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GENERAL CROSS REFERENCES

For names of States, see list of States under Conservation, Forestry Associations, Forestry Schools, Private Irrigation, State Work in Forestry, Waterways, and Women's Clubs.
For list of waterways associations and meetings, see Waterways Associations.
For names of separate forestry schools, see Forestry Schools.
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For names of different National Forests, see National Forest.
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CONSERVATION

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FRANK GLOVER HEATON, *Editor*

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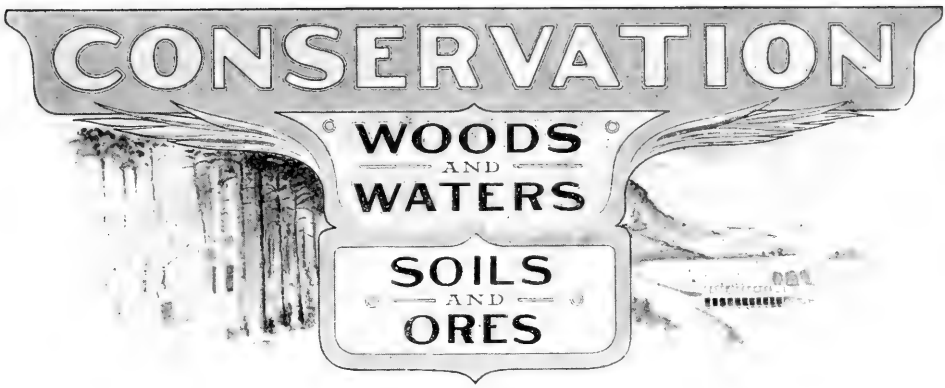
HON. GIFFORD PINCHOT, CHIEF FORESTER

Secretary of the National Conservation Commission, and Chairman of the Joint Conservation Conference



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THE JOINT CONSERVATION CONFERENCE

Second Gathering of the Governors in Washington—Report of the Commission Is Received—Notable Assembly and Noteworthy Addresses

IN CONTINUANCE of the work so ably inaugurated at the White House, in Washington, last May, the first gathering of the Joint Conservation Conference—being the Governors of the various States, their advisers, members of State Conservation Commissions, representatives of State and National organizations and others—met in Washington on December 8, 9, and 10. The purpose of the conference was, primarily, to receive the report of the commission appointed last June by President Roosevelt; which commission has been at work since its appointment, preparing an inventory of the Nation's natural resources.

The sessions of the conference were held in the Red Room of the New Willard Hotel, though the conference was opened with a monster mass meeting at the Belasco Theater. This opening meeting, which was designed to give the initial impetus to the later sessions, was, in a measure, open to the general public—that is, admission tickets were distributed to those who really wanted them. From the size of the audience, its representative character, and the hearty applause that was vouchsafed every telling point made by the several speakers, it is safe to say that very few of those holding tickets failed to use them.

The meeting at the Belasco was presided over by President-to-be William Howard Taft, who was introduced by Chief Forester Gifford Pinchot, acting as temporary chairman. Judge Taft, with few preliminaries, introduced President Roosevelt, the first speaker; and, following the President, Governor Chamberlain, of Oregon, in a deeply interesting paper, placed before the members of the conference, and the invited guests, the case for conservation of natural resources.

Occupying the stage with the chairman and the principal speakers were members of the President's Cabinet, members of the National Conservation Commission, Governors and their associates, and others particularly interested in or identified with the work of

conservation. The audience filled every seat in the beautiful theater, even the upper galleries being crowded; and the interest of those who were in attendance was made unmistakably manifest by the appreciative applause that was of such frequent occurrence and volume as to interrupt the speakers.

In calling the meeting to order, Mr. Pinchot, as temporary chairman, introduced Rev. Edward Everett Hale, the venerable chaplain of the United States Senate, whose invocation was especially appropriate, closing with the Lord's Prayer, audibly joined in by the entire assembly. Mr. Pinchot introduced the permanent chairman, in a brief speech of explanation.

MR. PINCHOT'S OPENING SPEECH

MR. PRESIDENT, ladies and gentlemen: The meeting of the Governors at the White House last May, out of which this joint conference sprang, considered the natural resources of the country as the foundations of our prosperity. The conservation of these resources is clearly necessary for our welfare, as a nation, now and hereafter.

Conservation implies both the development and the protection of resources, the one as much as the other. The idea which underlies it is in harmony with the true spirit of this Nation. It expresses a deep-seated National conviction, latent until it came, that we have inherited from our forefathers both an opportunity for ourselves and a duty to those who come after us. Conservation demands the use of common prudence and common foresight in dealing with the great material resources upon which our present and future welfare depends.

The essence of conservation is the application of common sense to the common problems for the common good.

Conservation is simply obvious and right. Therefore, of all the great movements of our recent history, not one has gained so rapidly in public appreciation and support, and not one has promised such results in securing the greatest good to the greatest number for the longest time.

This Nation has been given three million square miles of the richest, the most varied, and the pleasantest of all continents. That land belongs to us now, just as it has belonged to our forefathers, and as it will belong to our descendants. We have the right to use it and we have the power to impair it. The choice is ours. We cannot avoid it and we cannot delay it. That we shall choose well, this meeting is the best earnest and guarantee.

The history of a nation is written best of all in the progress and happiness of its people. But it is written also in great movements, great occasions and great men. We are gathered here to-day in the furtherance of a great movement on a great occasion and in the presence of great men.

Judge Taft lost no time in presenting to the audience the first speaker of the meeting, President Theodore Roosevelt. The President was compelled at frequent intervals to interrupt his remarks while waiting for the applause to subside, his declaration in favor of a bond issue for internal improvements, if no other course seemed open, apparently meeting with the fullest and heartiest approval of his hearers.

ADDRESS OF PRESIDENT ROOSEVELT

GOVERNORS, Representatives of the States, and of the great national organization, members of the National Conservation Commission, and you men and women, my fellow citizens, I welcome you here, our guests, to Washington and to the work you have gathered to do. No service to the Nation in time of peace could be of greater worth than the work which has brought you together.

In its essence your task is to make the Nation's future as great as its present. That is what the conservation of our resources means. This movement means that we shall not become great in the present at the expense of the future, but we shall provide that we may show ourselves truly great in the present by providing for the greatness of our children's children who are to inherit the land after us.

It is the greatest National task of to-day, and I thank you for making ready to undertake it.

If you do no more than fix the National

attention upon the problem, you will have done well. It augurs well for the future that you are here and it is to the credit of our country that in this matter it should take the lead among the nations of the world. All we are asking, gentlemen, is that the National Government shall proceed as a private business man would, as a matter of course, proceed. He will regularly take account of stock, so that he may know just where he stands. If you find that he does not, that he does not know how his outgo corresponds with his income, you will be afraid to trade with him. The same measures of prudence demanded from him as an individual, the same measures of foresight demanded from him as an individual, are demanded from us as a nation. Unfortunately, nations have been slow to profit by the example of every individual among them who makes a success of his business. The United States is substantially the first nation to prepare to take an inventory of its stock in hand, and it has only begun to do so, in any definite way, within the last few months.

Last May, you, the Governors of the States and Territories, met at the White House to confer with each other and the President, upon the material basis of our National welfare. You united in a memorable declaration, which should hang on the wall of every school, and every citizen who is a voter in the United States in the next generation should know about it. Out of the conference at which the declaration was adopted grew the National Conservation Commission, whose chief duty was, as I have said, to prepare an inventory of the natural resources of our country, those resources which are, in the language of the Governors, the foundation of our prosperity. This report is to be used by the President in transmitting to Congress information as to the state of the Union so far as the natural resources are concerned.

The Commission consists of Senators and Representatives, members of the executive departments, and public-spirited private citizens familiar with particular resources. It is wholly without funds and it has, therefore, depended altogether on the public spirit of its members and the cooperation of the executive departments at Washington and in the several States, especially the scientific and statistical bureaus.

I wish to take this opportunity to express on behalf of the people of this country my profound appreciation of the disinterested work—work so valuable that it could not be paid for adequately and which, as a matter of fact, was not paid for at all—performed by the members in private who have given so lavishly of their best time and thought in forwarding this cause.

Its work has brought these bureaus in closer and more effective cooperation than ever before, and for this reason its results will rank as by far the most useful statement of natural resources ever prepared in any country. Each bureau, without relaxing its regular work, has collected and summarized the results of its past work, and has contributed them to the Commission.

I desire to make special acknowledgment to the men who have so cheerfully and successfully accepted and carried out this additional task. They have rendered a real service to the whole Nation at a cost of great personal sacrifice of time and effort to themselves. And the best of it all was the admirable spirit of cooperation which characterized the whole work.

I am especially glad to welcome the cooperation of the States, through their conservation commissions and otherwise. Without it the great task of perpetuating the National welfare would succeed with difficulty. If States and Nation work for it together, all in their several fields, and all joining heartily where the field is common, we are certain of success in advance.

No right-minded citizen would stop the proper use of our resources; but every good American must realize that National improvidence follows the same course and leads to the same end as personal improvidence, and that needless waste must stop. The time to deride or neglect the statements of experts and teaching of the facts has gone by. The time to act on what we know has now arrived. Common prudence, common sense, and common business principles are applicable to National affairs, just as they are to private affairs, and the time has come to use them in dealing with the foundations of our prosperity.

Now, I do not believe in hysteria or sensationalism—in the press or anywhere else. I would not grow hysterical or sensational in describing our condition; but neither must we allow a false security based on conditions long since passed away to blind us, to prevent us from seeing the facts and applying common sense to the situation they disclose. The purpose of the inventory was to give the facts—not to create an alarm, but to take stock of what we have, and so to lead to the necessary action for its preservation and increase.

Our natural resources are so related that the use of one affects the use of all the others. This is especially true of our waterways. Every man, woman and child within our borders has an interest in them, through navigation, power, irrigation or water supply, or through all four. We have neglected our waterways more than any other natural resources, and we must put an end to that neglect. The Inland Waterways Commission has told us how.

First, let us prepare a comprehensive plan for inland waterways development along the lines pointed out by the Commission. Such a plan must consider every use of the waters; it must put the interest of all the people in advance of any private interests whatsoever.

Now, gentlemen, remember that the way to make the waterway improvement what it must be made is at hand, and let us refuse to pay heed to anything but the great common interest. If you dissipate improvements throughout the country on the ground that each congressional district shall have its share, you would better abandon the project from the beginning. I want you to have a comprehensive plan formulated by a National commission, because I want to see that plan genuinely National in scope, conceived in a spirit that will make it genuinely for the use of the whole Union. That plan must consider every use of the waters and the preparation of that plan should begin at once. We need the plan. We need to have a comprehensive plan; but that does not mean that we should not begin the work now. Begin the plan; but there are certain features of the work which we already know will fit into any right plan that is produced; for these pieces of work, plans have already been approved. Our precious policy of procrastination, delay and fitful and partial action has borne its fruit. Our waterways are deserted, and in return for our vast expenditures we have little or no actual navigation to show. The people are ready for a change. Let us have it, and let us have it at once. If we can pay the cost from current revenues, let us do so. If not, let us issue bonds. I always favor paying out of the current revenue anything that we can possibly pay. I would not on any account go into the business of issuing bonds to pay for anything that was not of a permanent and National good. I hope it will not be necessary here; but this is a great permanent enterprise for a permanent National good, for the permanent National good of our children, and if it is necessary, then it is all right to issue bonds so that the enterprise may go ahead.

The work should be begun at once. Of course, there must not be the slightest recklessness or waste of money. No work whatever should be undertaken that has not been thoroughly examined and fully approved by competent experts. Above all, not one cent should be expended to satisfy special interests, whether of a business or a locality, or to promote any man's political fortunes. This is too large a matter to be handled in such a way. We must approach it from the point of view of the National interest, under the guidance of the wisest experts in engineering, in transportation, and in all the uses of our streams.

Forests and waterways cannot be separated in any successful treatment of either. Forest protection and river development must go hand in hand. The three things which should be done without any further delay are, therefore:

First, to provide for a comprehensive plan of waterway development. Second, to begin at once on work already planned, that will surely fit into the larger plan. Third, to provide amply for forest protection against fire, against reckless cutting, against wanton or reckless destruction of all kinds, and to secure the Appalachian and White Mountain National Forests without delay.

Immediately following the address by the President, Governor Chamberlain, of Oregon, addressed the meeting. While his paper dealt more particularly with waters and waterways and the difficulties in the way of establishing a just and equitable *modus vivendi* in their control as between the Nation and the States, the address, as a whole, was one of the ablest and most thoughtful contributions of the entire conference.

ADDRESS OF GOVERNOR CHAMBERLAIN

ON THE third day of October, 1907, the Inland Waterways Commission, at a meeting on board the steamer Col. A. Mackenzie, the President of the United States being present and presiding, it was decided to call a conference on the general subject of the conservation of the natural resources of the Nation. The Commission thereupon prepared a formal letter to the President, giving their reasons for such conference, and asking him, in case of concurrence in their views, to issue a call for the same. The next day, in a magnificent address delivered by him before the Deep Waterway Convention at Memphis, the President announced his intention to call the conference; and on the 13th day of November he issued invitations to the Governors of the States and Territories to meet at the White House May 13-15, 1908, the conferees to comprise, in addition to the Governors, three advisors to be selected by each, the Senators and Representatives in the Sixtieth Congress, the members of the Inland Waterways Commission, and representatives of certain national organizations dealing with natural resources.

