

55TH CONGRESS, }  
— 1st Session. }

SENATE.

{ DOCUMENT  
No. 105.

FOREST POLICY FOR THE FORESTED LANDS OF THE  
UNITED STATES.

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MESSAGE

FROM THE

PRESIDENT OF THE UNITED STATES.

TRANSMITTING

THE REPORT OF THE COMMITTEE APPOINTED BY THE ACADEMY  
OF SCIENCES UPON THE INAUGURATION OF A FOREST POLICY  
FOR THE FORESTED LANDS OF THE UNITED STATES.

MAY 25, 1897.—Read, referred to the Committee on Forest Reservations and the  
Protection of Game, and ordered to be printed.

*To the Senate and House of Representatives:*

I transmit herewith for the information of the Congress the report  
of the committee appointed by the National Academy of Sciences upon  
the inauguration of a forest policy for the forested lands of the United  
States.

WILLIAM MCKINLEY.

EXECUTIVE MANSION, May 25, 1897.

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REPORT  
OF THE  
COMMITTEE  
APPOINTED BY THE  
NATIONAL ACADEMY OF SCIENCES  
UPON THE  
INAUGURATION OF A FOREST POLICY FOR THE FORESTED  
LANDS OF THE UNITED STATES  
TO THE  
SECRETARY OF THE INTERIOR,  
MAY 1, 1897.

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REPORT  
OF THE  
COMMITTEE APPOINTED BY  
THE  
NATIONAL ACADEMY OF SCIENCES  
UPON  
A FOREST POLICY FOR THE FORESTED LANDS OF THE UNITED STATES.

ARNOLD ARBORETUM, HARVARD UNIVERSITY,  
*Jamaica Plain, Mass., May 1, 1897.*

SIR: The committee appointed by you, in compliance with the request contained in the following letter, has the honor to submit this report, which is based on actual examinations of much of the reserved and unreserved forest lands of the public domain and on a general study of the topography and climate, and of the economic conditions of the Western States and Territories:

DEPARTMENT OF THE INTERIOR,  
*Washington, February 15, 1896.*

SIR: I have the honor, as the head of the Department charged with the administration of the public domain, to request an investigation and report of your honorable body, as is provided in the act incorporating the National Academy, and by article 5, section 5, of its constitution, upon the inauguration of a rational forest policy for the forested lands of the United States.

Being convinced of the necessity for a radical change in the existing policy with reference to the disposal and preservation of the forests upon the public domain, I particularly desire an official expression from your body upon the following points:

- (1) Is it desirable and practicable to preserve from fire and to maintain permanently as forested lands those portions of the public domain now bearing wood growth, for the supply of timber?
- (2) How far does the influence of forest upon climate, soil, and water conditions make desirable a policy of forest conservation in regions where the public domain is principally situated?
- (3) What specific legislation should be enacted to remedy the evils now confessedly existing?

My predecessors in office for the last twenty years have vainly called attention to the inadequacy and confusion of existing laws relating to the public timber lands and consequent absence of an intelligent policy in their administration, resulting in such conditions as may, if not speedily stopped, prevent a proper development of a large portion of our country; and because the evil grows more and more as the years go by, I am impelled to emphasize the importance of the question by calling upon you for the opinion and advice of that body of scientists which is officially empowered to act in such cases as this.

I also beg to refer you to the proposed legislation which has been introduced into Congress for several years past at the instance of the American Forestry Association, supported by memorials of private citizens and scientific bodies, and more especially the memorials presented by the American Association for the Advancement of Science in 1873, which led to desirable legislation, and again in 1890, 1892, and 1894.

As I believe that a speedy change in the existing policy is urgent, I request that you will give an early consideration to this matter, and favor me with such statements and recommendations as may be laid before Congress for action during this session.

I have the honor to be, your obedient servant,

HOKE SMITH, *Secretary.*

Prof. WOLCOTT GIBBS,  
*President of National Academy of Sciences, Newport, R. I.*

## THE CONSERVATION OF FORESTS.

The influence of forests upon climate, soil, and the flow of water in streams has attracted much attention during the past century; but while the general consensus of opinion among experts is that this influence is potent and beneficial, the absence of exact data extending over long periods of time, and the complex nature of the phenomena involved, render it necessary to base this conclusion rather upon general considerations than upon statistics.

An elaborate statistical study of climatic changes has been undertaken in Europe by Gustav Wex, ministerial counselor and chief engineer of the Danube improvements at Vienna. His study is based on an analysis of all available water-gauge observations made on large European rivers during the last two centuries. Such records were collected for fifty five stations on twelve rivers, all but two, the Tiber and Glommen, heading in central Europe.

These observations were discussed by dividing each record into two equal parts and finding for each half (about thirty years, more or less) the arithmetical mean of the mean annual stands and of the highest and lowest annual stages. Some of these records extend back more than a century; all are authentic, and relate to districts where the physical conditions and changes are well known. By comparing the mean levels (annual, flood, and lowest water) in the first half and last half of the periods covered by the observations, Wex believes that he can detect any secular variation in the flow of streams attributable to increased cultivation, and especially to the known destruction of forests. The following consolidated table derived from his two treatises\* on the subject exhibits the general results of this analysis:

River.	Records between—	Limiting periods.	Lower in second half period (inches per annum).			
			Stations.	Mean level.	Flood level.	Lowest level.
Rhine .....	{ Basle .....	1770-1874	{ 22 in 23	0.11 to 1.44	.....	.....
			{ 27 to 28	.....	0.07 to 2.91	.....
Danube.....	{ Dillingen .....	1822-1875	{ 6 in 6	0.12 to 1.55	0.20 to 1.63	0.02 to 1.24
			{ Old Orsova .....	.....	.....	.....
Elbe .....	{ Dresden .....	1731-1873	{ 7 in 7	0.39 to 1.28	0.11 to 1.95	0.36 to 1.14
			{ Magdeburg .....	.....	.....	.....
Vistula .....	{ Cracow .....	1800-1873	{ 2 in 2	0.43 to 0.53	0.07 to 0.25	0.71 to 0.93
			{ Kurzelack .....	.....	.....	.....
Oder .....	{ Custrin .....	1778-1835	{ 1 in 1	0.36	0.32	0.34
			{ La Lobe .....	.....	.....	.....
Moselle .....	{ Sierk .....	1830-1896	{ 2 in 2	0.47 to 0.82	0.62 to 0.93	0.31 to 0.81
			{ Busselheim .....	.....	.....	.....
Main .....	{ Kirtzburg .....	1845-1874	{ 2 in 2	0.08 to 0.21	0.14 to 0.30	0.16 to 0.46
			{ .....	.....	.....	.....
Theis .....	Szegedin .....	1851-1872	{ 1 in 1	1.89	.....	1.42
			{ 0 in 1	.....	0.95	.....
Po .....	{ Piacenza .....	1837-1874	{ 2 in 2	0.17 to 1.34	.....	.....
			{ Cremona .....	.....	.....	.....
Tiber .....	Rome .....	1622-1871	{ 1 in 1	.....	2.25	0.38
			{ 0 in 1	0.45	1.31	0.53
Seine .....	{ Nastengen .....	1800-1866	{ 1 in 1	Not kept.	1.07	0.34
			{ 2 in 2	0.11 to 0.24	.....	0.24 to 0.81
Glommen .....	{ Sarpsfos .....	1847-1876	{ 0 in 2	.....	0.38 to 0.73	.....
			{ .....	.....	.....	.....

\* Rise.

\* Ueber die Wasserabnahme in den Quellen, Flüssen und Strömen bei gleichzeitiger Steigerung der Hochwässer in den Culturländern, Zweite Abhandlung über die Wasserabnahme in den Quellen, Flüssen und Strömen bei gleichzeitiger Steigerung der Hochwässer in den Culturländern, both translated by General Weitzel, of the Corps of Engineers, United States Army, and published in the Government Printing Office in 1880 and 1881.

In drawing conclusions from these data it should be remembered that the mean level for each year is derived from 365 observations, while the corresponding flood level and lowest water level are each determined by the records of only a few days, and are especially subject to exceptional variations. The mean levels are therefore entitled to the greater weight. Moreover, the highest and lowest points reached throw little or no light upon the durations of the corresponding high water and low water stages of the river, which are vital elements in estimating the discharge, and hence the general hydraulic conditions affecting the district.

The figures in the table indicate a pronounced lowering of the mean, of the flood, and of the low-water stages of these rivers, but that caution should be observed not to misinterpret the apparent flood change as implying a reduction of flood volume, or even of extreme flood height, is shown by the following quotation from Wex:

The plots of the gauge readings show that in these rivers [the Rhine, Danube, Elbe, Vistula, and Oder] the floods in recent periods occur oftener and rise higher than in former times. It follows clearly, then, that during flood stages the discharge is much greater than formerly. These plots show further that the earlier floods were more regular than those of the later decades, in which excessive heights in one year are followed by very moderate heights in another, thus proving that very wet and very dry seasons occur more frequently and show greater variations than formerly. This is particularly noticeable for the Elbe and Vistula.

What conclusions are, then, to be drawn from these data in regard to the influence of forests upon climate and stream flow? They certainly demonstrate a progressive reduction in the mean annual, the flood, and the lowest water levels upon all the chief rivers draining central Europe; and that the change is very considerable. Wex claims that this reduction is due to cultivation and to the extensive clearing of forested lands, and argues further that it implies a corresponding diminution in the annual discharge of the springs, streams, and rivers, and hence in the annual rainfall. This last inference has been disputed, because rain records kept during these same periods at Paris, St. Petersburg, and Copenhagen indicate no change. Wex replies that these cities are too near the coast and too far from the mountains to afford a check, and that rain records kept in the Erz Mountains and at Geneva do show small reductions.

Whether a grand climatic change in Europe be in progress or not, it would seem that the observed facts can be more simply explained by the well-established change in regimen often following the destruction of forests, especially in mountain regions. The more rapid melting of snow and the reduced obstructions to surface drainage hurry the water forward and increase the number and sometimes the extreme height of the spring freshets, leaving a less volume to be absorbed by the ground and gradually returned through springs and brooks during the low-water season. Destructive floods are thus rendered more frequent, and summer droughts more to be dreaded. But since both the mean velocity and the area of cross section, and hence for a double reason the discharge per second per foot of rise, increase much more rapidly in the higher than in the lower stages, such a change of regimen (the annual volume remaining unchanged) would exhibit itself by a reduced mean annual level, and a reduced low-water level.

The influence upon the flood level is less easily inferred, because in large rivers the extreme height attained depends more upon the coincidence of floods in the different tributaries than upon the height reached in each. If the change in regimen leads to less frequent

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coincidences than before, a much larger volume may pass off at a less flood height, lasting of course for a longer period.

Since these are the only data covering sufficiently long periods of time to be worthy of confidence, and since their indications can be logically explained without resorting to the hypothesis of a reduction in rainfall consequent upon cultivation and the destruction of forests, it can not be claimed that observation supports such an hypothesis. But the problem contains too many uncertain elements to warrant a purely theoretical solution, and it is therefore the part of wisdom to be cautious in advancing a claim that forests exert a beneficial influence upon the precipitation of moisture.

But however these valuable records be interpreted, whether they indicate a progressive change in climate or simply a change in river regimen, they certainly tend to confirm the belief generally entertained by experts, and based on facts observed at many widely different localities, that forests exert a most important regulating influence upon the flow of rivers, reducing floods and increasing the water supply in the low stages. The importance of their conservation on the mountainous watersheds which collect the scanty supply for the arid regions of North America can hardly be overstated. With the natural regimen of the streams replaced by destructive floods in the spring, and by dry beds in the months when the irrigating flow is most needed, the irrigation of wide areas now proposed will be impossible, and regions now supporting prosperous communities will become depopulated.

Moreover, forests upon steep mountain slopes like those upon the public domain of the United States should be preserved to protect their surface. The soil on such slopes is held back by the roots of trees and shrubs and by grasses and other low plants, and protected against wind. When these are removed, the soil washes down into the streams and is swept over arable lands in the valleys below, leaving the naked rock behind. In this way forest destruction on high mountain slopes produces results similar to those due to hydraulic mining in California, against which legislation by Congress has been sought and obtained. Millions of dollars have been expended during recent years in Europe in checking the force of floods due to denuded mountain slopes by the construction of stone dams and river beds and the planting of sod and trees; and in this country similar expenditures must follow the destruction of mountain forests if the narrow valleys of the West are to continue habitable.

In districts of less abrupt slopes, the trees form and accumulate a mass of humus and absorbent materials which gathers moisture and holds the rain water until it can percolate into the subsoil through channels provided around their roots. Ultimately this ground water finds its way into springs and brooks, and promotes the general fertility of the region. Experience in every civilized country bears testimony to the fact that cutting away trees under such circumstances is followed by the drying up of streams and by less favorable conditions for local water supply.

But a well-regulated water supply is not the only thing dependent on the preservation of forests. In civilized nations the demand for lumber and other forest products is continuous, and requires systematic and intelligent forest reproduction. Numerous districts in our country have now no more timber than is needed for early use, and if forest reproduction is not encouraged local-timber scarcity in the not distant future seems inevitable. The enormous waste from forest fires, incendiary and accidental, which prevail in nearly every part of the United States, the extravagant modes of lumbering, especially in the West,

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permitting valuable logs to rot in the brush on account of slight defects, and the universal neglect of all reproductive measures threaten the prosperity of the country and should receive early attention from the Government.

#### FOREST ADMINISTRATION IN FOREIGN COUNTRIES.

Before considering the American problem in detail, or any system for the administration of the public forests of the United States, it may be useful to briefly outline the forest measures which experience has dictated in other civilized countries, where, with the exception of Great Britain and China, the people enjoy the advantages of well-organized and efficient forest departments, which also exist in nearly all British colonies. Our political, social, and climatic conditions are so different, however, from those of the countries of the Old World, that their methods of silviculture and the legal complications resulting from their governmental, municipal, and private ownership of land, possess little practical value for us at this time; but it is desirable that Congress should appreciate that forest administration is now regarded as an important Government duty throughout the civilized world, and that it has been wholly neglected by the United States.

So many of the general features are common to all foreign forest systems that it will be necessary to consider only one of them in detail and to refer briefly to others which appear to afford good models for our consideration. That of France is selected for fullest explanation, not only because it dates from the Middle Ages, but because it is applicable to an entire country without the confusing special conditions which in most European states are the result of local provincial subdivisions.

*France.*—Some kind of forest rules in connection with the game laws are said to have been handed down from the time of Charlemagne, but in 1669 Colbert, the minister of finance under Louis XIV, caused stringent forest laws to be enacted which proved of great benefit to the country. During the French Revolution the division of the large landed estates among many proprietors led to a general devastation of the forests, and induced legislation which finally, in 1827, established essentially the present forest administration system.

The central authority is vested in an administrative forest council, which consists of the minister of agriculture as president, the director of forests, and three officers entitled administrators. The forest council ordinarily meets once a week and deals with general matters pertaining to the forest administration.

The director of forests is the executive head of the forest service. His personal staff consists of two secretaries, one of whom is a forest inspector, and two clerks.

The three administrators are each the head of a bureau with headquarters in Paris, but they may be sent on special missions. In certain cases they act largely as inspectors, which was originally their exclusive duty. The first bureau deals with matters of law and police, purchases and condemnations of land, forest instruction, tools, supplies, etc. One of its sections is responsible for carrying into effect the decisions of the forest council, and for office work connected with the inspecting tours of the administrators. The second bureau is charged with preparing working plans and the actual management of the forests. The third bureau deals with torrents, the reforestation of mountain slopes, the care of young plantations, and with dunes, roads, buildings, and pasturage.

