Something further was needed to awaken the people, and it was had in the disastrous Beaudette fire of two years ago. The next legislature enacted a new forest law, which is a very comprehensive one. This law provided for a new State department—the forest service—and in order to get it out of politics as far as possible a forestry board was established, which includes the dean of the agricultural college and the director of the forest school of the State university, two members recommended by the board of regents of the university, two by the Minnesota Forestry Association, and one each by the State Agricultural Society, the State Horticultural Society, and the State game and fish commission. The law further provided that the board should select a State forester, who should be a trained forester and who should select his own assistants in the office and in the field. Thus we were given a free hand to select the men and organize the field work, and as a result succeeded in getting a good force of rangers. Our system has been in operation two years.

There are 28,000,000 acres of forest land in the State, of which 20,000,000 acres are really in need of fire protection, the remainder being included in the hardwood country, where there is no great danger of fire, and in the National Forests and Indian reservations, which are already protected and where State rangers are not needed. These 20,000,000 acres we divided into 20 ranger districts. Under each district ranger there is a force of State patrolmen, and on the Weeks-law cooperative areas an additional force of Federal patrolmen. We look to the rangers to select these men. On the start we held an examination. While we are not under civil service, and did not have authority under the law for holding the examination, it seemed a good plan in order to head off the various recommendations which are made. As a result of this examination, a force of efficient men was obtained.

The Federal cooperative fund has been of great assistance to us. It can be expended on most of the forest areas of the State; there is

only a small territory in the northeast, draining directly into Lake Superior, in which we are prevented from using it.

In addition to the State patrolmen, the law provides for various other kinds of patrol; for instance, the organized towns are authorized to vote a tax, not exceeding 5 mills, for fire protection. Over 60 organized towns have voted this tax and provided patrolmen, who must be approved by our district rangers and given appointments by the State forest service. These men work under the rangers and fit into the organization as if they were State men.

Furthermore, the railroads put on patrolmen as called for. The State service has great power to compel the railroads to put on as many patrolmen as are necessary. We call on the district ranger to let us know how many men there should be along a certain railroad running through his district, where they shall be placed, and how equipped. We then call on the railroad company to comply with our request for these men and to maintain them on duty as long as the ranger deems necessary. As a result the railroads have on duty during the fire seasons in the spring and fall something like 200 men in the northern part of the State.

The lumber companies have also put on patrolmen. As a rule, the companies in Minnesota do not own large areas of valuable timber land. They buy timber stumpage in small lots from settlers and others. Many of the larger holdings are cut—at least the pine has been cut off—and the companies do not feel justified in spending money on a basis of acreage, as is done in the Pacific Northwest. However, all of them have camps, dams, and the like scattered over their holdings, where they maintain watchers throughout the summer. These watchers and a few additional men employed for patrol purposes are given instructions to comply with our rangers' requests as to protecting certain districts: in this way they fit into our organization and relieve us of a great deal of the burden of patrol.

The rural mail carriers, as a result of the arrangement which the Federal Forest Service worked out with the postal authorities,¹ were of considerable assistance in the southern and central part of the State, and also helped the rangers in the northern districts to some extent.

The patrol force, considering that it must be distributed over 20,000,000 acres, is only a skeleton force, and the men must be so placed as to do the most effective work of fire protection. We find that it is more effective to place our men on the border of settlements along routes of travel and where there is really danger of fire than to have them patrol districts where a few people go in the summer time or in the fire season. Thus, while on paper it averages something like 280,000 acres to the man, our men actually patrol about 80,000 to 100,000 acres, and there are large districts in which there are no patrols. With more men we could, of course, get much better results.

It is important that the patrolman know the district sufficiently to go around easily and take advantage of the lay of the country. I believe that an outsider is the right man for the head patrolman, though a local man can very often be employed to look after towers

¹ A copy of the Post Office Department's order concerning the reporting of forest fires by rural mail carriers is contained in the Appendix, p. 79.

and similar improvements. In my opinion the rangers should have wide discretion in selecting and directing their patrolmen. The ranger has a large enough territory from which to pick his men and to switch them around, so that they are not really local men.

The patrolmen have been helped a good deal in certain parts of the State by "rural fire brigades." The rangers have gone into these little communities and have been instrumental in organizing forces of men comparable to the fire brigades in villages—volunteer brigades. A captain is selected in each case and definite plans are made for action in case a fire is discovered or reported. The patrolman is thus relieved to that extent, though, of course, if he were in reach he would have charge of the fire fighting.

Returning to the railroad feature—a very important one with us—in northern Minnesota, as in most timber countries, wherever the railroad penetrates the forest there is a strip on each side extending back from 5 to 15 miles where the country is badly burned up. This is true even where settlement is lacking. At a greater distance than that, as a rule, the conditions are very favorable to forest reproduction. Therefore we feel that it is the duty and responsibility of railroad companies to look after their own fire troubles, and they are finally beginning to come to that point of view themselves. We have had a number of meetings with the chief officers of the companies, and some companies favored the plan of putting an immediate end to the fire problem; others, however, were more dilatory about it, but have gradually come into line. While there is a provision of law which requires the maintenance of railroad patrols, we do not want to use the club any more than we can help. We feel that if we can get them to see the reason for the work and the benefit of it we will get better results. Owing to the way in which the railroad company is organized, it is mighty hard to force anything on it, because the responsibility can be easily shifted.

There are about 30 railroad organizations in the State, of which 8 or 10 are important. There are single companies in the State which have paid out \$400,000 a year damages as a result of forest fires, and there is no doubt that they could have prevented that loss absolutely by an expenditure of \$10,000 a year. That kind of argument appeals to them, and they are beginning to take hold of it. The general manager of one of the large companies announced at one of our meetings that he had looked into the matter thoroughly and was convinced that his company could have afforded to have covered the entire right of way 8 inches deep with gravel and would have been ahead at the end of two years. There is a suit now pending against the Canadian Northern Railroad for \$2,500,000 as a result of fires in 1910; they could do considerable in the way of fire protection for that amount.

We are using patrolmen more and more as inspectors and educators, because, after all, the number of fires that they detect and put out is very small compared with the number that could be extinguished by the average citizen, the settler, or campers going through the country. Therefore the thing for the patrolman to do is to educate the public to the idea that there is a force of men permanently employed to look after this work, and that it is worth doing. There is a notion in the minds of many people that the young forest is worthless; this should

be overcome. If people think that the young growing pine has no value, they will not make much of an effort to protect it; but if they realize that it represents an asset of from \$10 to \$20 an acre they will view it in a very different light. Back from the burned areas along the railroads, especially in northern Minnesota, there are numerous young forests—hundreds of thousands of acres of as pretty stands of young white and Norway pine as one would wish to see. Of course, that kind of forest has a value, even if the trees are very small; and as soon as the public appreciates such property we are going to have less trouble with fires.

We have equipped the patrolmen in various ways. In the more settled parts of the State we have in some instances furnished horses. In case the patrolmen furnish their own horses the service pays one-half the cost of maintaining them. In the northeastern section of the State we have supplied canoes, which are the common mode of travel there. We have also furnished launches for some of the lakes and larger streams, and in this way enabled one man to do the work of two or three. A great many cabins, lookout towers, and shelters have been erected. For shelters we frequently get the heavy 20-ounce canvas used in pulp mills. In the matter of lookouts we follow a somewhat different plan from that used in the East. In the Adirondacks the observation station is a place where a man stays. With us most of the lookouts are erected on some hill along a trail or canoe route, and they are climbed merely as the patrolmen come to that part of their beat, or if there is a settler or fisherman living in the vicinity we pay him to climb the tower regularly during the fire season and get word to the patrolman in case of fire.

With regard to the telephone proposition we have gone at this also in a little different way from most of you. As I understand it, in the East you have built telephones mainly to the permanent observation stations, which, of course, is the proper thing there. In our case, where there is no one living at the lookouts, we find it more advisable to build telephone lines into the remote settlements. In the northern part of the State there are settlements scattered 20 and 30 miles apart. Some of them are 30 miles from the nearest wagon roads, necessitating our getting into communication with them by wire, and we have built in one case a telephone line that is nearly 100 miles long. Here again we rely on the cooperation of settlers, lumber companies, and others in the region to help us out. We furnish the wire and supervise the work; the settlers and lumber companies do the work, putting up the poles and getting the line in operation. The patrolmen maintain it.

One-half of the State appropriation, or about \$40,000, is set aside for strictly patrol work. So far we have laid a lot of stress on the educational feature, as I do not believe it can be over-emphasized in the beginning of such a work as we have in Minnesota. After the service becomes well organized and the people know more about the nature of the work it will be proper to devote two-thirds or more of our appropriation to patrol.

We hope to have a greater force of patrolmen in the future. The legislature is in session now and we are asking for a larger appropriation, which I think there is fair hope of getting.

C. P. WILBER, State fire warden of New Jersey, was next called on and spoke as follows:

GENTLEMEN: First, I want to outline the situation we have to meet in north Jersey, because that is the only part of the State where we can use Federal funds. The whole territory there is within two or three hours' ride by railroad from the metropolitan district. It is commonly called "New York's playground," and includes all the well-known New Jersey mountain and lake resorts. Furthermore, Jersey City, Newark, Paterson, and the large manufacturing centers, where there are many foreigners—the most careless type—who go into the woods in crowds on Sunday, are nearby. There are also a large number of permanent residents throughout the region.

The whole State is gridironed with one of the best systems of roads in the United States, which draws automobilists from all of the New England States, New York, and Pennsylvania; besides there are some 75,000 automobiles in New Jersey. These people are continually passing through the territory, and it is impossible to watch them. Furthermore, the whole country is criss-crossed by railroads. Most of them are coal-carrying roads that have very heavy hauls and heavy grades, which increase the fire danger. In addition, fully half of the gunning around the New York district is done in north Jersey. Trains will stop nearly anywhere to drop sportsmen off, and there is no adequate way to reach them as they go into the woods.

Thus, we have a territory that must be handled differently from sections where there is a large area of woodland sparsely settled and remote. We must prepare for a large body of people all the time. We also must provide for the class of people who go out from the cities on Sundays and holidays, the greater part of whom we can not keep track of. There seems no way, except through general educational work, to reach them. A great many people who come into the territory are from outside of the State. They have no personal or property interest in the work we are doing, and can not be reached as can our own citizens for either education or penalty.

The only way we have found to cope with the problem is by endeavoring to penalize the people who start the fires. We put particular emphasis on getting the offender. If we can make a man pay a fine for starting a small fire, and the fact gets into the newspapers, it makes an impression on the people who frequent or use the forest. I believe we have done the greatest part of our educational work by making it expensive to start fires.

The State organization in north Jersey consists of a division fire warden as an assistant to the State fire warden and a township warden in each township where there is any appreciable amount of woodland, in addition to enough district wardens to adequately control the area. The aim is to assign a warden to each 5,000 acres of land. This force is composed of local men, who receive a small annual fee of \$10 or \$20 besides the money paid them for actually fighting fires. It is, therefore, a good deal of a voluntary service. These men, as soon as they hear of a fire, get together enough men to take care of it. They have authority to require assistance. Such work is entirely in their hands, and the results through the local organization in this territory indicate that we can rely upon the system.

In handling the Federal fire patrol work I did not know in the beginning how to go at it, because it seemed almost useless to put patrolmen on a road and have them walk 15 or 20 miles a day, if they could cover that much, and leave perhaps 150 miles of road absolutely without patrol.

Our idea first, in the fall of 1911, was to use a large number of men and cover the whole territory for a short period. We did so for two months with about 40 men, and had very few fires, but since the season was wetter than usual, the effectiveness of this plan was not fairly tried out. In 1912 it was evident that we could not afford such a patrol. Further, it appeared that we were not getting enough value from so large a number of men, outside of the publicity feature, to justify such expenditure. Therefore, during the past summer we used from six to eight men at particularly dangerous points where there had been a large number of fires heretofore, principally along the railroads. They patrolled an area of from 4 to 6 miles each, and together they handled as high as 31 fires a month, stopping them entirely unaided and in only one case allowing a fire to get enough headway to require a call for help. It was purely railroad patrol, and I feel that its continuance is not justified. I think, however, it will help us in getting a grip on the north Jersey roads, some of which claim there is no use in patrol. I have not yet had an opportunity to work up the data these men collected, but I think the greatest value of the work will be in showing the railroads that they are setting enough fires to make it worth their while to watch them.

We are placing particular emphasis on holding the railroads liable for the fires they start and enforcing money penalties. We do not collect a large fine, but require the railroads to pay the costs of extinguishment, a great deal in the same way that Connecticut does. This sum is getting larger each year on the northern roads, and probably in time we will be able to put enough pressure on them to look at the fire problem from a practical standpoint, as Mr. Cox has done in Minnesota.

In the fall of 1912 we determined to continue with the small force, but put them in the woods. Most of them had routes covering about 33 miles of road and trail, and the territory was covered in from one to three days. They were picked largely from the 40 men employed the previous year, and we found that we did not have to inspect them continuously to secure conscientious work. They were seen on an average of once a week from September until the last of November, and we found no case where a man had shirked the work. They were told to watch for fires, and in no case to try to fight large ones. If they saw a fire they were to get the township wardens to it and then go on. Special emphasis was laid on the necessity for arresting offenders against the fire laws and penalizing them. There were, however, no arrests, and in two and one-half months there were but five fires per man reported.

I am pretty thoroughly satisfied that in northern New Jersey a patrol system is too expensive a method of protection. I think in a territory of this kind, so accessible to large centers of population, and where the people go into the woods, the lookout system is probably the only one that will pay in the end.

So far we have not been able to do much lookout work in north Jersey, except where in two places we found local families some

members of which would climb a tower six or eight times a day. One of our greatest difficulties in installing lookouts is that there is no telephone communication over large areas. It is localized in the towns, in the large cities, and along the railroads. Our wardens are scattered through the more remote districts, where the State can not afford to put in and private interest is not sufficient to support such service. However, the building of new lines is being extended through the initiative of the telephone companies themselves at every opportunity, with our interest and assistance. When we get such service I am confident that we can put in a lookout system in the northern part of the State which will cover the territory very satisfactorily, leaving the actual fire fighting and what little patrol is necessary to the local wardens themselves.

F. W. BESLEY, State forester of Maryland. was then called upon, and gave the following talk:

GENTLEMEN: Our problem in Maryland is quite different in many respects from the problems in Minnesota and New Jersey.

Cooperative work under the Weeks law is being conducted in the western half of the State, which includes the Appalachian and Piedmont regions. In the Appalachian region there are a few large holdings of timberland, but for the most part the holdings are relatively small. The Federal patrolmen are employed in this region exclusively. In the Piedmont region the holdings are mostly in wood lots; our work there has been largely in the nature of educating the public in fire prevention.

The fire season in the State is confined to two relatively definite periods—one in the spring, from about April 1 to May 15, and another in the fall, from about September 15 to December 15. This enables us to concentrate our efforts and reduce the cost of protection. In certain sections, especially in the wood-lot section, the spring fires are the most common ones and do the most damage. They result largely from brush burning, incident to clearing land. The larger fires, however, usually occur in the fall, in the mountain section.

Our protective system consists of forest wardens, forest patrolmen, and lookout watchmen. The wardens are commissioned by the governor, upon the recommendation of the State forester, the law limiting us to the appointment of not more than one warden for each 15,000 acres of woodlands in the county. The wardens receive no salary, but are paid for services rendered, half by the State and half by the county. Since under our law there are no restrictions in the appointment of the wardens, except as to number, we have been able to select men who would make the best officers, most of them actuated by a high sense of public duty. The chief difficulty is that they are too far apart, and in order to overcome this we are appointing deputies for each warden, with the view of having the men within 2 or 3 miles of each other.

The patrolmen, all of whom are Federal employees, are regularly commissioned forest wardens, assigned to patrol duty. They are usually farmers who know everybody in the community and who understand the local situation thoroughly. These men are assigned a territory covering from 85,000 to 100,000 acres each, and, as far as possible, they travel along the ridges, where a good view of the sur-

rounding country can be obtained. They are mounted on horses, in which respect our system appears to be different from that of other States. The patrolman furnishes his horse and receives \$3 per diem when actually employed, and his patrol is limited to days when it is dry enough for fires to run in the woods. This usually amounts to from 50 to 60 days during the year. By paying a dollar a day more for a mounted patrolman than for one on foot the efficiency, I believe, is at least doubled. There are roads and trails all through the mountains, so that it is possible for a man on horseback to reach about any point desired. He can also cover a much larger territory, and in case a fire is discovered some distance away he can reach the point quickly and get together a force of men with little delay. Our woodlands are not in large, continuous bodies as in the North, and the country is more thickly settled. We find that one of the greatest accomplishments of our patrol service is in showing the people the importance of fire protection. The patrolman is instructed to confer with the property owners in his district and to warn those who are likely to be careless in the burning of brush and the escape of fire. He also visits the school houses to secure the cooperation of the teachers and children in educating the public of the need of fire prevention. The people of this section have become impressed with the importance of the work, because they see the active interest which the State and the Federal Governments are taking in it.

The lookout watchmen aid very materially in the fire-protection plan. We have a number of lookout stations in the mountains. Each one has a telephone connection with the forest wardens, so that a forest fire is quickly observed and reported to the nearest warden. We have found that under this system the fires have not only been reduced in number, but the average area burned over by each fire is very much less than before the system was inaugurated.

In addition to the regular lookout stations there are a number of good observation points where we employ men living near by to make three observations daily during the dangerous seasons, for which they are paid 50 cents a day. We find that this arrangement works very well and saves the expense of a regular station where we would not be justified in having an all-day lookout.

In regard to cooperation with private owners, we have not been able to secure any from the larger owners of timberland, while we have gotten considerable from the smaller owners of wood lots. Our forest law requires that each owner shall, to the extent of his ability, control fires that may burn on his own land. When a fire occurs it is the duty of the forest warden to go at once to it and see that the owner and the help that he may have on the place are doing what they can to extinguish the fire. If the force at hand, with the help of the warden, is not sufficient, then the warden is authorized to employ additional help at the expense of the State and county, each paying half. It is, therefore, the intent of the law that the State fire-protection work shall be supplementary to private effort. In the case of the large nonresident owner, who frequently has no one available for fire fighting and yet who should be just as responsible for the protection of his own land as the resident owner, we have considerable difficulty in having the spirit of the law strictly observed. As a matter of course, we do not discriminate in our efforts

to protect any forest land, but in justice to all taxpayers we feel that the whole burden of protecting the lands of nonresident owners should not be borne entirely by the State and county. We have concluded that the spirit of the law would be properly carried out if each owner of as much as 500 acres of woodland would agree to have one man on the place available for fire fighting, to be paid by him, and an extra man for each additional 500 acres up to 5,000 acres, and for each 1,000 acres in excess of 5,000. One large company has practically accepted this arrangement, and another is, I believe, willing to carry it out, though unwilling to enter into an agreement with us. Some have refused, and many others are undecided. Public sentiment, however, is being worked up and will, I believe, eventually bring some of the doubtful ones into line.

This, in the main, covers our system. We have but few features not found in other States. Under our conditions, where the woodland is in relatively small areas and where the timber is practically all hardwood and is in consequence liable to surface fires only, there is not the need for so extensive a system as is required in the North. The fact that the dangerous season is restricted to three or four months makes it possible for us to concentrate our efforts in fire protection to a small part of the year.

COOPERATION WITH PRIVATE OWNERS.

E. T. ALLEN, forester of the Western Forestry and Conservation Association, led the discussion of this subject with the following address:

GENTLEMEN: Mr. Peters has suggested that I discuss cooperative private work, rather than the Weeks law, in order to help, perhaps, in your attempts to start private organizations in your own States.

The Western Forestry and Conservation Association is a league of such local associations throughout the five Pacific States. It does not do field fire work itself. The first locals to ally in this way were the four Idaho patrol associations that were also the pioneers in cooperative patrol in the United States. They soon joined with a western Washington association, and, as cooperative patrol spread, we took in Montana, Oregon, and California organizations.

Except in Idaho, where the law places State cooperation upon an acreage basis, the methods and organization principles of all these locals are very similar. They are patrol and fire-fighting systems financed by uniform acre assessments upon their members and cooperating with county, State, and Government to the extent possible under the local conditions of these public agencies. As a rule they have the usual officers, with a standing fire committee and a chief fire warden. In contributing acreage they vary from 50,000 to 3,000,000 acres, and the territory patrolled usually is two to three times the contributing acreage because of scattered holdings. The total patrolled by our 14 active constituents is about 20,000,000 acres, and the total expenditure for all purposes runs from \$200,000 to \$700,000 a year, according to seasonal hazard. This maintains about 450 regular wardens, a shifting force of temporary men and fire fighters, and yearly increasing trail and telephone systems. It protects approximately 500,000,000 feet of timber, about a fifth of

the Nation's entire supply. Aggregate losses have ranged from about one-hundredth of 1 per cent in easy years to perhaps one-fourth of 1 per cent in 1910, the worst year in history. Assessments vary with locality and season, ranging from 1 to 15 cents, with an average of perhaps 3 cents.

In Idaho there is no State forest administration other than that afforded through the land board, but there is a law under which timber owners may organize fire districts and have their warden given police power. The State itself is a timber owner, so it joins the association in each district and pays upon its acreage exactly like the rest. In Washington the association does most of the patrolling, while the State helps pay for fire fighting. In Oregon the State appoints and pays the district wardens nominated by the associations and the latter furnish subordinates. In Idaho and Oregon Weeks-law rangers work directly in these State-private combinations. In Washington, the bond being less, they are under the State only, but are stationed so as to dovetail into a related patrol system. In Montana the cooperation is rather less systematic still. In all four States there is systematic private and State cooperation with the Forest Service, varying in method. California, having no State fire work and only one small private fire association, offers little that would interest you except an increasing tendency to place private lands within National Forests under Federal protection, toward which the owners contribute.

But while these local associations exist primarily for actual field fire work, one of their results, and the object of their alliance almost wholly, is the strengthening of the whole protective movement with such elements as the public legislative bodies and nonprogressive lumbermen. A warden cautioning a settler or a logger to improve dangerous conditions or prosecuting an offender is immensely stronger with a broad, useful organization back of him than he would be as the employee of one timber owner. An association that can show its own liberal expenditure and practical results has an unquestionable right to suggest legislation and request appropriations for State work.

It was discovery of this power resulting from their independent local strength that suggested the five-State league for still more effective educational work and for a clearing house of technical ideas. At first this was pretty much an interassociation movement, but it soon transpired that the Forest Service and the States had practically equal place in it, so the next step was to make the Western Forestry and Conservation Association a sort of triple alliance of private, State, and Federal protective agencies. So now we represent the combined influence and technical competence of all branches and have corresponding strength in molding legislation and public sentiment, as well as a unique usefulness in helping each other in our own work. Each one of the three gets the active help of the other two whenever it needs it to any good end. Recently the British Columbia people have signified a desire to have us take them in too.