The conference was held at the appointed time and place, and was largely and enthusiastically attended. Later, carrying out the purposes of the conference, the President appointed a National Conservation Commission, organized in four classes to consider the resources of water, forests,

lands and mines, and invited the Governors to appoint State commissions to consider and report upon the condition of the same resources in the several States and Territories. This meeting has been appointed for a conference of the National and State Commissions, in order to assist in devising ways and means for future conservation of the natural resources of the country by appropriate legislation, National and State. The Oregon commission is here to-day represented by the Chairman, Mr. J. N. Teal, with a splendid report on the natural resources of our State, and I presume all the other States will be represented and reported upon.

I have been honored by an invitation to address you on behalf of the Governors, and I have accepted with some reluctance, because I fully understand that the views of the executives of the different States may be so divergent, with respect to the matters to be considered, the topography, climatic conditions and needs of the commonwealths comprising the Union so unlike, that it would be impossible for me to voice their sentiments on a subject of such vast importance to the present and future welfare of the Nation.

We are probably all agreed upon one point. Conservation of the natural resources is necessary to the well-being of our country, the protection of generations yet unborn and the perpetuation of our institutions; and cooperation of State and Federal authorities is essential if we are to accomplish beneficial results. As to the means to be adopted to attain the ends desired we may differ radically. In the outset, therefore, I disclaim an intention to be the mouthpiece of the executives of the different States in the suggestions I may make as to the steps which I believe are essential to bring about the greatest good for the greatest number. It was undoubtedly timely that the Forestry and Reclamation branches of the Federal Government first sounded a warning as to the wanton destruction of the forests and the resultant consequences—fuel famine, soil erosion, flood waters at certain seasons and at others an insufficient supply for domestic, industrial, irrigation and navigation purposes. It is questionable, indeed, if this warning, unsupported in other directions, would have been sufficient to arouse the people to vigorous action. But the distinguished President of the United States, with the energy which has characterized his whole official life, early took up the subject, and on the 14th day of March, 1907, appointed the Inland Waterways Commission, not only to prepare and report upon a comprehensive plan for the improvement and control of the river systems of the United States, but upon the correlated subjects of forests and their conservation, soil erosion, and, generally, upon the control and use of the navigable and other waters of the country for navigation and industrial purposes.

The conclusions reached by the Forestry and Reclamation services were sustained and strengthened by the investigations of the Inland Waterways Commission. All were practically agreed that the navigability of our waterways and the maintenance of uniformity of depth and flow depended upon the tributary supply streams, and these in turn upon the protection of the forests along the watersheds and upper reaches. In other words, that the preservation of the forests, the distribution of water for irrigation, domestic and industrial purposes, its use for the generation of power, light, heat, and the navigability of the rivers, were so correlated and interdependent that the consideration of means for the preservation and protection of one involved consideration of means for the preservation and protection of all.

From the earliest days of the Republic the public lands, agricultural and mineral, arid and semi-arid, the waters on and under the earth, and all the resources of sea and land have been given away with wanton and reckless prodigality, until much that is most valuable and essential to National strength has gone into individual or corporate ownership.

As a result, magnificent resources, that should have remained under government control for the use and enjoyment of the whole people, have been dissipated and uneconomically administered, to the enrichment of the few and the impoverishment of the many. The forests of the country, on the mountains of the headwaters of many of the navigable streams, as well as in the valleys, have been denuded until now the date can almost be named when, if present methods be pursued without reforestation, there must inevitably be a lumber famine with all that such a condition entails; the coal mines are being exhausted, with an ever increasing fuel demand; natural oils and gases are being used extravagantly and wasted wantonly as though the supply were inexhaustible; soil erosion is taking place so rapidly by reason of the destructions of the forests that vast areas of agricultural lands are being washed into the navigable waterways, impairing the navigability of these important avenues of commerce; the increased and increasing demand for iron and steel seriously threatens the exhaustion of the mines; and until now no step has been taken to call a halt to wasteful extravagance or to safeguard to present and future generations the little of these resources that remain. I do not underestimate the creative and inventive genius of our people, but it is no answer to the charge of wasteful extravagance in the use of our magnificent resources to say that substitutes for them all may be found whenever the necessity arives. That is not the history of other countries and of other peoples who have ruthlessly squandered the gifts of a beneficent Providence.

A partial inventory was made and an account of stock taken at the last conference, and it would be out of place at this time to indulge in detail, because the National and State Conservation Commissions are now engaged in making a complete inventory of all natural resources.

The question, it seems to me, which ought to engage the attention of the present conference is, what policy ought to be adopted for the future with respect to the conservation of the natural resources of the country.

One of two policies must be adopted in order to succeed—and that policy must be either National, or State.

Whatever policy is adopted must be entered upon with a vigorous determination, a strong hand and under intelligent direction.

And first as to a National policy:

As to the authority and jurisdiction of the Federal government over the undisposed-of portions of the public domain, there can be no question. There the power of Congress is unquestionably supreme with respect to the soil, the mine, the forest and the streams tributary to the navigable waterways and their use, certainly insofar as such use might interfere with navigation.

Again, the Federal government, under the interstate clause of the Constitution, has jurisdiction over the navigable waterways of the country. About this, too, there can be no question.

In the exercise of jurisdiction over the navigable waterways, how far can Congress or the courts go in the matter of the control of streams which, though non-navigable, are nevertheless tributary to the sources of supply, and so affect the uniformity of the flow of, waters in the navigable highways?

In the case of the United States *v.* Rio Grande Dam and Irrigation Company, 174 U. S., 690, the court discussed this question in connection with the appropriation of water for irrigation and other purposes as affecting the navigability of a river, and in the course of the opinion said:

"Although this power of changing the common law rules as to streams within its domain undoubtedly belongs to each State, yet two limitations must be recognized;

"First, that in the absence of specific authority from Congress, a State cannot, by its legislation, destroy the right of the United States, as the owner of lands bordering on a stream, to the continued flow of its waters; so far at least as may be necessary for the beneficial uses of the government property.

"Second, that it is limited by the superior powers of the general government to secure the uninterrupted navigability of all navigable streams within the limits of the United States. In other words, the jurisdiction of the general government over interstate commerce and its natural highways vest in that government the right to take all needed measures to preserve the navigability of the navigable water-courses of the country, even against any State action. It is true, there have been frequent decisions recognizing the powers of the State, in the absence of Congressional legislation, to assume control of navigable waters within its limits to the extent of creating dams, booms, bridges and other matters which operate as obstructions to navigability. The power of the State to thus legislate for the interests of its own citizens is conceded, and until in some way Congress asserts its superior power, and the necessity of preserving the general interests of the people of all the States, it is assumed that State action, although involving temporarily an obstruction to free navigability of a stream, is not subject to challenge."

And again in the same case the court said:

"It does not follow that the courts would be justified in sustaining any proceeding by the Attorney General to restrain any appropriation of the upper waters of a navigable stream. The question is always one of *fact*, whether such appropriation substantially interferes with the navigable capacity within the limits where navigation is a recognized fact. In the course of the argument this suggestion was made, and it seems to us not unworthy of note, as illustrating this thought.

"The Hudson River runs within the limits of the State of New York. It is a navigable stream and a part of the navigable waters of the United States, so far at least as from Albany southward. One of the streams which flows into it and contributes to the volume of its waters is the Croton River, a non-navigable stream. Its waters are taken by the State of New York for domestic uses in the City of New York. Unquestionably the State of New York has a right to appropriate its waters, and the United States may not question such appropriation, unless thereby the navigability of the Hudson be disturbed. On the other hand, if the State of New York should, even at a place above the limits of navigability, by appropriation for any domestic purposes, diminish the volume of waters which flow into the Hudson, a navigable stream, to such an extent as to destroy its navigability, undoubtedly the jurisdiction of the National government would arise and its power to restrain such appropriation be unquestioned; and within the purview of this section it would become the right of the Attorney General to institute proceedings to restrain such appropriation."

Numerous other cases might be cited to show that Congress has not only jurisdiction of the navigable waterways, but over the tributary streams as well, so as to pre-

vent their use to the detriment of the navigability of the rivers they supply, and can even resume control of waters appropriated by a State for domestic purposes, to the destruction of the navigability of a stream.

If this power and jurisdiction be recognized, may it not be insisted, that it is within the powers of Congress to enact a uniform code, not only to safeguard the waters tributary to the navigable waterways against such diversion or obstruction as may destroy navigation, but also to provide for the distribution of such waters for beneficial use in the reclamation of the arid and semi-arid lands of the country? For surely the time will come, if it is not already at hand, when the appropriation and diversion of the waters of many of the non-navigable waters of the country for purposes of irrigation and generation of power for industrial and other purposes, will seriously impair if not destroy the navigability of streams emptying into the Mississippi, the Columbia and other great rivers of the country.

My purpose in this discussion is to call attention to the powers which Congress *unquestionably* has and to others, which in my opinion, it has, as an incident to those expressly granted. If the position assumed is correct, Congress has jurisdiction over many of the most valuable resources of the country, and why may not a law be passed, creating an interstate Conservation Commission, authorizing it to work in connection with the departments of government now having jurisdiction over the public lands, the forests, navigation, reclamation and kindred subjects; making appropriations for the purchase of deforested lands in the Appalachian Range and elsewhere, with authority to reforest them; empowering it to exercise the right of eminent domain, in such cases as might be necessary; authorizing the adoption of rules for the distribution of the waters of all streams tributary to the navigable waterways and particularly those which are interstate?

Such an act would vest in the National government jurisdiction over by far the largest part of the work of resource conservation and would create a central administrative system which would result in great and lasting good and be more effective than any other system.

But it may be asked, Why may not the States exercise the powers herein suggested as likely to be better performed by the National government? To this I answer:

First, the States as a rule do not seem disposed to act for the preservation of their natural resources either with respect to the land owned by them or by the exercise of their police power. There are, however, some notable exceptions to this rule.

Second; even in cases where the States have legislated with reference to the subject of the distribution of waters, whether from interstate or intrastate streams, there is such a lack of uniformity in legislation, as well as in judicial interpretation, that it is difficult, if not impossible, to determine the rights of individual citizens.

It is well known how unpopular was the policy of National Forest creation in its inception in all the States. The range user and the small settler along the edges of the forests had come to feel that they had a right by prescription to use as they saw fit the unsold portion of the public domain. I myself was of the number to oppose the policy, but that opposition was the result of lack of information as to the correlation of water conservation, soil erosion, flood and drouth, and the uniform distribution of waters for reclamation of the semi-arid regions of the West. The movement, I assure you, now meets my hearty approval.

The unpopularity of the Forest Reserve is gradually giving way to acquiescence and approval, and all opposition, I am sure, will vanish when the rules for their administration can assume the order and method of a code, and people come to understand better the objects and purposes underlying it all.

Who doubts for a moment that State effort along these lines would have entirely failed, and that but for the persistent, indomitable, and intelligent effort of Gifford Pinchot, who deserves a very warm place in the hearts of his countrymen, even National effort would have to come to naught?

But the difficulties that beset State control can be better illustrated by reference to the distribution of waters for irrigation purposes, particularly where the rights of citizens of different States along the upper and lower stretches of interstate navigable waters and their tributaries are involved.

To aid in the full enjoyment of these rights, there should be a uniform code governing both the distribution and use of waters, and an administrative system that can reach across State lines and enforce by proper proceedings all rules and regulations.

The National Irrigation Congress, held at Boise, Idaho, in September, 1906, realizing the difficulties in the way of regulating the distribution of waters along such streams, appointed a committee of expert irrigationists to examine into the matter and report to the next Congress. This was done at Sacramento, Cal., the next year, and the committee reported amongst other things as follows:

"If there is to be any protection of priorities across State lines, it should be by a Federal administrative system corresponding in character to that needed for the establishing and protection of rights within a State.

"While it is true in the administration of water rights upon interstate streams by different States, the right of appeal to the Federal courts exists, that remedy is expensive, slow and unsatisfactory. A de-

cision of a court, once rendered, remains fixed and only settles the particular question involved in the case, while conditions surrounding irrigation on either side of the State line are constantly changing and the use of water for irrigation rapidly growing."

While it is true that some of the States have adopted fairly good laws governing the distribution of water for irrigation and other purposes, yet even in these there is a lack of uniformity and a conflict of judicial interpretation. A few instances might serve to show the difficulties of an equitable adjudication of water rights on interstate streams. Bear River begins in Utah, flows into Wyoming, crosses again into Utah, returns to Wyoming, then into Idaho and empties into Great Salt Lake. Lands are being irrigated from its waters in each of the States through which it flows, and each State has a different law.

Lesser Snake River crosses the boundary line between Colorado and Wyoming four times. Adjudications as to the rights of water users in Wyoming are not heeded in Colorado and *vice versa*, and there is no authoritative administrative system.