The field personnel consists of 33 conservators, through whom all

matters from below reach the central administration. Thirty conservancies are established in France, 1 in Corsica, and 3 in Algeria. In 11 of these conservancies officers of the working-plans division are stationed, and in 5 officers of the reforesting division.

In the lower grades are 232 inspectors, 249 assistant inspectors, and 274 "guards general," or a total of about 800 men in the superior forest service. Forest guards of all grades number 4,170, so that the grand total of the service is about 5,000 men.

The areas in charge of the forest service include the property of the Government, of communities, and of public institutions. In addition, a certain oversight, varying in closeness with situation and character, is exercised over the forest holdings of private individuals.

All members of the forest service below the grade of officer must have served in the army and, as a rule, must have attained the grade of noncommissioned officer. Their appointment and promotion are regulated by merit. They live in or near the forest, and each guard is charged with the care of about 2 square miles. Head guards superintend all work in progress and communicate the instructions of the officers. Police duties are an important part of their functions, including the right to make domiciliary visits and to arrest suspected persons. They take the oath of office and are prohibited from engaging in any industry connected with wood. They are entitled to pensions after completing twenty-five years' service, including the time spent in the army.

Forest products are sold by forest officers at auction or by the granting of permits, as the case may be, but the sums realized are paid directly into the public or communal treasury. Forest officers have nothing to do with the receipt or payment of funds.

Candidates for the grade of forest officer are, as a rule, trained at the National Forest School at Nancy, but one-third of the appointments are reserved for the promotion of deserving subordinates. After leaving the school the young officer is employed for about a year in learning his duties practically, under an inspector. His advancement and further promotion depend on his qualifications and exertions as reported by his immediate superiors. Forest officers are retired for age, as in the military service.

There are two forest schools in France, one for officers at Nancy, established in 1824, and another at Barres, to facilitate the promotion of deserving subordinates deficient in education. The course covers two years, each comprising six and a half months of theoretical and two and a half months of practical instruction. The latter consists of tours into the forests near Nancy, the Vosges, the Jura, etc., for the purpose of studying forestry, natural history, and surveying, a part of the time being devoted to military exercises. Military science forms part of the theoretical course. Between the foundation of the school in 1824 and 1887, 1,334 candidates for the forest service in France and 73 Englishmen had been received; the latter being admitted to prepare for service in India, under a special arrangement made with the French Government.

Under the general law the forest department forms part of the army, which in the case of mobilization is at the disposal of the war minister. The officers hold rank in the reserve or territorial army, and in time of war may be employed in command of the forest corps, or otherwise, as ordered. A military uniform is prescribed for all grades of the forest service, including the students at the schools.

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governor-general has been invested with special powers, to avoid constant reference to the central Government.

The annual revenue from the Government forests of France and Algiers exceeds \$6,000,000, and the expenses for 1896 were estimated at \$3,300,000.

*Germany.*—The political division of the Empire causes the regulation of the forests to devolve largely upon the several states, and slightly different systems are adopted, according to local requirements; but the management in Prussia may be regarded as practically typical of the whole.

The destruction of forests which occurred in the seventeenth and eighteenth centuries has caused the advance of sand dunes from the shores of the Baltic, the washing away of surface soil in the western mountainous districts by torrential floods, and the overwhelming of fertile valleys with debris from mountain slopes. Forestry has thus been forced upon the attention of the Government. Bounties are granted to communes which undertake tree culture upon waste mountain slopes, seedlings and young trees are supplied at cost, and considerable sums are spent annually by the State in forest improvement, and especially in checking the advance of sand dunes.

Forest administration in Prussia is vested in the ministry of agriculture, domain, and forests. The minister regulates the maintenance and utilization of the State forests. His staff consists of a head State forester, a director, and four technical forest counselors.

Prussia is divided into 679 forest districts, each averaging about 9,000 acres in extent, and under the control of a head forester. The district is the unit of financial administration, all accounts passing from the head forester through an independent treasurer to the finance department of the Government for audit. The head forester is charged with the entire management of his district; he receives a permanent appointment from the minister, after passing a prescribed technical examination, and he is entitled to a pension. Under him serve foresters, forest guards, and assistant foresters, for whose performance of duties and pay he is responsible. In 1887 there were in Prussia 3,390 foresters and 349 forest guards; previous service in the army is a condition of appointment to these grades, and the wearing of a uniform is compulsory, as indeed is the case with all grades of forest officials.

The next grade above that of head forester is that of forest master, who supervises several forest districts. Above him is the head forest master, who is a member of his provincial government, and supervises all the forest districts within its limits. These officers are appointed by the Sovereign, upon the nomination of the minister of agriculture, domain, and forests, each being selected from the next lower grade, and in the case of head forest masters the provincial ministry being consulted.

There are two forest academies in Prussia, one at Eberswalde and the other at Münden. The course of study covers two years, and is designed to fit the pupil for the higher grades of the forest service. There are also two classes of preparatory forest schools, for practical instruction in the duties of the lower grades.

The forest administration of Prussia contributes a large sum to the revenue, the annual receipts being about \$14,000,000 and the expenditures about \$8,000,000.

*British India.*—The vastness of the forest area of British India, on arid, which has been successfully managed and protected, the

varied climate and difficult sylvicultural conditions existing in these forests, and the great pecuniary success of the Indian administration, make it specially interesting to the students of the American problem who find here many valuable suggestions.

The forest department code is applicable to all the provinces under the control of the government of India, but not the presidencies of Madras and Bombay, which, however, by special order may adopt the system.

The officers of the forest department are: One inspector-general, an assistant inspector-general, conservators of three grades of pay, deputy conservators of four grades of pay, assistant conservators of three grades of pay; also a director and instructor at the School of Forestry, and a superintendent of surveys.

The subordinate employees are graded as sub assistant conservators, forest rangers, foresters, forest guards, etc.

The inspector-general is attached to the secretariat of the home department of the government of India. He assists in dealing with forest matters, and controls the School of Forestry at Dehra Dun, the forest survey, and the working plans. He is aided by an assistant inspector-general. He makes inspections and submits reports thereon either to the government of India or to the local governments; and he may correspond with the officers in local charge of forests, but can not give orders to them.

Immediate forest management is vested in the local governments of the several provinces. Their executive is a conservator. His charge is divided into "divisions," "ranges," and "beats." The range is the unit of administration. It is subdivided into beats, and grouped into divisions, each in immediate charge of a forest officer of suitable grade.

The numbers and pay of subassistant conservators are regulated by the government of India, which also fixes the maximum amount to be spent for the lower-grade employees. The appointments are made directly by the local governments, or are delegated to the conservator. Subassistant conservators are usually promoted from the grade of forest ranger. Forest rangers are appointed from graduates of the Dehra Dun Forest School, or from subordinates of good record, or from native noncommissioned officers of the army.

Vacancies in the lowest grade of forest officer are filled (1) from candidates who have had a professional training in a manner prescribed or approved by the secretary of state for India, or (2) by promotion for special merit after a service of at least five years. Promotions in the lower grades are regulated by the local governments, but in the higher grades by the government of India. Seniority is recognized. Examinations and favorable reports from superiors influence the selections. Transfers from one province to another are exceptional below the grade of conservator. Officers are entitled to retirement, and may be reduced in rank for misconduct. All resignations must be accepted by the government of India.

Working plans are prepared by local officers under the direction of local governments, but are subject to supervision and approval by the inspector-general. In case of disagreement reference is had to the government of India.

The Royal Indian Engineering College, at Cooper's Hill, England, since 1885 has had a forestry course designed to fit students for the service in India. About ten graduate annually. Applicants selected by competition before the civil-service commission are then put to further tests by the Indian office, and, having taken the course at the

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college, are, with application and good conduct, sure of appointment in the Indian forestry service.

The total area of forest land under the control of the forest service in 1894-95 was 12 per cent of the total surface of India, or 112,952 square miles, of which 74,271 miles were reserved forests, 7,090 protected forests, and 31,591 unclassed state forests. The increase for the previous year exceeded 9,000 square miles, acquired by the settlement or extinction of prescriptive rights. The total length of boundaries demarcated up to June 30, 1895, in provinces under the government of India alone, was upward of 60,000 miles.

Working plans in operation cover 14,769 square miles, and in a territory of 30,963 square miles fires are kept in check. Protective measures failed on 6.6 per cent of this area during the last year, so that 28,913 square miles were effectively protected, at a cost of 8.75 rupees per mile. The present value of the rupee is about 30 cents, and therefore the cost of effective protection in India, where fires are at least as difficult to control as in the United States, is rather less than half a cent an acre per annum. An area of 33,420 square miles is covered by topographical surveys, executed in nearly the same proportion by the forest survey branch and the survey of India department. Forest offenses of all kinds during the last year averaged less than 1 to 3 square miles of forest.

The product of the great area administered by the forest service yielded during the year 1894-95 46,000,000 cubic feet of timber, 100,000,000 cubic feet of fuel, 134,000,000 bamboos, and minor products to the value of more than 3,000,000 rupees. The gross revenue from the forests is given at 16,788,880 rupees, and the net at 7,415,590, or about \$3,000,000.

This surplus has grown from less than 2,000,000 rupees in 1870-71 to 2,500,000 rupees in 1880-81, to a little less than 7,000,000 rupees in 1890-91, and finally to almost 7,500,000 rupees in 1894-95, when the yield was nearly 1,000,000 rupees less than that of the year before. These results have been reached with a consistently conservative forest policy and in spite of the enormous drain made by the holders of prescriptive rights in the forests, which in 1894-95 amounted to nearly 6,000,000 rupees.

Systematic government forestry in India is of recent growth. The first Indian forest act was passed in 1865, although nearly ten years before Dr. Dietrich Brandis, the first inspector-general of the Indian forests, had begun to manage the teak forests of Pegu.

*Dominion of Canada.*—Physical and topographical conditions in Canada so much resemble our own that special interest attaches to its legislative measures regarding forests. As in the United States, the title to lands situated in the older provinces and not held by individuals is vested in the provincial governments, while in the central and western provinces the Dominion itself, as representative of the Crown, holds the fees. Hence result different and independent systems of forest administration in the different provinces.

The Provinces of Ontario and Quebec, bordering upon the Great Lakes and the St. Lawrence River, and extending far to the northward, contain on the high table-lands that form the divide between the southern watershed and Hudson Bay immense areas of Crown lands which have never been sold, and which are generally rocky, unsuitable for the plow, and clothed with timber. In both of these provinces the management of the Government forests devolves, under quite similar regulations, upon the department of crown lands, the administrative

direction forming a branch or bureau which is charged with public instruction in forestry as well as with the supervision of the forested districts. The latter are divided into "agencies," of which the control is vested in officers denominated Crown lands and timber agents, having under them experienced woodmen called forest rangers, fire rangers, etc.

The agents are charged with the inspection and sale or lease of the public lands, the granting of licenses to cut timber, the collection of dues, and the protection of the public domain against trespassers and fires. Of the subordinates, some hold office during the entire year and others only during the dangerous fire months, the number of the latter being discretionary with the commissioner of crown lands. The functions of justices of the peace, constables, and watchmen are performed by these subordinate officers. The last annual report for the Province of Quebec gives the names of such employees, amounting to 40 Crown lands and timber agents, 65 forest rangers, 73 fire rangers, 81 game keepers, together with a superintendent, an assistant, and 3 clerks of the branch of woods and forests, making a total of 264 officials. The total revenue from lumbering operations in this province collected during the year ending June 30, 1896, amounted to \$951,098.92.

The system of disposing of the timber on the Crown lands of Quebec and Ontario was adopted many years ago and has been found to work well, except that it does not provide for future crops of timber on lands unsuitable for tillage, and which therefore remain unsettled and unproductive after the forest has been removed. Under the rules now in force, when it becomes advisable to sell the timber from certain determined areas, forest rangers, who are experienced woodmen employed by the Government under the direction of the different crown timber agents, are sent out to examine the forests and furnish the department of crown lands with estimates of standing timber. The territory is then divided into timber "berths" of different sizes, which are advertised for sale at auction to the highest bidder, the department fixing a minimum price based upon the estimate of the forest rangers. The timber is sold at a rate per square mile subject to stumpage dues, but as these are low, large sums are bid by way of bonus for the license to cut over certain areas. At the last sale, that of 1892, the sums paid in Ontario as bonus average \$3,657.18 per square mile.

The timber when cut also pays dues on saw logs of from \$1 to \$1.25 per thousand feet board measure, and on square dry timber of from \$20 to \$25 per thousand cubic feet. The timber licenses are for one year, renewable on the license holder complying with the conditions of the license, which include a yearly ground rent of \$3 per square mile. Although the early licenses included all timber, in sales held since 1891 the white pine only has been specified. The land, it must be remembered, is not sold to the licensee or "limit holder," but is reserved for settlers. When the land under license is required for settlement, the licensee or limit holder is given a reasonable time to remove the white pine, all other timber becoming the property of the settler on his complying with the terms of settlement. In case of unsettled land the limit holder, as long as he continues to pay ground rent, retains control of the limit until the land is required for settlement. Forest Rangers under this system are also employed to watch areas not under license to prevent unlawful cutting of timber.

A provisional fire act, based on laws of several of our States, had, prior to 1886, been on the statute books of the Province of Ontario, but from lack of proper means for the enforcement of its provisions it had not succeeded in checking forest fires. In that year the system now in force

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was adopted and in practice has proved highly successful. Under its provisions a number of men are placed upon the Crown lands from May until October, when forest fires are most dangerous, in those localities specially exposed by reason of settlement, railway construction, or lumbering. Where the land is under license the cooperation of the limit holders is required, it being optional with them to avail themselves of the system. The number of men necessary to properly protect a piece of property is determined by the owners of the limit, who are supposed to be familiar with the country and with local conditions and special dangers. The selection of the men to be employed in this protective force is also left to the limit holders, the department reserving, however, the right to reject or remove any man whom it may consider unfit for the position.

These fire rangers are constituted officers for the enforcement of the fire act, and are governed by instructions from the department. They make the public acquainted with the provisions of the fire act by posting it in conspicuous places and circulating it among settlers and lumbermen. In case forest fires break out, they are authorized to engage assistants to suppress them; if dangerous, it is their duty to notify the limit holder and the department. One-half of the expense incurred in maintaining this forest staff and in suppressing fires is borne by the Crown lands department and the other by the owners of the limits. The pay of fire rangers is fixed at \$2 a day, without board or other extras. The good effects of this system were especially manifested during the summer of 1895, which was extremely hot and dry. In consequence of this exceptional danger the staff of rangers was strengthened in specially exposed places and close vigilance was maintained.

Reports from 49 timber limits where this system was in operation during the summer of 1895 show that the value of the timber damaged by fire was only \$41,600. The number of fires specifically reported was 93; in addition to these many others, principally small, were not enumerated in the reports of the fire wardens; and the Canadian forest officers are convinced that forest areas which might well have amounted to hundreds of square miles would have been burnt over during that exceptionally dry summer without the presence at exposed points of this trained corps of Forest Rangers. This saving in Ontario has been effected by the employment of 114 men for a few months, at a total cost of \$26,253, shared between the public treasury and the owners of timber limits. The Ontario forest-fire system has now been tried for nine years and its compulsory extension is recommended by the Canadian Government officers. In Quebec equally satisfactory results have followed the introduction of the forest-patrol system, which can no longer be regarded as experimental in that Province.

In the districts of Upper and Lower Ottawa during the summer of 1895, where it was also unusually dry, no serious conflagrations occurred. No less than fifty-six incipient fires, however, were extinguished by the Forest Rangers, any one of which might have assumed serious damages and caused heavy losses. The total damage in the district amounted to between \$500 and \$1,000. In other districts in Quebec numerous small fires are extinguished every year by Rangers, who, appearing promptly on the scene, assist the inhabitants in suppressing them.