These activities of our five-State alliance take four chief forms. One is the function of a clearing house for ideas and experiments in fire methods, as in handling and feeding men, building telephone lines

and lookouts, burning slashings, improving tools and equipment, etc. Secondly, we engage in an active publicity campaign, using every adaptable device of modern advertising. Thirdly, we afford an expert for framing and pressing forest legislation. Finally, and probably most interesting to you in connection with the Weeks law, is our service as a medium for bringing about cooperation between the several agencies in actual field organization of protective forces.

We were all troubled once by the waste of money and ineffectiveness due to duplicate effort and neglect of neutral territory. State, Forest Service, and associations were all sincere in trying to keep down fire and in building up good organizations, but, likely enough, sending three men along the same trail to go after the same fire and equally neglecting some other fire. Sometimes there was mutual suspicion of each other's competence.

But after we got acquainted, through a common working medium, each found the other had much to contribute, and none had any monopoly of advantage that warranted its standing alone. So now they get together—Forest Service officials, State foresters, and association heads—with maps and lists in hand and say, "How can we divide this territory so as to get the best fire protection for the least money?" Roughly speaking, the Service is chiefly interested inside the National Forests, the associations where private timber interests are paramount, and the State in its grant lands and in regions where water supply or settlers demand protection that no one else will give. But there are overlaps of interest and also regions where none would act if obliged to make a sacrifice to do it. We try to divide these up. The best man is put in charge, whether State, Federal, or private, and the subordinates of each are given the right relations, or the territory is abandoned to one agency, which is in turn relieved elsewhere, or some other mutually satisfactory plan is devised. Advance arrangements are made for fixing responsibility in emergencies and for sharing expenses.

The Weeks law money has been a tremendous help in all this. It has forced better relations where they tended to lag. Some of you may have thought it should not go to States that already have Federal aid through the National Forests. To this we can reply that it is quite as important to double the efficiency of an existing joint expenditure of perhaps \$300,000 a year by spending \$10,000 more as it is to bring about the expenditure of \$10,000 in some State that has hitherto spent nothing. It is the addition of a new element—the Weeks law patrolmen—that has necessitated cooperation on a widespread systematic scale and is knitting all parts of the system into an efficient whole for the public good. In Oregon, for example, it has helped greatly in the organization of many new associations with strong patrols where no patrol existed before. The State forester simply adopted the Carnegie library system of inducement, saying to the timber owners and the country, "If you will put in a system of a certain standard of excellence, I will pay a fair share of the cost from the Weeks law fund; otherwise the money will go to some locality that will."

We of the West also feel that the methods of using Weeks law money should be left fairly flexible. While in some regions lookouts are as valuable as patrolmen, in others, or at certain times, they do

little good. It should be possible to put a man at trail building during a week of rainy weather, for example. We think the Service should lay down principles and ideas to guide the work toward uniform ends, but leave enough discretion with the State to insure meeting conditions. I believe this has been the policy of the Service from the start.

Returning again to association work, it has a peculiar field in publicity work that is hard for you to cover as State officials, especially where you are restricted by State printing rules or by statute fixing what you may publish. The association can do anything it has money for, can get the lowest rates, and is not hampered by red-tape or official dignity. The State can then purchase the material from the association at cost, thus receiving all advantage. Our association issues colored pictorial fire warnings, gummed stickers, various illustrated circulars designed for the general public, and special circulars distributed among school children by teachers.

We also prepare copy for use by other agencies at their own initial expense, such as drills on forest-fire subjects to go in State arbor-day bulletins, arguments and precautions printed in time tables by railroad companies and in directories by telephone companies, forest-fire epigrams on checks used by business houses, and all sorts of similar publicity material printed by our State foresters, constituent associations, and anyone else who will make use of it. By gaining a reputation for having reliable forest information on tap, we find a large field in supplying clubs, public speakers, State commissioners, and the like with material for addresses and reports. You will be surprised by the number of people who will call on you for this if you will furnish it in attractive form, keep confidence, and let them use it as wholly their own. Advertise the other fellow, not yourself, and he will spread the propaganda at his own expense. Our principle is to do ourselves only what we can not get done in this way.

In legislative work you will find the association of immense assistance to you. On the other hand, its help to private owners in this kind of work is one of the best arguments with which to organize associations. The foundation principle of success in forest legislation is to have your measures fair to all interests involved and then to enlist all interests in their passage and execution. It is unfortunate to have a legislative movement pushed singly by either the Federal service, a State forester, the lumberman, or the lay reformer. It will seldom either be an ideal measure or receive the necessary support.

With a clean association of forest owners who do useful things themselves and are entitled to a voice, you get a point of view in framing the bill that safeguards you against any impractical features. Moreover, giving them a part removes the indifference or suspicion they might have even if the bill did not warrant it, and it enlists their interest in getting it through. The knowledge that they will also have a voice after its passage makes them far readier to accept what otherwise might seem like dangerous State regulation. Finally, they can get behind a kind of campaign for its passage that you, as a State official, are debarred from attempting. It is our associations' personal and financial backing of a whirlwind campaign that passes practically all of our progressive forest legislation, yet there is

nothing uncommendable in this from the public's point of view, because the bills are also indorsed by the official forest authorities.

Possibly your forest owners may not see the desirability of cooperative fire protection. Often they don't until they have tried it. Then talk to them of the dangers of foolish compulsory legislation at any time likely to be sprung by impractical reformers, quote any examples of this as handwriting on the wall, and show them that by organization with a useful purpose they will acquire a systematized, workable influence against anything of the kind. There is no better way to get a helpful, sympathetic understanding of their industry; a safeguard in all directions, not forgetting taxes. It brings them friends at court, as it were; the friendship of the State, the Forest Service, the educational institutions, and all the mediums that influence public conduct. Once get them together with arguments like this as well as with talk of fire fighting, and in a little while they get the spirit of the whole forest movement and work with you heartily in everything if you deserve it.

In some States you can not get satisfactory cooperation with private owners in fire work, because the law does not provide for it. This is a good ground for getting their organized help in changing the law. I maintain that every State forest law should contain such encouragement; that instead of contemplating a purely official system, it should induce private owners to get into the game and, in return for consideration of their needs, work with you to get freedom from politics, practical efficient personnel, spirit of mutual confidence, and local and technical familiarity with forest conditions, in a combination that can not exist in an exclusively private, State, or Federal system.

Mr. HAWES. Gentlemen, we are fortunate in securing the time of Mr. George Otis Smith, Director of the United States Geological Survey, for a few moments this afternoon. Mr. Smith is here as a representative of the Kennebec Valley Protective Association, and will speak to us on the work of that association. I take pleasure in introducing Mr. Smith.

Mr. SMITH. Gentlemen, I come here somewhat under false pretenses. I am not an expert on the matter of the forests of Maine. I suppose there are States in the West whose forests I am better acquainted with than I am with those of my own State, where I have the privilege of paying taxes and having my children spend their summers. I was, however, one of the organizers of the Kennebec Valley Protective Association. As it happened, I was in the State at the time that the timberland owners of the Kennebec Valley got together and perfected an organization, the principal purpose of which is to aid the State and Federal Governments in their fire-fighting work. It is essentially a timberland owners' association. The membership is based and the right of voting is based upon acreage ownership. The organization is small, though representative of large ownership.

I simply desire to call attention to the fact that the directors are given large powers in the matter of authorizing very informally, but very effectively, an assessment which may amount to 5 mills per acre. That is simply an emergency measure, the purpose of the association being more to stand in the background and assist the

State and the United States officials in their work. When there is need for a reserve being called into the field this association stands ready, and its five directors have the power to vote very expeditiously money for fire fighting in addition to that which is available on the part of the State. We trust that that power of the directors may not have to be exercised, but it is quick money that they can vote, because these men are leaders in the industrial activities of the State, and they do not have to go to the bank to get money; their word is enough for the men who will go on the fighting line.

Maine seems to me to be more comparable in these matters to one of the Western States than any other of the Eastern States for the reason that it is sparsely settled. We have about 30,000 square miles in Maine, and the greater part of it is really wooded, even in the southwestern portions of the State.

The northern half of the State is densely wooded and practically unpopulated. Piscataquis County, which lies in the central portion of the State, has a population of a little over 5 per square mile, whereas our country as a whole has 31 per square mile. So the conditions are altogether different from what they are in the old State of Massachusetts. I believe, however, that the lookout service is quite similar. While I can not speak authoritatively regarding the present method of establishing these lookouts, I remember when the first ones were established, which happened to be in the Kennebec Valley. The procedure was for the landowners of certain areas to get together and meet the expenses of erecting shelter and putting in the telephone line. Then the State would step forward and take on the upkeep of the station.

There are now 28 lookout stations, all located in the Maine forestry district, which includes the wild lands of the State. Emergency tool boxes are distributed over this district at advantageous points. They are similar, I suppose, to what you have in the other States, the equipment being from 1 to 2 dozen tools, or in some cases 5 or 10 dozen.

I believe we can not lean too heavily upon the work of the Federal and State Governments. While their work must be carried on in a way adapted to normal conditions, in time of war the reserves must be called out, and this association is like the organized militia of the State—ready to go to the assistance of the standing Army.

E. C. HIRST, State forester of New Hampshire, followed Mr. Smith.

GENTLEMEN: I will take this subject up under two heads, cooperation with (1) large owners and (2) small owners.

Cooperation with the large owners in New Hampshire is confined almost entirely to an association formed two years ago. This association was the first one of its kind in the East. About three years ago the State forestry commission called a meeting of the large timberland owners of the White Mountain region to discuss fire protection. Mr. Cox, who was then in the Forest Service, came up and spoke to us on how the Government cooperates with fire protective associations in the West. At that time most of the owners did not think it necessary to organize for fire protection. Most of them were willing to do something, but felt that the best way was for each owner to turn over the amount of money he was willing to expend each year directly to the State forester and let him use the funds, together with the State appropriation, to the best advantage.

At that meeting the timberland owners present subscribed about \$5,000, and gave it to the State forester for the building of mountain lookout stations. During the summer of 1910 nine stations were built and operated. At the end of the fire season the owners who had contributed held another meeting and the State forester reported how their funds had been used. It was then decided that the owners could best cooperate with the State through an organized association, and the New Hampshire Timberland Owners Association was later formed and incorporated. Some of those who went into it did not think it would be permanent. However, during the first year of field work the association demonstrated its usefulness pretty clearly, and I do not believe there are any members now who could be driven out of it.

I have here a map which shows how our fire-protective system operates. The black lines indicate the fire districts; there are four of them, each supervised by a district chief employed by the State. The Weeks law cooperative area is within the three northern districts, as also is most of the land of the association owners. In 1911 New Hampshire experienced the most dangerous fire year on record. In the three northern districts, where most of the wild lands are located, there was very little fire damage, due to the cooperative system which had been worked out between the Government, the State, the towns, and the timberland owners. In the southern district, however, which is largely a wood-lot country, and in which we have heretofore not expected serious fires, there was more damage than in the other three districts together. This at once shows the benefits of cooperation and indicates that it must be extended into the southern wood-lot region.

The work of the timberland owners' association is divided into patrol, lookouts, and education. Early in the spring, as soon as we find out just what money the State can spend on fire protection, and as soon as our agreement is completed with the Federal Government, the forester for the association, Mr. Billard, and I get together for a conference. I prepare a State and Federal budget for the fire season, and he plans the association work to supplement and strengthen the State and Federal work. He tries to spend the association's money, as nearly as he can, in the regions from which he derives the revenue. The association members assess themselves 1 cent an acre a year, which may be increased in case of emergency, and he tries to give each locality adequate or proportional protection. By putting a little money in the form of patrol, or trail building, or something of that kind, into the different localities from which he gets revenue, he can secure more members. The Federal Government has purchased 72,000 acres in the White Mountains proper, which was formerly association land, but Mr. Billard has been able to get enough additional members to offset that purchase, so that there will be just as much land in the association next year as there was before.

The greatest value of the association's patrol service is that it is so very elastic. In 1911 our agreement with the Forest Service for the Weeks law patrolmen did not go into effect until June 2, but we had had fires in the mountain region as early as April 30. The association stepped in and hired about 75 patrolmen, doubling the force on Sundays and holidays. This filled in a gap when we

would otherwise have had inadequate protection. Throughout the summer Mr. Billard aims to keep on a small number of permanent patrolmen, but can expand the field force quickly if necessary. He usually takes this up through the town fire warden, visiting each one in the spring and making the arrangements. The warden is given the first chance at the patrol job, and this keeps him interested in the association's work. If he does not want to do the patrolling himself, he usually hires somebody near by and keeps a watch on him.

The association has also been able to extend the State work a great deal. The lookout stations it first built have been taken over by the State through a special appropriation made for the purpose. It would have been very difficult to get a bill through the legislature to establish lookout stations without first demonstrating their usefulness, and the association enabled us to do this. Last year it built additional stations, which we hope to take over at this coming session of the legislature, and continue that policy until the whole State is covered with as many lookout stations as are needed.

In addition to building the stations, the association built a number of telephone lines into dangerous localities and along patrol routes. In some cases it has been possible to repair and use old lines abandoned by lumber companies, which were formerly used along driving-streams or for connecting camps. In this way they have built new or reconstructed about 100 miles of telephone line.

The association also does a great deal of educational work. Mr. Billard plans to be in Concord all the time the legislature is in session to appear before committees and explain legislative measures to members individually.

I am not able to give so favorable a report from New Hampshire on cooperation with the small owners. Since we get such good results in the mountain region, where we secure effective cooperation, it is clear that in the rest of the State we have got to make the State or the local communities or the private owners do more. I do not see how we are going to get these small wood-lot owners together in an organization.

It is possible we may be able to work it out on a town basis. We have a pretty good set of fire wardens, and it has taken quite a while to get them. Most of them are willing to do a great deal in the way of local organization. We are following up the warden appointments by sending our district chiefs around to each town and having them get in touch with woodland owners. The town warden has furnished us with lists of all the persons in each town who own any woodland to speak of, and the district chief, as he has time, makes it his business to visit them. If he finds a place on a hill where some one is living who has a telephone and can look over considerable country, he goes there and makes arrangements for the owner to report fires to the warden, and leaves a list of town fire wardens and deputies in the vicinity, with their telephone numbers. There may not be a great many fires reported from such places, but it spreads the information of fire protection throughout the town. Then if there is anybody who has been employed and owns tools that can be used for fire fighting, the district chief makes an arrangement with him to furnish these men and tools in case of fire. I am inclined to believe that it is along that line that we will have to work for cooperation with the owners in the wood-lot regions. Perhaps

by organizing local forestry societies, like the Society for the Protection of New Hampshire Forests is doing, we may develop volunteer forest-fire companies in the rural towns. In that way I think we can build up some kind of an effective cooperation with the small owners, but I rather doubt whether we can go as far as getting them to pay any assessment on their timberland for fire protection.

DISCUSSION.

Mr. PETERS. I would like Mr. Hirst to explain why we made Mr. Billard, the forester of the New Hampshire Protective Association, a collaborator in the Forest Service.

Mr. HIRST. I requested his appointment because he is in the field nearly all the time looking after his own men. In 1911 we found that the Federal men to whom he would give suggestions did not really know whether they were under him or not. Now, however, that he is appointed a collaborator in the Forest Service, we place in the fire budget to each district chief a notice that Mr. Billard is in charge of field work in the absence of the State forester. It gives one more man, who is in the field considerably, authority over the patrolmen.

Mr. HAWES. Does the Forest Service take the stand that in any case where a cooperative organization is formed the forester in charge will be appointed a collaborator?

Mr. PETERS. Yes; to a reasonable extent, provided his appointment would further the effectiveness of the work. For example, in Idaho there are five collaborators, including the commissioner of the State land office and the chief fire warden of each of four timber protective associations. Under the law the State as a timberland owner is authorized to cooperate with other owners, and it does this through these four associations.

Mr. COX. I would like to ask Mr. Hirst if the association members pay on a basis of total acreage or of only uncut timberland?

Mr. HIRST. Total acreage, including cut-over land.

Mr. HAWES. I will ask Mr. Cox to speak of his experience in securing cooperation from private owners in Minnesota.

Mr. COX. We have not had so very much cooperation with the lumber companies. As I have already said, they have their camp watchers, and some companies have put on a number of patrolmen in addition. The iron companies which have large holdings in north-eastern Minnesota, especially the steel trust, have a regular forest service of their own. They cooperate with us very fully, putting their men under our district rangers to a certain extent, but they, too, have what might be called district rangers. We feel that the lumber companies are doing almost enough in looking after the disposal of their slash, and that it is up to the State to look after the patrol work. In meeting the slash requirements, which are very stringent, the companies are paying the equivalent of \$300,000 a year for fire protection, so we feel that they should not be called upon to contribute very heavily in the matter of patrol.

Mr. HAWES. Mr. Wilber, what have you to say on this subject?

Mr. WILBER. We have not been able to secure any private cooperation to speak of in North Jersey. The only people we can turn to are those owning large estates, many of whom have their own pro-

tective systems, which they consider better than ours. I have been trying for 18 months to get some sort of cooperation on one property in installing a lookout on a high mountain. It will entail on the part of the owners the expense of building probably half a mile of telephone line, but they can not see the advantage of it. These owners are, for the most part, satisfied with things as they are. On the wood-lot proposition I agree with Mr. Hirst, that it is exceedingly difficult to bring these people together.

MR. ALLEN. Where you have had this difficulty in any association, may I ask whether the small man has had an equal vote? How is that in New Hampshire?

MR. HIRST. In the New Hampshire association every man has an equal vote. That policy was adopted in order to bring the small owner in.

MR. ALLEN. It helps to allow the small man equal vote; that is, to make membership privileges uniform without regard to acreage. He then takes more interest and is less apt to fear he will not be looked after as well as large contributors. All our associations do this.

MR. WILBER. I would like to ask Mr. Allen whether in organizing an association he thinks it should be wholly private, with a private individual to handle it, or could the State forester handle it?

MR. ALLEN. It would depend considerably upon existing sentiment and upon the confidence in the State office of those who would be involved. Generally speaking, however, I should prefer to see the timber people feel that they were doing the work, so as to insure their own interest, but have the association cooperate with the State very closely. It would not be so strong with the public if it didn't, nor would you feel so safe with it. On the other hand, in getting efficiency in the woods through good men well handled a private organization has an advantage over the State forester. It is closer to the job and free from politics. It can insist on getting maximum results from every dollar spent. And why should the State forester have to spend valuable time supervising and inspecting men doing things which the local owners have just as much interest in and will look after as well or better? Is it not better for him to be relieved, where possible, and have more opportunity to work where he can not get such help? I think every element, public and private, has a duty and responsibility in forest preservation and that the task should be divided fairly and to insure that each contributes its special efficiency.

MR. HAWES. I would like Mr. Allen to say something to us about the development of specialists by fire associations.

MR. ALLEN. This has been one of our great opportunities. Being free from the miscellaneous administrative duties that take so much of most State and Federal forest officers' time, we can detail men to particular lines exclusively and make them highly proficient.

For example, one of our great problems is the disposal of slash. In red-fir lumbering there is no selection cutting, leaving a thinned stand to protect, but we cut clean and burn the slashing in order to reduce risk and facilitate reproduction. This is required by law. While approving of the principle, few lumbermen really like to touch the match to slash, especially when it is dry enough to burn. To do it both safely and effectively requires more experience than he gets in his own operations. So the associations develop expert slash burners,

who work at this exclusively during portions of the year, burning many thousands of acres under varying conditions, and are able to decide when it is safe and what precautions are necessary. They relieve the individual operator of the responsibility, and it is such assurance that the work will be regulated by experts that makes lumbermen accept what might otherwise be dangerous legislation.

It is much the same with spark-arrester laws. Operators are glad to have them when they feel that enforcement will be largely in the hands of association engine inspectors who know the subject in a practical way.

There are other things a strong association seems to be able to accomplish better than State or Government. Patrol and the use of oil fuel by railroads would not be as far along in the West were it not that the associations include big shippers and men of wide business influence who can get the ear of railroad officials. I do not think the Forest Service could have had the Army ordered into fire work in 1910, but when our alliance of associations, themselves spending \$700,000 that year, telegraphed the President, departmental prestige or jealousy had no bearing.

So in trying to form private associations in your States, show the timber owner that this is the way to get a voice in all things that affect him, and thus to safeguard himself against compulsory legislation that might be dangerous if enforced wholly by impractical men. He will be a tremendous help in getting things you can not get alone as State officials.

RAILROAD COOPERATION.

W. O. FILLEY, State forester of Connecticut, opened the discussion of this subject, as follows:

GENTLEMEN: Connecticut is primarily a manufacturing State, but the agricultural interests run a pretty close second. Less than one-half of the State's area is suitable for cultivation, and nearly all the remainder is better adapted to the raising of trees than any other crop. In handling the forest land the largest factor is the fire problem, and in studying this problem during the last eight years we have found that the railroads cause the largest number of fires. During the last four years the railroads have been responsible for about one-third of all the forest fires in the State. So we have tried to get the railroads to cooperate voluntarily by means of patrol. In 1908 Mr. Hawes, the State forester, made an arrangement with one of the railroad companies providing for a patrol along a certain section of track for a period of three weeks or a month. Although the practical value of the patrol was clearly demonstrated to the railroad, we could not persuade the company to take the matter up voluntarily. A little later State Forester Spring prepared a bill for the legislature which would have made patrol compulsory on the part of the railroads, upon instruction from the State forester. The railroads were opposed to any such measure, and they offered a substitute making themselves liable for the cost of fighting fires which they started. This seemed worth while accepting, and for the time being we dropped the idea of compulsory patrol. The measure was enacted into law in the summer of 1911. If it had been in effect in the spring thousands of dollars would have been saved, which were paid by the

State and towns in fighting fires. That was the most serious forest fire year we have ever had.

The only other law in the State relating to forest-fire work by the railroads is one which makes them liable for damages caused by fires they start. Although we have only about 1,500,000 acres of forest land, about 65,000 acres of that area were burned over in 1911, almost all of it in the spring. Thirty-three per cent of the fires and nearly 33 per cent of the damage were caused by railroads.

Those of you who are familiar with Connecticut know that the valley through the center of the State is largely agricultural land, and the forest land is in the shape of small wood lots. The conditions are similar to those of many portions of New Jersey, Maryland, and Massachusetts. The hilly areas in the eastern and western parts of the State are pretty thoroughly cut up with deep valleys, and the railroads run through them or cut through the hills. The hills are usually well covered with forest growth; in fact, there are extensive tracts of unbroken woodland, and the railroad fires occur almost entirely in the hill sections. Therefore we can reduce the railroad problem to a very small area if we can get the railroads to see that those sections must be attended to.