The Arkansas River is another instance. It rises in the Rocky Mountains, flows for 300 miles in Colorado, crosses into Kansas, traversing it for 310 miles, enters Oklahoma, and empties into the Mississippi on the eastern boundary of Arkansas. A suit was recently instituted by the State of Kansas against the State of Colorado to determine the rights of the citizens of the two States with respect to the waters of this river. It is safe to predict that the final determination in this suit cannot and will not settle finally the rights of all the parties, and some sort of interstate regulation will eventually be necessary.

Other instances might be cited, but these are sufficient to illustrate the difficulty which besets State regulation and control of waters for irrigation and other purposes.

There are again other cases where a stream has its source in one State and its waters are used for irrigation and power purposes in another; the latter State has no power or authority, if the necessity should arise, to go into the former and construct storage reservoirs, no matter how valuable they might be.

I would not for a moment be understood as claiming that Congress has any power, jurisdiction, or authority, to disturb rights to water which have become vested through National or State laws. On the contrary I insist that such rights should be protected and will be promoted by the course here suggested for National control and administration. It is in the interest of these rights, as well as for those yet to accrue, that radical and immediate action should be taken. Who could have foreseen, when the Constitution was adopted, or even a quarter of a century ago, the change that has taken place in the semi-arid regions through the distribution of water? The beginning has only been made, and the prediction may safely be hazarded, that by the construction of dams and storage reservoirs and the enactment of laws for the proper distribution of water for reasonable and beneficial use, hundreds of thousands of acres of land, which to-day are considered worthless, will in the next quarter of a century be reclaimed and will furnish homes for thousands of sturdy men and women. It is to protect the men of the present day and age and their descendants in the enjoyment of their vested rights against the men of the future, and those of the future against the unreasonable demands of the present, that Federal jurisdiction and legislation is here suggested. With the Federal authorities in control of the undisposed-of portions of the public domain in the several States, including the forests within the reserves, and the mines and minerals therein situate, the navigable waterways with their tributary streams, both for controlling their use to maintain a uniform flow for the purposes of navigation, and the distribution of waters for irrigation purposes as an incident to the maintenance of the navigability of the rivers, and in control, as well, of deforested areas owned and to be purchased for reforestation, there is no doubt that a policy of Federal administration can be formulated, that will do more for the preservation and protection of our natural resources than is possible to be done by the States acting separately. But cooperation by the States will still be necessary to accomplish the highest results, and in what I have suggested it is with the idea that such a movement would have the hearty cooperation of the State authorities.

As to the policy of State administration, I have pointed out some of the difficulties in the way of administration on the part of the States, of a portion at least, of our National resources. There is no question but that Federal administration and control would be more effective, and yet I realize that jealousies between the States themselves, and fear of Federal encroachment upon the rights of the States, will make it difficult to agree upon a proper course of legislation. The work in hand is so important, not only to us of the present, but to future generations, that we ought to be able to lay aside all jealousies, and endeavor in a spirit of the loftiest patriotism to reason together and formulate, if possible, a policy of administration that is best for all.

Before the older States realized the value of their forests, their waterways, their mines and minerals, they had allowed all to slip from their hands and into private ownership. The same thing is now going on in the younger States, and soon there will be left nothing to conserve of what we received

from our forefathers as a magnificent heritage. Some course ought to be mapped out now for our future conduct.

If a National administrative system does not meet with approval, then let it be State. The conflicting interests of the States, the different conditions which prevail in the humid and semi-arid regions, in soil, in climate, in topography and finally in laws and judicial interpretation, will render the enactment of a uniform code a task of great difficulty. It cannot be done here and now, but the initial steps may be taken for the appointment of commissioners from the different States to confer together and agree if possible upon a code for submission to the different State legislatures.

But whether the policy for the conservation of our natural resources be National or State, there should be hearty cooperation on the part of both the National and State governments, for without it, all efforts must fail.

To you gentlemen of the East, the North, and the South—to you gentlemen from every section of our country in control of the Federal government, we of the West promise our best efforts in the work of conserving all the natural resources of all these States for the benefit of all the people.

THE CONFERENCE PROPER

Sessions at the New Willard Hotel—Report of the National Conservation Commission—Section of Minerals

ON WEDNESDAY morning, December 8, in the Red Room at the New Willard Hotel, the conference proper began with the reading by Governor Blanchard, of Louisiana, of the report of the National Conservation Commission. This report being a State document, prepared for the President and to be transmitted by him to Congress, of course cannot be published in full. A condensation, however, covering the work of the four sections and giving the principal points contained in the report, has been prepared, and these four summaries are available.

After a brief talk by Senator Newlands, in reference to other matters, Senator Flint was called upon for the report of the Section of Minerals, of which section Hon. John Dalzell is chairman. He prefaced his remarks with the statement that the most impressive fact faced by the Section was the lack of exact knowledge in regard to mineral resources; and he added that this fact emphasized the importance of continuing the Commission in all its branches until a thorough inventory shall have been made of the resources of the country, mineral and others.

Among the startling points brought out in the report is that contained in the statement that the gas that is now escaping from gas and oil wells, and the loss of which is altogether preventable, is sufficient to light all the cities in the United States of over 100,000 inhabitants. Another is the demonstration that the existing and known coal fields of the country contain only sufficient unmined coal to last until the middle of the next century. Of all minerals produced in the United States, one-sixth is wasted, this waste amounting to $1,000,000 a day—$365,000,000 annually. This waste of mineral products is not the only staggering fact developed; the loss of life, through careless, imperfect mining methods, and through a lack of harmony in the laws of the different States and the National Government, is far greater than is true of any other country in the world, where men are engaged in the same lines of work Senator Flint urgently recommended that the strongest sort of resolutions be adopted calling for the enactment and enforcement of laws safeguarding the miners, with the end in view of putting a stop to this awful and wholly needless sacrifice of human lives.

In regard to conditions so far as the country's mining laws are concerned, Senator Flint said:

"We have three different schemes for obtaining title to mineral property: viz., the coal land laws, the lode claim laws, and the placer mining laws. Under the placer mining laws we know of the great frauds committed in taking up timber lands in the West; but at the same time it is difficult to frame a law that will permit placer mining and at the same time not permit the placer miner to own the surface of the ground. In other words, in placer mining as it is in the West, it is necessary to take the surface or we cannot have a placer mine. * * * Our mining laws should be changed so as to permit the taking out of the various minerals, and at the same time hold the ground itself so that it may afterwards be used for farming."

Changes of the laws governing the handling of oil wells and oil lands were recommended; the position was taken that the use of oil as fuel for locomotives and other engines is unnecessary and a needless waste of this mineral resource; the present condition and future prospects as to coal and iron deposits was gone into; the importance of the protection of phosphate rock deposits was urged, and several recommendations were made.

The mineral production of the United States now exceeds $2,000,000,000 in value annually, standing second only to agriculture as a producer of National wealth. The mining industry of the country furnishes our light, heat and power, and supplies sixty-five per cent. of the freight traffic of the country. The annual waste in mining and treating mineral products is more than $300,000,000.

The fuels, supplying heat light and power for domestic and industrial purposes, are the most fundamentally essential resources of the Nation. Use of fuels involves their immediate and complete destruction. The use of large quantities of other materials also increases the rate of consumption of the fuels; for, as the Nation has now passed the stage of early development, the use of fuels is increasing much more rapidly, in proportion to increase of population, than in the past. The available and easily accessible coal supply aggregates approximately 1,463,800,000,000 tons. At the present rate of production—and waste—this supply will have approached exhaustion before the middle of the next century. From the beginning of coal mining in America to the close of the year 1907 there have been mined of all kinds of coal 6,865,000,000 tons, and it is carefully estimated that for every ton of coal taken from the mines one-half a ton has been wasted. The rate of production has been steadily increasing. The initial step in extending the life of the coal supply must be the lessening of the waste in mining, handling, and transportation of the coal. More advanced methods of use

SECTION OF MINERALS

Hon. John Dalzell
Hon. Joseph M. Dixon
Hon. Frank P. Flint
Lee S. Overman
Philo Hall
Dr. I. C. White
James L. Slayden
J. A. Holmes
Andrew Carnegie
Dr. Chas. R. Van Hise
John Mitchell
John Hays Hammond

and better means of transforming the fuel into energy are also to be considered.

The known supply of high-grade iron ore in the United States is approximately 3,840,068,000 tons. At the present rapidly increasing rate of consumption this supply cannot be expected to last beyond the middle of the present century. Should the average of increase be maintained it would require, during the next three decades, the production of about 6,329,000,000 tons. It is evident, therefore, that the Nation faces one of two conclusions; before the year 1940 the production will have reached a maximum and begun to decline, or large use must be made of inferior, low-grade ores, such as are not now classed as available, or the importation of foreign ores must be largely increased.

The known supplies of petroleum, natural gas, and high-grade phosphate rock cannot be expected to last much beyond the middle of the present century.

The waste of natural mineral resources used in building and engineering construction is of three kinds: That due to improper and wasteful methods of mining and preparing for market, that due to excessive use of structural materials, through ignorance of their strength, durability, etc., and that due to destruction by fire on account of the inflammable character of building construction, and inadequate building laws and the non-enforcement thereof.

The greatest source of waste of structural materials, and the one most easily reduced, is that arising from fires. The substitution of fire-resisting materials for those now used will tend largely to put an end to this waste. The fire loss for 1907, including property destroyed, maintenance of fire departments, payment of insurance premiums, protective agencies, additional cost of water supplies, etc., reached a total of over $456,485,900, about fifty per cent. of the total value of new building construction in that year. This amount is thirteen times the interest on the total National debt.

After a brief discussion, between the Chair and several delegates, as to the manner in which the full text of the reports is to be placed before the people of the country, Mr. John Hays Hammond, the famous mining engineer, was called on for a statement as to the loss of life in mining operations. Mr. Hammond, however, declined to go into detail on this subject, owing to the fact that he was without statistical information. The general discussion was opened by Prof. J. M. Bogert, President of the American Chemical Society.

ADDRESS OF PROF. J. M. BOGERT

I WILL ask the attention of the conference for about ten minutes to present some details, for all the economic utilization of our resources must finally be worked out by scientists, and I would like to present, on behalf of the chemists, a brief statement as to what assistance you may expect from the chemist and chemistry.

It would be strange indeed if the science which deals with the ultimate constituents of our material universe, their combinations and transformations, could not offer any assistance in the solution of the problem as to how our natural resources may be conserved. It is chemistry that has determined the composition of those materials which make up the earth upon which we live, the atmosphere which surrounds it, the heavenly bodies beyond. Chemistry studies the properties of the elements and their various compounds, and upon these fundamental data our industries rest.

The transformation of the raw material into the finished product consists either in changing its external form, as in wood or metal working, weaving, and the like, or there is involved a chemical change, as in metallurgy, fermentation, the manufacture of glass, soap, cement, chemicals, etc. Practically all of our manufacturing processes are, therefore, primarily either mechanical or chemical. In the production of a metal from its ores, or of indigo from coal tar, it is chemistry that points the way; and the more complex the problem the greater the dependence upon this science. In devising new processes and in the discovery of new and useful products, chemistry is again the pathfinder. The com-

munity is apt to overlook the extent and diversity of the services rendered by the chemist because of the quiet and unobtrusive way in which the work is carried on; and yet the statement in the report of the twelfth census of the United States is quite correct when it says that:

"Probably no science has done so much as chemistry in revealing the hidden possibilities of the wastes and byproducts in manufactures. This science has been the most fruitful agent in the conversion of the refuse of manufacturing operations into products of industrial value. * * * Chemistry is the intelligence department of industry."

The measure of a country's appreciation of the value of chemistry in its material development, and the extent to which it utilizes this science in its industries generally measure quite accurately the industrial progress and prosperity of that country. In no other country in the world has the value of chemistry been so thoroughly understood and appreciated as in Germany. And in no other country of similar size and natural endowment have such remarkable advances in industrial development been recorded; and this, too, with steadily increasing economy in the utilization of the natural resources.

That our own Government realizes the importance of chemistry seems evident from the fact that six of our nine Federal Departments already maintain chemical laboratories, where they handle not only their own chemical work, but also that of the Departments of State, Justice and Postoffice, which as yet have no chemical laboratories.

Coming, then, to our mineral resources, in the first place, let it be kept clearly in mind that metallurgy is a branch of applied chemistry, as it is founded upon chemistry and engineering. In general, it may be said that the seriousness of our mineral problem lies in the fact that these are resources that cannot be renewed. It may be urged that as matter is indestructible, metals once won from their ores should not waste, but accumulate. And this no doubt is partly true. It is not so with our fuels, however, for when our carbon is once burned to carbonic acid it is no longer available as fuel, until by the slow process of vegetable life some of it is fixed in plants and gradually reduced through peat to coal again. Six times as much of our carbon is now locked up in mineral carbonates unavailable for fuel as we have in the form of coal.

The life of our mineral resources may be prolonged by the discovery of new supplies or satisfactory substitutes, by avoiding waste in mining and extracting ores and the discovery of methods which will render low grade or other ores available by a more complete utilization of the latent possibilities of the ore, including the recovery of all by-products, and by preventing loss of life and property from fires and explosions.