The forests of the western provinces of the Dominion are under the control of the minister of the interior, who, following the system adopted in the older provinces, has under him Crown timber agents charged with the administration of suitable districts.

The value of the system which has been adopted in Canada, under

which the Government retains the fee of its forest lands, would have been inestimable in large immediate revenue and in future crops of timber in such regions as those adjacent to Puget Sound or the coast of northern California; but the fee of nearly all the best timber land in the United States has now passed into the hands of individuals or corporations, and such a policy can now be applied only to comparatively small areas generally covered with inferior timber.

#### THE RESERVED FOREST LANDS OF THE PUBLIC DOMAIN.

The peculiar topographical and climatic conditions of western North America would appear to make the preservation of its forests essential to the profitable and permanent occupation of the country. The precipitation of moisture west of the one hundredth meridian is unequally distributed throughout the year; the summers are hot and dry, and the whole territory, with the exception of the coast region of the northwest, is watered so imperfectly that forests are restricted to the slopes of high mountain ranges or to elevated plains and mesas, the valleys of the interior and of all the south being practically treeless. In all the interior and southern regions precipitation is insufficient for certain and profitable cultivation, and permanent agricultural prosperity can only be assured through irrigation. Much of the region is traversed by lofty mountain ranges well wooded at the north and sparsely wooded at the south. Their forests serve to collect and in a measure regulate the flow of streams, the waters of which, carefully conserved and distributed artificially, would render possible the reclamation of vast areas of so-called desert lands. Irrigation systems have been undertaken in many localities under State or corporate control and have been prosecuted until their value has been amply demonstrated, although the one essential condition of their permanent success, the preservation of the forests on high mountain slopes, has been entirely neglected.

Under authority of section 24 of the act of Congress approved March 3, 1891, by which the President of the United States can withdraw from sale and entry and set apart as forest reservations parts of the public domain, whether wholly or in part covered with timber, seventeen forest reserves, with a total estimated area of 17,500,000 acres, were established prior to 1894. During the journey made by your committee last summer through the Western States and Territories it became impressed with the importance of extending this reserved area before further encroachments were made on the public domain; and on its return it prepared a short preliminary report, recommending the establishment of thirteen additional forest reserves with an estimated total area of 21,378,840 acres and roughly designating their boundaries. On the 6th of February this report was submitted by the Secretary of the Interior to the President, who on the 22d of February issued proclamations making the recommendations of your committee effective. The correspondence relating to this matter is appended to this report. (Appendix A.)

Members of your committee visited during the summer and autumn all the forest reservations established prior to February 22, 1897, with the exception of the Pecos River Reserve in New Mexico, the Battlement Mesa Reserve in Colorado, the Yellowstone National Park Timber Reserve in Wyoming already well known to its members, and the small and comparatively unimportant Afognak Reserve in Alaska, the Bull Run Forest Reserve in Oregon, and the Trabuco Canyon Reserve in southern California, and studied also forest conditions in many of

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the unreserved regions of the national domain. Beyond the limits of the national parks, which are effectively and economically patrolled by detachments of the United States Army, your committee was unable to discover any evidence that serious attempts are made by the Government to protect the forests of the public domain from illegal timber cutting and pasturing, or to prevent the starting or check the spread of forest fires except in the north end of the Cascade Reserve in Oregon, where in August it found a single agent of the Interior Department actively and successfully engaged in scattering several large flocks of sheep that had been devastating this reservation for several weeks.

Fire and pasturage chiefly threaten the reserved forest lands of the public domain. In comparison with these the damage which is inflicted on them by illegal timber cutting is insignificant. Timber can only be cut profitably when the operation is conducted on a comparatively large scale; and large operations require roads and sawmills, and consequently the use of capital, and are usually easy to detect and arrest. The cutting of timber on the unreserved public lands under cover of bad laws or without a pretense of legal sanction causes, as we shall show later, serious losses to the Government, but so far as we have been able to observe it does not now seriously menace many of the reserves.

*Forest fires.*—Fires are particularly destructive to the forests of western North America. These are composed almost exclusively of highly resinous trees, which, when they grow beyond the influence of the moisture-laden air currents from the Pacific Ocean, ignite easily, and, burning fiercely on the surface, are quickly killed, while the flames sweep forward, leaving standing behind them the dead, although unconsumed, trunks to furnish material for later conflagrations and to intensify their heat. The climate, with its unequally distributed rainfall and intensely hot and dry summers and the peculiarly inflammable character of the forests, make forest fires in the West numerous and particularly destructive, and no other part of the country has suffered so seriously from this cause.

Fires in Western forests are started by careless or ignorant hunters and campers, who often leave their camp fires burning or, in utter wantonness, ignite coniferous trees to enjoy the excitement of the conflagration. They can be occasionally traced to the effects of lightning, which locally is held responsible for many forest fires, although in reality fires set in this way are rare, as lightning is usually accompanied or followed by copious rains, which extinguish them before they can gain headway; and very rarely they are produced by the rubbing together of adjacent trees swayed by the wind. The right of way of every railroad crossing the Rocky Mountains and the other interior ranges of the continent is marked by broad zones of devastation due to fires which have started from the camps of construction gangs or the sparks of locomotives; and thousands of acres of timber are destroyed annually by the spread of fires lighted by settlers to clear their farms.

Prospectors in search of valuable minerals frequently set fires in wooded regions to uncover the rocks and facilitate their operations; and the shepherds who drive their flocks to pasture during the summer months in the mountain forests of Oregon and California make fires in the autumn to clear the ground and improve the growth of forage plants the following year. No statistics show the area of forests destroyed annually by fires in the Western States and Territories, but nearly every summer their smoke obscures for months the sight of the sun over

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hundreds of square miles, and last summer your committee, traveling for six weeks through northern Montana, Idaho, and Washington, and through western Washington and Oregon, were almost constantly enveloped in the smoke of forest fires.

Such conflagrations have occurred in the West since it was settled, and they will always menace the prosperity of that part of the country. Once fully under way, a fire in a forest of coniferous trees will spread until it is extinguished by rain or encounters some natural barrier like a river, or, until driven back over its own course by a change of wind, it expires from want of material. No human agency can stop a Western forest fire when it has once obtained real headway, and the only hope of averting the enormous losses which the country suffers every year from this cause is in preventing fires from starting in the forests or in extinguishing them promptly. They will always occur, but the experience gained in the Yellowstone National Park since it has been patrolled by detachments of the United States Army, and in Canada, shows conclusively that with the aid of disciplined forest rangers intelligently directed the number of forest fires in any district can be greatly reduced, and that it is frequently possible to extinguish small fires if they are energetically attacked when first discovered.

*Nomadic sheep husbandry.*—Nomadic sheep husbandry has already seriously damaged the mountain forests in those States and Territories where it has been largely practiced. In California and western Oregon great bands of sheep, often owned by foreigners, who are temporary residents of this country, are driven in spring into the high Sierras and Cascade ranges. Feeding as they travel from the valleys at the foot of the mountains to the upper alpine meadows, they carry desolation with them. Every blade of grass, the tender, growing shoots of shrubs, and seedling trees are eaten to the ground. The feet of these "hoofed locusts," crossing and recrossing the faces of steep slopes, tread out the plants sheep do not relish and, loosening the forest floor, produce conditions favorable to floods. Their destruction of the undergrowth of the forest and of the sod of alpine meadows hastens the melting of snow in spring and quickens evaporation.

The pasturage of sheep in mountain forests thus increases the floods of early summer, which carry away rapidly the water that under natural conditions would not reach the rivers until late in the season, when it is most needed for irrigation, and by destroying the seedling trees, on which the permanency of forests depends, prevents natural forest reproduction, and therefore ultimately destroys the forests themselves. In California and Oregon the injury to the public domain by illegal pasturage is usually increased by the methods of the shepherds, who now penetrate to the highest and most inaccessible slopes and alpine meadows wherever a blade of grass can grow, and before returning to the valleys in the autumn start fires to uncover the surface of the ground and stimulate the growth of herbage. Unrestricted pasturing of sheep in the Sierras and southern Cascade forests, by preventing their reproduction and increasing the number of fires, must inevitably so change the flow of streams heading in these mountains that they will become worthless for irrigation.

Other parts of the country have suffered almost as seriously from the nomadic sheep industry. Great flocks are wintered in the sheltered canyons of Snake River, and then spreading through eastern Oregon have destroyed the herbage of the valleys and threatened the forests on its mountain ranges; and sheep raised in eastern Oregon and Washington are driven every summer across Idaho and Wyoming to markets

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in Nebraska and Dakota, eating bare as they go the pastures of ranchmen and carrying ruin in their path. In every Western State and Territory the nomadic sheep men are dreaded and despised. Year after year, however, they continue their depredations. The actual loss this industry inflicts on the country annually in thousands of acres of burnt timber and in ruined pasture lands is undoubtedly large, although insignificant in comparison with its effects on the future of mountain forests, the flow of streams, and the agricultural possibilities of their valleys.

From a recent statistical abstract of the Treasury Department it appears that there are 5,958,348 sheep in the three States of Washington, Oregon, and California, producing annually about 16,000,000 pounds of wool, net weight, worth now in eastern markets about \$5,000,000. The net profit from this industry in these States must therefore be small, and its commercial importance is certainly insignificant relatively to the injury it inflicts on the country. The Government in permitting free pasturage on the public domain to sheep owners in the public-land States and Territories, clearly commits an injustice to persons engaged in this industry in other parts of the country, who are obliged to own or hire their pastures. The pasturage of sheep on the national domain has been so long allowed, however, that the men who benefit by it have come to believe that they have acquired vested rights in the public forests, and their trespass can only be checked by the employment of vigorous measures. That the public domain can be freed from the encroachment of sheep herders has been demonstrated in the Sierra, General Grant, and Yosemite National Parks in California, from which small detachments of troops have easily removed them.

*Actual condition of the forest reserves.*—In all the reserves visited by your committee traces of depredation were visible. These in the Pacific Forest Reserve in Washington were confined to the upper forest belt just below the snow of Mount Rainier, which in summer is much frequented by tourists and campers who frequently set fire to the resinous fir trees for the pleasure of seeing their lives go out in sudden flashes of flame. This wanton custom, which destroys in a moment trees several hundred years old, has greatly injured the beauty of the foreground of one of the noblest and most impressive pictures in the United States.

The Cascade Range Forest Reserve, which extends from the Columbia River nearly to the southern borders of Oregon, has suffered severely from forest fires which have destroyed a considerable part of its most valuable timber, and from the pasturage of sheep which has been excessive, especially on the dry northern and eastern slopes of the mountains. If timber is taken from this reserve, it is only in small quantities and probably only for the use of actual settlers or the owners of small mines.

The Sierra Forest Reserve, which embraces nearly all the Sierra Nevada Range south of the California national parks, is every year invaded by sheep, which now reach its highest alpine meadows, the number having increased since their expulsion from the adjacent national parks.

In the San Gabriel Timber Land Reserve, in which the forests are particularly useful in their regulation of a scanty water supply, essential for the irrigation of southwestern California, fires are common and destructive. During October of last year about 40 square miles of steep mountain slopes were burned over in this reserve. This fire, after burning during several weeks and inflicting serious injury on the watersheds of the Tejunga, Arroyo Seco, and other torrential streams, was finally extinguished by private enterprise.

The San Bernardino Forest Reserve, which adjoins the San Gabriel Timber Land Reserve on the south, shows the traces of many large fires, and in the south is injured by sheep. The forest reserves of southern California are in greater danger from fire than those in other parts of the country, owing to the general dryness of this region. They are, moreover, the most important of all the reservations for the supply of water for purposes of irrigation, and will therefore require special protection, which will probably be needed throughout the year.

In the Grand Canyon Forest Reserve in Arizona 2 or 3 square miles at one point near the rim of the canyon and 1 square mile at another have been fenced in by squatters during the last two years, or since the establishment of this reserve. Timber is cut in considerable quantities for local use, and mining claims are being established on the slopes of the canyon itself. During the summer of 1895 the Howard Reef Company of Flagstaff pastured about 5,000 sheep in this reserve, and until the fall in the price of beef made the cattle business unprofitable herds of cattle ranged freely through it.

In the White River Plateau Timber Land Reserve in northwestern Colorado, a sawmill is manufacturing, from timber cut in the reserve, all the lumber used in the town of Meeker and by the settlers in the upper White River Valley, while another sawmill, located just outside the southern boundary, is supplied with timber cut within its borders.

The Pikes Peak Timber Land Reserve, the Plum Creek Timber Land Reserve, and the South Platte Forest Reserve have all suffered terribly from forest fires, which have exterminated their most valuable timber. That which is left is freely taken by miners and railroad contractors; and in driving from Colorado Springs to Cripple Creek, members of your committee saw many railroad ties cut on reserved land and openly piled by contractors along the highroad. In no other part of the country visited by your committee are the rights of the Government in its property more disregarded than in this part of Colorado, and it is evident that these scanty forests must, under existing conditions, soon disappear from all the Colorado reservations.

A study of the forest reserves in their relations to the general development and welfare of the country, shows that the segregations of these great bodies of reserved lands can not be withdrawn from all occupation and use, and that they must be made to perform their part in the economy of the nation. According to a strict interpretation of the rulings of the Department of the Interior, no one has a right to enter a forest reserve, to cut a single tree from its forests, or to examine its rocks in search of valuable minerals. Forty million acres of land are thus theoretically shut out from all human occupation or enjoyment. Such a condition of things should not continue, for unless the reserved lands of the public domain are made to contribute to the welfare and prosperity of the country, they should be thrown open to settlement and the whole system of reserved forests abandoned. Land more valuable for its mineral deposits, or for the production of agricultural crops, than for its timber should be taken from the reservations and sold to miners and farmers, the mature timber should be cut and sold, settlers within or adjacent to the boundaries, unable to procure it in other ways, should be authorized to take such material from reserved forests as is necessary for their needs, and prospectors should be allowed to search them for minerals.

But it must not be forgotten that the public domain of which these reserves form a part belongs to the people of the whole country, and not to those of any one section. It is right, therefore, that the forest reserves

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should be managed for the benefit of the people of the whole country, and not for any particular class or section. Steep and elevated mountain slopes should not be cleared of their forests for the sole benefit of the prospector or the miner, because this by its influence on water flow might mean permanent injury to persons living hundreds of miles away. A few foreign sheep owners should not be allowed to exterminate great forests at the expense of the whole country; and prospectors and miners should not be permitted to burn willfully or carelessly forests in which all classes of the community are equally interested.

Our examination of the Western forests shows that the existing methods and forces at the disposal of the Interior Department are entirely inadequate to protect the forests of the public domain. Civil employees, often selected for political reasons and retained in office by political favor, insufficiently paid and without security in their tenure of office, have proved unable to cope with the difficulties of forest protection, and the reserves are practically unguarded. Excluded from the provisions of the general land laws and without protection, they invite trespass of every kind and demoralize without benefiting the community. It is evident that if the Government proposes to protect public property in the reserves, and to enforce any laws or regulations which may be enacted for their administration, the assistance of the military must be called in until an organization can be developed in the Interior Department for the protection, management, and improvement of all reserved Government forest lands; for without such assistance the experience of the past clearly shows that it is idle to hope that fires can be restricted, pasturage abolished, and timber cutting and mining regulated in the reserves; and if this can not be done their forests will sooner or later be ruined and the objects defeated for which they have been established.