Last year we used the Weeks law funds for railroad patrol, because we felt that its use for this purpose would give the most satisfactory results. We wanted information and data which we could present to the railroads in regard to patrols. Although in 1912 there was a comparatively wet spring, and we had only 250 fires as against over 800 in the spring of 1911, yet 43 per cent of the fires in 1912 were due to the railroads as against 33 per cent in 1911. I think next year we shall be able to get from the railroads the cooperation for which we have been working so long. I do not feel we need any law compelling patrol, for I think we can get the help of the railroads in this matter without compulsion. If we can get them to patrol voluntarily, it will produce a better cooperative spirit between the railroads and ourselves. They already cooperate with us to the extent that when we report the right of way in bad condition they usually clear it pretty well; and they issue general instructions to their section foremen to cooperate with our fire wardens in every way possible. The section hands in some parts of the State do very well, while in other parts their cooperation is rather perfunctory, and for the least excuse they shirk it. It depends entirely on the foreman. So far as the higher officials are concerned, the instructions are clear.

Conditions as regards the motive power of the railroads are going to change in Connecticut greatly during the next few years. The New York & New Haven section is being electrified now, and the Hartford section will be electrified later on. Therefore it is only a matter of a few years when fire danger from railroads in the State will be greatly reduced. Yet it may be advisable for us in Connecticut to have a law compelling inspection of the locomotives, because it seems to me patrol work is not getting to the bottom of the trouble. We ought to go further back than that and eliminate the cause of fires. Our patrols have reported defective locomotives, and we have notified the motive department of the railroad of their numbers. In some cases the locomotives have been taken off, but when returned to

service they seem to set just as many fires as before. We have no power to compel them to repair locomotives at present.

I want to say that Massachusetts, being next door and having more stringent laws than Connecticut, helps us quite a little. The attitude of the railroad companies has changed considerably because of the fact that they are required to take precautions in Massachusetts.

DISCUSSION.

Mr. ALLEN. You have a spark-arrester clause?

Mr. FILLEY. No; but the locomotives are equipped with spark arresters, and these are what we record as being out of order.

Mr. HUTCHINS. I think you will find the worst trouble comes from the ash pans. The New York, New Haven & Hartford's are in very poor shape.

Mr. FILLEY. I know that much trouble comes from the ash pan. However, fires often occur in cuts where the sparks are thrown up on the bank, and in such cases the spark arrester must be to blame.

Mr. GASKILL. The question I want to ask is directly the contrary to that which has just been propounded. Why should the State take up the question of spark arresters or ash pans? In my experience, which has not been confined to New Jersey entirely, it has been demonstrated pretty conclusively that such a provision of law affords a refuge behind which the railroad companies can secure immunity against claims for damages. Precedents and decisions in New Jersey, at least, are almost all to the effect that compliance with any such requirement absolves the company from consequential damages.

Now, we absolutely weaken our position, in my opinion, by imposing any such requirement upon the companies. I can go one step further, in personal experience, if you like. In discussing the origin of a large number of fires along one of our railroads with a chief engineer, we went into the question of the efficiency of spark arresters—we all know what that is, more or less—and he stated frankly and clearly that they do not do and can not do what is claimed for them. Finally I said, "Will your company agree to the repeal of that clause in our railroad law?" He said, "No;" they preferred to let it stand.

Mr. PERRIS. I can hardly agree with Mr. Gaskill. I will agree to this extent: That I believe the railroads are glad to have inspection, provided it is done by competent men, for the reason that it relieves them of that much expense. On the other hand, when it comes to a question of proof that they caused a fire, I think we are in a far better position. In other words, if our inspections are thorough enough, we know the condition the engines are in. At the present time we have a case as the result of a fire by the Erie Railroad Co. The inspection of three engines, one of which caused the fires, were all made about three or four days before, and all of the engines were found to be in bad shape. I believe if this inspection had not been made we would have had trouble in trying to make a jury believe the fires were caused by defective spark arresters.

Mr. GASKILL. May I contribute one piece of information which I have found is news to a number of men? It is to the effect that the harder the coal the more readily are fire-bearing sparks likely

to be discharged through a standard spark arrester. It is easy to understand why. The softer coals, the bituminous and semibituminous, coke quickly and exhaust themselves rapidly. They frequently expand after going through the screen, and when thrown up into the air they flare up, but strike the ground practically dead. On the contrary, take anthracite as the extreme of the hard coals, and you will find that small sparks can be discharged through the screen of an ordinary arrester, and yet those small sparks will reach the ground in a condition capable of setting fires. In other words, I have found that fires in many cases come from the small brands, not from the big ones.

F. W. RANE, State forester of Massachusetts, was then called upon to tell how his department is solving the railroad fire problem.

GENTLEMEN: When I went to Massachusetts six years ago we did not have a single statute on our books with regard to the regulation of spark arresters on railroad engines or anything else relative to fires set by railroads. I think that in all probability more real gain has been made in the past two years than in any previous time. This has been due to the fact that we have a specialist in Massachusetts, in Mr. Hutchins, who had had a lot of experience in New York with railroads before he came to us.

I secured a law whereby we compelled the railroads to have spark arresters on engines, but the enforcement of the law was put into the hands of the railroad commission, because we thought it would be easy for them to enforce it. When Mr. Hutchins was employed and we began to look into matters more thoroughly, it was found that the spark arresters on the engines were in very fair condition, and that the cause of fires was largely a question of defective ash pans, a thing the railroad officials and their engineers apparently did not know much about.

It has been a process of education with me, and I am sure it has been with the railroads. Recently each railroad has placed a man in charge of this special work. The master mechanic is constantly going over his engines in the different companies. It is not a question of Massachusetts alone. The New York, New Haven & Hartford runs through Connecticut and the Boston & Maine is in every other New England State. It is not a question of just one State looking the matter up, but of all pulling together. Last year we had a splendid record so far as railroad fires were concerned. About a year ago the Boston & Maine Railroad appointed Mr. E. A. Ryder, a man experienced in the business, to have charge of the work. Mr. Ryder has gone into the matter of forest-fire protection and is an expert on that question to-day. The report that he sends in to us in regard to fires in Massachusetts is a masterpiece. Every single fire that has occurred, big or little, has been reported by the railroad. He goes, therefore, even beyond the reports that come principally from our forest wardens in the various sections. This shows that if the railroads want to cooperate they can, and I think it has been demonstrated sufficiently, and will be through Mr. Ryder's report, that they can not afford to do otherwise than to have a man of this type in their employ.

Our experience last year was very satisfactory until within six weeks ago, when all at once fires began to break out in one district,

and we seemed to be returning to 1911 conditions, so Mr. Hutchins concentrated his men there. We have three automobiles now, so that our men can go from place to place quickly. They found upon investigation that a large percentage of these fires were caused by defective ash pans and front ends. I took the matter up with the railroad commission, and found that they did not feel that they had sufficient authority to give us permission to examine the engines, so we drew up a tentative bill. We said we were going to propose to the legislature that we be given more authority, but I thought it would not be necessary to go to the legislature for an act of that kind if the railroads wanted to take hold and cooperate. The railroad commission thereupon called a meeting about a month ago of all the railroads that come into Boston, and we got together and had the most satisfactory meeting we have ever had. The very fact that Mr. Hutchins knows what he is talking about, and knew something about the engines, and the fact also that the railroad commission put a man on the work as their deputy—he is an ex-engineer and also has gone to the bottom of things and can give them information—lead toward the point we are aiming for. The railroad people who came to the conference told us how many engines they had remodeled last summer, how many they have to remodel, and how many weeks it is going to take them to get the rest of them remodeled. They have a feeling that they are going to handle the problem. At the last meeting the State fire warden and his four deputies were allowed the privilege of inspecting all locomotives on the different roads. The railroad officials preferred to grant this request rather than to have us ask for extra legislation covering the inspection of locomotives. Therefore, I think the thing for us to do is to cooperate with the railroads and not ask too much legislation, and in that way I believe we can bring the present difficult matter under control.

Mr. PETERS followed Mr. Rane's address with the reading of a paper from E. M. Griffith, State forester of Wisconsin, who was unable to be present.

GENTLEMEN: Our legislature of 1911 gave Wisconsin one of the strongest and most practical laws in the country for reducing the number of forest fires set by railway locomotives, donkey, traction, and portable engines. The following provisions of the law are worthy of special note:

(1) Between March 1 and December 1 all logging locomotives, donkey, traction, or portable engines which are operated in, through, or near forest, brush, or grass land and which do not burn oil as fuel must be equipped with screens or wire netting on top of the smokestack so constructed as to give the most practicable protection against the escape of sparks and cinders. "The term logging locomotive, as used in this act, shall be construed to mean any locomotive operated on a railroad, branch line, or division the chief or main business of which is the transportation of logs, lumber, or other forest products." The great value of this provision of the law will be at once apparent to any forester, as it compels every locomotive which is operated through the forests to be equipped with the oldest, simplest, and yet by far the most effective device for preventing the escape of sparks or cinders, namely, a screen or hood over the smokestack. Locomo-

tives operated on main through lines which make long runs could not be equipped in this way, for with the smokestack covered with a hood the front end of the engine would clog up with cinders and then, of course, the engine could not steam or pull its load. Therefore the law provides that "all locomotives operated on any railroad other than a logging railroad shall be equipped with the most practicable spark arresters, so constructed as to give the greatest possible protection against the escape of sparks and cinders from the smokestacks thereof, and each such engine shall be provided with the most practicable device to prevent the escape of coals from ash pans and fire boxes and such devices between March 1 and December 1 shall at all times be maintained in good repair."

(2) The law provides that the superintendent of motive power or equivalent officer on each railroad shall designate an employee of such railroad at each division point and roundhouse who shall examine each locomotive each time it leaves the division point or roundhouse between March 1 and December 1, and such employee shall be held responsible for the proper carrying out of the provisions of this section, but without relieving the company from its responsibility thereunder. This provision of the law has proved very effective in keeping the locomotives in proper condition, and also in bringing about real cooperation between the State and the railroads.

(3) It will be noted that the law provides that screens or hoods on the smokestacks must give the "most practicable protection" and that spark arresters must be constructed so as to give the "greatest possible protection." The question naturally arises as to who shall decide as to the most practicable device. This is provided for in the following section, which is the strongest part of the entire law:

Any locomotive inspector designated by the State board of forestry shall have the power to reject from service immediately any locomotive, donkey, traction, or portable engine which, in the opinion of the said inspector, is deficient in adequate design, construction, or maintenance of the fire-protective devices designated in sections 1 and 2 of this section, and any such locomotive, donkey, traction, or portable engine so rejected from service shall not be returned to service until such defects have been remedied to the satisfaction of the State board of forestry. In case of disagreement between said inspector and the owner of the locomotive, donkey, traction, or portable engine so rejected from service as to the efficiency or proper maintenance of said protective devices then the owner of said locomotive, donkey, traction, or portable engine may appeal to the railroad commission of Wisconsin for a decision of said matter, but pending such decision the said locomotive, donkey, traction, or portable engine shall not be returned to service.

Particular attention is called to the fact that any defective engine can be ordered out of service and that it can not be returned to service until the defects have been fully remedied. This provision of the law is extremely important and is far more effective than the usual fines, for any railroad that was inclined to disregard the law would be quickly brought to its senses by having its locomotives ordered out of service.

(4) Minor though important provisions of the law are:

(a) Railroads must provide patrols for duty along their tracks in dangerously dry weather, and if any railroad fails to provide such patrols after due notice, the State board of forestry may employ patrols and charge the cost to the railroad.

(b) Every railroad must at least once every year cut and burn, or remove from its right of way all grass, weeds, brush, logs, and refuse material.

(c) No railroad shall permit its employees to deposit fire, live coals, or ashes upon its tracks outside of the yard limits, unless they be immediately extinguished.

(d) Engineers, conductors, or trainmen who discover fires along the right of way, or on lands adjacent to the railroad, shall report the same to the agent at the nearest telegraph station.

The main causes of railroad fires are sparks which escape from the smokestacks, and live coals which are dropped by the ash pans. The Chicago & North Western Railway has been cooperating with the State for the last three years in an endeavor to perfect a spark arrester which would prove entirely satisfactory in preventing the escape of sparks, and though great progress has been made, complete success has not been secured as yet. It is a comparatively simple matter to get an arrester that will stop a locomotive from throwing sparks, but very difficult to find one that will also allow the engine to steam freely and pull its load.

The State board of forestry has a locomotive inspector who devotes his entire time, from March 1 to December 1, to inspecting locomotives in the forest regions of the State, and he is constantly working with the railroad officials to perfect improved devices. A brief summary of his report for 1912 follows:

SPARK ARRESTERS.

The Chicago & North Western Railway now uses the Slater box front-end on nearly all of its engines operating in the forest reserve regions. This front-end is a big improvement over the old style known as the master mechanic front-end. Fifteen night runs were made on engines equipped with the box front-end, and several on engines equipped with the old style front-end. Less sparks are thrown from the stack when the former is used, and it is estimated that less than 5 per cent of the sparks are alive when they strike the ground. The box front-end is in nearly every case a self-cleaner, while the old style is not, but the engine crews state that it is harder to steam with than the old style and that it uses considerably more fuel.

The Great Northern Railway has experimented during 1912 with a new spark arrester, known as the cannon or conical front-end. Four night runs were made on engines equipped with this arrester, and one night was also spent in the tower at Saunders, Wis., watching 25 engines which passed. Very few sparks were thrown from the stack, and only occasionally would one reach the ground alive. The engine crews do not appear to have any fault to find with this arrester.

A number of other spark arresters are being tested, and the necessity for finding the best possible device is so great that the investigation will be continued along all possible lines.

HOODS AND SCREENS.

The Chicago, Milwaukee & St. Paul Railway, during 1912, has used a very satisfactory hood on all its engines operated through forest lands. The hood is fastened to the top of the smokestack with a hinge

at the back. At first engineers and firemen were inclined to tip the hood back when they thought there was not much danger from forest fires, but close supervision and the fact that one or two men were laid off by the railroad for doing this, has largely put a stop to the practice. This is considered to be the best hood in use, the only objection to it being that the cinders are apt to fly back into the engine cab, but a device was perfected last August which overcomes this trouble to a certain extent.

Some of the smaller railroads and a number of lumber companies use the old diamond stack, with a large top and cone well down in the stack. This type of stack has been found very expensive to keep in good repair, and the front ends sometimes choke up, since they collect a lot of cinders. It would appear that an entirely satisfactory hood has not been worked out as yet, but the type of hood used by the Chicago, Milwaukee & St. Paul Railway is fairly satisfactory.

ASH PANS (HOPPER BOTTOMS).

There are many of this type now in use, but frequently a hopper ash pan supposed to be in perfect condition is found upon close examination to still allow room for some live coals to fall through. It seems absolutely impossible to make a sliding or tilting door which will not warp or crack and which will always come up tight.

The Chicago, Milwaukee & St. Paul engines are equipped with one of the very best types of hopper ash pans now in use. They are an improved Chicago, Burlington & Quincy Railway ash pan, and are considered to be a great improvement over the original. The doors open at the ends and are equipped with an automatic latch, which is easily opened and yet can not be jarred open. About 40 of these ash pans were inspected during the season and only one defective door was found.

The hopper ash pans, which were in use by the Omaha Railway early in the season of 1912, were found to be a very inadequate type and in bad condition. The many forest fires that occurred along its lines in 1908 and 1910 were undoubtedly very largely caused by these ash pans. In the latter part of July, 1912, this road began to equip its engines with a new ash pan, known as the swipe pan, which has a sprinkler blowout. This type gives promise of proving very satisfactory.

The inspection of locomotives in 1912 is summarized as follows:

	Number.	Per cent.
Locomotives examined.....	651	100
In good condition.....	327	50
In fair condition.....	145	22
In bad condition.....	126	19
In shop for repairs.....	41	7
Ordered out of service.....	12	2

DISCUSSION.

Mr. ELLIOTT. In regard to the inspection of engines, I do not think we ought to require the State to do that at all, but the railroads themselves. Our law says that all engines must be equipped with ade-

quate spark arresters; if an engine sets fire along the road, it is prima facie evidence that the spark arrester is not satisfactory, and the use of the engine can be enjoined. We had a little trouble in 1911 with a company that I had worked for for a number of years. We kept getting reports that certain engines were scattering fire. I wrote the superintendent and got a very nice reply, stating that he had taken the matter up with the master mechanic, who reported that all the engines were inspected every time they came in and that the best spark arresters the road could get were being used. I simply sent back a copy of the law, calling his attention to the fact that there were still reports coming from our wardens and patrolmen along the railroad that certain engines were setting the fires. I told him that if the engines continued to set fire, I would take steps to have them shut down. Immediately we got action. The roadmaster was right out along the road watching the engines and finding out just what the causes were. We found that while some of the engines were scattering fire from sparks more fires were being set by the ashes thrown out along the road in places where there was débris close to the track. I do not think the responsibility ought to be put onto the State or the railroad commission. I think it should be left to the railroads themselves.

Mr. ALLEN. I might add a word to what Mr. Elliott says. I wrote that section in the Oregon law, and rather purposely avoided having anything done compulsory; but apparatus must be adequate, and upon complaint any magistrate must enjoin the operation of an engine until it is proven guilty or not guilty. I never had much faith in enforcing a law against a railroad company, because it is difficult to prove anything. However, if you can shut down the engine for three or four months while this proof is being gone over the railroad does not like it.

Mr. HAWES. At the meeting of the American Forestry Association yesterday Secretary Fisher made a very interesting comment on the possibility of the transcontinental railroads being electrified within a few years owing to the development of water power. Will Mr. Allen tell us what he knows about that subject and the general one of cooperation of the railroads in the Northwest?

Mr. ALLEN. We consider electrification a logical future development, but not so near at hand, as a general thing, that we can recognize it in present plans. The present tendency is toward oil installation. The majority of our large roads burn oil through forest territory. It was forced on them in the first place by continual hammering by the Forest Service and the fire associations, but now they find it pays. Saving of labor, time formerly consumed in engine cleaning, and better steaming, as well as elimination of fire risk and damage suits, more than compensate the initial cost.

Some roads owning coal mines or interested in fostering coal towns feel obliged to use their own fuel and tell lumbermen their protests are as unfair to industry as would be a request to stop using lumber for cars and bridges. As a rule, however, these roads are good about patrol and protective systems generally and are doing their best with the spark-arrester problem.

On the whole, we consider oil fuel the solution of the question, and what frightens us most is the fear that oil will go up in price as a

consequence and also because of the withdrawing from the market of refinable oils needed in the increasing gasoline production. This is a serious contingency.

Mr. HAWES. I would like to ask Mr. Pettis what has been the experience of the railroads in the Adirondacks in regard to the use of oil—the relative expense in the use of oil and coal, etc.?

Mr. PETTIS. The use of oil as fuel for steam development eliminates sparks and cinders as a cause of fires. We know of no case where fires have been caused in New York State through its use. In 1909, when the public service commission issued its first order requiring the use of oil, the Standard Oil Co. quoted a price of \$0.024 per gallon f. o. b. Albany. Last spring this price was materially increased. The railroad officials state that it has been costing them about 40 per cent more to generate steam with oil than with coal. The supervisor of equipment in our public service commission, a man of wide experience, says that this may be true, but that the difference could be reduced to from 15 to 20 per cent if the firemen were more careful in the use of the oil, i. e., did not waste it. The price of oil has advanced and may increase still further, but, on the other hand, the cost of coal is increasing, especially in the East.

During the oil-burning season last year there were only two fires along the New York Central Railroad from Utica to Malone, a distance of about 170 miles, and I think both were caused by cigarettes or cigars thrown from smoking-car windows. There were no fires along the Carthage & Adirondack Railroad, which operates about 40 miles, nor along the Chateaugay division of the Delaware & Hudson Railroad.

While the use of oil is effective, a very large percentage of the fires can be prevented if the locomotives are equipped with proper devices to prevent the escape of sparks, coals, or cinders. Last year our law was changed, and its application extended from the forest-preserve counties to the whole State. The only objection of the railroad people was that they did not want the word "adequate" used in the definition of proper screens; so there was a provision put in the law that these devices had to be approved by the public service commission. Their argument was that whenever they had a damage case they did not want to bring in all the experts in the country to prove what was an adequate device. Now, before the railroads equip the engines, they submit blue prints showing exactly how they are going to fix side openings, grate rods, or the front end. Then they feel warranted in going ahead. For instance, some time ago we went to the superintendent of motive power of the New York Central, on which road there are some 4,500 engines. He fully appreciated the fire dangers and the expense due to fire claims. As a result he issued orders immediately to have blue prints prepared for different types of engines, and as the engines go to the shop the changes indicated are made, any little defect being fixed up at once in the roundhouse or at the terminals.

For the benefit of those of you who think that the number of fires can not be reduced by this method, I would like to cite a few instances. The old law limited the operation of inspected engines to forest-preserve counties and on certain lines. There is a short line from Saratoga to North Creek along which there would be no fires

for weeks, and then, all of a sudden, there would 10 or 15 a day. We would look the matter up and find the company had run in an engine which had not been inspected. In another case a short railroad had rented an engine from the Delaware & Hudson Co. This company gave the road a dead engine which had practically no screen in it at all, and there were fires continually. Therefore, if you can have the engines equipped properly, you will not have more than 5 per cent of the fires you are now having.

Another thing about railroad cooperation—if you get hold of the right man in the company you will get satisfaction. The company has its right-of-way department, motive department, operating department, and legal department, and not one of them will spend 15 cents to save the other \$1,500 if they can help it. Therefore you have to go to the man higher up to issue orders and have your requests taken care of. If you go to the general superintendent or some one in a like capacity you will get satisfaction.

We wanted one line to pipe the overflows from the injectors into the ash pans, in order that whatever water was left would kill the fire in the ash pans. The company did not want to do this, but said it would put in a sprinkler. A blue print was submitted to us and was accepted. The company said that sprinklers were impracticable to use with its cast-iron pans, but we insisted, and the company yielded. A year ago last fall we told the road it could take the sprinklers out; it did so on some of the engines and left them in on others. Last fall we again advised this road that it could take them out, but we were told that it did not want to; that the sprinklers kept the ash pans from freezing up in the winter and thus prevented the engines becoming stalled on the road.

Let me make another suggestion. Do not dictate to a railroad what devices it must use. It has clever men who know more about fixing up engines than we do. Let each company work out its own plan, and if the plan is good accept it. We are not requiring the same thing on all roads, but we have a minimum requirement. We are reducing the number of fires and are accomplishing a great deal.

I do not believe that the railroads will voluntarily do the necessary amount of inspection. Also, after the railroads put these devices in shape you want to have some law that will make the employees use them properly. If wide fire-box engines are used, equipped with doors, screens, or other appliances, make those fellows use these appliances. In the case of the Lackawanna Railroad we found the engines running with the slides open. We called attention to it, and in the first instance the engineers got a lay off of 10 days and later of 30 days. Now we do not find any more open slides on the Lackawanna.

COOPERATION BETWEEN ALL PROTECTIVE AGENCIES.