The chemist is helping in many of these lines. It is to him that we must usually turn for the production of satisfactory substitutes, for devising new processes, and for the utilization of by-products and wastes. It was the pioneer investigations of Bunsen and De Faure which pointed the way for the use of furnace gases in preheating and in other directions, such, for example, as the recent commercial manufacture of formic and oxalic acids from the carbon monoxide present in generator gas. In smelting operations the chemist must analyze the raw materials—ore, coke, limestone, etc.; the intermediate products—pig iron, if steel is to be made—and the final products, including the furnace gases and slag. Without the explosives of the chemist, modern mining, as well as most great engineering works, would be impossible. After the precious metals have been extracted, it is powder which stands guard over them as it does over all the accumulated wealth and prosperity of this and other nations. On the other hand, a chemist, Sir Humphrey Davy, by his invention of the safety lamp, has done more than anyone else to protect the miners from explosions. It is worth noting that the authorities did not appeal to a chemist until all suggested engineering methods had proven powerless to avert the terrible "firing" of the mines. The new sodium dioxide compound, "oxone," may prove of value in mine accidents, for it absorbs carbonic acid with liberation of oxygen. The oxygen upon which rescuers now depend is also the result of the skill of the chemist.

At one time the waste in the oil business was enormous, as only the kerosene was saved. Now, with the exception of occasional fires and the relatively small amount sprayed into the air with escaping natural gas, and those regions where the oil is wasted by seepage from earth pits, there is very much less lost, for chemistry has not only shown how a greater yield of kerosene may be obtained, but also how the by-products—gas, gasoline, naptha, lubricating oils, paraffin, vaseline, coke and so on—may be saved with considerable financial profit. Certain of these distillates are used for the production of high candle power illumination, as in the Pintsch and Blau gas processes. Rapid development in the use of gasoline engines has developed an enormous demand for this petroleum fraction. The most promising substitutes for gasoline appear to be alcohol and the benzole from by-product coke ovens. The former of these, although giving much higher efficiency as a fuel, is still too expensive to compete with gasoline except in special cases. The latter, as our number of by-product coke ovens increases, is likely to play a more prominent part in this field.

In 1907 over forty million tons of coke, valued at nearly one hundred and twelve million dollars were produced from about sixty-two million tons of coal. Only five and a half million tons of this, or less than fourteen per cent, was obtained in by-product ovens. About fifty-four and a half million tons of coal were coked in bee-hive ovens. This involved a waste of one hundred and forty-eight billion

cubic feet of gas, worth $22,000,000; four hundred and fifty thousand tons of ammonium sulphate, worth a similar amount, and nearly four hundred million gallons of tar, worth $9,000,000. The gases evolved in coke ovens have high calorific power. Dentin estimates that in modern ovens only sixty-five per cent of this is necessary to effect the carbonization. The remaining thirty-five per cent amounts to above 3,700 cubic feet of gas, equivalent to 420,000 calories per ton of coke produced. As a gas engine of 100 kilowatt power absorbs 3,000 calories per kilowatt, the power wasted in bee-hive coking amounts to over 4,000,000,000 kilowatt, or about 3,000,000,000 horse-power. We are, therefore, wasting enough power to establish a great manufacturing center, enough ammonium sulphate to fertilize thousands of acres, enough creosote to preserve our timber, and enough pitch and tar to roof our houses and briquette our slag and waste coal. Lignites have been found to give out not only an excellent yield of gas, but also tar, oils, paraffin and other valuable by-products. It has recently been claimed that one ton of dried peat can be made to yield 162 liters of pure alcohol, and about sixty-six pounds of pure ammonium sulphate.

In 1907 4,000,000 tons of coal were consumed in the production of 34,000,000,000 cubic feet of coal gas for heating and illumination, worth $36,000,000, in addition to over 100,000,000,000 cubic feet of water and oil gas, worth $90,000,000, or $126,000,000 worth all told.

The value of coal to the consumer depends upon its heating power, the percentage of water it contains, the amount and character of its ash and of the clinker formed, and how extensively it corrodes the grate bars. For an authoritative answer to these and similar questions, the chemist must be consulted.

The composition of furnace and flue gases has been determined by chemical analysis in smelting and other industries, and by the utilization of these gases for preheating and for the generation of power, the amount of coal consumed has been reduced, and in addition valuable by-products recovered. In gas illumination the invention of the Welsbach mantle has greatly increased the amount of light obtainable from a given weight of coal, and has correspondingly reduced the drain upon our coal resources. The conversion of carbon into acetylene through calcium carbide should also be mentioned.

As iron, according to Clarke, composes four and one-half per cent of our lithosphere, the chance of our discovery of other important deposits of iron ore seem far better than in the case of other metals or of coal. The development of iron alloys is a most promising field and among these we may find satisfactory substitutes for other metals now more seriously threatened with exhaustion. The production of ferro-silicon may render available [illegible] as hitherto regarded as unworkable.

The chief use of iron is in the construction of railroads and building. In building operations concrete is helping, not only as a substitute for iron and steel, but also as a protective covering for metallic pillars, girders, and the like. The iron and steel industry rests mainly upon chemistry and is under chemical control at every point. The production of steel by the Bessemer process depends upon the combustion of the carbon and silicon of the pig iron, the heat of combustion serving to maintain the mass molten. By the utilization of what was formerly the waste heat of the blast furnaces to raise steam for the blowing engines and preheat the blast, the amount of coal necessary to produce one ton of pig iron is only one-quarter what is was.

The slags are now largely used for the production of cement and concrete, as fireproof packing for steam pipes, and so forth, as ballast for railroad tracks or macadamizing highways, and for building purposes, as slag brick, slag blocks, etc., while those rich in phosphorus, as from the Thomas-Gilchrist process, are extensively employed in fertilizers. In the words of James Douglas, "When all the volatile products of the blast furnaces are deprived of their heat-giving property and their chemical constituents, and when the slags as well as the metal have returned their heat to man instead of to the atmosphere, and the slag itself has been turned into cement or some other useful article, it will be a question as to whether the pig iron is the principal object of manufacture, or one of the by-products."

The safety and comfort of travel on our railroads depends in large measure upon the skill of the chemist in testing the character of the materials employed in their construction and operation. It may be only a delay from a hot box, due perhaps to a poor quality of lubricant, or it may be a disaster from the failure of a signal or headlight at a critical moment, or a breaking of an axle or locomotive part, because of steel brittle from impurities.

Chemistry has played a prominent part in copper metallurgy. The matter is now bessemerized, and seventy per cent of our total product is refined electrolytically. The avoidable waste in mining copper, zinc, lead, silver, and many other metals is estimated as at least thirty per cent. But the value now locked up in the Arizona slags, the Comstock slimes, and the Anaconda tailings, will sooner or later be recovered by chemistry.

Chemistry has finally pointed the way by which aluminum may be obtained cheaply and in large amount from its ores. Last year our consumption of aluminum was 8,500 tons, worth $5,000,000, the world's production for 1907 being estimated at 20,000 tons. The commercial utilization of aluminum and its alloys is writing a new chapter in our mineral history. To appreciate what this development in aluminum means, it should be recalled that the total supply of it is nearly twice as great

as of iron and about 800 times that of copper. Aluminum is already replacing copper for certain electrical purposes. A large part of the power now generated at Niagara Falls is distributed through aluminum castings, for air ship constructions, and for utensils of various kinds. The use of finely divided aluminum in Goldschmidt's "thermit" process of welding and casting is an important application of one of the chemical properties of aluminum.

A good example of the economy accomplished by chemical investigation and discovery is furnished in the case of ultramarine. Many years ago, when this was made by powdering the mineral lapis lazuli, it sold for more than its weight in gold. Now that the chemist has discovered how to make the same material from such cheap substances as kaolin, sodium sulphate and carbonate charcoal, sulphur and rosin, the price is only a few cents per pound.

In the field of the precious metals, chemistry has contributed, among other things, the cyanide and chlorination processes, through which formerly rejected low grade ores and residues have been compelled to give up their gold. The gold production of the world between 1851 and 1907 was three times that produced between 1493 and 1850. The value of our specie, upon which every commercial transaction rests, is determined by the chemists, while the green ink used in printing our bank notes, and to which we owe the name of "greenbacks," was invented by a former president of the American Chemical Society, Dr. T. Sterrey Hunt. The chemist lets nothing escape unsearched. The sweepings from mints and from the shops of workers in precious metals, as well as the water in which the workmen wash their hands, are all made to relinquish the gold or silver they contain. Even waste photographic solutions must disgorge their silver before they are released. The invention of electroplating led to the use of plated articles instead of solid ware, and thus reduced somewhat the drain upon certain of our mineral resources. The supply of platinum has been for years so limited that the price has ranged high. Chemistry has now put on the market vessels of transparent and opaque quartz, which seem likely to replace platinum for some chemical purposes.

Many other instances might be cited where chemistry has made important contributions to the economic utilization of our mineral resources, such as the carbonyl processes of Mond, for example. But there is still much to be done in improving the present wasteful methods of smelting certain of our ores, and we may look for great advances in this direction through the rapidly developing and most promising field of electro-metallurgy.

Of the various factors upon which the success of this conservation movement depends, none, in my estimation, is more important than that of awakening the producer and manufacturer to a proper realization of the value of science to our industries.

Mr. A. W. Damon, Vice-president of the National Board of Fire Underwriters, presented a striking address on fire waste. He suggested that a fifth division, or section, might well have been added to the four into which the Commission was originally divided—a Section of Fire; and he advanced strong arguments for the specific treatment of this branch of the subject of conservation.

Mr. Damon said that the fire loss in the United States for the past four years was $1,257,716,955, or an annual fire loss of over $251,000,000—a daily loss of about $689,160! The four-year period mentioned includes the San Francisco and Baltimore fires; but the annual fire loss for a ten-year period has been $202,793,434, or an average daily loss by fire, for every day of the past ten years, of over half a millon dollars—to be exact, $556,091! Property value destroyed by fire is gone beyond recovery. Insurance only shifts the distribution of the loss; an irrecoverable loss it still remains.

That this loss is altogether needless and unnecessary is proven, Mr. Damon said, by the extraordinary difference between fire losses in European countries and the United States. While the per capita loss in our own country for the past five years has been $3.02 per annum, in European countries it has been only 33 cents per year, or little more than one-tenth as much as our own fire loss. It was shown that nearly five times as many fires occur in cities of the United States as is the case in European cities.

Three principal causes exist, said Mr. Damon, for this excessive difference. First, the difference in the point of view as to responsibility of European peoples and those of the United States; second, the difference in the construction of buildings, both public and private; and, third, the difference in the regulations governing hazards

and hazardous materials and conditions, and in the enforcement of these regulations. The difference in the ideas of thrift; in the view of responsibility to neighbors; in the perception of the real meaning of fire loss or waste, are the causes of the larger numbers of fires per capita in the United States, and, perhaps, of the larger loss per capita.

The organization of which Mr. Damon is vice-president, he said, believes that the present staggering fire waste in this country is a wholly unnecessary National calamity and that to reduce it, it is essential, first, that the public be brought to understand that property destroyed by fire is gone forever and is not replaced by the distribution of insurance, which is merely a tax collected for the purpose; second, that the States severally adopt and *enforce* a uniform building code which shall require a high type of safe construction, essentially following the code of the National Board of Fire Underwriters; third, the adoption by municipalities of rigid ordinances governing the storage and handling of explosives and inflammable materials; fourth, the establishment by the States of the office of Fire Marshal, such Fire Marshal to have the authority to examine under oath and to make arrests; fifth, that all cities maintain a paid, well disciplined, adequately equipped and non-political fire department; and, sixth, that in all cities an adequate water system, with proper distribution and pressure, be installed and maintained, larger cities to have separate high-pressure systems. All these matters appear to be within the province of State legislation, rather than National; but, said Mr. Damon, the adoption by the States, and the subsequent rigid enforcement, of uniform laws on these subjects will go a great way toward ending the Nation's horrifying annual fire loss, which is a National disgrace.

Following the remarks of Mr. Damon, Hon. Thomas F. Walsh, of Washington and Colorado, read an address dealing with conditions affecting mining and minerals.

ADDRESS OF MR. THOMAS F. WALSH

THE object which calls you together—the conserving of our natural resources—is a question which deeply affects our Nation's future. It is the part of wisdom, for nations as well as individuals, to pause and look the field over—take stock, so to speak—and try to see whither we are drifting. This is not only wise as regards our natural resources, but is equally so of all other channels through which wealth is created, and even more so in the sphere of ethics. Thanks to a beneficent Providence, no nation has ever made more rapid progress in the creation of wealth, and what is of greater importance, in the uplifting and bettering of humanity, than the one to which we owe loving allegiance.

In developing and creating our great wealth, it became necessary to call freely upon our natural resources. Prodigal waste went hand in hand with use until their consumption and destruction—for it is a sad fact that we destroy more than we use—became great. Sounding the alarm and submitting the question, to an intelligent and truly representative body like yours, of how to stop waste and conserve these natural resources, was one of the wisest of President Roosevelt's many wise acts.

In reviewing the past we must not forget that conditions have materially changed. Much that we condemn to-day was regarded as lawful and right—of sheer necessity—in years past. As an illustration, take the consumption of timber. The West never could have been settled without railroads. When these railroads were projected they were looked upon as hazardous ventures, and proved so for their promoters in many cases. In the early days of railroad building, the Government gave help in many ways, permitting the use of timber and ties from the forests in their construction. But the end surely justified the means.