#### PROPOSED SYSTEM OF FOREST ADMINISTRATION.

It has been shown that the preservation and judicious management of the forests on those portions of the public domain which are unsuited for agriculture are of great importance for the flow of rivers needed for the irrigation of arid districts, and to furnish forest products for settlers on adjacent arable lands, and for mining operations. The cheapness of forest products in the United States, and the length of time required to produce crops of timber in the West, will make the investment of the capital of individuals in silvicultural operations, for the present at least, a doubtful enterprise in those States and Territories where the public domain is now principally situated; and silviculture in western North America will only be really successful under sustained Government control and administration; for, dealing with crops which often do not reach maturity until the end of one or two centuries, it can only be made profitable by carrying out without interruption and under thoroughly trained officers' plans which must often be followed during the lives of several generations of men. This stability and continuity of management can only be secured by a permanent Government administration composed of officers of the highest character, entirely devoted to duty.

Annual taxes on the land of individuals demand annual income; and to avoid or meet this burden of taxation land which should always remain covered with forests is often denuded before the requirements of commerce justify it, or is devoted to uses for which it is ill adapted. Private ownership, for example, of the redwood-bearing land of the

California coast region, the most productive forest land in the world, has resulted in this land, which should remain covered with forest for all time being rapidly converted into indifferent pasturage. The fee of lands which are most valuable for the production of timber should remain vested in the General Government, and these lands, if they are managed wisely, can be made to supply forest material indefinitely to the agricultural and mining populations of adjacent districts and to improve in productiveness and value.

Ultimate self-support of a Government forest administration is possible in the United States and it may be expected to yield a permanent income if the national forests are managed with the intelligence, thrift, and honesty which characterize the forest administration in Germany, France, and other European countries. At first, however, the cost of administration will exceed the receipts, as is almost invariably the case in important economic reforms, but outlays may be expected to diminish in proportion as the administration is faithful, intelligent, and honest.

*Temporary measures.*—To inaugurate at once a complete system of forest administration would be to attempt more than is wise or feasible at this time; but the necessity of prompt action for the protection of the forest reserves from fire, illegal pasturage, and other depredations; is urgent, and efficient temporary police measures are needed immediately. A plan for the temporary care of the forest reserves may be wisely based on the experience gained in the management of the national parks. This clearly shows that it is possible to protect forests in the most exposed and difficult parts of the public domain with small bodies of troops; whereas, before soldiers were detailed to police the Yellowstone National Park, all efforts to manage it by civil officers of the Government had shown the futility of any attempts at control which did not rest on the moral and physical support of the Army.

The collection and confinement of the Indians upon reservations, together with the rapid extension of settlements throughout the arid and semiarid regions of the West, have terminated the state of actual or quasi war which prevailed there less than a quarter of a century ago, and have freed the Army from the burden of active scouting which then consumed its time and energies. Under the new conditions, however, new duties have arisen, which make its presence hardly less important than it was under the old state of affairs. Not only is timber, the property of the nation and essential to supply the wants of farmers and miners, rapidly disappearing in consequence of forest fires, sheep grazing, and pilfering, but wide areas capable of supporting an industrious population are threatened with ruin from the destruction of mountain forests feeding the sources of streams necessary for irrigation. This danger is no less real than Indian massacre was formerly, and the citizens of the West can only look to the Army for immediate and temporary protection from it.

The patrolling and guard duty required will be professional in character, involving marches and practical experience in field service, which will be valuable as a preparation for war; and it is believed that it may be so combined with the usual field instruction now given to troops that it will accomplish not only the forest protection sought for, but also military training. The service will not be onerous, for many of the reserves will need no protection at present, and in others the danger period will not exceed two or three months annually. It is believed that this temporary detail of troops can readily be arranged between the Interior and War Departments in such a way that the objects

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desired can be accomplished without any detriment, and with many benefits, to the public service; and that the reserved forests can not be efficiently and cheaply guarded at this time in any other way.

Each important forest reserve should be placed at once in charge of an officer of the army, detailed during the season when forest fires are to be dreaded, to report to the Secretary of the Interior and to act as superintendent, and he should be supported by sufficient details of soldiers. In or near each forest reservation a United States commissioner should be stationed to deal promptly with all cases rising from violations of forest laws or regulations, and perform the duties of a police justice under a district attorney and the United States court. The authority to make arrests should be conferred upon the forest guards.

The primary object of such temporary management would not be to produce a revenue, but to protect the reserves against fire and depredation. It should be the duty of the superintendents to issue passes to persons desirous of entering or crossing them, and to keep a careful record of the names and residences of all such persons. Sheep should be wholly excluded from the reserves, and cattle should be admitted only in moderate numbers and when the property of actual settlers on adjacent lands.

*Permanent forest organization.*—The fundamental principle of any government system of forest management should be the retention of the fee of forest lands, and the sale of forest products from them at reasonable prices, under regulations looking to the perpetual reproduction of the forest. While it is not desirable, perhaps, that the Government in the immediate future should enter into competition with the private owners of forest lands, it is evident that ultimately the sale of forest supplies from the Government timber lands should not only cover all expenses of Government forest management, but produce a steadily increasing income.

Upon officers charged with the administration of the Government forests will devolve the care of immensely valuable public property, its improvement under the best established scientific methods, police responsibility of exceptional delicacy, surveys, the construction of roads and engineering works for the protection of mountain slopes, and the control of numerous agents widely separated and not easily trained to habits of discipline. Many of these duties are essentially military in character, and should be regulated for the present on military principles. Wise forest management calls for technical knowledge which must be based on a liberal scientific education. The forest officers must be men of the highest personal character, who can be trusted to avoid participation in any private business connected however remotely with forest products. To secure the service of men qualified to meet these several requirements will call for liberal remuneration and permanent tenure of office.

The following permanent organization is recommended to meet these demands:

One director of forests, to have charge of a forest bureau in the Department of the Interior. He should be the president of an advisory board consisting of himself, an assistant director, and of four forest inspectors, and should have general charge of all matters relating to the forests on the public domain; he should approve all plans made by his subordinates for the management of these forests. His staff should consist of a legal adviser well versed in the laws and regulations of the

service, and of a disbursing officer to attend to the distribution of funds among the forest officers and to receive and audit their accounts. Such clerks as experience may show to be necessary should be provided.

An assistant director of forests with authority to sign such letters, papers, and documents, and perform such other duties as may be designated by the director, to act as director in case of the absence of that officer or in case of a vacancy in the office of director, and to be a member of the advisory forest board.

Four inspectors of forests, each to have charge of a forest department and to be a member of the advisory forest board. The permanent stations of these officers should be at the most convenient localities in their departments, but they should assemble in Washington to confer with the director and with each other, and to discuss matters connected with the service. Each should have a legal adviser on his staff and as many clerks as necessary. All papers relating to his department, whether from superiors or inferiors, should pass through the office of the inspector.

The following limits are suggested for the four forest departments:

First department: To include the forest reserves comprised in California and Nevada. At present there are six such reserves, aggregating 6,867,200 acres.

Second department: To include the forest reserves comprised in Oregon and Washington west of the one hundred and twentieth meridian. At present there are six such reserves, aggregating 12,671,360 acres.

Third department: To include the forest reserves comprised in Arizona, New Mexico, Colorado, and Utah. At present there are eight such reserves, aggregating 6,141,440 acres.

Fourth department: To include the forest reserves comprised in Wyoming, South Dakota, Montana and Idaho, and Washington east of the one hundred and twentieth meridian. At present there are eight such reserves, containing 9,117,440 acres.

Twenty-six head foresters, each to have charge of a forest district not too large for close personal supervision. The area of a district should vary according to locality, rarely comprising less than half a million acres or more than one and a half million acres. The district should form the unit of organization. Its chief should control his subordinates, regulate expenditures, prepare projects for and direct the execution of all public works, and should be responsible for the proper execution of all orders received from higher authority. Persons desiring to purchase forest products should apply to him; and if recommended by himself and approved by his forest inspector, he may make formal contracts, supervise the delivery according to the terms thereof, and duly notify the receiver at the nearest land office, or such other agent of the Government as may be designated by competent authority to receive funds. In no case should payments be made to officers of the forest service. To the staff of each head forester should be attached a United States commissioner appointed by the judge of the United States court for that locality. This officer should hear all cases arising under violations of forest laws and regulations, and, where necessary, report them to the district attorney for prosecution in the United States court.

Twenty-six foresters to act as assistants, and in case of absence or illness of the head foresters to perform their duties. They should also disburse all Government funds and be responsible for all Government property in use under the forest organization of the district, but under the direction and subject to the approval of the head forester.

## REPORT OF THE NATIONAL FORESTRY COMMITTEE. 27

The fifty-eight officers designated should constitute a permanent forest corps, holding office for life during good behavior or efficiency, but subject to retirement at the age of 64 years, and their promotion should be by seniority. They should be appointed by the President and confirmed by the Senate.

Under the temporary organization already suggested, officers of the army will have had experience in forest administration, and some of the first appointments to the permanent forest corps would naturally be made from those officers who had shown special fitness for forest duty. The officers of the forest corps thus recruited from graduates of the Military Academy at West Point will have had the advantage of the military training required in the forest service and a scientific education well calculated to prepare them to profit by instruction in special forest schools in this country or in Europe. The certainty of future employment, dependent on ability and good behavior, will induce young men of good ability to seek employment in the forest service through this channel.

The disadvantage of being obliged to devote considerable time in the Academy to the study of subjects which have no immediate connection with forestry will be more than compensated for by the character of the education obtained there. There is now no other school in which the Government can train young men so cheaply and efficiently in many branches of knowledge which will be directly advantageous to them as forest officers. Provision, too, must be made for the admission into the forest corps of the graduates of other scientific schools and of universities in which special attention is given to scientific education. The graduates of West Point pass before graduation a severe Government examination. To make sure, however, of obtaining men equally well fitted for their duties from other schools and colleges, these should pass a civil-service examination before they receive nominations by the President for appointment in the forest service, but no discrimination should be made against either. To provide at once technical forest education a certain number of graduates of the Military Academy who may desire to enter the forest service should be sent for two or three years to one of the great forestry schools of Europe, and when these first officers have been graduated it should be their duty to organize at some convenient place near one of the great reservations a forest school for the instruction of the forest corps and of such civilians as may desire to avail themselves of its privileges.

Provision for the promotion of deserving individuals in the lower grades of the forest corps, to fill 50 per cent of the vacancies in that of officer, should also be made, not only as a reward of merit but as an additional inducement for educated young men to enter this branch of the public service.

The following organization is recommended for the subordinate grades in the forest service:

Two hundred rangers, to serve under the orders of head foresters. The rangers should have authority to make arrests for violations of forest laws and regulations, and should thus be constituted a sort of national police. They should supervise all work undertaken on the reserves; should see that contracts for forest products are executed according to the terms agreed upon, and in general should act as assistants in the regulation of local affairs. Upon entering the service they should sign articles to serve for a period of five years, and they should be selected under civil-service rules by the head forester, under whom they are to act. Being eligible for promotion in the grades of forester

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under the conditions above indicated, it is believed that these positions will be sought by young men desirous of entering the service.

Assistant rangers, in such numbers as may be found necessary in the different districts after experience has made known the requirements of the service. They should be employed during the season when the reserves are frequently visited by campers and others, and when fires are to be chiefly apprehended, and should be discharged when no longer needed. They should be appointed by head foresters under civil-service rules and should have authority to make arrests for violations of forest laws and regulations. The routine manual labor of the reserves should devolve upon the assistant rangers.

The following are the rates of annual compensation suggested for forest officers, with an increase of 10 per cent for each period of five years' service: For the director, \$4,500; for the assistant director, \$4,000; for an inspector, \$3,500; for a head forester, \$2,500; for a forester, \$2,000.

For the subordinate grades a monthly pay of \$45 for rangers, and of \$35 for assistant rangers is proposed, with a gradual increase for length of service. Rations in kind, or a commutation, should also be furnished.

All officers of the service on reaching the age of sixty-four years should be entitled to receive 50 per cent of their pay at the time of retirement, and a like inducement to faithful service should be extended to rangers after a service of thirty years.

This organization will require for salaries, including those of rangers, for each of the first five years an annual appropriation of \$250,000. While the number of officers proposed is much smaller in proportion to the area of the territory to be protected, now about forty million acres, than has been found necessary in other countries, it is believed to be sufficient for the immediate wants of the service. It is probable, however, that it will have to be enlarged in the future, when increase of population in the Western States and Territories and a greater demand for forest supplies than now exists will make the protection of the reserved forest lands more difficult and will justify more elaborate methods of forest management than now appear necessary, or when now unreserved forest lands of the public domain are controlled by the officers of the forest bureau.

When it is remembered that several million dollars worth of timber are taken every year from the public domain without the Government being able to obtain any payment for it, it would appear a wise and economical policy to spend annually a few hundred thousand dollars on an organization which would prevent such unnecessary drains on the wealth of the nation; it must be remembered also that an efficient forest administration would be able to prevent many forest fires on the public domain, and that it is not an unusual occurrence for a single fire to destroy material in a few days worth more in actual money than this forest administration would cost in years, while the loss to the country in impaired water flow through forest fires, which might be easily prevented, is incalculable. The expenditure, therefore, of \$250,000 a year in furnishing means for protecting the forests on the public domain would appear to be justified by every consideration of common sense and economy.

The example, moreover, of wisely directed national forests may be expected to be a substantial benefit to the private interests of the citizens of the United States, both as object lessons and in the opportunity they would offer for the special training of foresters. Such examples would gradually change the wasteful methods now practiced by

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individual owners of forest property, and in this way increase national wealth and prosperity. Your committee fully realizes that the organization of such an administrative bureau of civil officers would be a radical departure from the recognized customs of the United States. The nature and extent of the interests at stake, however, and the difficulty, delicacy, and permanency of the duties demand an exceptionally stable service. The experience of all other countries shows that this service can be successfully performed only by highly trained and conscientious officers.

*Board of forest lands.*—Topographical and economic surveys upon which it would have been possible to establish scientifically the proper boundaries of the reserved lands do not exist, and their limits have been laid down roughly with the idea that they would be modified as soon as it was possible to determine accurately what portions were more valuable for the production of minerals and for agriculture and grazing than for their timber growth, and that such lands would then be opened to entry and settlement. In all the forest reserves visited by your committee it saw opportunities to improve their boundaries, and found lands which can not be permanently reserved without inflicting serious hardships and losses on the community. Only a small portion of the White River Plateau Timber Land Reserve in Colorado, for example, is forest land, the remainder being covered with grasses and scattered clumps of oak bushes. Such land is, of course, most valuable for pasturage, and its withdrawal from use cripples the important cattle industry of the region. In the Washington Forest Reserve, and in the Cascade Forest Reserve are mineral deposits which can not wisely be held from entry, and near the borders of others there are lands more valuable for agriculture or fruit growing than for other purposes.

It is evident that such lands should be taken from the forest reserves as soon as it is practicable to do so, but before this can be done safely those parts of the public domain which have been reserved, or which may be reserved, should be accurately surveyed and carefully mapped. As the United States Geological Survey is the only Bureau in the Department of the Interior equipped for this work, it can probably most conveniently make these surveys. Their proper interpretation is a matter of the greatest importance, for on the men who undertake it will devolve the duty of establishing the final boundaries of the reserved forest lands of the public domain. Enormous interests are involved in these final decisions, and this work can be intrusted only to men of the highest integrity, intelligence, and public spirit. Efforts will certainly be made to improperly influence their judgment, and they will be subjected to severe temptations. The power to open any part of the reserved lands to settlement is in the hands of the President of the United States, but he will necessarily base his decisions in such matters on the reports and recommendations of the experts who are to study the results of the surveys made under the direction of the Geological Survey.