F. A. ELLIOTT, State forester of Oregon, spoke on this subject as follows:

GENTLEMEN: Up to 1911 cooperation between the various protective agencies in Oregon, including the Federal Government, the State, counties, railroads, and private owners, had been quite meager, although Mr. Allen, as forester for the Western Forestry and Con-

ervation Association, and Mr. Chapman, as the secretary of the Oregon Forest Fire Association, had gotten a skeleton of the work started, which has been a great help to me since my appointment as State forester a little over a year and a half ago. In my first season's work during the summer of 1911 the time was very limited, but with the assistance of Mr. Chapman we organized several local forest-fire associations, each of which includes holdings in one or two counties. These associations cooperated with the Federal authorities under Mr. Cecil, the Federal district forester, and we also got some assistance from the county courts.

In 1912 we had a little more time for organization. We spent nearly all of the winter of 1911 in getting timbermen and others interested in fire protection, and, as you all know, this is a difficult task when it is pouring down rain; most of them want to begin about a month after there is real danger from fires. However, in cooperation with Mr. Chapman, fire-patrol organizations covering seven counties were perfected, thereby increasing the number of counties in which associations existed to 11. The cooperation we have had under the Weeks law has been a very great help in getting these organizations together. For instance, last spring we organized one association in Douglas County, which covers a very large area. The central part of it is mostly farming country, and on either side, both in the Coast Range and Cascade Mountains, there are heavily forested districts. Between the farming districts and these large holdings of timber are what we call the foothills, which are burned over and covered largely with brush and second-grade timber; up to this time they had received no protection whatever. As these lands came especially under the provisions of the Weeks law, I was able to take up the matter with the timbermen. I proposed that if they would organize and agree to handle all fire fighting I would appoint the man they would recommend as supervising warden for the county, and I would also give them 10 Federal patrolmen paid by the Weeks law fund. These men, together with 12 men hired by the association, gave them a large force, and the county was looked after in much better shape than it had ever been before. It cost them, I think, about a cent an acre on the holdings represented by the association. This association represents possibly from one-fourth to one-third of the timber in the county.

We organized another county which was largely timbered, and the State furnished two men—a supervising warden and an assistant supervising warden. These men were recommended by the association and appointed by the State; the State paid each of them \$100 a month, and the association \$50 a month additional and expenses. In that county, to get thoroughly equipped men who are acquainted with logging and cruising and are competent to handle the work of an association of this kind, we have to pay them a good salary. Two Federal patrolmen paid from the Weeks law fund were turned over to the association. The association itself hired 18 additional men, and the county court appropriated \$600 and turned it over to the association for patrol work. It spent $3\frac{1}{2}$ cents an acre for the protection of its timber.

In one county in southern Oregon, where we have an organization, I furnished the supervising warden and 3 or 4 Federal patrolmen

to some 12 or 15 men hired by the timber owners. The county court cooperated with us in that it agreed to furnish \$500 a month for the three dry months for the purpose of fighting fires. This year it got off very easily, because we had practically no fires there, and it cost the county only \$250 for the entire season. The protection cost that association about 1½ cents an acre. Of course, all of the timbermen who enter the association come in on an acreage basis.

In regard to cooperation with the railroad companies we have, I think, succeeded very well. While none of the companies this past year put on a regular patrol, one or two had all their section foremen appointed as State fire wardens, and their train crews were instructed to stop and put out a fire if they were any distance from a telegraph office or section house. If within a reasonable distance, the train crews are to notify the telegraph operator, the agent, or the first section crew.

The private owners who are especially interested in fire-protection work in Oregon are generally large owners. We have had very little success in getting small owners interested, although in a few cases we have a number of men who own from 160 to 320 acres. The large owners, as a general rule, are cooperating not only with the State but with the Forest Service and the counties.

I want to give due credit to the assistance we have gotten from the Weeks fund, and I hope Congress will make a further appropriation. Just before I left home we had a meeting of the State Board of Forestry, and it passed resolutions, which I brought to our Representatives, asking for such appropriation.

DISCUSSION.

Mr. SYKES. I would like to ask if the locomotives on the railroads in Oregon are equipped with any fire-prevention apparatus?

Mr. ELLIOTT. On some of the logging roads, yes; but not on the main lines. We have had more trouble with fires starting from the logging roads, most of which burn wood. On the other hand, the Southern Pacific, which is the principal line running through the timbered portion of the State, burns oil altogether. The Oregon Railroad & Navigation Co. has been very good in aiding us whenever possible along its right of way; the company inspects its spark arresters carefully. I should add that some lumber companies are converting their donkey engines and locomotives to oil burners.

Mr. HAWES. I should like to say in regard to the subject of cooperation that in Vermont we have a law providing that if any landowner will build a lookout station on his land, we will put on a watchman. We have had several such stations built by lumber companies. I would like to hear from Mr. Sykes, president of the Emporium Lumber Co., as to what chances are for his company building such a station?

Mr. SYKES. We have no plans at present for the Vermont property, which includes about 50,000 acres. When we bought it, some eight years ago, it was an operating property, with seven sawmills on it, all of which were connected by telephone. The wires have since largely fallen down, so that they are not in operation, and there is no forest work done on the line. We have had no fires in eight years. It is remarkable we have been so fortunate.

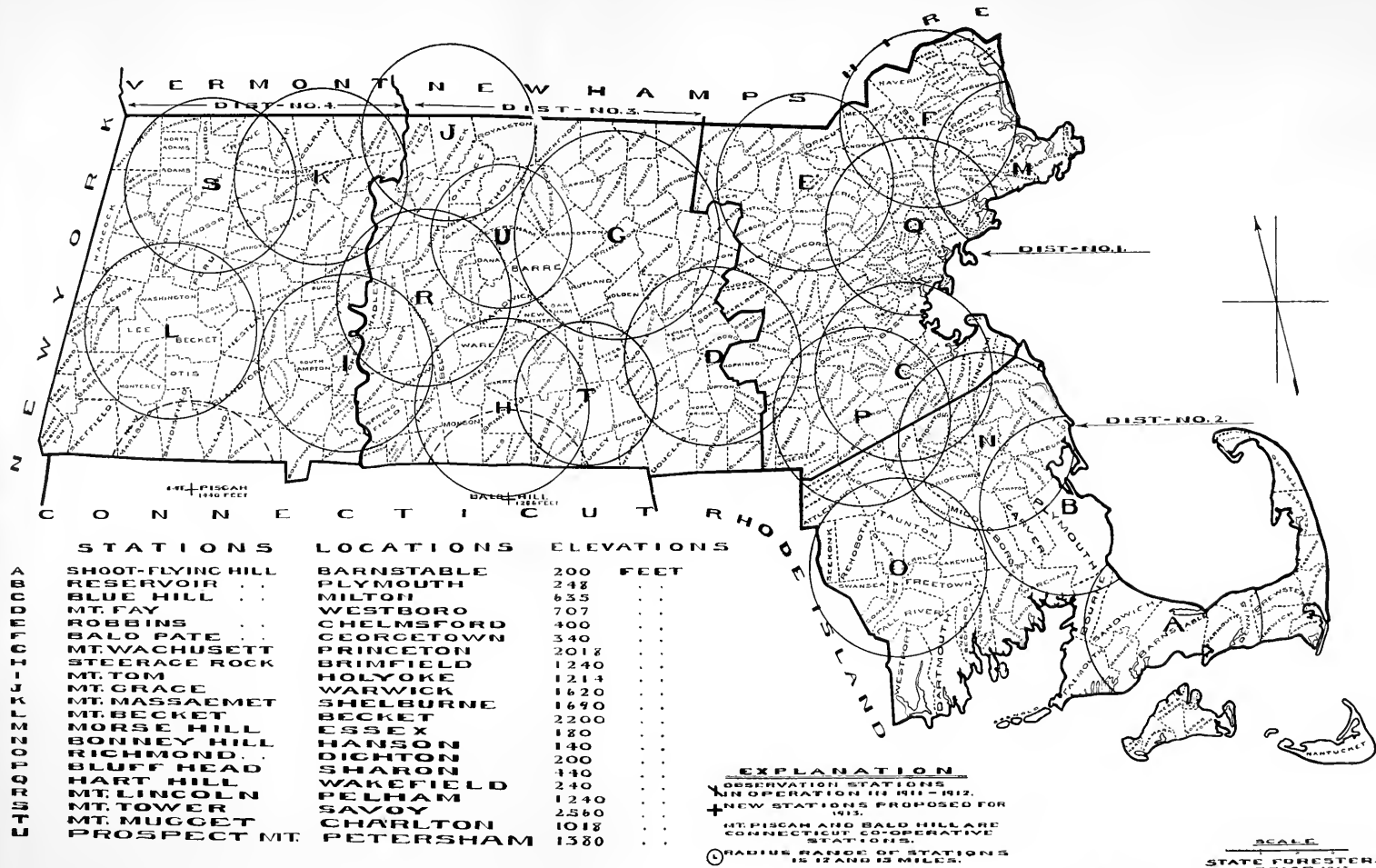


FIG. 1.—Massachusetts forest-fire observation stations.

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I think the Emporium Lumber Co. would cooperate with adjoining timberland owners toward establishing a lookout station somewhere on Stratton Mountain or at some other point. I consider this a matter of great importance for the protection of the forests, and will be willing to recommend to the company as soon as we hear from you about it. I trust something can be done before the dry season comes on this spring.

LOOKOUT SYSTEMS.

The morning session of January 10 was called to order by W. B. Greeley, assistant forester, Forest Service, acting as chairman, at 10 o'clock.

Mr. Greeley asked that special subjects which the collaborators wish to discuss in the afternoon session be submitted to the Chair, provision having been made in the program for such discussions.

The first subject of the morning session was "Lookout systems." M. C. HUTCHINS, State fire warden of Massachusetts, was called upon to open the discussion.

GENTLEMEN: I desire first to give you a general idea of the conditions with which we have to contend. The area of Massachusetts is 5,500,000 acres, of which from 60 to 70 per cent is wild or forest land. We have a population of nearly 4,000,000, which means that during holidays and Sundays a large number of people are traveling through the woods or along the highways in their automobiles, constantly increasing the fire danger. We have over 2,500 miles of railroad main-line trackage, with 1,937 locomotives in use. We also have 317 portable sawmills in operation throughout the State, each one leaving one or more dangerous fire slashes.

Massachusetts appropriates annually \$255,000 for the protection of its forests; \$200,000 for the suppression of the gipsy and brown-tail moths; \$25,000 for forest fires; and \$30,000 for reforestation, chestnut bark disease work, and office expenses.

The fire loss in Massachusetts for the year 1911 was \$537,749. During the three preceding years a conservative estimate of the fire loss would not be far from \$300,000 each year. In 1912, with a rainfall of 7.36 inches less than in 1911 and 8.61 inches less than normal, our reports show the fire loss to be only \$80,836. The reports of our lookout watchmen show that over 2,200 fires have been observed, of which about 400 were permit fires or fires extinguished in their incipiency by the forest wardens. The forest wardens reported 1,851 fires, over 1,500 of which were first observed by the men in charge of the lookout stations. Of the latter, 51 per cent were extinguished within an hour from the time they were observed, 21 per cent within two hours, 15 per cent within three hours, 5 per cent within four hours, 3 per cent within five hours, and but 5 per cent burned over five hours, many of which were peat-bog fires.

We have in Massachusetts what is called the town forest-warden system. Each town, of which there are 354, has a forest warden, who is appointed by the selectmen of the town and approved by the State forester. Each forest warden appoints necessary deputies, distributed

throughout the forest area of his town; there are 1,640 such deputies, of whom 1,135, in addition to most of the forest wardens, have telephone communication with the observation stations. Owing to our forest-fire appropriation being limited, we have found that better results would be obtained by devoting our funds to the establishment of observation stations rather than a paid patrol force. The State has been divided into four forest-fire districts, each in charge of a competent fire warden. These wardens are provided with automobile runabouts, and practically all the patrol work in the State is done by them. They have general supervision over the town forest wardens and the observation stations in their respective districts, and during the coming season will devote considerable time to the inspection of locomotive spark arresters and ash pans.

The portion of the State shown on figure 1 as districts 3 and 4 comes under the cooperative agreement with the Federal Government. In this territory our fire loss in 1912 was about \$35,000, as compared with about \$400,000 in 1911. We have within this territory 163 forest wardens and 770 deputies, 512 of whom are connected by telephone with our observation stations.

We have had in operation during the past season 17 observation stations, located on the highest elevations throughout the State. Each station is in charge of a competent local watchman, who knows every elevation, railroad, highway, and the exact location of every forest warden and deputy. We have erected 30, 40, or 50 foot iron towers, especially designed for forest-fire work. These are set on cement piers, and at the top of each tower is an 8 by 8 foot wooden or steel structure, as far as possible inclosed in glass. (See fig. 2.) The steel of the 30-foot tower costs \$120; the materials for the wooden structure at the top, including windows, cost about \$75. The construction and cement work is done entirely by our own men. Three men will make the cement piers in about two days; four men will put up the tower in from one and one-half to two days; and two men will build the wooden structure in about three days.

Each station is equipped with long-distance telephone connection with the New England telephone system. We have had some delays during the season, owing to being on party lines, but this has been eliminated in two or three instances by having a line run to the central office. Arrangements are now being made so that practically every station will have its own private line for use the coming season.

The stations are each equipped with a map stand, elevated $3\frac{1}{2}$ feet from the floor, on which is a topographical sheet covering the territory within a radius of 15 miles from the station, with the town boundary lines plainly marked. These maps also have on them a table of degrees for use in crossing lines, one station with another, and each station is furnished with a large map of the State showing where each 2-degree line drawn from that station will cross similar lines from other stations. There is communication between the look-outs, and our triangulation system of locating fires has worked out very successfully between many of the stations. We have found during the past season that it is absolutely impossible to thoroughly cover a radius of 15 miles from our stations during hazy and smoky weather. We shall, therefore, add several substations to be used during the spring and fall, thus reducing our radius to 12 miles at most.

Better results would be accomplished if this could be reduced to not over 10 miles.

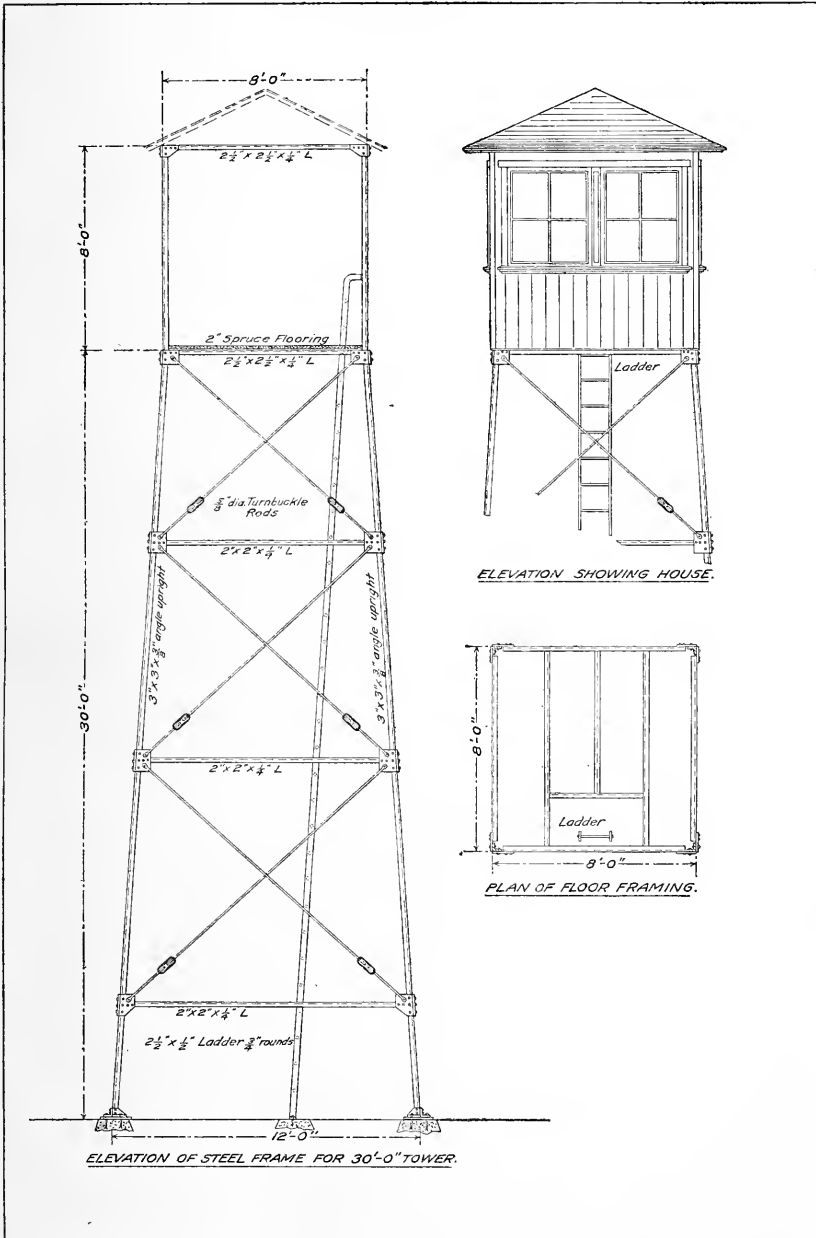


FIG. 2.—Observation tower designed for Massachusetts Forest Department.

In selecting the watchmen for our towers we have made it a point to employ local men who are familiar with the territory under their

supervision and who are personally acquainted with the town forest wardens. These men are on duty from 7.30 a. m. to 6.30 p. m. During the portions of the season when not required for observation work their time is devoted to building fire lines, clearing out trails, repairing and trimming out their telephone lines, and visiting the town forest wardens and deputies throughout their territory. Many of our stations are supplied with a watchman's time clock. This is punched every half hour, and has proved very effective. We also check up our observers' reports with the reports of fires received from the town forest wardens, in order that we may ascertain whether or not they have promptly reported each fire.

The cooperative work carried on between the State and the towns has been very gratifying. Several towns have contributed one-half and others have contributed the entire purchase price of an observation tower. We shall erect four towers this spring that have been purchased in this manner.

We have an annual appropriation of \$5,000 for forest-fire equipment. All towns with a valuation of \$1,500,000 or less are entitled to 50 per cent reimbursement from the State on all equipment of this kind they desire to purchase not exceeding \$500. The equipment is approved by the State forester and placed under the supervision of the town forest warden subject to inspection at least once a month by the State fire warden or his authorized assistants. Our reports show that the total amount expended by the State and towns for such equipment in 1912 was nearly \$24,000, including sums expended by the larger towns that do not come under the reimbursement act.

There are two other matters I wish to speak of—the cooperative work with the rural mail carriers and the boy scouts. As soon as the order was issued requiring rural mail carriers to report all forest fires we at once supplied each carrier with a list of the forest wardens to whom he was to make report. We have had 85 fires observed and reported by such carriers, and several fires have been extinguished by them in their incipency.

We have also taken up the matter of interesting the boy scouts in the forest-fire work. There are about 7,000 scouts throughout Massachusetts, divided into 250 separate companies. Early in the spring we supplied each scout master or assistant scout master with a copy of our fire law and instruction book, thus enabling them to instruct the members of the different companies relative to the forest laws. We have had no fires caused by boy scouts, and it is but fair to assume that the educational work done through the scout masters has prevented many fires.

DISCUSSION.

MR. GREELEY. What is the relation between the lookout watchman and the patrol force? When the lookout observes a fire what does he do?

MR. HUTCHINS. As soon as the fire is accurately located the observer calls up the town forest warden or the deputy warden residing nearest to the fire.

MR. WILBER. Do you have any trouble with what you might call false fire alarms—a man calling out the warden to go to a fire when some one is burning brush?

Mr. HUTCHINS. Yes; we have had some trouble along this line caused by our forest wardens not notifying the observers at times when permits are issued.

Mr. WILBER. Who owns the property your towers are located on?

Mr. HUTCHINS. In some instances the State, in others private individuals. There has been no objection by private owners to our cutting trails and running telephone lines through their property. Our lines are practically all run on trees, and we use a heavy triple braid No. 9 wire. This wire costs us \$30 a mile, and three men will run a mile of wire a day.

Mr. WILBER. Are the forest wardens in touch with telephones?

Mr. HUTCHINS. In most cases they are men we can get very promptly. In case we are unable to get the forest warden we are always sure of getting in communication with at least one of the deputies. Our observers make it a point to get in personal communication with the forest warden or deputies.

Mr. WILBER. Do you have trouble with the fall fogs or mist that hangs over the hills?

Mr. HUTCHINS. We experience this trouble more or less throughout the Cape country. We also had trouble at the Greylock station by being shut in with clouds, owing to the elevation.

Mr. ELLIOTT. Our legislature will soon be in session, and we have to go before it for another appropriation. I want to call your attention to the difference between our State and Massachusetts. The area of Massachusetts is something like 5,500,000 acres. We have 61,000,000 acres, of which there are probably 40,000,000 acres of either timber or brush land which needs protection. We are getting a little appropriation of \$30,000. I buy my own automobile to inspect the whole State. I want to get a map of Massachusetts and a thorough report on that State to report to our legislature. I think it will be good information for it.

Mr. RANE. There is one thing Mr. Hutchins has not touched upon; in fact, there are many things he has not had time to touch upon. One thing we did that I think has not been mentioned was to get out a forest wardens' handbook which contains the names of every warden, his deputies, and the telephone number of each. We started out with the idea of distributing these handbooks through the automobile association in the State. They are pretty enthusiastic people over forestry, particularly from an esthetic standpoint, and where we have a publication of this sort with the names of all the towns alphabetically arranged, any automobilist going through the State, if he is interested at all, should there by a forest fire, has an opportunity to be of assistance. With one of these books an automobilist, if he comes across a fire, simply has to see what town he is in, then stop off at the first farm house that has telephone connection and report. The same use can be made of this book by those operating electric lines. Rural mail carriers and the boy scouts are also making use of it.

J. H. FOSTER, professor of forestry at New Hampshire College, who has been intimately associated with the protective work under

the Weeks law as a Federal inspector, was called upon to continue the discussion of lookout systems. He said:

GENTLEMEN: To my mind lookout work is so important that as time goes on other lines of fire protection will become less necessary. I say this with a full understanding of the shortcomings of lookout stations and with the full knowledge that there are times when smoke and haze render them useless for short periods. In order that lookout stations may render the best service they must, of course, be efficiently equipped and maintained.

Last summer I visited a great many of the stations in New England and was much impressed with the quality of the men employed as observers. They were accustomed to the region about them, were acquainted with the people, and most of them were experienced in woods work. Furthermore, they enjoyed the life of isolation, which is, of course, essential to satisfactory service.

I am sorry to say that in a number of cases I found that the district chiefs neglected the lookout men under their direction. They should keep in touch with the lookouts daily if possible. It is discouraging for an observer never to see or seldom to have communication with his district chief. While it may be impossible for a district chief to get to isolated stations often, he can telephone to the men, which is not only encouraging to them but helps him to gauge the efficiency of the service they are rendering. It is not enough for the observers to make written reports to the district chief. They should come personally in contact with him.