The same wise course was followed by the Government in the field of mining. I remember being in Leadville during the winter of 1878-79. The rush to that great camp had commenced. The population increased almost over night from a few hundreds to many thousands. The winter was unusually severe, and as most of the population lived in tents, the death rate from exposure and pneumonia was something appalling. The rush continued until the population increased to 30,000. Shelter had to be provided for this great army of human beings. The magnificent forests that spread for miles in every

direction from the town, even to the mountain slopes, had to be sacrificed to house and shelter them. When comfortable homes were established, the sickness and death rate dropped to normal. Here, as with the railroads, the end justified the means. Leadville has made permanent homes for thousands of our citizens and has enriched the country by hundreds of millions of dollars. It is one of the great productive mining camps of the world to-day. It may be said in passing that if we had had a law in force at that time, similar to the laws of France, requiring the planting of a tree for every one cut down, the restoration of those beautiful forests would be almost complete by this time.

The same wise and liberal policy was extended by our Government in the building of homesteads, villages, and towns on agricultural lands, and in the development of coal and iron mines. The rapid growth and development of our country was in a great measure due to the encouragement and assistance extended to infant industries by our National Government.

We are apt to bewail the great consumption of natural resources, forgetting the magnificent permanent assets which we have to show for it. Trees have been put to better use in sheltering human life; coal and iron has been used in changing our land from desert conditions to teeming industrial and educational activities. Nor should we forget the sturdy pioneers of our civilization and the dangers and difficulties that they had to meet and surmount.

Now, however, the time has come to call a halt on lavish prodigality in giving away the people's inheritance. The time has come to stop giving away the public domain, and to devise ways and means to husband our resources. To this end there are two courses to be pursued: one is arrestation, the other development. These should go hand in hand, for one helps the other. By arrestation I mean the stopping of the terrible wastes that are going on in the mining and using of mineral fuels, and to some extent in other materials.

To preserve public lands for agricultural purposes, for actual settlers, we must stop the awful destruction of forests by fires, and prevent the acquisition of vast tracts by greedy corporations and individuals.

The other course, which I believe we should pursue, is that of development. Development is the greatest of all conservers. It creates and brings new wealth into activity.

The reclamation of the desert wastes, the drainage of miasmatic swamps, and the utilizing of their stored fertility for the support of human life in comfortable independence, are among the highest and best forms of conservation.

Development creates wealth, and wealth distributed to the widest possible extent and wisely used by its possessor, is of the greatest of blessings to a nation.

This development should be carried on by the Government whenever this can judiciously be done. Individuals and corporations should receive encouragement and fair treatment from both the Government and people. Although much has been accomplished in the past, there is much, very much, to be done in the years to come to keep up our established rate of progress, and to meet the pressing needs of our rapidly growing population.

Well directed development will put all of our idle powers to work. It will utilize waters that are now going to waste, and discover and bring new means to light for saving in the consumption of and the husbanding of our resources. If electricity and heat could be drawn from nature's storehouse; if the air we breathe, one of the greatest forces, and one of the most pliant, ductile, and efficient for all the uses of man, could be compressed by and through itself with compensating results—in a word, if nature's materials could be used without waste, these natural blessing would be useful to man in many ways undreamed of until the end of time.

In the sphere of mining there is much that development can accomplished which will lead to conservation. It is only recently that the world has awakened to the facts about the rarer minerals. What little we know of radium leads us to believe that it possesses perpetuality of power, light, and heat. To what extent the production of this miraculous mineral may aid in this conservation is a fascinating field of speculation. The ore, by the way, from which this mineral was first extracted by Madam Curée came from a mine in Colorado, yet no atom of it has ever been produced in this country. The uranium ore that has been, and is now, produced from this same mine is all shipped to Germany.

Vanadium is another of the rare minerals, the development of which will accomplish a wonderful conservation. It is the greatest alloy ever found for the making of steel. Its use will prolong the life of steel to many times what it is now. Here again, because of apathy, ignorance, and the lack of a Governmental institution of guidance, we do not produce one pound of this valuable mineral that would do so much to husband our iron resources.

Gentlemen of the Conservation Commission, a majority of your labors will lie in the field of mining. You will not proceed far before you will find that whilst our good Government has been generous toward all the other great activities of our national life, it has been strangely neglectful toward giving a helping hand to what is in many respects the greatest of all industries.

For instance, in the field of agriculture that grand man who presides over its industries

has linked science to the plow. You will find a young man at the head of the Forestry Bureau who, filled with patriotic devotion, is bringing science and energy to her aid. The Geological, Reclamation, and Weather Bureaus are established on high principles and are rendering great scientific service. This is true of all other departments except that of operative mining, which receives no direct aid of any kind from the National Government.

For development and conservation of our mineral resources two governmental institutes for research are necessary—one for the baser and one for the precious minerals. These should be equipped with every modern appliance and managed by a small, compact force of the best experts and scientists obtainable. These institutes should be located in fields of active mining—one, say, in Pennsylvania and the other in Colorado. They should lead, direct, and instruct in the best methods for saving life, arresting the terrible destruction and waste now going on; they should give reliable data and information for finding and treating new minerals.

The need of such institutes has been forcibly shown recently, when our Government had to borrow scientists from other countries to solve the causes of the terrible explosions in coal mines, with the accompanying horrifying loss of life. You, too, will soon see the need of such institutes to go to in your work for information and advice.

Gentlemen, I have taken up much of your time. I ask you not to throw a blanket of sleepy inactivity over these questions of great National importance. Shut out the lawbreaker and the grafter, but encourage the prospector, the homesteader, and the honest investor. Conserve the people's rights. Be just to the present, but do not forget the future. Stand for the people and make them your allies in accomplishing the good work which you have undertaken.

In closing, let me express my appreciation for the heads of our departments and their assistants. I know many of them intimately, and believe that no government receives more faithful service than ours.

It has become a good deal of a habit for certain classes to hurl criticism at public men and corporations regardless of whether they are trying to do their duty or not. Honesty and dishonesty are often but the reflex of the status of the body politic. It rests with the masses to make your task easier. It is the people who can create public sentiment, which will not only conserve our National resources, but what is more dear to every lover of his country, uplift and improve the standard of that priceless heritage —American citizenship.

The chairman, at the conclusion of Mr. Walsh's address, alluded to the fact that the Governors present "had the right of way, but seemed disinclined to avail themselves of it." He then called upon Gov. John A. Johnson, of Minnesota, for an address on the subject of minerals, Governor Johnson responding with a forceful and interesting speech. He dwelt upon the iron resources of the Mesaba Range, in Minnesota; but, departing from the subject of minerals, he paid particular attention to the subject of forestry, and the related subject of waterways.

ADDRESS OF GOVERNOR JOHNSON

I AM at quite a loss to know exactly how to discuss this or any other question identified with this movement. I certainly am not in a position to discuss the matter of mineralogy or mining from a technical standpoint, either as to the matter of its waste, or its chemistry, or any other particular feature of it. If I were to say anything at all it would be to take rather an optimistic view of the situation so far as the matter of iron mining is concerned. It seemed to me, as I listened to the discussions of mining both at this conference and the one held last May at the White House, that probably we got the pessimistic opinion in our heads somehow that within a very short space of time the iron resources of the country are going to be entirely exhausted. I am quite sure that is not exactly the case, and that there is no immediate danger of our running out of iron. I remember in May Mr. Carnegie read a very delightful and very able paper at the White House in which he said that the Lake Superior country or particularly that portion of it located in Minnesota, where they originally believed they had five or six million tons of iron ore, had now, they were quite certain, a billion and a half tons of iron ore. The statisticians who are going to present figures here later during this meeting have now items from the Oliver Iron Mining Company, an institution to which Mr. Carnegie is related in at least a very small way—the Federal Steel Company—estimating, from measurement made through the diamond drill process, that they have two and a half billion tons of ore. If the product has increased a billion tons within a year and the production has decreased from forty-two million tons to twenty-six million tons in the same length of

time in the same territory, it seems to me we are going to have too much iron ore in the future. At least the press so far has put too much iron in the souls of Americans because of some of the conditions which obtain.

I am gratified to be able to bring to you—and I am not here to advertise Minnesota especially—my suggestion that we are sufficiently conceited in Minnesota to think we are going to be able to provide iron for the world for a long time to come. As a matter of news, and not particularly because it is of interest, but because it is germane to some extent to the subject here, we say that a few years ago iron was first discovered in Minnesota. The conditions have been materially or completely changed in the meantime. As a matter of fact, when the Mesaba Range was first opened up, no one thought the commercial ore was of great value, being what they called 60 per cent ore. Then it ran to 55 per cent ore. That is almost the standard now. Even out on the western part of the Mesaba Range, they are mining very profitably 35 per cent ore, because the steel companies understand the conservation of their natural resources. Because of a washing process, they raise the standard of that ore to 50 or 55 per cent for commercial uses.

The great bodies of ore which have been discovered have been made useful by the conservation of their resources. West of the Mesaba Range we are opening what they call the Cayuna Range, and the ore is in very much deeper bodies, not of so high grade, but all new. The most sanguine promoters, if I might use that term, declare that the finding of ore on the Cayuna Range will vastly eclipse the Mesaba Range; so that we have every reason to believe that within a few years we are going to develop sufficient bodies of ore to take care of all needs of this country for the next two hundred years, and as Mr. Cole, the general superintendent of the Oliver Mining Company, said, something like a year ago, when I was talking to him about it, "We have just begun to scratch the earth." I do not say that in a spirit of boastfulness, so far as Minnesota is concerned, or so far as the National Government is concerned. It is a matter of humiliation to me to know that those great iron resources of the country at one time belonged to the Federal Government and later to the government of the State of Minnesota, and by reason of the lack of interest of the people in the conservation and ownership of their natural resources, they have allowed them to pass into the hands of special interests. They are there and they belong not to the National Government, nor to the State of Minnesota, except in small degree. It is very important the National Government and the State government should conserve that which they do own and see to it that it does not pass into the hands of private owners in the future. But it is a matter of humiliation that it has gone as far as it has and into the hands of private parties.

Let me say in behalf, too, of the private individuals who own it, that owning a private enterprise means the conservation of their natural resources. There is no question of the interest of the steel company in the protection and preservation of their own property, and because it is a private enterprise they will look after the details of their business much better and much more closely than State or governmental enterprises are looked after. Because of the things they have done, the Federal Government and the State government too, can learn a very valuable lesson, and that is, in all material things, at least, to conduct their business on the same broad lines of business interest which characterize a successful business man in the conduct of his private affairs. When we have divorced our public business from political considerations—and I was much moved by a remark, I think by the President yesterday, who said that this should not be made the vehicle for the enhancement of any political fortunes—then the situation will be more tolerable. If we will use as a measure of public good, using for our own benefit and our own advantage, the lessons which come to us from successful business men's enterprises, we will do much to conserve our natural resources in that particular direction.

Now, this steel company I have mentioned not only owns mines in Minnesota, but mines in Alabama—and when I speak of Alabama I mean the Birmingham district—and has, by reason of experience, learned to conserve natural resources, and I am quite amused, so far as the iron industry is concerned, to hear people talk about the waste.

In the Mesaba country, as a matter of fact, I want to say it is all open pit mining, not the underground mining. That is still done somewhat on the Vermillion Range, but in the Mesaba Range, the greatest iron range in the world, it is all done by open pit mining, just as you would strip off a quarry or a sand pit and then start to dig the open ore, and there is absolutely no waste to it at all.

I am not going to discuss the matter any further than to say that I do take an optimistic view of the situation.

They say while there are billions of tons of ore, possibly the grade is low. The average grade would probably run 50 per cent in the Mesaba Range. The Krupp works, in Germany, do business with iron which averages 29 per cent, and if they can use the average standard of ore in Germany, and that average is 29 per cent, I think no particular alarm is to be felt about Minnesota ore.

I realize iron is a different proposition from that which we meet with in coal, for instance, because the iron is not, after all, destroyed. It is like some of the other minerals—always with us in some form or other. When coal is consumed, it is gone forever. It is not entirely so with iron ore. We are not particularly alarmed with that particular feature of it in our country. We are interested so far as the development of iron interests is concerned, and the conservation of the natural resources, because the conservation thereof, in my judgment, if it means anything,

means the private development and private exploitation of the industry much along the line suggested by Mr. Walsh.

We say it is kindred to or inter-related with the matter of transportation, and because of the fact that it is so in the middle West, the matter is very important, because with us it is a problem of distribution, rather than a problem of mining, or the value of the thing itself. For that reason, because we are the greatest mining district in the world, because of the fact that we are interested as a mining district, we are interested in this work of an inland waterway and believe that forestry and the inland waterways are kindred and cannot be separated from each other.

I believe the great problem for this conference, and the great problem for the country in the future, is the development of inland waterways. I believe the greatest investment this Nation can make today, bonded or otherwise, is to construct a canal from Lake Superior to the Gulf of Mexico. It may cost $500,000 000. Estimates have been made at $400,000 a mile. A thousand miles would cost $400,000,000, practically the capitalization of a private enterprise such as the Milwaukee or the Northern Pacific, and much less than the capitalization of some of the larger railway systems. This would solve the matter of rate regulation in the interior of the country and would make unnecessary future discussions between sections or political parties as to whether Federal control or State control is best, because then the matter of competition and the matter of reform or better system of transportation would solve that question of itself; and because then, too, we would have a great route of transportation which belonged, not to private enterprises, but which would always be the heritage of the people of this country, not only today, but in the future; and such a canal as I have spoken of, with lateral and spur canals, would have much to do with the conservation, in my judgment, of the fuel. I believe it would pay for itself every fifty years in the matter of the saving of fuel alone, and would pay for itself every ten or twenty years in the reduced cost of transportation to the people.