To provide for this important duty, we recommend that the President be authorized to appoint a commission to be known as the board of forest lands, to consist of an officer of the Engineer Corps of the Army, a member of the Geological Survey, a member of the Coast Survey, and two persons not connected with the public service, and that it shall be the duty of this board to determine, with the aid of actual surveys and such other examinations as may be found necessary, the boundaries of those parts of the public domain which should be retained permanently



mill owners, and railroad contractors have cut timber under its provisions for commercial purposes, and lumber cut on lands held to be mineral by the men who plunder the public domain under the protection of this act has been sent by rail to cities in distant States.

Individual avarice and corporate greed have vied in accepting this bounty offered to them by the Government, and the most valuable timber accessible to railroads has already been cut from all reputed mineral lands. A conspicuous and notorious example of what this act has accomplished is seen in South Dakota, where the forested lands among the Black Hills, although only a small part of them have been surveyed, have been held by the mining companies of the region to be mineral lands; and for years these companies, under the provisions of this act, have consumed large quantities of timber and firewood without being subjected to any charge. In this region, which affords a fair example of what is going on in other mineral regions, no attention has been paid to the regulations of the Secretary of the Interior, under which timber less than 8 inches in diameter can not be cut; and there is now pending a suit in the United States court by the United States against the Homestake Mining Company for timber cut before 1891 under 8 inches in diameter, amounting to about \$688,000. Special agents of the General Land Office several years ago estimated that the value of the timber cut at that time by this company amounted to between \$2,000,000 and \$3,000,000, but owing to ignorance as to the nature of the land and uncertainties of the law no suit has been brought to recover the value of any part of it cut from trees above 8 inches in diameter.

This company has built and operates a railroad nearly 40 miles long into the public domain for the purpose of bringing timber and fuel to its mines from land which has not yet been shown to be mineral, and is destroying the forest as far back from this line of railroad as timber can be easily and profitably moved. It is a matter of common report that millions of feet of lumber cut on the public domain in the Black Hills under the authority of this act have also been shipped by rail and sold in Omaha, although the Government has received no compensation whatever from the companies carrying on these operations. To this act can also be traced the destruction of immense forests in Colorado, Nevada, Arizona, and Montana, and whenever it can be made applicable the evil results which have followed its passage are plainly visible.

The act of March 3, 1891 (26 Stat., 1093), permits residents in the States of Colorado, Montana, Idaho, North Dakota, South Dakota, Wyoming, Nevada, Alaska, and Utah to take timber from nonmineral public lands therein under rules and regulations prescribed by the Secretary of the Interior, and the act of February 13, 1893 (27 Stat., 414), extends the provisions of this act to Arizona and New Mexico. Under the provisions of these acts the Secretary of the Interior is authorized to issue permits to cut timber on unreserved nonmineral lands, but it provides for no compensation for the Government in return for these privileges. The intention of the act was doubtless to enable actual settlers to obtain legally from nonmineral lands necessary forest supplies for their own immediate use. In reality it has been taken advantage of by rich and powerful corporations who, securing permits without difficulty to cut timber for commercial purposes, prevent as far as possible agricultural settlers and the owners of mining claims from obtaining them, and, in this way preventing competition, control the market for the timber which the Government presents to them.

The largest and wealthiest mining corporation in Montana is now

supplied with timber cut principally under the provisions of this act, and lumber manufactured from trees cut under its authority is sent by it to many parts of that State. The bounds of the lands on which authority to cut timber under this act is given are never clearly marked, and there are reasons for believing that little attention is paid to them in actual practice. The act and its working has favored wealthy corporations able to pay the Government for all the timber they require. It is unjust in its discrimination against the residents of those States and Territories which are not included in its provisions and in its gifts to the competitors of individuals and firms who have acquired timber by the purchase of lands under the timber and stone act of June 3, 1878, or otherwise.

The act of June 3, 1878 (20 Stat. L., 89), known generally as the timber and stone act, authorizes the sale of unreserved surveyed but unoccupied timber lands in California, Nevada, Oregon, and Washington in quantities not exceeding 160 acres to one person or association of persons at \$2.50 an acre, and by the act of August 4, 1892 (27 Stat. L., 348), the provisions of this act are extended to embrace all the public-land States. Under the workings of these acts great bodies of valuable timber lands speedily passed into the hands of individuals and of corporations and syndicates, domestic and foreign, for purposes of speculation, the Government obtaining only a small percentage of the actual value of the standing timber. It has been made use of by corporations and wealthy individuals to secure fraudulently, for the purpose of manufacturing lumber, or to hold for speculative purposes, most of the valuable redwood lands of the California coast region and great bodies of the sequoia and sugar pine forests of the Sierra Nevada and much of the best timber land on Puget Sound has also been taken from the national domain under authority of this act.

Some of the most valuable timber land in the world has thus been acquired at mere nominal prices through the medium of dummy entries, for it is a notorious fact that the greater part of the entries under this act have been made in the names of poor and ignorant people who have never seen the lands and who, immediately after the issuance of the final certificates, have transferred their claims to corporations or individuals dealing in lumber or timber lands; and it has been shown that at one time in California regular agents employed by lumbermen were authorized to offer men \$50 apiece to make entries of land covered with redwood timber and deed them to their employers. Similar frauds have been practiced in Oregon and Washington, and in other States, since the extension of the law. This act has robbed the Government of the United States of its most valuable timber land, worth at market prices many millions of dollars, for which it has received no adequate return, and has demoralized and degraded whole communities.

By the act of March 3, 1875 (18 Stat. L., 482), right of way through the public lands of the United States is granted to any railroad company which had filed with the Secretary of the Interior due proof of its organization, etc., and also the right to take, from lands adjacent to the line of the road, timber necessary for its construction. Such loose and ambiguous terms as "adjacent lands" and "construction purposes" used in this act have served as a cover for illegal speculation in public timber and have fostered its unlicensed waste and destruction.

Under the provisions of this act large quantities of timber from the public domain have been cut and removed for export and sale. Corporations have been formed in which the railroads were the principal

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owners for monopolizing the timber traffic in the northern Rocky Mountains, and these corporations have cut timber from unsurveyed public lands far from the right of way of any railroad and have shipped the product to distant markets. Millions of feet of public timber have been unlawfully appropriated under this act, the elastic term "adjacent to the line of railroad" having been held to extend to any distance where timber could be found, and the term "construction purposes" to apply not only to the roadbed, but to station houses, depots, snowsheds, and even to rolling stock.

The attempts made by the Department of the Interior and the courts to properly construe the terms "adjacent" and "construction" have resulted in conflicting rulings, and the question is still undecided whether adjacent timber lands means 1 or 100 miles from the road, whether it lies laterally from the line of the road or from its terminus, or whether it means land conveniently accessible by railways or waterways; while the term "construction" is held by some authorities to apply only to the roadbed proper and the first laying of the tracks, and by others to extend also to subsequent changes of gauge and to the construction of bridges, snowsheds, stations, and freight houses. The timber taken from the public domain for railroad purposes under the provisions of this act has resulted in an enormous waste and the unnecessary devastation of forests along water courses and the head waters of streams which should have been preserved for the general good of the public. While it may have been necessary when the first transcontinental railroads were built to permit them to take timber from the public domain for actual purposes of construction, there is no longer any reason why privileges of this sort should be granted to corporations in one part of the country and not in others, or why any corporation which may desire in the future to build new railroads or extend existing lines in the public land States should not buy and pay for the timber it may require for construction.

The act of June 8, 1872 (17 Stat. L., 339), allows the Denver and Rio Grande Railroad Company to take timber without supervision or control from the public domain for the repairs of its line. This is an unjust discrimination in favor of this particular road, granting it privileges which are not enjoyed by any other railroad in the United States and permitting it a continuous use of public timber practically for all time. It is clearly unjust that this valuable privilege should be granted to one particular road while corporations controlling competing lines of railroad are obliged to pay for the timber needed to keep their roads in repair; and this act is peculiarly dangerous because the country tributary to the Denver and Rio Grande Railroad was never well timbered and has suffered more than most other parts of the United States from forest fires and injudicious cutting.

The United States has proved its inability to enforce the rules and regulations established from time to time by the Secretary of the Interior to protect its interests in its own timber lands; and attempts made to recover the value of timber unlawfully cut from the public domain have failed through the ambiguity and defectiveness of the various acts under which it was hoped that actual settlers might secure forest supplies, and because the sentiment of a majority of the people in the public-land States with regard to the public domain, which they consider the exclusive property of the people of those States and Territories, does not sustain the Government in its efforts to protect its own property, juries, when rare indictments can be obtained, almost invariably

failing to convict depreddators. This is shown by the following table compiled from the records in the General Land Office, and covering the last eleven years:

Year.	Timber and lumber illegally taken from the public domain.	Amounts sued for.	Amounts recovered by suits.	Amounts recovered by compromise.
	<i>Feet B. M.</i>			
1886.....	1,245,250,000	\$5,774,272.84	\$77,933.35	\$23,152.96
1887.....	1,029,100,000	2,082,236.72	112,952.87	15,689.22
1888.....	861,800,173	3,795,020.99	102,823.92	25,698.72
1889.....	3,359,525,410	12,113,326.26	161,347.80	20,538.41
1890.....	2,109,392,000	359,583.63	83,420.50	17,244.82
1891.....	1,425,876,209	954,874.20	62,402.47	53,863.03
1892.....	195,751,300	440,463.41	35,010.93	49,539.48
1893.....	47,708,000	27,290.63	43,049.42	11,503.24
1894.....	760,100,400	15,322.47	21,290.58	2,230.87
1895.....	158,801,965	344,683.44	31,081.36	16,698.70
1896.....	227,241,775	325,471.23	140,452.73	42,247.18
Total.....	11,420,607,202	\$26,233,145.82	\$371,765.91	\$278,406.63

In this table amounts sued for and amounts recovered do not represent the trespass cases reported in the same year, the damages being recovered from cases previously reported. The amounts sued for represent only the values of timber in those cases in which sufficient evidence was found upon which legal proceedings could be based with any hope of success. Many cases are investigated and reported to the General Land Office in which undoubtedly trespasses have been committed, although it is found difficult to secure sufficient evidence to justify the institution of suits.

The amounts sued for in the above table represent the market values of the timber in the condition and position where it was found. The following table shows the stumpage value of timber trespass reported by special agents to the General Land Office during the fiscal years 1886 to 1896, inclusive:

1886.....	\$1,726,516.89	1893.....	\$44,383.71
1887.....	965,576.04	1894.....	360,893.78
1888.....	840,145.15	1895.....	169,317.32
1889.....	1,182,987.14	1896.....	140,210.28
1890.....	832,120.48		
1891.....	349,440.62	Total.....	6,836,900.51
1892.....	225,009.10		

Or an average yearly value of \$621,536.41.

It has long been apparent to all disinterested persons familiar with the working of the land laws of the United States that the acts which we have described should be repealed, and unless this is done it is evidently only a matter of a comparatively short time when all the valuable timber will have been destroyed on the unreserved public lands or will have passed into the hands of individuals. Unless, therefore, the Government is prepared to abandon control of the water supply of many streams needed for irrigation, and to see the whole of its unreserved territory west of the one hundredth meridian stripped of its valuable timber and agricultural and mining interests crippled, it must contemplate the adoption of some policy like that which, after a fair trial, has proved successful and profitable in Canada, and under which all public lands in the Western States and Territories more valuable for their forests than for agriculture or the production of minerals can be reserved to protect the flow of rivers and to produce

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timber to supply the needs of agriculture and mining and the demands of commerce.

This can be accomplished by withdrawing now from sale and entry all public lands more valuable as timber lands than for other purposes through the repeal of the various acts under which timber and timber lands can be acquired by individuals and corporations. Such reserved lands should then be surveyed as rapidly as possible, in order that their true character can be accurately defined and such parts of them as may be found less valuable as forest lands than for other purposes opened to sale and entry, while the remainder should be held permanently by the General Government and administered by a competent forest bureau for the benefit of the people in the whole country. A scheme for the withdrawal of the forest lands of the public domain from sale, for their survey, and for their administration in such a manner that actual settlers, prospectors, and the owners of mining claims may obtain free and abundant supplies of timber for their actual needs, and that commerce may be supplied with forest products, will be found in the draft of the bill marked No. 3 attached to this report. Its passage, if these forest lands are wisely administered, will insure the permanency of many waterways in the arid States and Territories; it will enable agricultural settlers and the owners of mining claims to obtain under protection of the law such forest supplies as they may actually need for their personal use; and it will compel great corporations controlling mines, traffic lines, and sawmills to buy from the Government at public auction, in such quantities as they may require, the timber which they now take under one pretext or another and generally without payment.

#### ADDITIONAL NATIONAL PARKS.

Parts of two forest reserves contain features of supreme natural beauty, and can best be preserved for the enjoyment and instruction of the world by creating them national parks and governing them under the rules and regulations which have proved successful in protecting the Yellowstone National Park. The first of these is the upper slopes of Mount Ranier, in Washington, with its glaciers, its alpine meadows clothed with flowers, and the fringe of forest which maintains a precarious foothold on the steep ridges below the line of its perpetual snows. This mountain is one of the highest and most beautiful in North America, and outside of Alaska its glaciers are unrivaled in magnitude and interest in the United States. Memorials have been presented to Congress by the American Association for the Advancement of Science, the Geological Society of America, the Sierra Club, and the Appalachian Mountain Club favoring the establishment of this national park, and an act setting aside certain lands for it was passed by the Fifty-fourth Congress at its second session; but the bill, by extending to it the mineral-land laws, might have destroyed its scenic value, and it did not receive Executive sanction.

The second spot which we believe should be made into a national park is that portion of the Grand Canyon Reserve in Arizona which is immediately adjacent to and includes the walls of the canyon itself. These two localities, Mount Ranier in Washington and the Grand Canyon of the Colorado in Arizona, are each in its particular way unsurpassed in interest. Their natural wonders should be preserved without further defacement than is necessary to make them easily accessible to the people; and unless mining is prohibited in their immediate neighborhood, and unless they can be strictly guarded against fires, their

scenic value will be seriously impaired. As this protection can only be secured by the adoption of the rules and regulations similar to those which govern the national parks, we recommend the establishment of a Ranier national park and a Grand Canyon national park.

#### CONCLUSIONS AND RECOMMENDATIONS.

The Secretary of the Interior, in his letter of February 15, 1896, asked the Academy whether "it is desirable and practicable to preserve from fire and to maintain permanently as forest lands those portions of the public domain now bearing wood growth for the supply of timber."

Your committee is of the opinion that it is not only desirable but essential to national welfare to protect the forested lands of the public domain, for their influence on the flow of streams and to supply timber and other forest products; and that it is practicable to reduce the number and restrict the ravages of forest fires in the Western States and Territories, provided details from the Army of the United States are used for this purpose permanently, or until a body of trained forest guards or rangers can be organized. It does not believe that it is practicable or possible to protect the forests on the public domain from fire and pillage with the present methods and machinery of the Government.

In answer to the second question submitted by the Secretary of the Interior, "How far does the influence of forests upon climate, soil, and water conditions make desirable a policy of forest conservation in regions where the public domain is principally situated?" It is the opinion of your committee that, while forests probably do not increase the precipitation of moisture in any broad and general way, they are necessary to prevent destructive spring floods, and corresponding periods of low water in summer and autumn when the agriculture of a large part of Western North America is dependent upon irrigation.

The answer to the third question, "What specific legislation should be enacted to remedy the evils now confessedly existing?" will be found in the series of proposed bills appended to this report. They present the following recommendations:

(1) That the Secretary of War, upon the request of the Secretary of the Interior, shall be authorized and directed to make the necessary details of troops to protect the forests, timber, and undergrowth on the public reservations, and in the national parks not otherwise protected under existing laws, until a permanent forest bureau in the Department of the Interior has been authorized and thoroughly organized. (See bill No. 1.)