The need of easy communication from lookout stations to central telephone offices is absolutely essential. The lack of satisfactory communication in some instances has been responsible for bad fires. It is perfectly obvious that unless an observer can communicate without delay with the central telephone office and with his district chief or a fire warden the lookout station might just as well not exist. I know of one station with an excellent observer and in a region where great service could be rendered, but because the observer could only get the central station by relaying a message through a store he was in one instance unable to report a fire until it was already discovered by other people and beyond control. In some cases direct communication with central telephone stations is not possible at present even where the lookout is a very important one to maintain.

The Kennebec Valley Protective Association in Maine is rendering fine service in aiding the State in its fire-protective work. This association has recently completed a double telephone line connecting isolated portions of the Kennebec watersheds and so located that lookout stations may be readily connected and brought into close touch with the chief wardens in charge and the secretary of the association. Its work in other directions, such as furnishing funds to the State in time of emergency, is also very valuable.

In New Hampshire the timberland owners' association is doing effective work, not only by protecting large areas belonging to the owners, but by helping the State forester and the Federal Government to improve the entire fire service. Assistance rendered by this association is doubly important because of the fact that its funds can be used for any legitimate purpose and are often used to supply needs which the State and the Federal Government can not supply.

The association has built many lookout stations and equipped them and has used its funds in other ways, such as building lines of telephone to connect isolated points and paying for extra telephone service.

I am very enthusiastic over the lookout-station work which has been developed in Massachusetts. The ease with which one may communicate from one station to another and with central telephone offices makes it evident that any fire must be quickly reported. It is a policy of Massachusetts to have the observers come in close touch with the town fire wardens. The district chiefs during periods when there is no fire danger take the observers to the surrounding towns and make them acquainted with the wardens. In this way many important problems are discussed and plans made which help to increase the efficiency.

A great deal has been said about railroad patrol and the protection of property from railroad fires. I believe lookout stations can render an extremely important service in this regard, and they are already doing so to a certain extent. I believe the time should come soon when lookout service may do away more and more with the need of railroad patrol. A number of instances in New England show what excellent results have been obtained in checking fires along railroads by means of lookout stations. In Connecticut one of the stations in particular is so situated that many miles of the Central New England Railway can be seen from it. The observer has been able to call up the railroad station agent and report to him that a particular train has just started a fire, and the station agent has been able to get the section crew to the fire at once. Many miles of railroad can be seen from some of the lookout stations in western and central Massachusetts and also from stations in New Hampshire, particularly Black Mountain and the Mount Agassiz stations. In Maine the lookout stations are in a large measure located in a portion of the State where railroad fires are the greatest danger.

With reference to brush permits, a number of cases came to my attention last summer where the observer at a station was undecided whether or not to report a fire which was obviously a brush fire and in no danger of spreading. It would be well if fires set by warden permit could be reported to the observer either by the fire warden or by the person receiving the permit to burn brush.

Lookout-station work is comparatively new. It is being improved every year, and I am confident that a greater degree of progress in fire protection has been made as a result of lookout and patrol work in the last two or three years than has ever been made before or could be made by any other means.

TELEPHONE CONSTRUCTION.

C. R. PETTIS, superintendent of forests of New York, led the discussion on this subject, as follows:

GENTLEMEN: Our appropriation for fire protection applies to forest lands in the Adirondack and Catskill preserves. The money may be used for employing men for either patrol or fire fighting and their expenses, purchasing supplies, building lookout stations and telephone lines, or other necessary purposes. The financial aid from the Federal

Government has been used to pay the salaries of observers on lookout stations.

The region protected is divided into five districts—four in the Adirondacks and one in the Catskills. These districts include certain towns known as "fire towns," of which there are 77 in the Adirondacks and 19 in the Catskills; their aggregate area is 7,200,000 acres, including 1,644,088 acres of State land.

I think you are all convinced of the value of observation stations. In New York I believe we would not be able to maintain any kind of reasonable fire protection without them, and, of course, we can not have effective stations without telephone connections. Stations are being established as fast as our appropriations and facilities permit. In this work we have had the cooperation and financial support of private owners. In some cases we enjoy the free use of their telephone lines or they have joined in building new ones; in other cases complete stations have been built by the owners and we maintain the observers.

The first work we did in constructing observation stations and telephone lines was in the summer of 1909, when we established 11 stations. Since then we have been working on a comprehensive plan, and to-day there are 49 stations. We hope eventually to have about 60 stations probably not more than 7 or 8 miles apart.

We have already constructed 227 miles of telephone lines, of which 58 miles was built the past year almost entirely by the ranger force during the winter season. In some cases these lines are comparatively short, built to connect the station with a commercial line or to form a connecting link between existing lines, while in other cases they are from 30 to 40 miles in length. On some of the longer lines we are leasing a large number of phones which not only bring in a revenue and help pay the maintenance charge, but also put the force in touch with a greater number of people.

We build a two-wire line (metallic circuit) wherever we connect with one, and similarly in the case of a one-wire line (grounded circuit). We clear out a space along our lines and always attempt to go through green timber, if possible. If we have to go through fire-killed timber outside of State land, we try to make some arrangement with the owner to cut down the necessary trees so that they will not be constantly falling on the line. Only in cases of necessity do we erect telephone poles. We think it cheaper, if a telephone company has a line of poles where we wish to establish a line, to make an attachment contract; as a rule, there are unused pins which can be rented. The customary price is 10 cents per pin per year.

No. 12 galvanized-iron wire is used for lines attached either to poles or trees. This material costs approximately \$6 a mile. When lines are attached to trees we use Victor split insulators, the wire going through the center of the insulator, around which a short wire is wrapped, securely turned, and then attached to a tree by an ordinary fence staple. The insulators are placed approximately 150 feet apart, requiring 35 to the mile. The opening in the insulator is sufficient to permit the wire to slide, but as the line is built with some slack a tie around the insulator is made once in about every seven insulators. This tends to distribute the slack and prevents the wire from dragging on the ground. In case a tree falls on the line it is not broken, but simply pulls up the slack. When the tree is removed

the slack is redistributed. It is desirable to run the line near the trail in order to make inspection easy for the linemen. The lines through the woods are not built straight, but in a somewhat zigzag manner. This construction holds the wire out from the trees. If a metallic circuit is constructed, the lines should not be so close together that a tree might fall across both of them and thus make a short circuit.

Special attention should be given to the matter of protection from lightning. Mountain tops are very often "hit." A heavy protector should be used in all cases. The 58-A of the Western Electric Co. has proved very satisfactory. The observer should be provided with several additional fuses. We have also found that the use of a switch disconnecting the wire before it reaches the instrument gives an additional precaution; it should be opened in case of thunderstorms.

In purchasing instruments it is desirable to specify a 2,500-ohm ringer, as this increases the sound. Metallic telephone sets are being tried and will probably be desirable. In any case the sets should be carefully protected, not only from storms but from hedgehogs.

Subsidiaries of the American Telephone & Telegraph Co. (Bell) are our chief operating companies, and whenever we connect with their lines our agreements provide that we make the necessary construction subject to their inspection. We have had no trouble at all on this score, because we endeavor to build substantial lines.

The cost of construction varies in the case of a one-wire line (grounded circuit) from about \$10 per mile of tree line to \$40 per mile of pole line; and in the case of a two-wire line (metallic circuit) from \$20 per mile of tree line to \$60 per mile of pole line. Where there is no forest growth we have in cases found it advisable to use what the Western Electric Co. call No. 9 O. K. triple-braid galvanized-iron wire, costing \$30 a mile. I have heard of cases where this wire has been in use for eight or nine years, lying on the ground, and is still giving satisfactory service. It is particularly adapted to use on mountain tops where there is nothing but barren rocks and it is impossible to erect poles.

As Mr. Hutchins pointed out, it is very desirable, if possible, to get a direct connection. Do not have your telephone wires so that the man on the mountain station has to wait for somebody to run across the road to telephone to somebody else, or where you can not talk to the fire warden. If your station man is any good he may tell his ranger or warden something in regard to the size of the fire and how it is coming up, so that the ranger can get an idea of how many men he needs to take; those are the important things.

Wherever possible our lines are connected to lumber camps. In fire fighting one man from a lumber camp is worth 25 men picked up around a village. The lumber companies in nearly all cases have telephones running into their camps. They give us free use of these and switchboard service wherever necessary, and all we have to pay is our long-distance telephone rental.

It never seemed to us quite fair to ask a commercial company to build a line to the top of a mountain to get the business that would come from the operation of a single telephone, and therefore we went ahead and built our own lines. We furnished our own instruments and maintained these lines, and there is no additional expense to the telephone company for the new business. We use the telephone prob-

ably seven months in the year and pay the regular full annual telephone rental. That rental varies, according to the size of the telephone exchange, from \$18 to \$36 a station a year.

Mr. FOSTER. May I ask if the telephone companies give you a rebate for a half-year or more?

Mr. PERTIS. They are willing to have a contract canceled on payment of one-half of the rental for the unexpired period. They have offered that option.

In the case of two lookout stations we have our lines on toll-service basis; that is, drop the money in the slot when we use the telephone; they offer contracts for such service on toll lines only. In another case, at Tupper Lake, we built our line from the top of the mountain to the telephone central station, where we are on a regular toll basis and pay whatever the prescribed toll rate is.

We have had most of our trouble with party lines. A great many lines were so heavily loaded that it was not desirable to add another telephone. One case of this kind was where we had four mountain stations and five rangers on a long and heavily loaded line. In this instance we have signed a contract with the Bell Telephone Co. to attach our line to their poles, and have run a wire to handle our employees, who now get service among themselves direct on our own line or through central to others. Private owners have cooperated with us very fully. We built from Schroon Lake to Underwood, a distance of nearly 30 miles, a line which ran into the telephone central at Schroon Lake; a private party paid one-half of the expense and looked after all the maintenance.

The telephone companies have insisted that we pay business rates, while we have tried to show them that we were not doing business, but that the service is the same as that supplied a private house, because our phone was at the habitation of a single man on a mountain station. On some of our mountains we have two telephones, one on top of the mountain and one down a short distance at the camp. We have maintained that one telephone was an extension of the other, for certainly one man, even though he does have two telephones, could use but one at a time.

The telephone companies derive a great deal of revenue from the State's fire-protective organization. All of our 49 mountain stations are called every day by the district ranger. The tolls will vary from about 20 cents to as high as 40 cents a call.

So much for telephone construction. Before concluding let me say a few words about mountain stations. We have tried to make them an attraction in the locality in order to get the tourists interested. We have cleaned up the trails so that ladies can go up some of the mountains, and we have posted signs so that tourists can not get lost. The station is thus made much more attractive for the observer; he is not so lonesome. All this aids the work.

I wish to point out a single instance as to the value of a mountain station. During the dry period of last July, about noon one Sunday, a fire was discovered by the observer on Adams Mountain. It originated in one of the most inaccessible portions of the Adirondack forest, but in spite of this fact a fire warden with a small force of men reached there within two hours. By 5 o'clock the following morning the ranger was on the ground with a large force of men, and

the fire was controlled before it had burned over more than 5 acres. The land on which this fire occurred had been lumbered within recent years, and there was a large amount of slash on the ground. If the observation station had not been there it is probable that thousands of acres of timberland would have been burned over before the fire could have been checked.

The time to fight a fire is before it starts. We supply our stations with United States Geological Survey maps, but few of our men use them. We select for an observer a man who has tramped all the ridges and points and knows his own territory. When he learns of a fire he calls up the proper persons and gets them on the job. They get an automobile, or whatever is required, and put the fire out before it gets well started.

Last year we had 383 fires in the forest-preserve counties. The total acreage burned over was 6,990, of which 629 acres were State lands, and the total damage was only \$11,340. The average area per fire was 18 acres, and the average damage about \$30. Out of the area under protection about one-tenth of 1 per cent was burned over, and but a very small proportion of that was land upon which there was much timber. A large proportion of our fires occurred around the outlying sections of the Adirondacks. We are having most trouble there, and also in the sparsely settled portions along the highways.

Mr. GREELEY. Gentlemen, I have here some copies of a proposed contract¹ between the American Telephone & Telegraph Co. and the Secretary of Agriculture. We are extremely fortunate in having with us to-day Mr. M. C. RORTY, commercial engineer of the American Telephone & Telegraph Co., who has come here for the especial purpose of discussing the provisions of this contract, which may apply to the States as well as to the Federal Government, and such matters pertaining to telephone contracts and rates in general as you may wish information on. I take pleasure in introducing Mr. Rorty.

Mr. CHAIRMAN AND GENTLEMEN: Perhaps what I have to say can be introduced in the best way by telling just how this present contract has been developed and what the thoughts are as to the use of it, or of similar contracts throughout the several States and in the various portions of the country.

This particular agreement has been approved by the Secretary of Agriculture and has also been approved by the American Telephone & Telegraph Co., to the extent that we agree to advise its adoption by the various associated telephone companies.

I may, in this connection, make a little explanation as to the relations between the American Telephone & Telegraph Co. and the associated companies. The associated companies are separate and independent organizations except as to the stock interest that the American Telephone & Telegraph Co. has in all of them. That stock interest runs, in different cases, from a minority interest to complete or nearly complete control.

Contract forms similar to these will be forwarded to the associated companies as soon as completed copies are received from the printer, which I expect will be some time next week; and I have no doubt that the form will be adopted substantially as it stands, in so far as the Department of Agriculture may wish to have contracts executed.

¹A copy of this contract form is contained in the Appendix, p. 80.

The contract has been drawn up specifically to meet the interests of the Federal Forest Service. Nevertheless, we have had in mind, in drawing it up, that there would be a desire on the part of the various State foresters to arrange for somewhat similar contracts, and, while the details will necessarily have to vary in the different States according to local conditions, nevertheless I think it is safe to say that the spirit of this agreement—the general spirit of cooperation in which it has been written—will be carried out in connection with any separate contracts that may be set up between the State forest departments and the local Bell telephone companies.

The essential feature of this contract, as between the Secretary of Agriculture and any associated Bell telephone company, is the agreement of the telephone company to establish for forest purposes practically the same type of service that is now furnished for rural telephone lines. The service may, however, by local arrangement be set up on a one-party-line basis if there is objection to having other parties on the forest lines, or there may be three or four or a dozen Forest Service telephones on any one line. The plan is expressed in general terms in this contract, with the idea that the schedule specifying the compensation will cover the details and will be taken up individually in the territory of each telephone company.

Provision is made, in addition, for a reciprocal use of attachments on Forest Service pole lines, and the pole lines of the Bell Telephone Co. These attachments are to be interchanged without charge, subject to the condition that there shall be spare facilities available in either case.

The telephone company also agrees to construct telephone lines for the Forest Service in any locality it may desire; to install telephones and perform maintenance work; and, in emergency, to sell to the Department of Agriculture such telephone equipment, line material, and supplies as can be reasonably supplied from local stock rooms of the telephone company, this service to be furnished at cost, including all supervision charges, plus 10 per cent, and the sales to be made at actual cost plus 10 per cent. It is a question just how far the Forest Service may desire to avail itself of this last provision, but it is at least desirable to have the arrangement set up in advance, so that when an emergency comes there may be no delay on account of special negotiations.

A further clause provides that the Department of Agriculture may attach telephones for lookout stations on the telephone company's pole lines and circuits without charge, but subject to certain restrictions that are enumerated, such telephones to be for emergency use.

Provision is also made for the connection of portable stations with subscribers' lines, and for the designation of local telephone officials who shall cooperate with the officials or employees of the Forest Service in connection with all telephone work. The telephone company agrees to furnish maps, blue prints, drawings and specifications, and recommendations in connection with the construction of forest telephone lines, and also agrees to cooperate actively with the officials and employees of the department in providing emergency communication by telephone during forest fires. This last provision will mean a great deal, I imagine, in a case of a large fire, and the intent of the section is to make sure that some one telephone man shall know that it is his job to cooperate with the local forest people

and to make things go properly as to the use of telephone service in controlling the fire.

The telephone company also agrees to keep any public telephone exchange open at all hours on payment of the actual extra expense involved. It may be that when a fire is burning furiously constant telephone communication will be necessary. In such cases the telephone company will keep the small telephone exchanges open all night or on Sundays and holidays. A great many of the smallest exchanges are open only until 10 o'clock, or about that time.

Another provision allows telephone calls made from subscribers' stations or portable stations to be charged to any telephone of the Forest Service, provided the telephone in question is either the one called or is one connected with the local exchange. In some cases there are local rules against reversing calls. This section makes it always possible for Forest Service employees to reverse toll calls to Forest Service telephones, and also permits them to have calls charged from an emergency station to any Forest Service telephones connected with the exchange at which the calls originate.

Another section provides that the telephone company will use its good offices in arranging, so far as possible, with its subscribers in or near any National Forest to give prompt notice to the telephone company's central office directly serving such subscribers of any forest fires discovered by such subscribers or of which they may receive notice, and will instruct its operators and other employees promptly to communicate such notice to the local forest officials. This gives you something in addition to the boy scouts and the rural mail carriers, and, I imagine, with a little careful work can be extended into a very valuable patrol system.

Another section provides that the telephone company shall furnish maps showing the arrangement and location of circuits, pole lines, and exchanges of the telephone company in the neighborhood of any National Forest.

Still another section provides that the telephone company shall use its good offices to secure for the Department of Agriculture, upon terms and conditions substantially similar to those provided for, suitable arrangements for the furnishing of similar service by such of the connecting companies of the telephone company within its territory as the Department of Agriculture may in each case desire or approve. This section simply means that the telephone companies will use their acquaintance with the telephone companies over which they have no actual control in the interest of the Forest Service. In the case of connecting telephone companies that have been doing business with the associated Bell companies for any length of time, there will probably be very little difficulty in making any arrangements that may be desirable.

A special provision in the contract which should be of particular interest to the State foresters is covered by section 14 of Article I, which states that the telephone company will "extend the telephone facilities and service covered by this agreement to State authorities and private timberland owners cooperating with the Department of Agriculture in forest protection in so far as, in the judgment of the telephone company, such facilities and service may reasonably be so extended: *Provided*, That any special rates for exchange or toll-

line service set forth in the annexed schedule A shall in no case hereunder be allowed to such State authorities and timberland owners for any purposes other than forest protection."

This clause was inserted to cover cases where State authorities or private timberland owners were directly cooperating with the Federal Forest Service in the protection of forests adjacent to existing National Forests. It had not in mind the cooperation that exists between the State forest departments and the Federal Forest Service under the Weeks law. The latter condition may, however, be met by the negotiation of contracts, substantially similar in general intent to that before us, between the State forest departments and the associated Bell telephone companies. However, such contracts must be negotiated in detail with the associated telephone companies and not with the American Telephone & Telegraph Co.

The only remaining section of particular consequence in the contract is that which provides for the furnishing to the telephone company of right of way through National Forests under certain specified conditions.

As to specific telephone rates to be charged under this contract, the present arrangements of the Forest Service with the associated companies vary widely, and it is not expected that the adoption of the new form of contract will necessarily require any modifications in the existing charges. All such matters will be questions for local negotiation and will be covered by the schedule in each case. It is hardly possible for me to indicate what the attitude of the local telephone companies will be in regard to any specific rates, although it is the expectation, in a general way, that the charges for forest telephones will be more or less in line with the charges made in each locality for rural telephone service on lines where the subscribers furnish their own instruments and the rural portion of each circuit. Such charges vary widely in different parts of the country, ranging from as low as \$3 up to as high as \$12 per station per annum for a minimum of about six stations on any one line. A very common rate is in the neighborhood of \$5 or \$6 per station. Additional charges are made, of course, in cases where the telephone companies furnish the instruments.

Mr. Pettis has raised a point in connection with the charges for service rendered during a part of each year which may need some explanation. From the telephone company's standpoint it is difficult to figure that service of this kind, particularly where it is required every year for a definite period, costs any less than service that is continuous through the 12 months. The switchboard apparatus, cable pairs, and outside wires, even when not actually in use, have to be held in reserve and maintained; and operators and repair men have to be provided to handle the maximum amount of work to be done during any part of the year, and can not very well be laid off simply because service at a few telephone stations is discontinued during the winter months. The result is that the rates for so-called "short-term" service have ordinarily been a compromise between this view of the situation and the subscriber's point of view that he should not pay for telephone service except when actually using it. Charges of

this kind become, of course, of less importance in cases where the Forest Service furnishes its own circuits and instruments.

The only general statement that can be made in regard to rate matters is to repeat what I have said before, that the present contract has been conceived in a spirit of liberality and cooperation, and that it is quite certain that the same spirit will be carried out by the telephone companies into any individual negotiations that the State foresters may undertake in their respective States.

CONSTRUCTION OF PROTECTIVE IMPROVEMENTS IN WISCONSIN.

J. G. PETERS read the following paper from State Forester E. M. Griffith, of Wisconsin:

GENTLEMEN: In 1910 there were only a few roads within the State forest reserve. As a complete system of roads, fire lines, and telephone lines was absolutely necessary in order to protect the reserve from fires, this work has been pushed during the field seasons of 1911 and 1912 as rapidly as the men and funds at the disposal of the forestry board would permit.

Within the reserve there were fortunately many miles of old logging railroad grades. With a comparatively small amount of work many of these have been made into very fair woods roads, which will also be excellent fire lines. Others are so located that they can not be used as roads, but most of them will be cleared of brush and other inflammable material.

Approximately 159 miles of road were built, at an average cost of about \$118 per mile. Where old railroad grades could not be utilized, roads had to be built through heavy brush or timber. The cost of building a typical piece of road on an old railroad grade was as follows:

Character of work.	Total cost; distance, 8 miles.	Cost per mile.
Cutting brush.....	\$56.85	\$7.11
Removing ties.....	58.08	7.26
Removing rock and sod.....	9.20	1.15
Plowing and dragging.....	49.85	6.23
Board of men.....	85.00	10.74
Board of team.....	33.40	4.17
Total.....	238.28	26.66

On most of these old railroad grades the brush is very thick. This must first of all be cut out to make a good wide road, then piled, and later burned. The heaviest part of the work is removing the ties, often birch, which have become firmly embedded in the turf. They are piled up along the road and, when thoroughly dry, burned. After the rock and sod have been removed the road is plowed and dragged, and then with a little use it packs firmly.