Minnesota is practically the water shed of the continent. Some of you people who are further South must remember that we start the Mississippi River down your way. We have our streams and our forests and our mines, and all those things up in Minnesota, and we are interested in the conservation of the resources of this country—forests, waters, mines, and so forth.

My own opinion is that proper conservation consists in proper exploitation and proper development, rather than a discontinuation of use, as, for instance, in Sweden, where I believe the amount of iron ore that may be mined is limited to five million tons per year. We want all these things to use as we need them, but we must properly exploit them and properly develop them. If the work is to be done, it must be done scientifically. It has always been my opinion that this problem was not a politician's problem at all, but that it was, after all, an engineer's problem. I realized this morning, as I looked at this conference and as I have watched it from the time I came into this room, that the politician is going to eliminate himself from this conservation work, and that the plodder, the man of whom the President spoke yesterday, using him as a type of man who sits at his typewriter desk and works overtime without any pay or hope of ever getting any, is the man who will have to take the work up.

I remember at the conference last May at the White House all the Governors of the States were there who could be present. Many of their conferees, having met in the White House, were satisfied, and then the politician, having satisfied the public as to himself, and having satisfied himself as to the public, left the work to go to someone else, and there is not that manifestation of interest which was displayed a little while ago; but it is going to grow, just the same. This movement, if I understand it, is bigger than the Government; it is bigger than the conferees; it is bigger than the conference; it is bigger than the Nation itself; and I am of opinion that we will all live to see the day when history will write into its pages the greatest achievement in the record of this Nation's present chief, who made possible the conference last May, and who made possible this conference, because out of it and because of the activity of the scientific men of this country, will come great good for the future of our country.

As I said at the outset, I am not a pessimist, neither am I unduly an optimist. I want to say to you, however, that if you will give us, by canal or otherwise, as good a mode of transportation as Germany has, for instance, we will guarantee to furnish you all the iron that this country wants for at least two hundred years, and you can husband the resources of every other section.

Governor Johnson having finished, the chairman called on Gov. Hoke Smith, of Georgia, whose speech concluded the morning session. The Georgia executive addressed the Conference as follows:

ADDRESS OF GOVERNOR HOKE SMITH

I HAVE felt a deep interest in the purposes of this gathering, and agree with Governor Johnson that among the many good things our President has suggested, perhaps none will last longer or include more broad benefit to the entire country than the organization which is here today.

I can express very strongly my sympathy

with the objects of this organization. It seems to me that great benefit must come from it. I do not understand that your work will be limited merely to the preservation of what we have; certainly not to any effort to retard the use of the resources of our country. That would indeed be objectionable.

We believe that as speedily as possible the resources should be brought into activity. We believe, first, that we should study our resources and that one of the consequences of this gathering and this general movement taking place throughout the entire country, and one of the consequences of the local conservation organizations in each of the States, will be the more complete investigation and comprehension of the possibilities, of a material character, in each of the States; and that we may expect a more complete knowledge in our own country of what there is in each one of the States of the country.

This movement has aroused interest in Georgia, has aroused interest in adjoining States, and we believe that we will rapidly bring into active coöperation quite a large body, not only of experts employed by the States in connection with such work, but the business men, the public-spirited men, the men of prosperity, who desire to know more fully than they know now just what are the possibilities within the soil and within the mountains of our part of the Union.

We think that this knowledge of what we have will help to utilize, at each point, in the best possible way, for the end sought to be obtained, those of our mineral wealths and our material resources that should with the least expense and with the best results be used for a particular purpose; that substitutes will be found for some things which we now waste, by using them at greater cost, and when they have larger values, it being at the same time true that less expensive and less valuable material can be substituted with practically the same result.

I do not desire to speak of the special resources of our section. It is not necessary to tell you that our immediate section fixes the price of pig iron the world over. We have vast bodies of iron ore still undeveloped in the State of Georgia. They are not developing rapidly, because over in Alabama they have all the ingredients necessary for the assembling of the various products required to make steel, and they do it a little cheaper than we can, and therefore our beds will wait for future use to a large extent; but we are making great progress in producing that which will act as a substitute, to a large extent, for iron ore. Our development of the utilization of slate and lime for the purpose of turning out cement of a high quality, is in its infancy, and yet already well grown, for plant after plant is being erected, producing vast quantities of Portland cement which must in structural matters largely relieve the pressure upon our iron ore beds.

Assisted by the study of our resources, we will find substitutes for many things now used, less expensive than those now used. We will learn how to use in the best possible way what we have, knowing what we have all over the land, and conservation will come, not from a lessening of activity, but from a quickening of those forces in the best possible way, with the best results, due to the knowledge of what we have, and how to use what we have. After all, it is not the rich field, but the minds of the State that makes the wealth of the Nation.

Along with the progress which will come with the study of our resources and the effort to conserve them, must come the better preparation of the boys and girls of our country to handle in artistic style and with the master's hand whatever either may be called upon to do; and from the simple handling of the hoe in the field up to the highest mechanical skill, it behooves us as a part of the progress for which we all long as a part of the power commercially of our Nation, which we now have and which we would hand down with growing strength from generation to generation, to pay particular attention to this feature. It behooves us to see that every child is taught to use his hand with a perfect skill, and we must neither yield in resources nor in capacity of our skilled artists and mechanics to Germany or to any other country in the world.

And so it is, Mr. Chairman and gentlemen, we come to you from our part of the country—rich, we believe, in resources of the most varied character—anxious, bent upon studying them, bent upon seeing that they are utilized in the most profitable way, not alone for the profit of the one who owns them; not alone for the advancement and the commercial and financial strength of those in the possession of whom they rest, but with the common purpose that our country, our great Nation, today, tomorrow, and hundreds of years hence, shall fill that place which our patriotism and our love assign to it—absolutely the first among the nations of the world.

AFTERNOON SESSION

Section of Lands

SUMMARY OF SECTION REPORT

A LITTLE more than one-fifth of the land area of the United States is under cultivation. The soils of the country, as measured by crop yield per acre, are not losing fertility; taking the country as a whole, nine out of ten counties are either holding their own in this particular, or are gaining in fertility. Those parts of the country that are losing in fertility are mainly in the newly-settled regions, where the farmers are still drawing upon the original fertility of the soil and are not renewing it with fertilizers or practicing crop rotation. The present low average yield per acre is in part due to careless farming, but more generally to the fact that farm land is cheap as compared with farm labor. This is proven by the fact that the highest yields per acre are in the older Northeastern States, where land is relatively high in value, and in the arid regions of the West, where water, the essential, is scarce. The acreage of cultivated lands is increasing much more slowly than the population, and can never be much more than twice what it is now; and the soils are not producing one-half of what they should produce, or what they will be required to produce in the near future, if we would avoid buying our foods elsewhere. An important factor in reducing crops is the loss due to injurious animals and insects, especially the latter. It is estimated that the annual loss to livestock, grains, etc., due to injurious mammals is in excess of $100,000,000. The damage by birds is comparatively slight, and is far outweighed by the beneficent work of the birds in destroying insects, eating weed seeds, etc. The public range lands of the West contain approximately 300,000,000 acres. Upon this range it is estimated that there are at present 50,000,000 head of cattle and 40,000,000 head of sheep. The range is in very bad condition, especially that part used by sheep, owing to over-grazing and trampling. These bad conditions can be remedied by an assumption of control over the range by its owner, the United States, and the apportionment of it to stock-rangers individually. This asset of the country has been misused and wasted almost as criminally as the forests. There are in this country from 75,000,000 to 80,000,000 acres of swamp and overflowed land, nearly all of which can and should be drained and protected, and thus added to our cultivable area. It is estimated that the profit from such operations will be from 100 to 200 per cent over the present value of the lands plus the cost of drainage and protective works.

AT THE opening of the afternoon session the chairman, after announcing the appointment of a Committee on Resolutions, called for an address by Senator Knute Nelson, of Minnesota, chairman of the Section of Lands. The paper aroused deep interest and was heard with marked attention.

ADDRESS OF SENATOR KNUTE NELSON

YOU who were here this morning heard the joint report of the Conservation Commission and the part of it relating to the matter of our public lands. This question of conserving our lands in this country resolves itself really into two different heads. One relates to the conservation of the lands that are now in private ownership, conserving them against soil erosion, and also against improper use or unwise, improper agricultural methods. That part of the problem is very well covered in the special reports that will accompany this general report. This problem relates more to the care-taking by the States than the Federal Government, for the underlying principle in reference to land matters is that where land has passed out of the hands of the Federal Government, the jurisdiction of it is under the laws and regulations of the respective States. So that whatever is done in the way of conserving lands that have passed into private ownership, the problem relating thereto must be in the main worked out under State legislation and through private efforts.

Indirectly the Government can help out in this matter, at least so far as the matter of soil erosion is concerned and so far as the matter of water is concerned, by the regulation of streams; but in respect to wasteful methods of farming and in respect to these other matters that go to the deterioration and diminution of the value of the land for agricultural purposes in the main, that is a problem either for the States or for the individual citizens.

The question to which I propose briefly to call your attention is the conservation of the public lands that are still in the ownership of the Federal Government, and before I state anything on that subject I want to call your attention to what we still own.

According to the latest statistics on this subject, we had, upon the first day of July last, 386,873,787 acres of public land that were unappropriated and in the Government's hands, and not in a State or reservation. We had in addition to that, 6,400,000 acres of land in Indian reservations, and we had 167,976,000 acres in forest reserves. This relates to the lands that we have within the continental boundaries of the United States and does not include the territority or district of Alaska.

The great object or purpose which we ought to have in view is to conserve these lands for the benefit of the American people. One of our great safety-valves in the past, when we have been in the midst of periods of industrial stagnation and paralysis, when we have found a large army of idle men in our industrial centers and our large cities, has been the fact that many of those people who failed to get work in those industrial centers in the large cities could wend their way to the frontier and take up public land and make little homes of their own.

I have figured out that all of the unappropriated public lands which we now have, which are not in forest or Indian reservations, fit for agricultural purposes would amount to 2,292,000 homesteads of 160 acres each. According to the statistics, we had, at the last census, 6,000,000 farms of 146 acres each. If all this public land that is still in a state of reservation could be conserved and utilized for agricultural purposes, it would furnish homes to 2,292,000 homesteaders.

One of the great problems, perhaps the greatest problem, we have on hand today is the utilization of these lands. Fortunately, we have a large body of lands in forest reservations. I think that is one of the most fortunate things that has occurred in recent years in respect to our public lands.

Some years ago we tried to repeal the timber and stone law, under which so many of our valuable timber lands had been appropriated at a cost of not more than $2.50 per acre. While such a bill was passed in one house of Congress, it failed to pass in the other body, and as a consequence, if it had not been for the fact that so many of our lands were segregated and put into forest reservations, we would today have been in a far more deplorable and precarious condition in respect to our timber lands than we really are.

When we think of how our public lands have been disposed of in the past, it is appalling. We began at the outset by selling, aside from filling certain grants to officers and men of the Revolutionary Army and some of our other wars, from our lands, at public sale or auction, auctioning them off in large bodies, and then those lands that were not bid in at public sale were offered afterwards at private sale, and from that usage we got the term of "offered" and the term of "unoffered" land. Offered land was that which had been offered at public sale, and could be always purchased at a price of about $1.25 an acre. Land that had been offered at public sale and not sold, was later sold at any price bid for it.

After we had continued under that policy of selling lands, first at public sale and then offering the lands remaining at private sale, the United States took another step, which was to adopt the preëmption law. That, for the time being, was of great value and assistance to pioneers, because it enabled them to get a brief period in which to raise the money to pay for their land. Originally they could go and occupy land and file a declaratory statement, and have a year in which to pay for the land. Afterwards that was so modified that they could have two and one-half

years, and on surveyed lands the same period after the plats of the survey were returned to the local land office.

In addition to these methods of disposal, we soon got the homestead law, which, in its main provisions, has been one of the great home builders of the country; I mean one of the great instrumentalities that settled up our Western country and, barring some defects in that law, it is one of the best land laws that any country in the world has ever adopted or worked under. The defect of that law was what we call the commutation provision. Originally a settler could enter his homestead, and, after living on it six months, could commute by paying the Government the price; but, in many cases, instead of the man who made the original entry becoming the permanent occupant of the land, the property got into the hands of speculators. The law was subsequently modified so as to permit commutation in fourteen months, and at first the land office interpreted that law to provide that they could commute within eight months after the first six months in which they were required to settle the land. Afterwards the land office abandoned that construction, and today they require fourteen months' actual residence before they can commute.

But even under that provision, today the records will show that a large number of these homesteads are taken and commuted, and as soon as commuted and proved up and paid for, they pass into the hands of speculators and middlemen who hold them simply for a rise and not for the purpose of utilizing them for agricultural purposes.