(2) That the Secretary of the Interior shall be authorized and directed to issue the necessary rules and regulations for the protection, growth, and improvement of the forests on the forest reserves of the United States; for the sale from them of timber, firewood, and fencing; to actual settlers on and adjacent to such reserves, and to the owners of mines legally located in them for use in such mines; for allowing actual settlers who have no timber on their own claims to take from the reserves firewood, posts, poles, and fencing material necessary for their immediate personal use; for allowing the public to enter and cross the reserves; for granting to county commissioners rights of way for wagon roads in and across the reserves; for granting rights of way for irrigating ditches, flumes, and pipes, and for reservoir sites; and for permitting prospectors to enter the reserves in search of valuable minerals; for opening the reserves to the location of mining claims under the general mineral laws; and for allowing the owners of unperfected

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claims or patents, and the land-grant railroads with lands located in the reserves, to exchange them under equitable conditions for unre-served lands. (See bill No. 2, secs. 2-4.)

(3) That a bureau of public forests shall be established in the Department of the Interior, composed of officers specially selected with refer-ence to their character and attainments, holding office during efficiency and good behavior and liberally paid and pensioned. (See bill No. 2, secs. 5-11.)

(4) That a board of forest lands shall be appointed by the President to determine from actual topographical surveys to be made by the director of the Geological Survey what portions of the public domain should be reserved permanently as forest lands and what portions, being more valuable for agriculture or mining, should be open to sale and set-tlement. (See bill No. 2, sec. 15, and bill No. 3, sec. 6.)

(5) That all public lands of the United States more valuable for the production of timber than for agriculture or mining shall be withdrawn from sale, settlement, and other disposition and held for the growth and sale of timber. (See bill No. 3.)

(6) That certain portions of the Rainier Forest Reserve in Washing-ton and of the Grand Canyon Forest Reserve in Arizona shall be set aside and governed as national parks. (See bills Nos. 4 and 5.)

Yours, respectfully,

CHARLES S. SARGENT.  
HENRY L. ABBOT.  
A. AGASSIZ.  
WM. H. BREWER.  
ARNOLD HAGUE.  
GIFFORD PINCHOT.  
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To the PRESIDENT OF THE NATIONAL ACADEMY OF SCIENCES.

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will be submitted to you. It believes that the solution of this difficult problem will, however, be made easier if reserved areas are now increased, as the greater the number of persons interested in drawing supplies from the reserved territory or in mining in them the greater will be the pressure on Congress to enact laws permitting their proper administration. For this reason it is the unanimous opinion of the Commission that the establishment, by proclamation, of the reserves described above is now a matter of the utmost importance to the development and welfare of the whole country.

Very respectfully,

C. S. SARGENT, *Chairman.*

## APPENDIX B.

### No. 1.

A BILL for the temporary protection of the public forest reserves and national parks of the United States.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That until a bureau of forests in the Department of the Interior has been authorized by Congress and duly organized for the protection of the public forest reserves, the Secretary of War, upon the request of the Secretary of the Interior, is hereby authorized and directed to make the necessary details of troops to protect the forests, timber and undergrowth, and natural curiosities in the public forest reserves and the national parks not otherwise protected under existing law, and to enforce the rules and regulations prescribed by the Secretary of the Interior for the protection of such reserves and parks, which he is hereby authorized to make and promulgate and which shall have the force and effect of law.

SEC. 2. That it shall be the duty of the troops detailed for service under the provisions of this act, and of any officer or employee of the United States, to arrest any person found violating any of the rules and regulations prescribed by the Secretary of the Interior hereunder, and take such person before the nearest United States commissioner, within whose jurisdiction the reserves or park is located, for trial. And upon sworn information by any competent person, any United States commissioner, in the proper jurisdiction, shall issue process for the arrest of any person charged with the violation of the rules and regulations made under the provisions of this act. But nothing herein contained shall be construed as preventing the arrest by any officer of the Government, without process, of any person taken in the act of violating any regulation of the Secretary of the Interior made in pursuance of this act.

SEC. 3. That it shall also be the duty of the troops detailed for service under the provisions of this act, to prevent, as far as possible, the lighting and spread of forest fires in said reserves and parks.

### No. 2.

A BILL to protect and administer public forest reserves.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That the objects for which public forest reserves shall be established under the provisions of the act approved March third, eighteen hundred and ninety-one, shall be to protect and improve the forests for the purpose of securing a permanent supply of timber for the people and insuring conditions favorable to continuous water flow. And all such forest reserves shall be controlled and administered in accordance with the provisions of this act and the rules and regulations prescribed hereunder; and all acts and parts of acts inconsistent with the provisions of this act and the rules and regulations prescribed hereunder are hereby repealed.

SEC. 2. That the Secretary of the Interior is hereby authorized and directed to issue all necessary rules and regulations for the protection, growth, and improvement of the forests on the forest reserves of the United States; for the sale therefrom of timber, firewood, and fencing to actual settlers on and adjacent to such reserves, and to owners of mines legally located therein for use in such mines; for granting permits to sawmill owners to enter the reserves for the purpose of manufacturing such lumber as may be sold to them for the use of actual settlers in and adjacent to the reserves and to owners of mines located therein: *Provided,* That authority may be given to actual settlers who have no timber on their own claim

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## REPORT OF THE NATIONAL FORESTRY COMMITTEE. 45

to take from the reserves firewood, posts, poles, and fencing material necessary for their immediate personal use; for allowing the public to enter and cross the reserves; for granting to county commissioners rights of way for wagon roads in and across the reserves; for granting rights of way for irrigating ditches, flumes, and pipes, and for reservoir sites, under the terms of existing laws; and for permitting prospectors to enter the reserves to search for valuable minerals.

SEC. 3. That the forest reserves shall be open to the location of mining claims under the general mineral laws, and the owners of valid mining locations made and held in good faith are hereby authorized and permitted to fell and remove from such mining claims any timber growing thereon for actual mining purposes in connection with the particular claim from which the timber is felled and removed.

SEC. 4. That in cases in which land covered by unperfected bona fide claims, or by patents, are included within the limits of public forest reserves, the settlers or owners thereof may, if they so desire, relinquish the same to the Government, and may select in lieu thereof tracts of vacant land open to settlement, not exceeding in area the tracts covered by their claims or patents; and no charge shall be made in such cases for making the entries of record, or issuing the patents, to cover the tracts selected: *Provided*, That in cases of unperfected claims, that the requirements of the laws respecting settlement, residence, improvements, etc., are complied with on the new claims, credit being allowed for the time spent on the relinquished claims. And the Secretary of the Interior is hereby authorized and directed to enter into negotiations with the land-grant railroad companies for the purpose of concluding agreements whereby said companies may relinquish to the United States title acquired by them to lands within their granted and indemnity limits, where such lands lie within the boundaries of forest reserves, accepting other unappropriated public lands in lieu thereof from the even-numbered sections within their granted and indemnity limits not embraced in forest reserves.

SEC. 5. That there shall be, and is hereby, established in the Department of the Interior, a bureau of public forests. That such bureau shall consist of a director, an assistant director, a law clerk, a disbursing clerk, a chief clerk, and such clerical assistance as may be necessary, four inspectors, twenty-six head foresters, twenty-six assistant foresters, two hundred rangers, and such assistant rangers or temporary field force as may be found necessary at different seasons of the year.

SEC. 6. That the director shall have general charge of all matters relating to forests on the public domain, and shall be the president of an advisory forest board consisting of himself, the assistant director, and the four forest inspectors, and shall prepare and submit to the Secretary of the Interior for his approval such plans for the management of the public forests as may appear necessary, and shall be charged with the execution of the same. The assistant director shall be authorized to sign such letters, papers, and documents, and to perform such other duties as may be designated by the director, and shall act as director in the absence of that officer or in case of a vacancy in the office of director. The disbursing officer shall furnish a sufficient and satisfactory bond, and shall audit all accounts of the bureau, disburse all moneys in connection therewith, and shall report to the Secretary of the Treasury the amounts derived from the disposition of public timber. The forest reserves shall be divided into four divisions, each in charge of a forest inspector, under the supervision of the director, whose stations shall be at the most convenient localities in their respective divisions, but they are to assemble in Washington when necessary as members of the advisory forest board. Each forest division shall be subdivided into such a number of districts as may most satisfactorily permit an efficient management, each district to be in charge of a head forester, under the control of an inspector. In the absence of an inspector, the director may designate a head forester of that division to act as inspector. There shall be an assistant forester for each district, who shall perform such duties as the head forester may direct, and in his absence act in his place, and who may also act as disbursing agent for his district. The head foresters may enter into contracts for the sale of public timber, subject to the approval of their superior officers, supervise the execution of the terms thereof, and notify the proper receiver of public moneys of the sums to be received. The head foresters shall also superintend the work of their assistants, rangers, and other subordinates in the execution of the laws and rules and regulations relating to the reservations, and shall approve all accounts and expenditures of their subordinates.

SEC. 7. That the director of the bureau of public forests, the assistant director, the inspectors, head foresters, and assistant foresters shall constitute a permanent forest corps, holding office during efficiency and good behavior, but subject to retirement at the age of sixty-four years, promotion to be governed by seniority of service; and they shall be appointed by the President, by and with the advice and consent of the Senate, as rapidly as men with the necessary education can be obtained.

SEC. 8. That officers of the forest corps shall be taken from graduates of the United States Military Academy or from graduates of other scientific schools, or universities having scientific courses, civilians first passing examinations satisfactory to the

Civil Service Commission, but no discrimination being made between them; and the successful applicant shall be certified by the director of the bureau of public forests to the Secretary of the Interior for appointment by the President. Not less than four graduates of the United States Military Academy shall be sent abroad for instruction in forestry; and it shall be the duty of the Secretary of the Interior, on their return, to organize a school of forestry, in or near one of the great forest reserves, to which newly appointed officers of the forest corps shall be sent for instruction, and which may be open to civilians under such regulations as the Secretary of the Interior may prescribe: *Provided*, That one-half of the vacancies in the forest corps may be filled by the promotion, after satisfactory examination, of deserving men in the grade of ranger.

SEC. 9. That rangers shall be appointed, under civil-service rules, by the head forester under whom they are to act, and upon entering the service shall sign articles to serve for a period of five years. Assistant rangers or temporary field force may be employed by head foresters, as authorized by the director, for such periods as the exigencies of the service may require.

SEC. 10. That the appointment of officers and employees not otherwise provided for in this act shall be made by the Secretary of the Interior under civil-service rules.

SEC. 11. That the forest corps shall receive the following annual compensation, with an increase of ten per centum for each period of five years' service: For the director, four thousand five hundred dollars; for the assistant director, four thousand dollars; for inspectors, three thousand five hundred dollars each; for head foresters, two thousand five hundred dollars each; for assistant foresters, two thousand dollars each: *Provided*, That on retirement said officers shall be entitled during the remainder of their lives to fifty per centum of the pay received by them at date of retirement. For the subordinate grades: For rangers, forty-five dollars per month, with an increase of ten per centum for each five years' service, and subsistence; for assistant rangers, at the rate of thirty dollars per month for the time actually employed, and subsistence.

SEC. 12. That all officers and employees of the bureau of public forests shall have authority to make arrests for the violation of the laws and regulations relating to the forest reserves, and any person so arrested shall be taken before the nearest United States commissioner, within whose jurisdiction the reservation is located, for trial. And upon sworn information by any competent person, any United States commissioner in the proper jurisdiction shall issue process for the arrest of any person charged with the violation of said laws and regulations; but nothing herein contained shall be construed as preventing the arrest by any officer of the United States without process of any person taken in the act of violating said laws and regulations.

SEC. 13. That every person who, either directly or indirectly, unlawfully appropriates, removes, cuts, injures, wastes, or causes the destruction, by fire, grazing, or herding of sheep or other live stock, or in any other manner whatsoever, of the timber, herbage, or other natural resources, or of the natural wonders or curiosities, or of any other public property whatsoever on or within any public lands embraced within such forest reserves shall, upon conviction, for every such offence be fined in a sum of not less than fifty dollars, nor more than one thousand dollars, or shall be imprisoned not exceeding twelve months, or shall suffer both fine and imprisonment, in the discretion of the court; that in addition to the criminal proceedings herein provided, the United States shall be entitled to recover in civil suit the value of all property so unlawfully appropriated, injured, wasted, or destroyed, and shall also be entitled to recover in such cases nominal or exemplary damages. It is further provided that the United States should be entitled to the injunction of waste by way of prevention of trespass upon public property within such forest reservations.

SEC. 14. That every person who breaks into the close and unlawfully occupies, for any purpose whatsoever, public lands within such forest reservations shall be subject to ejection and, upon conviction, shall for every such offence be fined in a sum not exceeding one thousand dollars, or shall be imprisoned not exceeding twelve months, or shall suffer both fine and imprisonment, in the discretion of the court.

SEC. 15. That the Secretary of the Interior shall cause the director of the Geological Survey to make topographical surveys of the forest lands set apart by Executive proclamation under section twenty-four of the act of Congress approved March third, eighteen hundred and ninety-one, and of such other forest lands as may be reserved from sale and entry under the authority of this act or any subsequent act of Congress: *And it is provided*, That there shall be appointed by the President a board which shall be designated the board of forest lands, consisting of one officer of the Corps of Engineers of the United States Army, one member of the United States Geological Survey, one member of the United States Coast Survey, and two persons not connected with the Government service: *And it is further provided*, That the members of the board of forest lands shall serve for five years, and that they shall be

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eligible for reappointment in the case that the duties for which this board is created are not completed at the expiration of their term of service: *And it is further provided*, That it shall be the duty of said board of forest lands to determine from the results of said surveys, and such other information as may be available, as rapidly as possible what reserved lands are more valuable for agriculture than for the production of timber, in order that such lands may be opened for settlement and entry by Executive proclamation. For the purpose of commencing and prosecuting this survey, there is hereby appropriated the sum of five hundred thousand dollars; and the Secretary of the Interior is hereby authorized to make such an allotment from this sum as he may deem necessary to meet the expenses of said board of forest lands as herein provided: *And it is further provided*, That the members of the board of forest lands herein established shall be allowed a per diem in lieu of subsistence at a rate to be determined by the Secretary of the Interior, and that they shall be allowed actual necessary expenses for transportation.

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### No. 3.

A BILL for the management of the unreserved public timber lands and for the sale of the timber thereon.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled*, That all public lands more valuable for the production of timber than for agriculture are hereby withdrawn from sale, settlement, and other disposition and shall be held for the growth and sale of the timber thereon.

SEC. 2. That until a survey of the public timber lands has been made and completed as provided for in section six a special affidavit shall be required in all cases where lands are disposed of under the homestead and other land laws, and in cases of indemnity selections, showing that the lands so entered or selected are more valuable for agriculture than for the production of timber: *Provided*, That such special affidavit shall not be required in cases of mineral location and entry; and that owners of valid mining locations made and held in good faith under the mining laws of the United States and the regulations thereunder are hereby authorized and permitted to fell and remove from such mining claims any timber growing thereon for actual mining purposes in connection with the particular claim from which the timber is felled or removed.

SEC. 3. That miners, prospectors, agriculturists, and other bona fide settlers, who have not a sufficient supply of timber on their own claims or lands for firewood, fencing, or building purposes, or for necessary use in developing the mineral and other natural resources of the lands owned or occupied by them, may be permitted, under regulations which the Secretary of the Interior shall prescribe, to procure timber from the public lands strictly for their individual use on their own claims or lands for the purposes enumerated in this section, but not for sale or disposal or use on other lands or by other persons; and the terms "miners," "prospectors," "agriculturists," and "other bona fide settlers," as herein used, shall be confined to apply strictly to individuals, and nothing herein shall be construed to extend the meaning of said terms to firms, companies, or corporations engaged in the wood or lumber business or in operating mines or claims.