It is interesting to compare the cost of a road built through very brushy country with that of one built on an old railroad grade, es-

pecially as the work was done under the same forest ranger with practically the same crew of men:

Character of work.	Total cost; distance, 2.75 miles.	Cost per mile.
Cutting brush.....	\$113.95	\$41.44
Removing stumps.....	44.85	16.31
Plowing and dragging.....	32.20	11.71
Scraping.....	70.05	25.47
Shoveling and grubbing.....	125.70	45.71
Dynamiting.....	19.00	6.91
Burning brush.....	26.45	9.62
Board of men.....	215.30	78.59
Board of team.....	86.95	31.02
Total.....	734.45	267.08

Approximately 118 miles of fire lines have been made, at an average cost of \$87.70 per mile. Most of the fire lines follow the old railroad grades. Many of them are really secondary roads, and can be used as such when desirable. However, in a great many places it has been found necessary to construct fire lines where there were no railroad grades, and in such cases the fire line has always been built so as to connect two lakes, or a lake with a river, road, or other boundary, from which the fire could be fought. The forest reserve contains several hundred lakes besides a number of rivers and many smaller streams, which makes it a comparatively easy matter to divide the reserve, by means of roads and fire lines, into a large number of blocks or districts, so that a forest fire can be held in the district in which it starts.

Fifty-six miles of telephone line has been constructed, at an average cost of \$36.77 per mile. The detailed cost of an average line was as follows:

Character of work.	Total cost; distance, 9 miles.	Cost per mile.
Cutting and skidding poles to road.....	\$78.30	\$8.70
Digging holes, hauling and setting poles.....	75.60	8.40
Stumpage value of poles.....	40.50	4.50
Stringing wire.....	49.12	5.46
Cost of wire.....	43.38	4.82
Cost of knobs.....	2.70	.30
Cost of nails.....	.54	.06
Total.....	290.14	32.24

Our telephone lines extend from a headquarters camp to ranger cabins, lookout towers, and near-by towns; a switchboard at the headquarters camp makes it possible to connect any of the lines.

During the summer of 1912 four 55-foot steel lookout towers were built on some of the highest hills within the forest reserve, so located that nearly the entire area of forest-reserve lands in Oneida and Vilas Counties can be observed.

The average cost of constructing the towers has been \$136.90, the detailed cost of a typical one being as follows:

Cost of tower.....	\$66.32
Labor setting up tower.....	52.51
Cement for foundations.....	9.55
Lumber for platform.....	3.05
Total	131.43

From any of the towers the country can be seen for 10 miles in almost any direction, and during dry weather an observer is stationed at each, who reports immediately by telephone any fire or smoke that may be seen.

Old dead stubs are one of the most prolific means of spreading forest fires, as the fire quickly runs up the dead bark to the top of the tree, and a slight wind will carry the burning bark for long distances across roads, fire lines, streams, or other barriers. Stubs of this kind, chiefly birch, have been cut back for 6 rods on each side of 83 miles of roads and fire lines, at an average cost of \$5.34 per mile.

Where the slash from old lumbering operations is very heavy, and especially where it adjoins timber or other valuable property, it is necessary to pile and burn it. Over 1,335 acres of dangerous slashings have been destroyed, at an average cost of \$4.88 per acre. The reason the cost was so high was on account of the work being done on the worst areas where the slashings were heaviest, and also because the lumbermen had made no attempt to pile the slash.

SLASH DISPOSAL.

W. T. Cox, State forester of Minnesota, addressed the conference on this subject, as follows:

GENTLEMEN: The forest service in Minnesota has two big problems—in the summer, fire patrol, and in the winter, slash disposal. The summer force is reduced in the fall to about one-half. We find it necessary to retain the complete force of district rangers and from one to three assistants in each district to look after slash disposal. There are over 1,500 logging camps operating in the northern part of Minnesota this winter, not including the small hardwood operations. It can readily be seen that it is a big job for the rangers to handle this enormous amount of work and to go around to all of these different operators, a number of whom are small contractors, many being irresponsible and requiring supervision. The larger outfits, of course, can be supervised less closely, because they are responsible people, and we can get back at them if they fail to dispose of the slash properly. The law is a very broad one and most satisfactory. It leaves to the discretion of the forest department the whole matter of how the slash shall be disposed of. The old law stated that the slash must be burned, and set a date before which it must be fired. That law was inoperative not only because of the failure of the State to provide the men to enforce it, but also because it was so drastic that it could not have been enforced; it was an impossibility and would have put the loggers out of business.

We have many different conditions in the State, various types of forest and kinds of soil, and they all have to be considered in making rules regarding slash disposal. I might mention some general rules or practices in regard to the handling of slash. In the northeastern part of the State there is considerable spruce and cedar, and the soil between the hills is very rocky and swampy. Under such conditions we require the operators—largely small contractors—to lop their slash and make fire lines around it; in general, no burning is required. This kind of work can be done for approximately 20 cents a thousand board feet, or its equivalent, since the slash is cut into poles, posts, and similar products. In this part of the State there are also large areas of mature white and Norway pine, growing mainly on the rocky ridges. Here we require the slash to be burned in winter as logging proceeds. There was a great deal of opposition to this at the start, because it looked like a very drastic measure. But we have had meetings with the lumbermen, and they now feel that it is their own work, which it really is. They have finally come around to our point of view, and many of the larger companies are burning the slash clean at a cost of from 5 to 20 cents a thousand feet. The lumbermen, as a rule, are reasonable, and at one of the meetings they agreed as a body to expend in slash-disposal work not to exceed 30 cents a thousand feet for their operations in order to reduce the fire risk. Some companies state that they are burning the brush at a profit, because it reduces the cost of skidding and they now find all of the logs. We want the brush burned in the winter or early spring while the cutting is actually going on, because if it were piled for burning later on the light soil or duff characteristic of this very rocky country would likely be burned off and destroyed, practically ruining the country.

In other sections of the State we employ different methods. For instance, in the sand-plain country of central Minnesota there is no reason why the brush can not be piled as logging proceeds and burned in the spring. Some loggers claim they can dispose of it more cheaply in this way, but others consider that they can burn it as logging proceeds just as cheaply, or at even less expense.

In some parts of the State, where the soil is heavy and the growth of pine dense, it is almost impossible to burn the slash in winter. As a matter of fact, this kind of land is bound to be used for agricultural purposes in the near future, and the companies are cutting it as clean as practicable, with a view to selling it to settlers for immediate farming. In this case we require that the slash be burned clean, without any effort to save the young timber. That applies only to certain limited parts of the State, but we think it desirable.

There are all sorts of gradations between the three principal methods of slash disposal—clean burning, piling for burning later, and burning as cutting proceeds by starting fires and throwing the slash on. Often it is very desirable to save the hardwood where pine is being cut and there is a valuable stand of birch, large poplar, and elm. In such cases the cost of slash disposal runs up rather high; but where the companies own the land they are willing to bear the expense, even when it amounts, as in some instances, to a cost of 40 cents a thousand feet. On the other hand, where the operators own only the stumpage it is more difficult to get them to dispose of the slash properly, especially since they are apt to injure the remaining timber and bring about damage suits with the owner of the land.

The character of the trees has an important bearing on slash disposal. For instance, in a thick stand of half-grown white pine, about 14 inches in diameter, there will be a great many limbs and branches. When these are cut the amount of débris is heavy, and it costs at least three times as much to dispose of the slash there as it would in a more open stand of mature white pine.

One of the small things that is really important is the matter of a torch for burning the brush. It has been very difficult to convince the loggers that the torch was a desirable implement. As there is a great deal of birch in that country, they had been in the habit of gathering the bark and starting fires in the piles. They have found, however, that the expense can be reduced considerably by the use of a torch; and they are now having torches made similar to the one used in the Forest Service, consisting of a large pipe designed to contain waste saturated with oil, attached to a smaller pipe, which is used as a handle. The torch should hold about $1\frac{1}{2}$ quarts of oil. It is strong and effective, and saves a great deal of time.

In regard to getting compliance with the law, the larger companies are all right, because the law authorizes the State to go ahead and burn the brush if they do not do it satisfactorily and collect the cost in a civil suit or as a lien on the land. However, with the irresponsible operator who has no property and is liable to be in Minnesota only during the fall and early winter and in Canada in the spring, we find it necessary to adopt somewhat different tactics. These men, as a rule, are contractors, and we reach them by requesting the company from whom they receive the contract to hold back a sufficient amount of their money until the district ranger has certified that the slash is properly disposed of. If they still fail to do the work satisfactorily, the ranger or patrolman may go ahead and do it, using as much of the money that is reserved as the work actually costs. A number of companies have agreed to follow this plan.

One of the reasons why we have got the lumbermen to see this matter of slash disposal in the right light is probably due to the working out of the law in the Minnesota National Forest. The disposal of slash was taken up early by the Federal Government on this Forest, and has worked out very satisfactorily. Conditions have been favorable, the work has been done cheaply, and the results are known to most of the loggers throughout northern Minnesota.

We have more or less difficulty regarding old slash, because the law was not made clear on this point. I believe the law gives us authority to require companies to go back over their cuttings and dispose of old slash. But this would be unfair, and in many cases it would be impossible to locate the responsible parties. Consequently we have interpreted rather broadly that feature of the law and have taken it to mean operations carried on after the passage of the law.

It is a difficult matter to educate a force of men to give uniform instructions regarding slash disposal. Even with our comparatively small number of district rangers, it requires a great deal of careful work and frequent inspection to get them to work in unity. One company may be operating in two or three districts, receiving instructions from as many different rangers. These instructions must be consistent, and they are issued only by the district rangers. A separate notice is issued for each land description, which is handled as a unit. There is a double object in this. The conditions vary in

different parts of the cutting area, but there is also another reason in that, when necessary, we can bring action separately for each notice issued.

In addition to the lopping of slash, the law requires that slash resulting from the construction of roads, trails, and ditches be disposed of. The State itself is doing considerable ditching through the tamarack and spruce swamps; several thousand miles of ditches are being built, some of them veritable canals. Of course, a great deal of débris results from this work. The State, county, and town roads must also be looked after. It is almost as big a task for the rangers to look after road and ditch slash as the logging slash, because it is hard to convince these petty officers that it is their duty to dispose of the débris. The State roads and ditches are, of course, more easily handled.

The whole object of brush burning at present is to reduce the fire risk. We aim, as soon as practicable, to give more attention to the reproduction of forests, but so far as burning and lopping are concerned, protection is still the one idea. While our law has been in operation not quite two years, it has resulted in a broad belt of country being rendered rather safe from fire. Naturally, there are still many areas of old slash, as well as stands of young timber and small reproduction, which are in danger, but we feel that we are gradually bringing about favorable conditions.

DISCUSSION.

MR. FOSTER. Mr. COX, have you found it necessary to take to court any case of noncompliance with the law?

MR. COX. Yes; with the result that the operators disposed of the brush very satisfactorily rather than pay the fine, and at a great deal higher cost than would have been necessary in the first place. Operators may be fined for noncompliance with the law, and they must pay the cost of disposal in addition.

MR. PETTIS. From what you know of the Adirondacks would you recommend spruce slash burning in our operations?

MR. COX. No; I think that lopping and the fire line are the proper precautions there, just as in Minnesota. I think the conditions are very similar.

MR. PETTIS. Why do you have such a wide difference in the cost of slash disposal? Is it due to the time of year?

MR. COX. Yes; and the men who are doing it. I believe more depends on the men than on anything else.

MR. PETTIS. Are any of the lumbermen opposed to slash burning?

MR. COX. Very few.

MR. PETTIS. One of the chief reasons the Adirondack lumbermen offer for their opposition to top lopping is that it kills reproduction; that is, the actual lopping and the shade from the lopped branches kill the young trees.

MR. COX. As I already have said, I think one of the reasons why we are able to get the lumbermen to see slash disposal in the right light is because of the successful working out of the law in the Minnesota National Forest.

MR. RANE. How do they handle the slash on that Forest?

MR. COX. It is piled and burned, either as the cutting proceeds or very soon after.

Mr. RANE. In your experience do you think burning as the operation is going on is as cheap a method as any?

Mr. Cox. It is the cheapest in certain types of forest, especially in our stands of white and Norway pine.

Mr. PETTIS. Have you had any fires escape in places where slash was being burned?

Mr. Cox. Yes; quite a number, but we have always extinguished them before they became destructive.

Mr. PETERS. Do you feel that the law needs amending in any important particular?

Mr. Cox. In my judgment it does not. I believe there is no important feature lacking in it.

Mr. PETERS. You believe it is a good plan to leave the method of disposing of the slash to the discretion of the forest department?

Mr. Cox. Yes. I see no objection to this plan; it has worked out a great deal better than I thought it would. The New York law, as I understand it, makes the lopping of evergreen trees in all cutting operations a hard-and-fast requirement.

Mr. PETTIS. We require lumbermen to lop the branches of evergreen trees in all of the 96 "fire towns." Last year there was some objection to the law, and we started an investigation. We held hearings at three different places; a large number of lumbermen and many others attended. The result is that we are confirmed in the opinion that top lopping is a good thing. We found cases where fires had occurred both in lopped tops and in unlopped tops, and we were thus able to make comparisons. One argument of the lumbermen was, as I already have said, that the lopping and scattering of branches kills reproduction. They also argued that if the tops are not lopped a fire will run underneath them and simply burn the weeds, and that the tops being raised off the ground—on stilts, as it were—will not catch fire. Our investigations scarcely proved this contention. A fire does not run as rapidly in lopped tops as in unlopped tops, and if one starts you are able much more quickly to make a fire line, because the branches are cut off and it is only necessary to separate them.

We have the same trouble which Mr. Cox pointed out in connection with operators who may be working in two or three different counties. Some of our forest rangers may be overzealous, while others are more reasonable. It is a hard job to keep 72 rangers all lined up to see the same thing alike.

The lumbermen make their greatest objection to lopping small trees. This has been a benefit in that fewer small trees have been cut, but I believe that the law will be amended to provide that tops shall be lopped up to approximately 3 inches in diameter, and that it will not be necessary to lop the tops of the smaller trees. Limbs on the part of a tree under 3 inches in diameter will not be more than 2 or 2½ feet long, and they will keep the top raised but a short distance above the ground, which, I think, will not seriously retard the rate of decay. Such a law will, I believe, be sufficient to accomplish the purpose of slash disposal and will save the lumbermen a great deal of money.

The cost, according to the testimony of the lumbermen, varies. If a man is in favor of lopping he will tell you it costs about 25

cents a thousand feet; if opposed, from 60 to 75 cents a thousand. The cost, so far as it depends on the amount of road to be constructed, will be decidedly increased if the roads are on low ground, where there is a large amount of small timber. In some cases, I think, the operators when they build roads through swamps charge too much of the cost to top lopping, for they cut the branches off and use them for road building but charge it to top lopping.

Mr. Cox. In Minnesota we found that the operators figure similarly where they are cutting pulpwood, poles, and posts. They figure the cost of swamping practically all against lopping, although they have to trim the trees anyway in order to get these materials out.

Mr. PETTIS. There are two other advantages the operators do not always consider. In the first place, they are removing a great deal of timber they never took before. Now that they have to cut the branch off they frequently take the pulpwood up to 2½ inches in diameter in the top, whereas before it was only taken in some cases to 5 inches. Some of the lumbermen who have watched the operations are willing to admit that the increased amount of material which they take out will offset the increased cost. There are others who contend that lopping the tops reduces the cost of making trails, because when all the tops are cut a log can be skidded anywhere. During the investigation a prominent lumberman, who was making an argument against the top-logging law, stated that getting the material close to the ground increased the fire danger. He further stated that he was taking pulpwood to about 4 inches at the top end. When asked if the fire danger would be reduced by not taking the pulpwood out to such a small diameter he said that it would, but he could not afford to leave the material in the woods.

FIRE FIGHTING.

The final session of the conference was called to order in the afternoon by C. R. Pettis, superintendent of forests of New York, acting as chairman.

J. E. BARTON, State forester of Kentucky, who was unable to be present, sent the following paper on fire fighting:

GENTLEMEN: With forest fires, as with fires in cities, the essence of successfully fighting and controlling them is a thoroughly trained and dependable organization. To the inexperienced a forest fire is a fearful thing before which men are helpless; this attitude breeds panic, so that effectual work for the control of the fire is out of the question. The experienced man soon learns that forest fires can be classified, have certain more or less fixed phases, and can be successfully fought and controlled. Confidence in these facts, which experience has shown to be true, is nearly half the battle. The means and methods of the actual work of control are largely a product of the immediate exigencies which his calm and experienced judgment suggests. Hysteria in the face of any fire means ineffectiveness. So that in fighting forest fires I feel the necessity in the first place of a well organized and disciplined force wherever possible, or at least it is essential that the men who direct and oversee the work shall have the requisite training and experience.

In the actual fire-fighting operations there is one general principle which suffices, namely, the fire must be reduced to the smallest pos-

sible "front," so that its advance may be eventually checked. This is what the rangers on the National Forests usually call "running the fire to a peak." Generally in coniferous forests this is accomplished by cutting rights of way and digging trenches ahead of the fire, and oftentimes back-firing from the trenches. The trenches are eventually completed around the entire fire, a close patrol maintained to see that the fire does not escape beyond them, and dangerous burning stubs or rotten trees within the fire zone are cut down. In the hardwood region the same general method is employed; but here the fires are ground fires, ordinarily, rather than top fires. Top fires burn more rapidly, so that the work must be planned and carried out far enough in advance of the "front" to give effective results.

In the Northwest there are a few fire-fighting tools which experience has demonstrated are the most satisfactory for general purposes. These are the long-handled shovel, ax, mattock (grub hoe), and cross-cut saw. Various other tools have been tried under special local conditions, but these four seem universally most efficient. A short time ago one of the men on the Coeur d'Alene Forest devised a combination ax, mattock, and shovel, and the resulting tool was very satisfactory, according to the latest information I have. The cost of making it was the chief objection. Recently various devices and fire extinguishers have been experimented with, and under certain conditions have proved very efficient. The difficulty with force pumps in many situations is the lack of water, and the same difficulty exists with regard to fire extinguishers where water is one of the chemical agents. In a mountain country the transportation of water and supplies for chemical fire extinguishers is an exceedingly important consideration.

In the eastern hardwood region other instruments and tools are possibly more effective than the ax, mattock, shovel, and crosscut saw. Where leaves and dead foliage serve to feed the fire, rakes and hoes will be found efficient instruments, and water buckets of canvas can be readily used and easily transported. Also force pumps and chemical fire-extinguishing apparatus of various sorts will be more serviceable and effective here than in the West.

The organization, equipment, and maintenance of fire crews in case of large fires is a matter calling for considerable executive ability and ingenuity. Usually small crews of from 8 to 10 men, with a foreman, will be found most satisfactory. It is essential that the fire-fighting force be well organized and systematized and that the commissary be carefully looked after. The commissary, unless well conducted, proves one of the most expensive parts of the whole operation, and careful supervision here usually more than pays for itself.

In Kentucky the fiscal courts of the various counties are authorized to provide funds for fire fighting, but are not compelled to do so. The funds must come largely from the general appropriation for the board of forestry until the system is fairly well grounded in the State. At present there are no cooperative associations of individuals or land and timber owners with funds at their disposal for fire protective purposes, although some firms and corporations have undertaken this work. It is hoped and expected that such associations will be rapidly formed within the State.

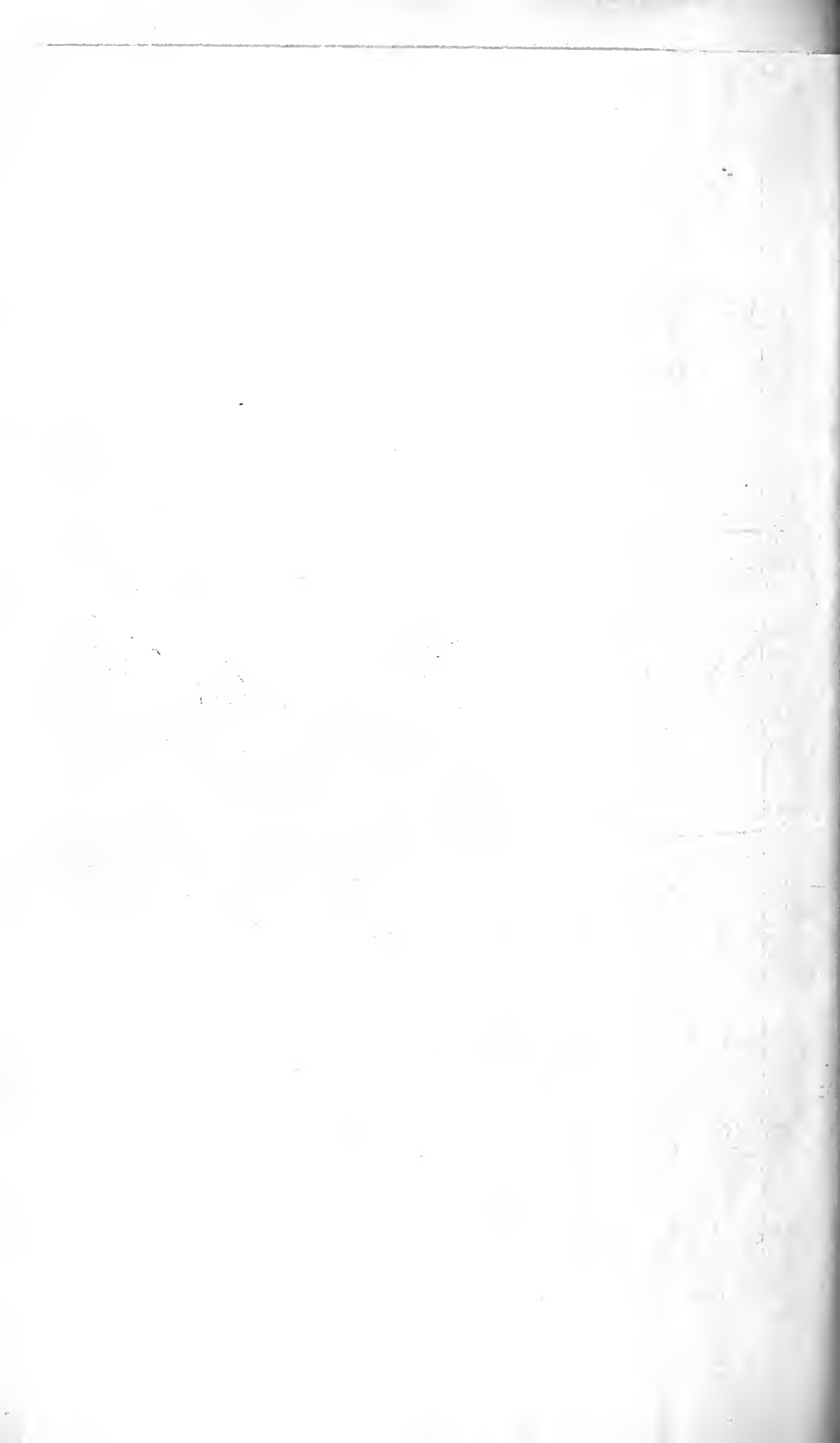
RELATION OF COOPERATIVE FIRE PROTECTION UNDER THE WEEKS LAW TO THE ACQUISITION OF LANDS UNDER THE LAW.