In addition to that, we have had other laws. They were no doubt designed for a beneficent purpose, but in their practice they worked out unsatisfactorily. We had, years ago, what they called the timber culture law. The object of that was to promote the growth of timber on the prairies of the country, but experience showed that law was almost a failure. In many of the Western States, where they have these timber claims, a few trees were raised, but today on many of those old timber claims you can scarcely find a tree growing. That law was repealed. Afterwards they passed what was known as the timber and stone act, to which I have already referred. That law was no doubt passed for a beneficent purpose, simply for the purpose of permitting the entry of that class of lands that were wholly unsuited for agricultural purposes, and to permit those entries to be made by men who actually wanted the land for their own use. But in recent years that law has been made the vehicle under which the big lumber men have been enabled to secure a lot of land.

Then we had some other laws allowing men to relinquish lands in forests and other reservations, and select new lands in other parts of the country. Years ago Congress passed an act relative to what they called the Mount Ranier Reservation. It was within the limits of the North Pacific grants. A great deal of the land was of very inferior character, with little or no timber on it. Claimants were allowed, under the law, to relinquish that land and select other lands in lieu thereof, and under that law they selected some of the best timber in those Western States.

Under the timber and stone act, the law required in terms that the land should be sold at a minimum price of $2.50 per acre. Until recently, the Land Department has been construing that to mean the maximum price, and the timberland owners or other intermediaries who secured these lands have secured the most valuable pine land for $2.50 per acre. The Land Department has now adopted a new ruling, under which they interpret the law to mean that $2.50 is the minimum price, and that the Government can charge a higher price in proportion to the value of the land. If that rule is enforced, it will be a great protection for us, but in order to enforce that rule the Government, through its officials, will have to investigate and examine these lands, classify them and determine, so far as they can, the quantity of timber, in order to fix the price for which these lands should be sold.

My own notion as to these timber lands—and this is merely my own individual statement—is that all our public lands, whether in the shape of forest reservations or other public lands valuable chiefly for the timber, ought never to be sold, but that the Government ought to retain possession of them, guard them, and simply sell the mature timber from time to time as the necessity arises. That is the only possible way in which we can conserve our timber supply.

Now with reference to these agricultural lands—I call them agricultural lands, but I mean lands not covered with timber. These lands are commonly in the western portion of our country west of the Mississippi, in the arid or semi-arid regions. Some of them can be farmed by dry farming, some by irrigation, and some of them can be farmed by careful and prudent farming by the ordinary method.

I have grown up in two frontier States, first in Wisconsin and then in Minnesota, and I have noticed one thing, and that is the arid belt and frost belt seem to retire in the face of settlement. I can remember twenty-five years ago when the earliest settlers went to Minot, on the Great Northern Railroad, in North Dakota. When the early settlers went there in the first instance they were literally starved out. They all came back into the timber in Minnesota. Within the last fifteen years, settlers have gone in there and have raised crops successfully for the last eight or ten years, and that country is now considered as good for agricultural purposes as any part of the great State of North Dakota. The same thing is true in the matter of frost. I can remember some eighteen or twenty years ago, when our wheat in northern Minnesota and in that territory north of a line through Crookston and Grand Forks, was bitten by the frost before the crop was mature. We

have not had anything of that kind in recent years. Look now at the conditions immediately north of us in Canada. I was up there and visited that country, and to me it appears that both the frost line and the arid lines are driven westward and northward in the face of settlement.

I believe a great deal of this country today, that we have considered utterly useless at one time—useless, at all events, without irrigation—can be farmed successfully by prudent and careful methods.

I noticed as I was passing through that country how those crops which the farmer had out, who had the year before summer fallowed his land, looked much better than other crops. I was told by people in North Dakota that crops raised on summer fallowed land were considered pretty sure crops, while as to the other lands they were not at all sure, on account of drouth and hot winds in the summer.

My idea is that, for the welfare of our people and in order to furnish homes for our future population, we ought to save all this great region that has not yet been taken up under the homestead or other laws. That land should all be saved for homesteads for future generations.

There are plans pending in Congress to make homesteads larger. There have been plans, and they have succeeded in passing a law some years ago applying to certain localities in Nebraska, fixing homesteads at 640 acres. I believe bills are pending in Congress now for 320-acre homesteads. It may be that in one sense a 320- or 640-acre homestead is not too much; but we must bear in mind the amount of land we still possess, and the number of people who will want land in the future, and I think the wisest and safest policy, if we consider our future interests, is to limit our homesteads in all cases to 160 acres.

There is another problem. Of course, where the Government still retains ownership and control of timber lands, the problem can be easily handled by the Federal Government; but when you come to the matter of protecting our timber lands from forest fires and other damage, lands that are in private ownership and within the several States, you will find it to be a problem that pertains to the States and belongs to the police powers of the States. Our recent fire in Minnesota, last fall, where one of the prosperous towns, in what we call the iron range, was totally destroyed, as well as other fires we have had there, all demonstrate that one of the causes of forest fires, that makes them so dangerous, is the refuse that is left by the lumbermen when they do their logging. We think it is entirely within the police power of the respective States, for the protection of lives and the property of their people, to pass a law requiring lumbermen, when they do their logging, to burn up and destroy the refuse and waste matter, just as is now required by the Forest Service of the United States. But we must look to the States for that relief, and all we can do in this convention, my friends, is to give them good, fatherly advice and good sensible suggestions.

I think that the two great problems, or the two important questions, so far as our public lands are concerned, are, first of all, to reserve all our agricultural land simply for homes. In the next place we should reserve our timber lands absolutely in the Government, and sell nothing but the matured timber. In the next place—and I agree with that part of the report—it is well to segregate these different rights. The timber lands should not be sold, agricultural lands should only be sold so far as the surface goes, and the mineral rights should be held separately and disposed of separately. I am free to confess, however, that in respect to that question I have some doubt. I can readily see how, in the matter of coal lands—for instance, the lignite coal lands in Dakota—it is quite practicable to give the surface right to one man and the right to the bed of coal beneath to another man, and how the two men could work in harmony and unity; but when it comes to a matter of mineral claims, such as lode claims and placer claims, then there is some question about working out the problem. As a rule, most of the lode claims are on the mountain tops and mountain sides, and very little of the land covered by those claims is fit for agricultural purposes. The same is true in reference to placer gold mines. They are generally found in the ravines and gulches and beds of rivers —land that as a rule is not of much value for agricultural purposes. So it seems to me there is necessarily no conflict, and in making up this general report I felt perfectly safe in agreeing to the general proposition, and I think the commission has made a wise and judicious recommendation to the people of the United States. Bear in mind, gentlemen, we can only work out this problem completely and thoroughly by the active work of the Federal Government and by the active coöperation of the several States as well as the individuals.

When it comes to this matter of policing our forests that are in private ownership, the great work in reference to that must be left to the States. When it comes to protecting our own forests and controlling them, the Federal Government has absolute power in the matter. When it comes to the regulation of our water supply, the Federal Government has control of all these streams so far as purposes of navigation may be concerned. Governor Chamberlain yesterday, in his speech at the Belasco Theatre, announced, in my opinion, the correct rule.

The correct rule was laid down by the Supreme Court of the United States in the Rio Grande case, and that is that even that portion of a stream which is above the head of navigation, if it be the headwaters of a navigable stream, is nevertheless, on account of its effect upon the navigability of that portion of the stream lower down, absolutely under the control of the Federal Government.

Now, gentlemen, I have in the rough stated

to you how the problem appeals to me. I can only say to you that as a representative of our Federal Government, here in Congress, I shall aim to the best of my ability to work along the lines suggested by this report, so far as the interests of the Federal Government are concerned; but you Governors and you representatives of the several States have a greater problem even than we have, and we must rely upon you more than upon anyone else to coöperate with us in this very important matter.

I trust that, while we may not all agree as to the details, yet in respect to the great problem in hand, we shall all work together as patriotic American citizens, not only looking to our own immediate welfare, but to the welfare of the generations to come, in order that our country may continue to grow and prosper in the future as it has in the past.

Senator Nelson was followed by Governor Noel, of Mississippi, who spoke on the same subject—lands—also paying considerable attention to the subject of water, and especially the rainfall of the Mississippi Valley and the stream flow of that river. His talk bore largely upon conditions in his own State, though attention was paid to other sections.

ADDRESS OF GOVERNOR NOEL

IN OUR State of Mississippi, unfortunately, both Federal Government and State government have acted unwisely and rashly in the past. Our lands, State and Federal, have gone from us, gone from the people of the State, and gone into private and corporate hands. Very little, and that of the smallest value of any in the State, is now possessed by either. However, that does not diminish my interest, nor that of the people of Mississippi, nor that of the people of the United States everywhere, in all the lands in all the States and all the territories that are yet owned by these different States or by the Federal Government. It touches us. It reaches everyone. It concerns the seasons, as to whether they shall be moderate or strict, cold or warm. It concerns the rains, the floods, and all of that which largely affects us, as has been fully explained here and in the reports of this Commission. All these matters are inter-related and we are to a large extent governed and affected by them.

Governor Johnson spoke of the waters that we of the South get in the Mississippi River from Minnesota. So we do get water, and we get the mud and the floods from up there too, and we are interested—those who live in our State near its outlet—in the kind of water we get down there, because the muddier the water, the harder it is to handle, the more bars it creates, and the worse it is. We are interested in the way it comes. If there is an average rainfall in the country amounting to 8.51 inches, we want it to be somewhat more equitably distributed through the seasons than can be when the forests are denuded and the waters only pour down at one time, and instead of having the leaves, and grasses, and roots to lead it under the earth, a greater part of it is forced down upon us at once.

One-sixth in area, one-third in value, of Mississippi is in what is known as the Mississippi Yazoo delta. It is, when protected from water in excessive amounts, one of the most fertile regions for cotton and other products in the United States, but when overflowed, we can do nothing with it. Until the Federal Government came to our aid in the past few years, the overflows were frequent and very disastrous in effect. These overflows destroyed the utility even for the God-given purpose of agriculture.

We are interested in the matter of the Government increasing its forest reserves. We are interested in Minnesota and all the other States, and in all individual and corporate land questions, in seeing that they properly use those lands which were primarily intended for and now are best adapted to forests. When it comes to agriculture, we are interested in better agricultural methods, not only in our State, but in all the States of the Union; for whenever they adopt a plan to conserve these forests, then will the water be more equally distributed into the smaller streams and thence into the larger rivers and on down to the sea.

We are interested in all that concerns any part of the Union, but especially interested in everything that concerns the water that falls between the Rocky Mountains and the Alleghenies and the Gulf and the Lakes. A large part of that water comes down to us in unequal amounts and under unequally helpful or hurtful conditions. We are all interested in these matters, and we do feel that control and conservation of the Applachian Reserve and the forest reserves on the Rocky Mountains and everywhere else in all the States should be had. We are interested in all the methods of cultivation and we are interested in the advancement and betterment of the conditions of the people of this country. God has so arranged the world and its inhabitants and all its

SECTION OF LANDS

Hon. Knute Nelson
Hon. F. E. Warren
Hon. Swager Sherley
Hon. Herbert Parsons

Hon. N. B. Broward

Frank C. Goudy

James J. Hill

George W. Woodruff

Hon. George C. Pardee
Chas. MacDonald
Murdo MacKenzie
Dr. T. C. Chamberlain

material conditions that the best use of each individual, when seen in its larger and broader light, is the best use for us all. So we are interested in the diffusion of the knowledge which has been collected by this Commission, and shall watch with great pleasure its dissemination.

We are interested in having what has been collected here as data and statistics, concerning our natural resources, carried back to the individual, that it may enable him in his own affairs and in public affairs, whether of his county, city, State, or Nation, to be fully informed, and to make known his wishes and his interest, and that his representatives in public affairs shall reflect these wishes and these interests or else give way to others who will do so.

The greatest work I can do as Governor of Mississippi is to carry back to that State, personally and through its educational and State and county and other agencies, all of the data that has been gathered here for use and for the guidance of our personal business and official and political action now and hereafter—and that is what I propose to do.

Coming down to where it affects us personally, where the Governor can be of aid, I come from a State to which some allusion was made in the reports yesterday in the Southern Commercial Congress, where three-fifths of the population are negroes and two-fifths white. It is a great agricultural country. Our interests are agricultural. Politically, there is nothing to say except that we are more united than any other State in the Union. When it comes to our action on this question of conservation of our resources, I trust we will be as unanimous. This matter is of interest to each of us as citizens of our townships, counties, cities and States, and our Nation. Each will have its responsibilities and duties, and we as citizens, all desire to get all the benefit that each can bring in its appropriate sphere and province, so we are not jealous of the Federal Government, at least those of us who see it in the right light. We are grateful to the Federal Government; we are proud of our Government. We look for its help in many lines in which the State cannot or does not help, at least as fully as the Federal Government does. As an agricultural matter, you may ask in what particular lines the Federal Government has aided us. First, against the waters, that through the improvident methods of cultivation and deforestation have been thrown upon us in such hurtful quantities and qualities. The Government helps us in order to help navigation, and whatever affects navigation through its interstate commerce affects the Federal Government, and comes to our relief as it should do in Louisana and Mississippi especially, being two of the States on different sides of the Mississippi River at its mouth, through which all of these waters must finally be discharged. The Government came to our relief when the people of the Yazoo delta were unable to establish levees of sufficient strength to retain the waters. The Government sent an engineer of great efficiency, with a wide knowledge of conditions of engineering and levee construction which the Federal Government had obtained through all the world and through its various agencies, and which we ourselves did not have. It furnished the most experienced engineers and helped us to defray the expenses. Then when we had the water cut off, as we have had down there, the Government came to us again and gave us aid through its engineers in matters of drainage, and now we have cut off from the overflow of the Mississippi, the lands of that State, many of which are now available that were not theretofore of any use at all. When we came to the question of lands over which water stood an unnecessarily long time, the Government came to us again, and now the Government engineers are aiding the State engineers in making a drainage map of that territory.