SEC. 4. That the Secretary of the Interior is hereby authorized to sell timber from unreserved public lands, under such regulations as he may prescribe, and in such quantities as the demands of commerce and settlers may require: *Provided*, That the removal of such timber will not injuriously affect the water flow or other public interests: *Provided further*, That the value of the timber to be thus disposed of shall first be estimated and the timber thereafter be sold at public auction for not less than the appraised valuation: *Provided further*, That no sale shall take place until after notice thereof has been published for thirty days in at least two newspapers of general circulation in the State or Territory where the timber is growing, and that the timber so sold shall be removed within twelve months from date of sale, but that no part thereof shall be cut or removed until payment in full therefor has been made and receipt for such payment has been issued by the proper receiver of public moneys.

SEC. 5. That when a bureau of public forests is established in the Department of the Interior these lands shall be administered by such bureau in the same manner as the forest reserves.

SEC. 6. That the Secretary of the Interior shall cause the Director of the Geological Survey to make topographical surveys of the forest lands reserved for sale and entry under this act: *And it is provided*, That there shall be appointed by the President a board which shall be designated the board of forest lands, consisting of one officer of the Corps of Engineers, United States Army, one member of the United

States Geological Survey, one member of the United States Coast Survey, and two persons not connected with the Government service: *And it is further provided*, That the members of the board of forest lands shall serve for five years, and that they shall be eligible for reappointment in case that the duties for which this board is created are not completed at the expiration of their term of service: *And it is further provided*, That it shall be the duty of said board of forest lands to determine from the results of said surveys and other information as rapidly as possible what lands on the public domain are more valuable for agriculture than for forest uses, in order that such lands may be opened for settlement and entry by executive proclamation. For the purpose of commencing and prosecuting this survey there is hereby appropriated the sum of five hundred thousand dollars, and the Secretary of the Interior is hereby authorized to make such an allotment from this sum as he may deem necessary to meet the expenses of said board of forest lands as herein provided: *And it is further provided*, That the members of the board of forest lands herein established shall be allowed a per diem in lieu of subsistence at a rate to be determined by the Secretary of the Interior, and that they shall be allowed actual necessary expenses for transportation.

SEC. 7. That all acts or parts of acts which are inconsistent with the provisions of this act are hereby repealed.

#### No. 4.

A BILL to set apart certain lands in the State of Washington as a public park, to be known as the Mount Ranier National Park.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled*, That there is hereby reserved, dedicated, and set apart as a public park, to be known and designated as the Mount Ranier National Park, for the benefit and enjoyment of the people, all that tract of land lying and being situated in the State of Washington, embraced within the following boundaries, to wit: Beginning at the southwest corner of township nineteen north, range seven east, Willamette base and meridian, Washington; thence easterly along the surveyed and unsurveyed township line between townships eighteen and nineteen north, to its point of intersection with the crest of the Cascade Range; thence in a southerly direction along the crest of said range of mountains to the Cowlitz Pass; thence down the right bank of the principal stream flowing from the Cowlitz Pass to its confluence with the Cowlitz River; thence down the middle of the channel of the Cowlitz River to the point where it will be intersected by the unsurveyed township line between townships twelve and thirteen north; thence westerly along said unsurveyed township line to the point for the southwest corner of township thirteen north, range seven east; thence northerly along the unsurveyed and surveyed range line between ranges six and seven east, subject to the proper offsets on the fourth standard parallel north, and on the township line between townships seventeen and eighteen north to the southwest corner of township nineteen north, range seven east, the place of beginning. And all persons who shall locate or settle upon or occupy the same, or any part thereof, except as hereafter provided, shall be considered trespassers and be removed therefrom.

SEC. 2. That said public park shall be under the exclusive control of the Secretary of the Interior, whose duty it shall be to make and publish, as soon as practicable, such rules and regulations as he may deem necessary or proper for the care and management of the same. Such regulations shall provide for the preservation from injury or spoliation of all timber, mineral deposits, natural curiosities, or wonders within said park, and their retention in their natural condition. The Secretary may, in his discretion, grant leases for building purposes, for terms not exceeding twenty-five years, of small parcels of ground at such places in said park as shall require the erection of buildings for the accommodation of visitors, all of the proceeds of said leases, and all other revenues that may be derived from any source connected with said park, to be expended under his direction in the management of the same and the construction of roads and bridle paths therein. He shall provide against the wanton destruction of the fish and game found within said park, and against their capture or destruction for the purposes of merchandise or profit. He shall also cause all persons trespassing upon the same after the passage of this act to be removed therefrom, and, generally, is hereby authorized to take all such measures as shall be necessary or proper to fully carry out the objects and purposes of this act.

SEC. 3. That the Secretary of War, upon the request of the Secretary of the Interior, is hereby authorized and directed to make the necessary details of troops to prevent trespassers or intruders from entering the park for the purpose of destroying

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the game or objects of curiosity or the timber therein, or for any other purpose prohibited by law, and to remove such persons from the park if found therein.

SEC. 4. That the United States court for the district of Washington shall take cognizance of all violations of the terms of this act and of the rules and regulations of the Secretary of the Interior prescribed hereunder.

SEC. 5. That upon execution and filing with the Secretary of the Interior by the Northern Pacific Railway Company of proper deed releasing and reconveying to the United States the lands in the national park hereby created, which have been heretofore granted by the United States to said company, whether surveyed or unsurveyed, said company is hereby authorized to select in lieu thereof, and receive patent therefor, an equal quantity of unreserved nonmineral public land, so classified as nonmineral at the time of actual Government survey which has been or shall be made, and to which no adverse right or claim shall have attached or have been initiated at the time of the making of such selection, lying within any State into or through which the railroad of said Northern Pacific Railway Company runs.

#### NO. 5.

A BILL to set apart certain lands in the Territory of Arizona as a public park, to be known as the Grand Canyon National Park.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That there is hereby reserved, dedicated, and set apart as a public park, to be known and designated as the Grand Canyon National Park, for the benefit and enjoyment of the people, all of that part of the Grand Canyon Forest Reserve in the Territory of Arizona, created by the President's proclamation of February twentieth, eighteen hundred and ninety-three, lying north of the parallel of thirty-six degrees of north latitude; and all persons who shall locate or settle upon or occupy the same, or any part thereof, except as hereafter provided, shall be considered trespassers and be removed therefrom.

SEC. 2. That said public park shall be under the exclusive control of the Secretary of the Interior, whose duty it shall be to make and publish, as soon as practicable, such rules and regulations as he may deem necessary or proper for the care and management of the same. Such regulations shall provide for the preservation from injury or spoliation of all timber, mineral deposits, natural curiosities, or wonders within said park, and their retention in their natural condition. The Secretary may, in his discretion, grant leases for building purposes, for terms not exceeding twenty-five years, of small parcels of ground at such places in said park as shall require the erection of buildings for the accommodation of visitors, all of the proceeds of said leases, and all other revenues that may be derived from any source connected with said park, to be expended under his direction in the management of the same and the construction of roads and bridle paths therein. He shall provide against the wanton destruction of the fish and game found within said park, and against their capture or destruction for the purposes of merchandise or profit. He shall also cause all persons trespassing upon the same after the passage of this act to be removed therefrom, and, generally, is hereby authorized to take all such measures as shall be necessary or proper to fully carry out the objects and purposes of this act.

SEC. 3. That the Secretary of War, upon the request of the Secretary of the Interior, is hereby authorized and directed to make the necessary details of troops to prevent trespassers or intruders from entering the park for the purpose of destroying the game or objects of curiosity or the timber therein, or for any other purpose prohibited by law, and to remove such persons from the park if found therein.

SEC. 4. That the United States court for the Territory of Arizona shall take cognizance of all violations of the terms of this act and of the rules and regulations of the Secretary of the Interior prescribed hereunder.

SEC. 5. That upon execution and filing with the Secretary of the Interior, by the Atlantic and Pacific Railroad Company, of proper deed releasing and reconveying to the United States the lands in the national park hereby created, which have been heretofore granted by the United States to said company, whether surveyed or unsurveyed, said company is hereby authorized to select in lieu thereof, and receive patent therefor, an equal quantity of unreserved nonmineral public land, so classified as nonmineral at the time of actual Government survey, which has been or shall be made, and to which no adverse right or claim shall have attached or have been initiated at the time of the making of such selection, lying within any State or Territory into or through which the railroad of said Atlantic and Pacific Railroad Company runs.

## APPENDIX A.

DEPARTMENT OF THE INTERIOR,  
Washington, D. C., February 6, 1897.

## The PRESIDENT:

An appropriation of \$25,000 was made in the sundry civil bill approved June 11, 1896 (29 Stats., 432), "to enable the Secretary of the Interior to meet the expenses of an investigation and report by the National Academy of Sciences on the inauguration of a national forestry policy for the forested lands of the United States." Under authority of this act and with the approval of the Secretary of the Interior, Prof. Wolcott Gibbs, president of the National Academy of Sciences, appointed a commission consisting of Prof. Charles S. Sargent, director of the Arnold Arboretum at Harvard University; Gen. Henry L. Abbot, United States Engineer Corps; Prof. William H. Brewer, of Yale University; Mr. Arnold Hague, of the United States Geological Survey; Mr. Alexander Agassiz, and Mr. Gifford Pinchot, the president of the Academy being ex officio a member of the commission. The state of Professor Gibbs's health would not permit him to accompany the commission on its tour of inspection, but the other members began their work July 2, 1896, and visited most or all of the forest reservations and other public forests of the United States, devoting three months of hard travel and careful study, without compensation, to the work assigned them. Upon their return they made an informal report to me, whereupon one or more competent clerks in the General Land Office, familiar with its records, were detailed to assist in the preparation of their report, which was completed and submitted about February 1.

I have the honor to forward said report herewith, and respectfully and earnestly approve the recommendations therein.

You will observe that the report recommends the establishment of thirteen additional forest reservations, containing an aggregate area of 21,379,840 acres. The location and limits of the proposed reservations are shown on the accompanying maps, and the report of the commission gives strong reasons for the establishment thereof. The amount of land in each reservation already entered under the general land laws is insignificant, and is set forth in accordance with the latest data in the General Land Office, and those portions of the areas described are exempted from the operation of the Executive order requested.

Some of the reservations proposed are within the limits of railroad grants hitherto made by Congress, and in such cases an Executive proclamation only reserves the alternate sections. This is notably the case in No. 6, the Priest River Forest Reserve, which the report of the commission characterizes as "the most valuable body of timber in the interior of the continent." If you decide to make this Executive order, I shall prepare and submit to Congress a bill authorizing the Secretary of the Interior to indemnify the beneficiaries in any of these railroad land grants included within the limits of forest reservations established by proclamation of the President by patenting to them an equal quantity of other portions of the public domain within specified limits.

The commission, which is composed of men of ability, possessed of scientific attainments which peculiarly fit them for this work, has performed this responsible duty with intelligent fidelity.

The authority for establishing these reservations may be found in section 24 of an act approved March 3, 1891 (26 Stats., 1103), "An act to repeal the timber-culture laws, and for other purposes." It provides:

"That the President of the United States may from time to time set apart and reserve in any State or Territory having public land bearing forests, in any part of the public lands, wholly or in part covered with timber or undergrowth, whether of commercial value or not, as public reservations, and the President shall, by public proclamation, declare the establishment of such reservations and the limits thereof."

Under this law seventeen forest reservations have been established, aggregating an area of 17,500,000 acres. No forest reservation has been established by the President since September 28, 1893. The total area of the reservations hereby proposed exceeds that of all those heretofore established by about 4,000,000 acres, but as our public forests are being rapidly denuded and the loss resulting therefrom is

incalculable I do not think this apparently large area should militate in any degree against the recommendation of the commission.

I respectfully suggest that the one hundred and sixty-fifth anniversary (February 22, 1897) of the birth of the Father of our Country could be no more appropriately commemorated than by the promulgation by yourself of proclamations establishing these grand forest reservations.

Very respectfully,

D. R. FRANCIS, *Secretary.*

FEBRUARY 1, 1897.

HON. DAVID R. FRANCIS,  
*Secretary of the Interior.*

SIR: I have the honor to transmit for your consideration the inclosed letter from the chairman of the forestry commission of the National Academy of Sciences in relation to the establishment by proclamation of the President of the United States of a number of forest reservations.

Very respectfully, your obedient servant,

WOLCOTT GIBBS,  
*President of the National Academy of Sciences.*

ARNOLD ARBORETUM, HARVARD UNIVERSITY,  
*Jamaica Plain, Mass., February 1, 1897.*

Prof. WOLCOTT GIBBS,  
*President of the National Academy of Sciences.*

SIR: The commission appointed by you last year at the request of the Secretary of the Interior to examine the forests on the public domain and prepare a plan for their care now recommends the establishment of the following forest reserves:

1. The Black Hills Reserve.

This proposed reserve embraces the central portion of the Black Hills of South Dakota, and has an established area of 967,680 acres. The mountains in this proposed reserve are covered with forests of yellow pine, and in the valleys between them spruces and cottonwoods principally occupy the ground. These forests are entirely isolated and afford the only timber which is produced in the territory between Minnesota on the east and the Big Horn Mountains of Wyoming and the Rocky Mountains on the west. The region immediately north of the proposed reserve contains a number of mines which depend on these forests for timber and fuel, and the settlers in the valleys of streams flowing from them have no other local timber and fuel supply.

It appears important, therefore, that these forests should be protected and made permanently productive, and that they should continue to guard the sources of the numerous streams which head in the Black Hills and are essential for the irrigation of the desert region adjacent to their courses. The forests on this proposed reserve have suffered seriously from fire and the illegal cutting of timber, the mines in this whole region having been practically supplied with timber and fuel taken from the public domain. It is evident that without Government protection these forests, so far as their productive capacity is concerned, will disappear at the end of a few years, and that their destruction will entail serious injury and loss to the agricultural and mining population of western North and South Dakota. Within this proposed reserve there are 13 quarter sections of land covered by existing entries, findings, selections, or other claims on record on the tract books in the General Land Office up to the 20th of January of the present year. These quarter sections are situated near the outside boundaries of the proposed reserve, and do not include the township sites of Custer and other small towns on the line of the northern extension of the Chicago, Burlington and Quincy Railroad, which crosses the proposed reserve from south to north.

2. The Big Horn Reserve.

This proposed reserve has an estimated area of 1,198,080 acres, and embraces both slopes of the Big Horn Mountains, a high, isolated, and exceedingly broken range in northern central Wyoming, containing a number of peaks varying from 9,000 to 11,000 feet in altitude, and the sources of many streams watering broad valleys east and west of these mountains. The forests which cover the Big Horn Mountains are composed of pine and spruces of small size. They contain sufficient material, nevertheless, to supply the local demands of agricultural settlers and of possible mining operations, but are not commercially valuable. These forests, however, protect the sources of many streams capable of irrigating a large territory which, without irrigation, can produce only scant and uncertain pasturage. The forests on the Big Horn Mountains have already suffered severely from fire. As the country becomes more

settled, fires may be expected to increase, and as forests reproduce themselves slowly in this dry climate, their loss will reduce the irrigating capacity of these streams and the value of many valleys of central Wyoming for agriculture. The proposed Big Horn Reserve contains only fifteen quarter sections which are covered by existing entries, findings, selections, or other claims on record on the tract books in the General Land Office up to January 20 of the present year.

### 3. The Teton Forest Reserve.

This proposed reserve embraces 829,440 acres, and is south of and adjacent to the Yellowstone Park Timber Land Reserve. The forests which cover it are similar in character to those in the Yellowstone National Park; they are capable of supplying all local demands that will probably ever be made on them, but have little commercial value. This proposed reserve contains the Teton Range of mountains and Jackson Lake, and some of the grandest and most picturesque scenery of the Rocky Mountains. Within its borders are many streams flowing west, south, and north, and as a reservoir of moisture it is important.