W. L. HALL, assistant forester, Forest Service, gave the following address on this topic:

GENTLEMEN: I assume that all members of this conference are acquainted with the purchase provisions of the Weeks law, so I will take no time to explain them. Purchases have begun both in the White Mountains in New Hampshire and in the Southern Appalachian States. In the White Mountains there is but one purchase area, comprising about 670,000 acres. In the Southern Appalachians we have designated 17 purchase areas, including 5,300,000 acres. On the map (figure 3) you will see outlined the areas in which the Government is now considering purchases in the Southern Appalachians. The reason why these areas were chosen for the beginning of purchases is simply the necessity of restricting purchases to certain localities. We have a limited amount of money with which to buy land. On the 30th of June, 1915, our appropriation will cease as far as it is now made. The money has been made available until expended—that is, \$8,000,000 of it—so you see, having a definite sum with which to work, it is necessary to fix certain limits within which we will consider purchases. We are, in fact, not expecting to purchase anything like all of the lands within the areas indicated as purchase areas on the map. The black areas show the lands which have been acquired or are being acquired. It is necessary for us to select those parcels of land which are going to be of the greatest value for the Government to control in the future. Our land must therefore be so grouped in purchasing that we will not, when the money is spent, be left with merely small bodies of land in any one locality; they must be fairly compacted together, so that they can be administered and so that such principles as we wish to apply in handling these forests may be applied.

It is a difficult and delicate question to determine how far we should go in any one locality in buying lands. Our mistake is likely to be, I fear, that we will go too far, scatter our purchases too much, and be left, when our appropriation is ended, with scattered bunches of lands which we will have difficulty in taking care of. We are therefore working against that difficulty all the time, and if we make a mistake it will not be because we have not seen the danger.

As we now view the matter, our best course is to establish bodies of land as well grouped as possible of from 25,000 to 100,000 acres each, and to have these bodies as well distributed as possible over the Southern Appalachian region. The areas indicated on the map as purchase areas merely help us to carry out that part of the program. When we have done that, and while we are doing it, a certain amount of administration is, of course, necessary. We have already acquired and paid for certain lands; they belong to the Government, and under provision which has been made by Congress we can take care also of lands while under contract for purchase; therefore, as soon as a purchase contract is entered into for any body of land that land becomes subject to our protection. The same is true of lands on which condemnation proceedings have been begun.



The land for which the Government assumes responsibility we shall attempt to protect from fire. I suppose we shall not have to ask the States or private timberland owners or their associations to help us in that work. As far as we can see, this work of protection belongs to the Federal Government. It is buying these lands for the purpose of keeping out fires, in part, and naturally it is the duty of the Government, as we see it, as soon as the lands are in our hands to take care of them. We also expect to make improvements on them in the way of roads, trails, telephone lines, and lookout stations.

There is one further thing that may be done: There will always be a lot of private lands adjoining the Government's purchase. It is likely in some cases we may work out cooperative agreements with private owners to place their lands under the Government's jurisdiction, so far as protection is concerned. That is the plan that is being followed upon the National Forests.

Aside from that there is another thing which occurs to me that can be done, although it lies entirely in the future, and that is that the Forest Service ought to encourage as much as possible the organization in the Southern Appalachian Mountains of fire protective associations. In the White Mountains there is such an association, but in the Southern Appalachians there is none, and I believe that the Government should assume some responsibility in encouraging that sort of thing throughout the Southern Appalachian region. With such associations in existence it may be possible for the Government to extend its influence through the associations over a great deal of territory which it can never hope to acquire. I do not believe that the Government can go much further than that.

DISCUSSION.

Mr. COX. I would like to ask if the areas already purchased are being administered to any extent?

Mr. HALL. Yes; we have attempted to keep out fires.

Mr. HOLMES. Mr. Hall, you spoke about timber protective associations in the Southern Appalachians. About a year ago we tried pretty hard to get up a meeting of timberland owners in western North Carolina. I wrote to nearly every owner, but there were only two or three firms that showed any interest at all. I would like to ask how far the Government would encourage an association—whether it would help by protection, or whether it would help in getting up meetings, or things of that sort? Would the Government be able to assist financially an association extending over the western part of North Carolina?

Mr. HALL. I do not suppose we could arrange to protect private lands, unless under some cooperative agreement whereby the owners and the Federal Government would protect jointly the lands of all parties to the agreement.

With regard to whether such associations can be organized, it seems to me that it is merely a matter of keeping at it. Your first attempt may fail, but if you keep on you are likely to succeed.

Mr. GREELEY. I can see no difficulty in carrying out in North Carolina with a landowner the same kind of an arrangement that has been put into effect in Idaho, Montana, and several other States, under

which the Forest Service cooperates directly with timberland associations in the protection of specified localities. There is laid out a fire protective unit, and in which the Government may own 25 per cent of the land and the association may own the other 75 per cent. We join forces with the association in protecting that unit as a whole, because the fire danger there is a common one, and if a fire starts it is just as likely to burn our land as theirs. I can see no reason why the same thing can not be done in the South when the Government has established National Forests there. That would be your position, would it not, Mr. Hall?

Mr. HALL. Yes; entirely.

ADDRESSES BY REPRESENTATIVES OF STATES WHICH ARE PROSPECTIVE COOPERATORS UNDER THE WEEKS LAW.

J. H. FINNEY, chairman of the forestry committee of the Southern Commercial Congress, told of the work of his committee, as follows:

GENTLEMEN: The Southern Commercial Congress, which has its headquarters in Washington, has been doing for the last four or five years a tremendously important work in the way of publicity concerning the resources of the South. It is a movement for a better understanding of the South and its problems. Its slogan is "A greater Nation through a greater South"—a movement that is maintained by voluntary contributions, mainly from people who are concerned in the South's highest and best development.

To further this work the congress has within the past few months increased its activities by organizing various committees, dealing with the most important topics or problems. You can readily see that such committees, composed, as they are, of people in the Southern States, can do more effective work locally and stir up more local interest in the problems than if the work were all done in Washington; but, of course, the work is directed from Washington, and therefore the Southern Commercial Congress keeps in close touch with everything that is being done. Among these committees is the forestry committee, of which I have the honor to be the chairman. This committee is composed of one man in each of the 16 Southern States, and that man has appointed in his State an advisory board of five or more men, so that we have in this way over 100 men and a thoroughly live membership that can work in cooperation with what we outline from this point as the proper sphere of our activity.

We realize that the South is perhaps more indifferent to the forest problem than any other section of the country. While it does not absolutely ignore the existence of the problem, the people are indifferent to it. This is, of course, a severe indictment, but it is practically a true one, or has been until the last two or three years. We believe that this agency of ours is going to be an effective means of getting the Southern States to cooperate not only between themselves but with the National Government for better forest conditions. As I conceive it, the South must have competent State foresters, better laws as regards fire protection, better methods of handling the forests, an equitable system of forest taxation, restriction of cut perhaps, State forest reserves, and anything else that may be with propriety worked for toward the betterment of forest conditions and that will

make for the perpetuation of this tremendously important asset of the South.

Our committee is working to get on the statute books of the Southern States laws which will at least be a step toward ideal forest conditions. Just how to do this work effectively is, of course, a serious problem. We have got the right men in each State, and these men are quite willing to do what we ask of them. I have offered to go to any of the 16 Southern States and talk to the legislature on the forest problems of the State as a business man sees them. I plan to study the local problem intelligently, present it as well as I can, and urge the enactment of laws for remedying conditions that are worse in the South than in any other section of the country. If the legislature invites me to talk they will probably listen to what I have to say, and if an intelligent plan is put up to them for consideration it seems to me that we can, through our local committeeman and his advisory committee in that particular State, bring influence to bear that will help to get the proper laws on the statute books.

We are intensely interested in doing something to remedy the appalling forestry conditions of the South. We will do whatever we can with you or through you or to help you in your work or whatever we can to influence the various legislatures.

J. S. HOLMES, State forester of North Carolina, was next called on. He said:

MR. CHAIRMAN: North Carolina has so far enacted very little forest legislation. We have made no State appropriation for fire protection, so that we are unable to cooperate with the Department of Agriculture under the Weeks law. I hope, however, that we are going to be able to come in this year.

Our legislature is convening this week, and a bill drawn up by a strong committee of the North Carolina Forestry Association, and backed by that association, will be introduced shortly. This bill will provide for a fire-warden system under the direct control of the State forester, who will be empowered to appoint wardens in townships where they are needed. These wardens will be paid by the State for the time they are actually employed. Other features of the bill require persons to give notice before firing and to watch fires until they are out, railroads to clear off their right of way, and locomotives to use spark arresters.

If we can get this law, or even a part of it, together with a small appropriation—and it will be small—we shall then be able and anxious to cooperate with the Federal Government in fire protection.

Our forestry association has been organized only two years, but we have had two well-attended conventions, showing a large and increasing interest. Our third annual convention will be held next week, and I am looking forward to seeing still more interest manifested.

J. A. VIQUESNEY, forest, game, and fish warden of West Virginia, spoke as follows:

GENTLEMEN: I have endeavored to be a good listener for the past two days. Had I known these speakers were so interesting, I would have tried very hard to induce every member of the legislature of my State, now in session, to come here and listen.

I feel certain there would be no trouble to get proper legislation to qualify under the Weeks law if they properly understood the advantages to be derived therefrom. If I can transmit to them the good impressions I have received from these discussions, I feel certain there will be no trouble in the matter. I am going back to the legislature to do the best I can.

Up until five years ago there had been no effort in West Virginia to control forest fires. Since that time we have been doing all possible under the system we have, and although it is imperfect we have done much good. In the year 1908, from data collected by the Federal Forest Service, there was \$3,000,000 damage done to forests in the State by fires. In the last four years this damage has only amounted to a few hundred thousands, and I think enough impression has been made by the little work we have already done to induce the legislature at this session to grant some appropriation whereby we can qualify under the Weeks law.

J. M. GOODLOE, of Virginia, gave the following talk:

GENTLEMEN: There has been practically nothing done in my State toward protection from forest fires. There is no organized effort anywhere in the State that I know of. We have great boundaries of timberland, and fires do considerable damage. I am truly glad that Gov. Mann sent me here to attend this conference, and when I go back home I shall urge him very strongly to give fire protection a great deal of consideration. I believe we ought to be in line with the more progressive States in this movement, and we ought to pass laws that will enable us to secure the cooperation of the Federal Government in fire protection under the Weeks law.

J. B. MOWRY, commissioner of forestry of Rhode Island, followed Mr. Goodloe. He said:

GENTLEMEN: It has been a great help and inspiration to me to attend this conference. I certainly appreciate the spirit with which the Forest Service is cooperating with the States, and I propose to do all I can to make Rhode Island enjoy this cooperation, for which I have already applied at this conference.

We have had a forest-warden system since 1909, and in 1911 a law was passed providing for 10 lookout stations in the State, 2 in each county. The law provides that any two or more adjoining towns, or any two or more private owners, may join in establishing a station, and the State will pay the cost of maintenance. Some of the towns have already appropriated money for the purpose.

We have difficulty in getting this work under way for the reason that in our State the counties cut a small figure politically. We are practically under town government, and when I have suggested that a tower should be built on the highest hill overlooking the county, there has been a tendency on the part of some towns to fail to cooperate. Some of them have said, "This tower is not in our town, and therefore we do not see why we should take any interest in it." However, I think that their attitude in the matter will soon change and that towers will be built in accordance with the law within a short time. I believe we will get one or two towers this spring.

FIRE PROTECTION UNDER THE WEEKS LAW FOR 1913.

The last address of the conference was made by W. B. GREELEY, assistant forester, Forest Service, as follows:

GENTLEMEN: I will attempt only a brief summary of the important considerations which influence the Forest Service in conducting its protective work in cooperation with the States. I will try to give you our point of view on some of the specific aims which the Service is seeking to attain.

It has been stated previously in this conference that the work to be accomplished under section 2 of the Weeks law is primarily educational. Two hundred thousand dollars would not go very far in actual fire protection. Much can be done with that amount, however, in demonstrating in many parts of the country what is possible under systematic fire protection. By the education and encouragement of local interests we can double or triple every dollar of Government money expended. Broadly speaking, for every dollar of public funds expended under this law the expenditure of four or five other dollars has been secured through the stimulus given to the whole protective movement.

Since our purpose is primarily educational, we must restrict closely the extent of our cooperation with any one State. It has been a matter of real regret that we could not increase the allotments to certain States whose effective and clear-cut lines of protective work needed only a little more money to make the system extremely efficient. In deciding such cases we have felt that we must adhere to the broader goal before us; and rather than attempt to develop protection to its maximum efficiency in any one part of the country, stimulate as many different parts of the country as possible to undertake and develop this work.

Mr. Graves said yesterday morning that the appropriation for this purpose was an experiment in a new public policy—assistance by the Federal Government to the States in preserving favorable conditions on the headwaters of navigable streams. We decided at the outset that to make this experiment conclusive it should extend over at least three years. Our fund has been handled with this aim in view. In carrying out this policy it has seemed unavoidable to reduce somewhat the allotments made last year to certain States. Again, we are guided by the same broad principle of helping the more advanced States less that we may enable the new States to make a start. In our allotment for the present calendar year \$15,000 has been reserved for new States, which we hope will cooperate with the Forest Service during the coming fire season. We have also reserved \$20,000 for emergencies. This little nest egg will be drawn upon to help any State during a critical period like our fire season of 1910.

The Forest Service desires greatly to extend its cooperation to other States. We are particularly anxious to have some of the States in the Southeast enlist in this big national movement. Thus far our cooperation has crossed Mason and Dixon's line only in the case of Maryland. We hope this year to include Kentucky, and are extremely anxious that other Southeastern States, like the Virginias, the Carolinas, and Tennessee, to which the perpetuation of the

lumbering industry is a question of the first importance, qualify for cooperation by meeting the requirements of the Weeks law. The experience of the Forest Service is at the service of any of these States as far as we can aid them in perfecting their protective legislation and field organization. The same applies in equal degree to States in the North, like Rhode Island, Ohio, Michigan, and others which are considering cooperation with the Forest Service.

In this connection I believe that the question of navigability can be made more specific than it was left yesterday morning. We can not accept as navigable streams which serve only for log driving or the transportation of rowboats and skiffs. Any more extensive use, however, such as the transportation of barges or launches of any size, will be considered as establishing the navigability of the stream for our purposes in the administration of this act. Within these limits, our point of view on the question of navigability, as applied to watersheds in new States which desire to cooperate, will be broad and liberal. We will accept as navigable, streams navigated only to the limits of tidewater. I think we may accept short tributaries to the lower courses of large rivers like the Mississippi, which have no important effect upon the flow of water in the main stream but may influence the silting of its channel. I doubt whether we would be justified in the cooperative protection of coastal plains or bottom lands adjoining the lower portions of large streams but not in themselves forming watersheds tributary to such streams. We will, however, be entirely open to conviction on such questions, and we are ready to give the State concerned the benefit of the doubt.

The fact that the adoption of this Federal policy is an experiment makes it essential that its results justify the action taken by Congress and the continuance of the policy which this action embodies. We have therefore felt it necessary to safeguard the expenditure of the funds appropriated under this act with more strict requirements and to exercise closer supervision than might appear necessary. It has not been our purpose to insist upon the adoption of our ideas on the conduct of protective work as against those of the men on the ground who are better acquainted with local conditions. Our aim is simply to make sure that the broader features of this work are maintained at a high standard of efficiency. When the time comes, as it will within a few weeks, for us to report to Congress on the expenditure of this money we must be able to say convincingly that we know that the objects sought in the act have been accomplished. Hence we have laid down certain requirements which may seem to go beyond the reasonable in a certain control of these expenditures. I wish simply to make clear that our object is to make the broad foundations of this work so sure that there will be no question of continuance, as far as they may be determined by the effectiveness of what has thus far been done.

In certain States we have asked that a portion of the allotment be expended for the maintenance of lookout watchmen. Where specific measures of protection have been shown to be particularly efficient, we believe it to be a proper function of the Forest Service to influence the States, and in some instances to require them to adopt such measures. We believe that we should not simply serve as a clearing house for ideas and methods, but that we should make the

best ideas and methods effective by putting them into effect as far as they are locally applicable.

In our requirements as to the number of patrols and of lookout stations in certain States we aim also to establish the foundations for permanent protective systems. It would be a great mistake to allow this work to be stopped if the participation of the Forest Service in it had to be dropped from lack of appropriations. It would be a great mistake to organize it on a temporary basis or to give this whole movement toward conservation in one of its most practical aspects a temporary or spasmodic character. So we have sought, as far as our influence is able, to direct the efforts of the States toward permanent as well as effective protective systems.

We have asked a few States to spend a part of their allotment outside of the area where protective work has hitherto been concentrated. Here again the purpose is to emphasize the educational features of this work. Some of the States, by statutory limitations, are required to spend their funds in certain prescribed portions of the State, leaving the rest of their area without assistance in fire protection. In other States the activity of timber owners has resulted in the effective protection of certain districts, while others are left unprotected. Under these circumstances it has seemed to us a duty of the Federal Government to require such a distribution of this fund as would extend the educational benefit of the work into the parts of States where no protective work is now being made.

Likewise we have asked the States to secure reasonable assistance from the timber owners whose property is benefited and from the railroads, which usually create the single greatest fire risk, as a condition to securing Federal assistance. This requirement also is designed to aid the progress of the State protective work along educational lines as an incentive to greater interest by the private owners of timber or to more effective State legislation.

In all of these things we have aimed to make no requirements which would retard the normal, healthy development of fire protective work in any State. If we have done so in any instance, we will endeavor to be entirely open-minded in adjusting any of these requirements to local conditions and giving the State foresters adequate authority to get the best results without long-range restrictions from Washington.

Your discussions have left little to be said on the cooperative work for the next year. There is one point, however, which I wish to emphasize strongly; that is, more general cooperation on the part of all interests and agencies involved in this big problem. My own experience in fire-protective work in the Northwest indicated that little real progress in the broader features of protective work could be made until we got a great many shoulders at the wheel. The success of the protective work in Idaho and Montana with which I have been particularly familiar has been measured largely by the extent to which we were able to get all interests to pull together. First, the private owners got together and we had protective associations, a tremendous step forward. Secondly, the private owners and the Forest Service got together in the joint protection of lands in and surrounding National Forests. Thirdly, the State was brought into the game in alliance with the private owners or with the Forest

Service, or both. Now in several of the Northwestern States this three-cornered cooperation is working out with varying degrees of efficiency, but in the main getting better every year. A fourth element of almost equal importance was the railroads; and one of the big gains made in protective work in the Northwest was when some of the main railway systems made cooperative arrangements with the Government for joint effort to reduce the fire risk and fire losses along their lines. Much has yet to be done in this region, but the foundations for effective cooperation along all of these lines have been pretty well laid. I feel that the same kind of cooperation must be worked out on all of the large timbered regions before we can get very far in the actual control of the fire problem.

There are, of course, still other elements which must be brought into line. Publicity is essential. You must get at the campers and hunters, at the children in the schools, at the laborers in the logging camps, at the congregations of the churches through their ministers, as Mr. Allen has done. While we may do this specific thing well or that specific thing well and the results are good as far as they go, the really big problem is to get everyone who contributes to the fire risk, directly or indirectly, educated and waked up.

My suggestion is therefore that in all of the States special effort be made to strengthen cooperation with these various elements which should all be helping and whose help, if they all pull together, will be powerful. We believe that the results of these two years justify Congress in making further appropriations for Federal cooperation in this important work. We look forward to continuing this work with you and to making it better and more effective by mutual counsel and advice every year.

APPENDIX.

ROSTER OF ATTENDANCE.

- E. T. Allen, Forester, Western Forestry and Conservation Association, Portland, Oreg.
- I. W. Bailey, Assistant Professor of Forestry, Harvard School of Forestry, Cambridge, Mass.
- H. P. Baker, Dean, New York State College of Forestry, Syracuse, N. Y.
- J. F. Baker, Professor of Forestry, Michigan Agricultural College, East Lansing, Mich.
- F. W. Besley, State Forester, Baltimore, Md.
- J. M. Briscoe, Professor of Forestry, University of Maine, Orono.
- R. S. Conklin, Commissioner of Forestry, Harrisburg, Pa.
- W. T. Cox, State Forester, St. Paul, Minn.
- G. Dawe, Managing Director Southern Commercial Congress, Washington, D. C.
- F. A. Elliott, State Forester, Salem, Oreg.
- W. O. Filley, State Forester, New Haven, Conn.
- J. H. Finney, Chairman Forestry Committee, Southern Commercial Congress, Washington, D. C.
- John Foley, Forester, Pennsylvania Railroad Co., Philadelphia, Pa.
- J. H. Foster, Professor of Forestry, New Hampshire College, Durham, N. H.
- Alfred Gaskill, State Forester, Trenton, N. J.
- J. M. Goodloe, Big Stone Gap, Va.
- G. A. Gutches, Indian Office, Washington, D. C.
- A. F. Hawes, State Forester, Burlington, Vt.
- E. C. Hirst, State Forester, Concord, N. H.
- J. S. Holmes, State Forester, Chapel Hill, N. C.
- M. C. Hutchins, State Fire Warden, Boston, Mass.
- Newbold Hutchinson, Georgetown, N. J.
- R. C. Jones, Assistant State Forester, Baltimore, Md.
- F. F. Moon, Professor of Forest Engineering, New York State College of Forestry, Syracuse, N. Y.
- J. B. Mowry, Commissioner of Forestry, Chepachet, R. I.
- C. R. Pettis, Superintendent of Forests, Albany, N. Y.
- F. W. Rane, State Forester, Boston, Mass.
- H. A. Reynolds, Secretary Massachusetts Forestry Association, Boston, Mass.
- P. S. Ridsdale, Secretary American Forestry Association, Washington, D. C.
- M. C. Rorty, Commercial Engineer, American Telephone & Telegraph Co., New York, N. Y.
- E. Secrest, State Forester, Wooster, Ohio.
- G. O. Smith, Director U. S. Geological Survey, Washington, D. C., (representative from Kennebec Valley Protective Association of Maine).
- E. A. Sterling, Consulting Forester, Philadelphia, Pa.
- W. L. Sykes, President Emporium Lumber Co., Buffalo, N. Y.
- J. A. Viquesney, Forest, Game, and Fish Warden, Belington, W. Va.
- C. P. Wilber, State Fire Warden, Trenton, N. J.
- George H. Wirt, Forest Inspector, Pennsylvania Department of Forestry, Harrisburg, Pa.

Representatives from the Forest Service charged with the administration of the Weeks Law.

- E. H. Clapp, Forest Inspector.
- H. S. Graves, Forester, U. S. Department of Agriculture.
- W. B. Greeley, Assistant Forester.
- W. L. Hall, Assistant Forester.
- L. S. Murphy, Forest Examiner.
- J. G. Peters, Chief of State Cooperation.
- R. Y. Stuart, Forest Inspector.

In addition to a number of other members of the Forest Service in Washington.

FORM OF FIRE-PROTECTION AGREEMENT.

The form of agreement between the Secretary of Agriculture and the State for the protection from fire of the forested watersheds of navigable streams is as follows:

UNITED STATES DEPARTMENT OF AGRICULTURE.