Incidentally, it may be mentioned that this proposed reserve is a favorite home of the elk and other large game, and that as a game reserve it would well supplement the Yellowstone National Park and the Yellowstone Park Timber Land Reserve. Within the proposed reserve only two quarter sections have been entered. A number of settlers, however, are living on unentered lands in the neighborhood of Jackson Lake.

### 4. The Flat Head Forest Reserve.

This proposed reserve embraces both slopes of the main Rocky Mountain Range or continental divide in northern Montana, and extends from near the line of the Great Northern Railroad northward to the international boundary. It has an estimated area of 1,382,400 acres and contains within its boundaries several high glacier-covered peaks, numerous lakes, and the sources of important streams. Nowhere in the United States is there more sublime mountain scenery. The eastern portion of this proposed reserve consists of lands recently purchased from the Blackfoot Indians under a treaty ratified by Congress on the 10th of June, 1896.

The eastern slopes of the Rocky Mountains are here steep and rugged, and are mostly covered with dense forests of lodge pole pines and spruces which protect the sources of tributaries of the Missouri and the Saskatchewan, dependent entirely for their water on the snow which falls on these mountains and is protected by these forests. From these mountains issue the Cut Bank and Milk rivers, the latter, owing to its great length and the exceeding aridity of the country through which it flows, the most important stream of this region, although the Cut Bank supplies much of the water used by the Blackfoot Indians and by cattlemen located east of the proposed reserve. North of Milk River flow from the melting snow fields and glaciers at their sources the St. Marys, Swift Current, and Belly rivers, the first passing into Canada after flowing thirty miles through the territory of the United States. This region, which is supposed to contain many mineral deposits, will soon be invaded by large numbers of prospectors and miners, and its coniferous forests will invariably be injured and perhaps destroyed by the fires which have followed settlement from one end of the Rocky Mountains to the other.

These forests are not commercially valuable in the sense that they contain timber which can be profitably shipped out of the region, but they can furnish sufficient forest products to carry on local mines and supply any agricultural population which may live on the streams in this part of Montana. If they are allowed to burn, mining operations will be crippled and the settlers along these rivers will be deprived during many months of every year of water for themselves and their animals; for even now Milk River is only a sluggish stream through much of the year, and in periods of drought is reduced to a series of muddy water holes. In this proposed reserve west of the continental divide are the great north fork of Flat Head River and many of the smaller tributaries of that stream. The forests here, under the influence of a more humid climate, are much heavier than those on the eastern slopes of the Rocky Mountains, and are composed of a large number of varieties of trees; and here are stores of spruce, fir, tamarack, cedar, and cottonwood, which in time can be made to play an important part in the development of Montana. These forests, too, in protecting the head waters of turbulent mountain streams reduce the damage of floods and render their fertile lower valleys habitable.

In that part of this proposed reserve which is east of the continental divide there is now no settled land, but west of the continental divide 272 quarter sections have been entered, as shown by the tract books in the General Land Office on the 20th of January of the present year. These entries are principally on the bottom lands of the north fork of the Flat Head River, where there are considerable bodies of arable land.

### 5. The Lewis and Clark Forest Reserve.

This proposed reserve embraces both slopes of the continental divide in Montana, and extends from near the line of the Great Northern Railroad southward nearly to

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the forty-seventh degree of north latitude. It has an estimated area of 2,926,080 acres, and includes an exceedingly rough mountainous territory, watered east of the divide by the north fork of the Sun River, and west of the divide by the south fork of the Flat Head River and by the Swan River, a large tributary of Flat Head Lake. The forests on the eastern slope of the Rocky Mountains are here similar in character to those in the eastern part of the proposed Flat Head Reserve. They protect the sources of innumerable streams tributary to the Missouri and essential to the existence of a considerable population residing on their banks and dependent on their waters for themselves and their stock.

West of the continental divide the forests are heavier, and are composed of yellow pines, lodge-pole pines, larches, Douglas spruces, balsam firs, and some white pines. These forests are valuable for their influence on the flow of water in tributaries of the Columbia, and for their timber, which can be easily floated into Flat Head Lake and then distributed by rail. In this proposed reserve there are no agricultural or grazing lands and no evidence of valuable mineral deposits; and no land whatever has been legally settled on. The desirability of this forest reserve has been discussed for many years, and numerous petitions favoring it have been filed in the office of the Secretary of the Interior.

#### 6. The Priest River Forest Reserve.

This proposed reserve occupies the basin of Priest Lake and Priest River, in the extreme northern part of Idaho and in northeastern Washington, and extends from a point a few miles north of the line of the Great Northern Railroad to the international boundary.

It is bounded on the east by the summits of the ridges separating the waters flowing into Priest Lake from those tributary to the Kootenay River, and on the west by the summits of the ridges separating the waters of Priest Lake from those flowing into Clark's fork of the Columbia. It has an estimated area of 552,960 acres in Idaho and of 92,160 acres in Washington, or a total of 645,120 acres, and is covered with what is believed to be the most valuable body of timber in the interior of the continent. This is composed of the Western white pine, which grows here to its largest size and in its greatest perfection, tamarack, cedar, spruce—all of large size. The forests on this proposed reserve have no significance as protectors of moisture and the flow of rivers, for this region is abundantly supplied with water, and its streams will always be able to meet any drain which may be made on them by the needs of irrigation. The establishment of this reserve is recommended, therefore, that this body of timber may be preserved until it is actually required by the demands of commerce, and that the Government may obtain for it its true market value. If scientific management of the forests on the reserves is ever attempted, the proposed Priest River Reserve, from the nature of its forest covering and the ease with which its timber can be marketed, will be found admirably suited for silvicultural experiments. No land in this proposed reserve has been entered, but it is covered by the land grant to the Northern Pacific Railroad.

#### 7. The Bitter Root Forest Reserve.

This proposed reserve includes a forest region of extremely precipitous and rugged mountains, and lies on both sides of the boundary between Montana and Idaho. It contains an estimated area of 691,200 acres in Montana and of 3,456,000 acres in Idaho, or a total of 4,147,200 acres. From its eastern border the Bitter Root Mountains rise abruptly from the valley and are cut by the deep canyons of the streams which feed the Bitter Root River and make agriculture possible in the broad and fertile Bitter Root Valley. West of the summits of the Bitter Root range the proposed reserve includes some of the tributaries of the north fork of the Clearwater River, nearly the entire basin of the main Clearwater, and many of the tributaries of Salmon River, the waters of all the western part of the proposed reserve reaching the Columbia by way of Snake River. The eastern and western portions of the proposed reserve contain the sources of streams which can be used advantageously for purposes of irrigation, and the whole is covered with forests of yellow pine, lodge-pole pine, spruce, fir, and cedar.

Portions of the reserve which lie in Montana are covered with forests of exceptionally large and valuable yellow pines, which are being rapidly cut without any pecuniary advantage to the Government. In Idaho, especially toward the southern part of the territory, which it is proposed to reserve, and at high altitudes, the forests are often separated by large burnt areas, many of them of ancient date; but no lumbering has been done, and the whole region is remarkably rough and broken; it has no value for grazing except over a few small scattered areas, and the few deposits of valuable minerals known to exist within its borders are already exhausted. With proper protection the burnt areas will in time become covered with trees, and the forests in this proposed reservation will be able to supply a large amount of material to the inhabitants of eastern Oregon and Washington, now one of the richest wheat-producing regions in the United States, and to the people of treeless southern Idaho. The region embraced in this proposed reserve appears to be the largest unsettled

region in the United States, there being but three quarter sections of land entered in Idaho, while in Montana no entries have been made; few persons pass over its rough and difficult trails, and it can therefore be easily protected from fire.

#### 8. The Washington Forest Reserve.

This proposed reserve extends in Washington from about the one hundred and twentieth degree of west longitude to nearly the one hundred and twenty-second degree and from the international boundary southward to a little below the forty-eighth degree of latitude, the settled valley of the Skagit River being excluded in the west, and contains an estimated area of 3,594,240 acres. The region embraced in this proposed reserve extends over both slopes of the Cascade Mountains, and is exceedingly broken and entirely clothed with forests. Those east of the Cascade divide have already suffered in places seriously from fire; they consist largely of yellow pine, and are more open and less commercially valuable than those on the western slopes of the mountains, which are composed of spruces, firs, pines, cedars, and hemlocks of large size and of the first commercial value.

Within this proposed reserve east of the Cascade summits are the sources of the Stehekin River, the principal feeder of Lake Chelan and of the Methow River, a considerable northern tributary of the Columbia, and, like all the rivers of Washington flowing eastward from the Cascade Range, important for the irrigation of a region which needs only water to become exceptionally fertile. The forests in the eastern part of this proposed reserve should be preserved to protect the streams which head here; west of the Cascade summit for the timber which they contain. Only three quarter sections of land in this proposed reserve are covered by existing entries, findings, selections, or other claims on record on the tract books in the General Land Office up to the 20th of January of the present year, although there are a few settlers living on unentered lands on the Stehekin near the head of Lake Chelan, and a few others on a small tract of arable land in the valley of the Upper Methow. The territory in this proposed reserve is one of the most rugged, difficult, least known, and unsettled parts of the United States.

#### 9. The Olympic Forest Reserve.

This proposed reserve occupies the high and broken Olympic Mountain region in northwestern Washington, and contains an estimated area of 2,188,800 acres. This is a region of steep and jagged mountains, their highest peaks clothed with glaciers and with perpetual snow. The forests here, watered by more copious rains than fall on any other part of the United States, are composed of enormous spruces, firs, and cedars, and in productiveness are surpassed in the world only by the redwood forests of the California coast region. Few explorers have penetrated far into this region, which from the denseness of its forest covering offers exceptional difficulties to travel; and there is no record that it has been crossed in a north and south direction. This proposed reserve no doubt contains for its area the largest and most valuable body of timber belonging to the nation; and here is probably the only part of the United States where the forest unmarked by fire or the ax still exists over a great area in its primeval splendor. Toward the northwestern borders of the proposed reserve fifteen hundred and thirty-two quarter sections of land appear to have been entered, principally under the provisions of the timber and stone act, but this entered land can not be readily excluded from the reserve without seriously complicating its boundaries, or without omitting a large body of unentered land which should properly belong to it.

There is no agricultural or grazing land whatever in this proposed reserve, and no traces of precious metals have yet been found in it. The character of its forests, which can be made to yield permanently vast quantities of timber, its wildness, the picturesqueness of its surface, and its remoteness make the proposed Olympic reserve one of the most valuable of all the forest reserves which have been made or proposed.

#### 10. The Mount Rainier Forest Reserve.

It is suggested that the existing Pacific Forest Reserve should be enlarged by the addition of a narrow strip of territory along its western border, in order to correct an error made when the boundaries of this reserve were first laid down, and to make it thus include some of the salient features of Mount Rainier; that it should be extended southward along the two slopes of the Cascade Mountains nearly to the Columbia River, and the name Pacific Forest Reserve should be changed to Mount Rainier Forest Reserve.

The name Pacific Forest Reserve is meaningless, and it is fitting that this reserve should bear the name of the great glacier-covered mountain, one of the highest, most beautiful, and interesting mountains in the United States, which is its chief natural feature. This was felt when the reserve was established, but to the people of Tacoma Mount Rainier is Mount Tacoma, and to avoid exciting local jealousies the Secretary of the Interior, at the last moment, adopted an inexpressive and inappropriate name. The mountain is now known officially in this country and by all foreign geographers as Mount Rainier, and is nowhere called Tacoma beyond the limits of the city of that name; and there seems no longer any reason why this reserve should not bear the

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name of Mount Rainier. The proposed extensions of this reserve contain an estimated area of 1,267,200 acres, which, with the 967,680 acres contained in the Pacific Forest Reserve, make a total of 2,234,880 acres. The preservation of the forests in the proposed southern extension will protect east of the Cascade summits the flow of several of the principal tributaries of the Yakima River, which furnishes the water for the most important system of irrigation in the State, and west of the Cascade summits timber of great commercial value.

This whole region, which has suffered from fire and unlawful pasturage of sheep, is practically unsurveyed and unsettled. One hundred and one quarter-sections of land have, however, been entered upon within its boundaries; these are principally situated in the extreme southeastern corner in the valley of the Little Salmon River; there are also a few settlers on tributaries of the Cowlitz River, close to the western borders of the proposed reserve.

#### 11. The Stanislaus Forest Reserve.

This proposed reserve extends north over six townships along the summits of the Sierra Nevada Mountains in California, and embraces an estimated area of 691,200 acres. Many streams flowing east and west head in this territory and are fed by innumerable small lakes and alpine meadows. The forests, except in a few townships, are scanty and without value, except for preserving the flow of springs and streams; and the establishment of this reserve is recommended solely for the influence it can exert on the flow of Sierra rivers if its natural features are preserved.

This region is now being injured by the illegal pasturing of sheep and by the fires which always follow the shepherd on the public domain, and its value as a water-storage basin is likely to be seriously impaired. For reasons which are not easy to explain, much of this high, rocky, timberless region has already been surveyed at the expense of the Government; forty-nine sections of land have already been entered and ten sections have been retained for reservoir sites.

#### 12. The San Jacinto Forest Reserve.

This proposed reserve embraces the San Jacinto Mountains in Southern California, and is separated from the San Bernardino Forest Reserve by the San Geronimo Pass. It contains an estimated area of 737,280 acres. The whole region, especially east of the mountains, is arid, and the lower slopes of the range, when not too steep, are clothed only with a bushy chaparral growth. Scanty forests of stunted conifers, however, exist on the sides of some of the canyons facing the ocean in the high valleys and on the elevated slopes, and the preservation of these forests seems essential that the mountain streams may supply water to irrigate the valleys of southwestern California, which, without water, are desert wastes, but irrigated, bloom into the fairest orchards of the continent. Within this proposed reserve four hundred and twenty-one quarter sections of land appear to have been already entered as well as twenty-nine quarter sections reserved for Indians. Much of this reserved land is in the San Jacinto Valley, where considerable timber has already been cut, and in Hermit Valley, where a large storage basin for irrigation has been built. This proposed reserve is covered by the land grant of the Southern Pacific Railroad. The people of southern California appear unanimous in their desire that this reserve should be made.

#### 13. The Utah Forest Reserve.

This proposed reserve embraces both slopes of the eastern part of the Uintah Mountain Range in northern Utah and the northern slope only of the western part of this range, the southern slope here being included in the Uintah Indian Reservation. The Uintah Mountains are covered with valuable forests of spruce which protect the sources of several large streams which eventually discharge into Green River, those flowing northward from the range being already utilized for irrigation. The region within the borders of this proposed reserve is practically uninhabited, only twenty-five quarter sections of its land having been entered. There is, however, a large agricultural population already living in the territory immediately adjacent to it on the north and east, who find in the forests of the Uintah Mountains their only local timber supply, and this population will suffer for water if the fires which have now for many years swept through these forests are allowed to destroy them. If the Uintah Indian Reservation is ever purchased by the Government, all the northern mountainous portion embracing the southern slopes of the western end of the Uintah range should be included in this forest reserve.

The total area of these thirteen proposed forest reserves, which are platted on the accompanying maps, is 21,379,840 acres. The Commission fully recognized the fact that the forest reserves established and proposed can not be maintained unless a plan can be adopted under which their boundaries can be modified so as to take from them all lands better suited for agriculture than for the production of forests, and under which their timber can be made available for domestic and commercial purposes and valuable minerals can be freely sought for and mined within their boundaries. The Commission is now engaged in perfecting a scheme of forest management which it believes will make the administration of the reserves possible and which in due time

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