Agreement for the protection from fire of the forested watersheds of navigable streams under section 2, act of March 1, 1911 (36 Stat., 691).

This agreement, made by and between the Secretary of Agriculture of the United States, under authority of section 2 of the act of Congress approved March 1, 1911 (36 Stat., 691), and the State of ----- by and through its State Forestry Commission, witnesseth:

That whereas the said State has requested the cooperation of the said Secretary in the protection from fire of the forested watersheds of navigable streams; and

Whereas the said State has provided by law for a system of forest-fire protection;

Now, therefore, the said parties do mutually promise and agree with each other as follows:

1. To establish and maintain a cooperative fire-protective system covering any or all private or State forest lands within the State of ----- and situated upon the watersheds of navigable rivers; and to furnish for this purpose Federal and State patrolmen or to take such other protective measures as may be deemed advisable, under the conditions hereinafter provided.

2. The State commission shall furnish maps showing the watersheds and areas which are proposed to be protected under this agreement. The cooperation shall be limited to such watersheds and areas in so far as they shall be approved by the Secretary. The said commission shall indicate the periods during which protection from forest fires is proposed under this agreement; the number of patrolmen, with their stations, which will be employed by the State; the character and extent of other protective measures which it is proposed to put into effect at the expense of the State; and the localities in which it is desired to place Federal patrolmen furnished by the Forest Service.

3. The State forester of -----, acting as an employee of the State commission, shall be appointed collaborator in the Forest Service of the United States Department of Agriculture at a salary of one dollar (\$1) a month, and acting in such capacity shall have direct charge of the force of Federal patrolmen employed under this agreement. The State forester shall select the Federal patrolmen, subject to approval by the Secretary, instruct them *in writing* as to their duties, supervise their work, and certify to their services on pay rolls of the Forest Service.

4. The Federal patrolmen so selected shall be appointed as temporary laborers in the Forest Service at a per diem rate not exceeding ----- dollars (\$-----); provided that they shall be employed exclusively in the protection of areas on the watersheds of navigable rivers which shall have been approved by the said Secretary.

5. This agreement contemplates the employment under ordinary conditions of fire hazard of not to exceed ----- Federal patrolmen, or in case of emergency of not to exceed ----- Federal patrolmen in the discretion of the collaborator, provided that in case of serious emergency the latter number may be increased with the approval of the Forester.

6. The State commission shall secure for the Federal patrolmen furnished under this agreement, by appointment as deputy State fire wardens or otherwise, without additional compensation, such police powers for the prevention and control of forest fires as may be granted under the laws of the State of -----, and shall equip such Federal patrolmen with such fire-fighting tools or devices and shall authorize them to employ such assistance in fighting fires as its funds and the State fire laws and regulations will permit.

7. The total sum to be expended by the Federal Government during any calendar year for the purposes of this agreement may equal but shall not exceed ----- dollars (\$-----); but in no case shall the amount expended by the Federal Government in any Federal fiscal year exceed the amount appropriated by the said State for and expended by it during the same period for the purpose of protecting from fire forested watersheds of navigable streams in

said State. This agreement contemplates an expenditure of State funds of at least ----- dollars (\$-----); and in the event of such expenditure falling below said amount the Federal expenditure will be decreased proportionately.

8. Payment for the services of Federal patrolmen employed under this agreement shall be made at the end of each calendar or fractional month on vouchers certified by the State forester as collaborator, and forwarded to the Forester, Forest Service, Washington, D. C., provided that no patrolman will be employed except during the real danger season from forest fires on the watersheds and areas approved by the Secretary under this agreement.

9. The said Secretary and his authorized representative shall have full authority to inspect the protective areas and the force herein authorized, and at his option, by giving the State commission written notice, may withdraw his approval of any such area or portion thereof, or terminate the employment of any Federal patrolman or patrolmen or of the State forester as collaborator in the Forest Service.

10. The State forester shall be responsible for seeing that each patrolman keeps a vigilant lookout for forest fires in or threatening his district, and that he makes every possible effort to extinguish such fires as occur, whether they are on lands belonging to the State, the Federal Government, or a private owner, provided that during the patrol period when in the judgment of the State forester patrol is unnecessary the patrolmen may be used on other fire-protection work. The State forester or his representative shall from time to time make such personal inspection of the cooperative fire-protection work done under this agreement as may be necessary to promote the effectiveness of said work.

11. The said State forester shall, with respect to all private forest land afforded protection against fire under this agreement, use every proper means to bring about the active cooperation of the owner in such protection, including aid from him in the form of hire of one or more patrolmen, construction of permanent improvements, and the like.

12. Both the State commission and the Forest Service of the United States Department of Agriculture shall have equal right to publish the results of the cooperation under this agreement: *Provided*, That any results intended for publication, except press notices of momentary or local interest, be approved by the commission and by the Secretary. In all such publications it shall be plainly stated that the results were secured through cooperation between the commission and the Secretary.

13. This agreement shall become effective on the ----- day of -----, 191---, and shall continue in force thereafter, subject, nevertheless, to the availability of funds appropriated by Congress by the act of March 1, 1911, for the purposes herein mentioned, and to any amendments which may be made hereof by mutual agreement of the parties; and it is expressly understood that this agreement or any modifications hereof may be terminated by either party upon thirty (30) days' written notice to the other.

In witness whereof the said commission has hereunto caused its name and seal to be affixed by its proper officers, on the ----- day of -----, 191---, and the said Secretary has hereunto set his hand and affixed his official seal on the date below written.

President State Forestry Commission.

Secretary of Agriculture.

Signed and sealed by the Secretary of Agriculture this ___ day of -----, 191---

RURAL MAIL PATROL ORDER.

POST OFFICE DEPARTMENT,
 FOURTH ASSISTANT POSTMASTER GENERAL,
 DIVISION OF RURAL MAILS,
 Washington, June 8, 1912.

To the POSTMASTER.

SIR: Your attention is directed to the following order issued by the Postmaster General under date of May 31, 1912:

"ORDER No. 6315.

"The following instructions are promulgated for the guidance of the postal employees concerned:

"In accordance with the request of the Secretary of Agriculture, this department has arranged a plan of cooperation with State and National forest officers whereby rural and star-route carriers shall report forest fires discovered by them along their routes to persons designated by the State and National authorities to receive such intelligence.

"Cooperation with State officers will be given in the following States: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Maryland, West Virginia, Tennessee, Kentucky, Michigan, Wisconsin, Minnesota, Idaho, Washington, Oregon, and California.

"The national forest officers will be cooperated with in the following States: Florida, Arkansas, South Dakota, Wyoming, Colorado, New Mexico, Arizona, Utah, Montana, Idaho, Washington, Oregon, and California.

"The State and National authorities will inform postmasters as to whom the discovery of fires should be reported, and each rural carrier should be directed to cooperate to the fullest extent with such authorities in the manner agreed upon, namely, that the carrier shall report a fire to the nearest State fire warden or National forest officer on his route, or, if no such warden or officer lives on the route, to arrange through some responsible citizen to have him notified, by telephone, if possible. Star-route contractors and carriers are included in the plan of cooperation and should be requested to report the discovery of fires in the same manner as will be done by the rural carriers.

"Postmasters in or near national forests are also directed to report fires to the nearest forest officer."

Respectfully,

P. V. DE GRAW,
Fourth Assistant Postmaster General.

FORM OF TELEPHONE AGREEMENT.

The form of agreement between the Secretary of Agriculture and the associated telephone companies of the American Telephone & Telegraph Co. is as follows:

This agreement, made this ----- day of -----, 19-- by and between -----, a corporation organized and existing under and by virtue of the laws of the State of ----- (hereinafter called the "Telephone Company"), of the first part and the SECRETARY OF AGRICULTURE OF THE UNITED STATES (hereinafter called the "Secretary") of the second part,

WITNESSETH :

Whereas the Telephone Company operates a general public commercial telephone exchange and toll-line system, which includes certain exchanges and toll lines located in the neighborhood of certain National Forests under the jurisdiction of the Secretary and situated in whole or in part in the territory of the Telephone Company; and

Whereas the Secretary desires to utilize, as an aid to the administration, protection, and preservation of said National Forests and in fire prevention and control, certain special telephone facilities which the Telephone Company is able to supply, and the Secretary also desires to procure from the Telephone Company, in connection with fire prevention and control and in the administration of said National Forests, telephone exchange and toll-line service; and

Whereas the Telephone Company is willing to furnish for the foregoing purposes the special telephone facilities and the telephone exchange and toll-line service hereinafter mentioned, and is also willing, to the extent and in the manner hereinafter set forth, to cooperate with the Secretary and to enlist as well, so far as possible, the cooperation of the Telephone Company's subscribers in the vicinity of said National Forests, in facilitating and supplementing the operations of the Secretary in fire prevention and control:

Now, therefore, in consideration of the premises and of the covenants and agreements hereinafter set forth, it is agreed by the parties hereto as follows:

ARTICLE I. The Telephone Company will, as the Secretary may during the continuance of this agreement from time to time request—

1. Connect, by telephone line or lines of suitable type, with the central office of the Telephone Company in any exchange then established in any municipality

or settlement adjacent to or in the neighborhood of any National Forest telephone stations in such number, on any one such line, and at such locations, within or adjacent to said National Forests and outside the limits of such an exchange, as the Department of Agriculture may require; equip each such line at the terminal thereof in such an exchange with such of the Telephone Company's standard terminal apparatus as will reduce to a practical minimum the chances of central-office trouble interfering with the operation of such a line; and furnish thereover local exchange, local toll, and long-distance telephone service under the terms and conditions and at the rates set forth in the annexed schedule marked "A" and hereby made a part hereof; provided, that the Department of Agriculture will, at its own expense, equip, install, and maintain, as herein provided, each of such telephone stations, and furnish and maintain, as herein provided, that portion of each such line which may extend to and between such stations and a point, to be designated by the Telephone Company, ordinarily at or near the central office of the exchange with which each such line may be connected or, in case of an exchange operated within a municipality, at or near the limits thereof, the Telephone Company to furnish and maintain that portion of each such line which may extend to and between said junction and the switchboard of the Telephone Company's said central office.

2. Furnish, for use by the Department of Agriculture in equipping any of the foregoing telephone stations, sets of telephones, with the necessary station equipment, appropriate for use hereunder and of any standard types then furnished by the Telephone Company to its subscribers and lessees in the exchange serving any such telephone station, each such set to be furnished upon the terms and conditions and at the annual rental specified in the annexed Schedule "A."

3. Furnish to the Secretary, in addition to the class of service hereinabove described in section 1, in any public telephone exchange then operated by the Telephone Company, such of the Telephone Company's regular classes of exchange and toll-line service, and such other service regularly furnished by it to the public as such exchange may supply and under the terms and conditions and at the rates expressed in said Schedule "A."

4. Furnish without charge, for the attachment of any telephone circuit furnished and maintained hereunder by the Department of Agriculture, space on any of the Telephone Company's pole lines located within any National Forest contemplated hereby or extending therefrom to the nearest exchange of the Telephone Company, or, in case such an exchange is located in a municipality, then to a point, to be designated by the Telephone Company, at or near the limits of such municipality; provided, that any such attachments to the Telephone Company's pole lines shall in all cases be made under its supervision and direction and in accordance with its standard specifications and engineering practices, and then only whenever, in the judgment of the Telephone Company, spare facilities for such attachments exist.

5. Construct for the Department of Agriculture in, through, and adjacent to any National Forest contemplated hereby such telephone pole lines as said department may require for use hereunder, string telephone circuits thereon, install the necessary telephone-station equipment to be used in connection with such circuits, keep such pole lines, circuits, and station equipment in repair, and in cases of emergency sell to the Department of Agriculture such telephone equipment and line material and supplies as can reasonably be spared from local stock rooms of the Telephone Company. All of the foregoing services to be performed by the Telephone Company for the Department of Agriculture at actual cost, including reasonable and proper charges for supervision plus ten per cent (10%), and all of the foregoing sales to be made at actual cost at

¹ Schedule "A" must be negotiated with each local telephone company within whose territory the Secretary desires telephone service on the basis of those concessions which each party to the agreement is actually able to make within the territorial limits of such local company. Thus, Schedule "A" may modify the main terms of the agreement to any extent and in any particular necessary to adjust them to local conditions.

State foresters particularly should bear this clearly in mind, since only where the State has valuable concessions to make to the local company can it be expected that equally valuable concessions in the form of reduced rates and the like will be granted by the company.

point of delivery plus ten per cent (10%); provided, that the Telephone Company shall not be bound hereunder to begin the construction of any line requested by the Department of Agriculture until the expiration of a reasonable time after the receipt by the Telephone Company of such request, which shall not be less than the time usually taken by the Telephone Company in preparing for the construction of its own lines.

6. Permit the Department of Agriculture, without charge and at its own expense, to attach to and maintain on the Telephone Company's poles, at such reasonable lookout points as may be agreed upon by the respective representatives of the parties hereto, designated as hereinafter provided, lock boxes equipped with sets of telephones, and to connect such sets of telephones directly with the Telephone Company's circuits attached to such poles, with the right to the Department of Agriculture to use such sets of telephones, in cases of emergency only, for telephonic communications over such circuits; and the Telephone Company will also, in such cases, allow the Department of Agriculture to connect its portable emergency sets of telephones, for like purposes, with the Telephone Company's circuits located within or adjacent to any National Forest contemplated hereby; provided, that the right herein granted to connect such lock box telephone sets with such circuits may be refused by the Telephone Company when such connection would involve the use hereunder of a toll circuit connecting together any two public telephone exchanges, and that connections of lock box telephone sets shall be made hereunder with subscribers' circuits only after any necessary consents of other users of such circuits have been obtained. The Department of Agriculture hereby agrees that any connections of emergency telephone sets with the circuits of the Telephone Company hereunder, shall be made by the Department of Agriculture upon its own responsibility, and said department shall hold itself liable to the subscribers and patrons of the Telephone Company for any claims of loss, damage or injury resulting from such connections.

7. Designate local officials or employees to cooperate with the officials or employees of the Department of Agriculture in the work of constructing, equipping, and maintaining any telephone pole lines and circuits, and in the work of installing and maintaining any telephone station equipment, which the Department of Agriculture may undertake to provide and maintain hereunder; furnish engineering and other advice and information, together with plans, drawings, blue prints, specifications, and recommendations with reference thereto; actively cooperate with such officials or employees of the Department of Agriculture in providing emergency communication by telephone during forest fires; and in behalf of and as agents of the Department of Agriculture in securing the prompt delivery of any telegrams transmitted by telephone during such fires to or for any employee of the Department of Agriculture.

8. Keep open at any or all hours, under special conditions of emergency or public necessity, in any exchanges contemplated hereby, such of the Telephone Company's central offices not regularly open at all hours, as may at such time be designated by the Department of Agriculture, such special service to be performed by the Telephone Company for the Department of Agriculture at the actual cost thereof in each case.

9. Allow any employee of the Department of Agriculture to charge, to any of its telephone stations served hereunder by an exchange of the Telephone Company, any message which such employee may transmit from any lock box or portable emergency telephone set herein provided for, or from the telephone station of any subscriber of the Telephone Company, provided, that if the telephone station accepting such a charge is not the station called, it shall be a station connected with the exchange at which the call originates.

10. Require its employees to strictly observe all the rules and regulations of the Department of Agriculture relating to the care and protection of the National Forests; exercise due care and caution to avoid injury to growing timber; and give prompt notice to the Department of Agriculture of any forest fires discovered by them, or of which they may receive notice, when engaged in any work in said forests.

11. Use its good offices in arranging, so far as possible, with its subscribers in or near any National Forest to give prompt notice to the Telephone Company's central office directly serving such subscribers of any forest fires discovered by such subscribers or of which they may receive notice, and instruct its operators and other employees promptly to communicate such notice to the local forest officials.

12. Furnish to the Department of Agriculture maps showing the arrangement and location of the circuits, pole lines, and exchanges of the Telephone Company in the neighborhood of any National Forest contemplated hereby.

13. Use its good offices to secure for the Department of Agriculture, upon terms and conditions substantially similar to those herein provided for, suitable arrangements for the furnishing of service similar to the service herein provided for, by such of the connecting companies of the Telephone Company within its territory as the Department of Agriculture may in each case desire or approve.

14. Extend the telephone facilities and service covered by this agreement to State authorities and private timberland owners cooperating with the Department of Agriculture in forest protection in so far as, in the judgment of the Telephone Company, such facilities and service may reasonably be so extended; provided, that any special rates for exchange or toll-line service set forth in the annexed Schedule "A" shall in no case be allowed hereunder to such State authorities and timberland owners for any purposes other than forest protection.

ARTICLE II.¹ The Secretary will:

1. Upon request, from time to time, when compatible with the public interest, grant or cause to be granted to the Telephone Company, its successors and assigns, easements for rights of way for periods of fifty (50) years from the date of the issuance of such grants for the construction, operation, and maintenance of any telephone lines which the company may have constructed, or may in future desire to construct, over, across, and upon any of the National Forests of the United States, or any land under the jurisdiction of the Department of Agriculture, including the right to cut down or trim any trees which may interfere with or endanger such lines; provided, that the grant of such easements to the Telephone Company, under the act of March 4, 1911 (36 Stat., 1235), shall be subject to general regulations issued thereunder by the Secretary of Agriculture in force at the time such grants are made.

2. Permit the Telephone Company, without charge, to attach the telephone circuits of its general commercial telephone system to the pole lines of the Department of Agriculture, now or hereafter located within any National Forest contemplated hereby or extending from such National Forest to, or to points near any public telephone exchange of the Telephone Company; provided, that such attachments shall be made in accordance with the rules and regulations of the Department of Agriculture, and shall be permitted only when and where, in the judgment of the Department of Agriculture, spare facilities exist.

3. Sell to the Telephone Company, in accordance with the regulations of the Department of Agriculture, for the construction and maintenance of the latter's lines, either within or outside of the National Forests, timber from such of the National Forests as are traversed by or are adjacent to such lines.

4. Use or require to be used upon all telephone circuits furnished and maintained by the Department of Agriculture for use hereunder, in connection with the exchanges and lines of the Telephone Company, only such telephone transmitters, receivers, apparatus, appliances, equipment, and material as shall in all cases be of a standard approved by the Telephone Company as suitable for the purposes of this agreement.

5. Equip at all times with such protective devices, and keep in such repair and maintain in such a manner as shall conform to the standard requirements of the Telephone Company for the performance of such work by its employees, all telephone transmitters, receivers, apparatus, appliances, equipment, material, wires, and circuits maintained by the Department of Agriculture and used hereunder directly or indirectly in connection with the exchanges and lines of the Telephone Company.

6. Protect, in accordance with the standard specifications and engineering practices of the Telephone Company, from all danger of or exposure to crosses or contact with or induction from high tension electrical circuits, all telephone circuits maintained by the Department of Agriculture and used hereunder in connection with the exchanges and lines of the Telephone Company or attached to its poles.

7. Observe, in the use of the telephone stations and circuits furnished or used hereunder in connection with the exchanges and lines of the Telephone Com-

¹ Since the form of agreement was perfected Congress has given the Secretary of Agriculture authority to grant free poles to telephone companies whenever he may deem it necessary for the protection of the National Forests.

pany, all reasonable rules and regulations of the Telephone Company governing the use of its subscribers' stations and not inconsistent with the provisions of this agreement.

8. Permit to the Telephone Company, at all reasonable times, access to any telephone station equipment or telephone circuit, used hereunder in connection with the exchanges or lines of the Telephone Company, for making such inspections or such service tests as may be requisite for the purposes of this agreement.

9. Pay, in accordance with the terms and conditions, and at the rates set forth in the annexed Schedule "A," all charges for local exchange, local toll, and long-distance telephone service furnished hereunder by the Telephone Company, and also pay, in accordance with the provisions hereof, all other charges of the Telephone Company for any other services performed hereunder, or for instruments, equipment, material, and supplies furnished to the Department of Agriculture by the Telephone Company.

10. Designate officials and employees with authority to assist and cooperate with the designated officials and employees of the Telephone Company in the construction and maintenance of the telephone lines furnished and maintained hereunder by the Department of Agriculture, and in generally effectuating the provisions of this agreement; and with the further authority to requisition or obtain, in behalf of the Department of Agriculture, any telephone circuits, apparatus, appliances, equipment, and material for use in emergencies, the construction, maintenance, or repair of telephone lines used hereunder, or any benefit or thing accruing to or to be derived by the Department of Agriculture under or by virtue of the provisions of this agreement.

ARTICLE III. It is expressly understood and agreed between the parties hereto that:

1. This agreement does not contemplate the use hereunder, in connection with any regular service of the Telephone Company, of any telephones and station equipment not furnished by it, except in cases of emergency, and the use of any such telephones and equipment is so permitted only in view of the public demand and necessity therefor.

2. No part of the facilities and service furnished hereunder by the Telephone Company to the Department of Agriculture shall be used in connection with any service for which a charge or compensation shall be received or collected by the Department of Agriculture from any person, firm, or corporation without the express approval and consent in writing of the Telephone Company.

3. No telephone transmitter, receiver, apparatus, wire, or circuit furnished to or used hereunder by the Department of Agriculture in connection with the exchanges and lines of the Telephone Company shall in any case, without its express approval and consent in writing, be connected directly or indirectly with any telephone transmitter, receiver, apparatus, wire, circuit, or service other than that of the Telephone Company, nor shall any telephone station served hereunder by an exchange of the Telephone Company be located outside its territory without such approval and consent.

4. Upon the termination of this agreement as hereinafter provided all connections of the telephone circuits furnished and maintained by the Department of Agriculture, theretofore made with the general commercial telephone system of the Telephone Company, may be discontinued and severed by either party hereto, but if at the termination of this agreement either party shall desire to continue the attachments made hereunder to the pole lines of the other, such attachments shall be allowed to remain on such poles under such terms and for such rental charges as may be agreed upon between the parties. In the event that the parties hereto are unable to agree as to the terms or rental charges for attachments other than those covered by specific easements, which may be retained on said poles, as above provided, all questions at issue between them shall be submitted to a board of arbitration composed of three members, one to be selected by each party and the third to be chosen by the two thus selected, and the finding of the majority of such board shall be final and binding upon both parties.

5. The provisions of this agreement shall be binding upon and shall accrue to the benefit of the successors and assigns of the Telephone Company.

6. No Member of or Delegate to Congress is or shall be admitted to any share or part in this agreement or to any benefit to arise therefrom. (Sections 3739-3741, United States Revised Statutes.)

This agreement shall remain in force for a period of one year from the date hereof, and thereafter shall be automatically renewed for periods of one year unless canceled by written notice from either party to the other not less than sixty (60) days prior to the expiration of any one-year term.

In witness whereof the parties hereto have caused this instrument to be executed in duplicate the day and year first above written.

By _____.

Attest: _____, *Secretary.*

Secretary of Agriculture.

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