The Federal Government, through its extended lines of activity, is doing for every part of this country a great and beneficent work. It is working along the lines to which this Commission has been turning, along the lines to which attention has been directed through President Roosevelt calling the Conservation Congress here last May; and the work that has been done by him since, and by his most able assistants here, through our chairman of this meeting, is the one with which we are all familiar. They have directed study and attention and thought to all of our natural resources, to their distribution, to their value, and to these agencies which were hurtful to us and to the remedies by which they could be relieved.

In behalf of a Southern State, of a State which, as I said, is united when it comes to politics, we wish to acknowledge our obligation, and gratefully we acknowledge it, to the Federal Government and to these most excellent and helpful officials for the services they have rendered us, referring especially to our worthy President and the chairman of this meeting.

Following Governor Noel's address, the session was open for general discussion. Governor Ansell, of South Carolina, opened the discussion with a reference to the bill pending for the Southern Appalachian National Forest. He spoke of the destructive floods of last year and commented at length upon the loss of soil caused by the wash of the torrents, and the relation

of forested headwaters to equable stream flow. He declared his deep and intense interest in the work of the Conference, particularly as it related to the conservation of soils, saying that if the Conference accomplished nothing more than to make people think, and act upon their thoughts, with a view to preserving for their children and their children's children the natural resources of land, waters, forests, and minerals to which they will justly be heirs, it will have done much.

Governor Broward, of Florida, followed with a few remarks along similar lines; after which Senator Newlands, of Nevada, offered some suggestions for practical cooperation between the States and the Nation in the work of conserving the natural resources of the country. His suggestions were for legislative or executive action on the part of the individual States, following a plan to be adopted, for the sake of securing uniformity of laws as between the States. The Senator's remarks called forth the statement from the Chair that already twenty-eight States have appointed conservation commissions, and that thirty or more National organizations have done likewise. The discussion was followed by the reading of the report of the Alabama Conservation Commission by Mr. W. P. Lay. The report follows:

ADDRESS OF MR. W. P. LAY

AS TO the reports from the States and the conservation commissions appointed by the States, I have the honor of being Chairman of the Commission, appointed for Alabama. We prepared a report and turned it in to your secretary, which I believe you have before you. I reserved a copy of that for myself. It contains probably fifty or seventy-five pages and takes up the subject fairly well, as best we could in the short time in which we had to compile it. We only reached the point where we could realize the arduous duties attached to the work, and the importance of the work. The further we looked into it, the more apparent became its importance.

We took up the agricultural question and the land question, as well as the question of waterways and the question of forestry and minerals. We found the study of some of those subjects extremely interesting.

I took up the subject of our waterways, and gave that matter considerable study and attention. I was one of these individuals whom you might probably say was suffering from water on the brain because of great study of this water question, and I had been for a number of years. In looking into the matter I found some very interesting facts and the field is one that offers great opportunities for study and research. Of our natural resources, I do not know of any that promises more results than are promised by a proper conservation of our waterways. Of course, I only took up Alabama. I did not go beyond the possibilities of our own State, but as a point on that, I will just quote a little here on the possibilities of Alabama and the water powers that can be developed in conjunction with the improvement of our streams for navigation.

We recommended very heartily a dual system of navigation and water power development, as our report will show, in connection with the system of impounding or storing water. Around the headwaters of our streams, as is the case in almost every instance in the United States, is generally found admirable locations for the impounding and storage of water. A careful study of that question promises very great results. As for the power development, it will promise about five to one, where you can increase the power development about five to one, but in my compilation here I have figured it on a basis of about three to one, leaving the balance of the flood waters to go to waste. In figuring it on a basis of three to one, I think the most economical and practical conditions, applicable to the Coosa River and the Alabama River in Alabama, are applicable to almost every stream in our country. Under question D-2 Water Powers, "What are the undeveloped water powers of the United States?" I said:

"Tennessee, with minimum natural flow, 162,000 H. P.

"Tennessee, with practical conserved flow, 396,000 H. P.

"Coosa, with minimum natural flow, 120,000 H. P.

"Coosa, with practical conserved flow, 360,000 H. P.

"Chattahoochee, with minimum natural flow, 115,000 H. P.

"Chattahoochee, with practical conserved flow, 230,000 H. P.

"Under the head of 'Navigable Streams,' I will say, it is probable the possible water powers on unnavigable streams will be about ten per cent of that on navigable streams."

This question was asked:

"To what extent can coal be saved by the substitution of water power?"

And to this question I responded as follows:

"Ten and one-third tons per horse power per annum. The estimated water power available for Alabama, as shown above, is as follows:

"With unconserved streams, 436,000 H. P.

"With practical conserved streams, 1,084,000 H. P.

"This means that it would require 4,505,000 tons of coal per annum to produce by steam the power of these streams in their unconserved state, and 11,201,000 tons of coal per annum to produce by steam the power of these streams in their practical conserved state."

If Alabama produced to-day 14,000,000 tons of coal, it would take 11,000,000 tons of that coal to produce the power of these streams that is now going to waste. Suppose for a moment that the coal fields of Alabama were sliding down and going over a precipice into space at the rate of 11,000,000 tons per annum; how long would it take the people of this country to rise up and demand that that waste be stopped in some manner? What is being done is to let our water go over the precipice, while we burn up our coal. It offers, if you please, a very great study and a very great opportunity for conservation. We hear our coal experts say they are looking forward to the time when our coal supply shall be exhausted, and yet in Alabama the power that is going to waste to-day is equivalent to 11,000,000 tons of coal per annum. That proportion would probably apply to every State in the Union. Many of our States will not be able to produce the power by water that Alabama produces, while others will produce a great deal more.

That is the power side of the question. In speaking of the advantages of the dual system of navigation and power, I have explained only the power. What can come to navigation in conjunction with this matter? We have a condition in Alabama on our streams, in the Alabama River especially, which has been a great stumbling block in the improvement of our streams, from the fact that they flow through an alluvial soil, and, with reference to the Alabama River especially, are subject to change in formation of sand bars. The able engineers of the United States have reported plans for its improvement, but they have never been sanguine about the success of these plans, in consequence of the alluvial soil and the formation of sand bars.

As a result, a study has been made of the question of impounding or storing the headwaters of the Alabama River, with the idea that during low water periods, those storages can be drawn on in aid of this navigation, and at the same time the water work its way through, turning the wheels of commerce in the production of manufactured goods. We find that our low-water periods extend over about sixty to ninety days on the Coosa and Alabama Rivers, and that only about once in ten years. We find that about 35,000,000,000 cubic feet of water stored in the region of the headwaters, will furnish a sufficient quantity, with intervening showers, to guarantee a discharge from that storage of about 4,000 cubic feet per second, thus carrying us over the sixty or ninety days of any low-water period that has ever yet occurred. The stream in its natural flow carries about 2,000 feet per second. With the addition of 4,000 cubic feet per second, as I say, which will only be necessary for sixty or ninety days, probably in every ten years, the stream then will carry a discharge of 6,000 cubic feet per second. With 6,000 cubic feet per second flowing down the Coosa River over the rapids, it will produce this additional horse-power which I have just read from the report, by passing through the numerous turbines which could be placed along the stream. We find thus that it will furnish on all parts of the Alabama eight and one-half feet of navigation at all periods of the year, except at one point, and that is at the Canton bar, and at that particular point it will furnish seven and one-half feet of navigation. While the river is within itself, we can hardly devise a scheme that will guarantee over four feet of navigation; while with this storage or impounding system, we have the promise, as I say, of seven and one-half to eight and one-half feet of navigation, which will solve the problem of the Alabama River more effectually than it is possible to solve it in any other way. Those conditions as they apply to Alabama would apply everywhere.

We find our studies along those lines hardly begun. The possibilities of the advantages that can be conserved by our waterways probably will apply to everything else—to our coal mines, ore mines, lands and forests. While the duty has been rather arduous, it has been very interesting. We have had no money at our command to enable us to obtain these results and this information, so we have had to go after it ourselves. We have done the best we could, and hope you may find it will be of some service and benefit.

Following the presentation of Mr. Lay's report, Doctor Van Hise, of the University of Wisconsin, representing the Wisconsin State Conservation Commission, read the report of that Commission on the subject of lands. Doctor Van Hise's address bore more particularly upon the subject of phosphate in the lands, the line of his argument being the reduced fertility of farming lands and the necessity for conserving the elements of fertility for the safeguarding of American agricultural interests.

ADDRESS OF DR. VAN HISE

REPRESENTING the Conservation Commission of Wisconsin, I am requested, in the absence of the Governor, to speak on one subject of the work of that Conservation Commission which is apropos to the subject under discussion this afternoon—the matter of lands. I might speak of the forest work, but that work will come up tomorrow and therefore I shall say nothing in reference to it, although the work of the Conservation Commission upon that subject is probably the most important work it has done.

The subject to which I shall call your attention for a few moments is that of the phosphate in the land. I select this particular subject because it shows the interrelation of the work of the State with reference to this subject. You may wonder why I, in Wisconsin, a State which has no phosphate deposits, should be especially interested in this question; but this is a question in which every State is interested, whether phosphates are present or not. Of the three elements of fertility in the soil which are most likely to be lacking nitrogen, potassium and phosphorus are the important ones. Nitrogen may be obtained by methods which I need not discuss; potassium is present to the extent of 0.2 or 0.3 per cent, and even if the deposits of nature are used up, we shall be able, by sufficient expenditure, to use the original rocks as the source of our potassium to fertilize the soil. Phosphorus is present in the original rocks to the extent of only 0.11 of one per cent. It is the element which is most crucial in the matter of soil fertility. Mr. Hill, at the conference last spring, told of the decreasing productivity of the grain fields, not only of the Northwest, but of the various parts of the country. The most important chemical factor in the matter is the depletion in phosphate. You who are familiar with the situation in the upper Mississippi valley may think that those wonderfully fertile States have a sufficient amount of this element, and yet an investigation recently made by the Agricultural and Experimental Association of Ohio, Illinois and Wisconsin, shows that already in these rich States that element has largely been extinguished. So far as I know the only quantitative studies which have been made are in Wisconsin. There the fields which have been cropped for fifty years, as compared with the original soil, have lost one-third of their phosphates. The Director of soil work in Illinois is here to speak for his Commission and will supplement my statement in reference to that State.

There is absolutely no way in which we can increase our supply of phosphate. If the loss for the United States has been as much, or one-half as much, as it has been for the State of Wisconsin, for the cropped fields for fifty years, a simple calculation shows that the entire product of our mines would be required for one hundred years to restore to the soils their original fertility in this element. And yet one gentleman who has made an estimate of the deposit of phosphate in Florida and South Carolina and Tennessee and given rough estimates as to the probable amount that may become available in the West, leads us to the conclusion that the supply of this element is inadequate, being sufficient to last for only fifty years.

Last month there was an announcement of the Franco-American Consolidated Phosphate Company, the capital of which is almost exclusively held abroad. This phosphate company has already purchased a large portion of the richest phosphate lands in Tennessee, which contains the largest supplies of phosphate in the United States, with the exception of these western deposits. What is the purpose of obtaining these lands? Manifestly, it is to ship our phosphates abroad to restore the depleted soils of Germany, France and Spain, for all three of those countries are represented in the capital of that company. Gentlemen, it seems to me there should be a law which would prohibit the exportation of a single pound of phosphate from this country. We do not want an export duty in this case. We want prohibition, the same kind of prohibition with reference to phosphate that has been adopted in the South lately with reference to another matter—absolute prohibition. To allow these deposits of phosphate to go out of this country is nothing short of agricultural suicide.

Under our modern conditions we are losing enormous quantities of these fertilizers. The investigations which have been made in Wisconsin by the agricultural stations with reference to this question, show that a large proportion of fertilizers is allowed to go down by the wash into the river and thence into the sea. Under our modern sewerage system, by which we dump into the rivers the sewerage, we also

are sending that valuable element into the sea. Here in the City of Washington itself there is going down into the Potomac and into the sea this valuable fertilizer. Upon that point, we have made a rough computation and we estimate that through the sewerage systems of the United States which dump their material into the sea, the equivalent of at least 1,200,000 tons of phosphate rock are lost annually. Upon the soil depends our food and clothing, and of all the fundamental questions which can come before this Commission, the preservation of the fertility of the soil is the most fundamental. If this is a correct conclusion, we must in some way stop this criminal waste of valuable fertilizer; for after all the amount exported is small, compared with the amount that is wasted by our improper methods.

Here is a great responsibility, and a great opportunity for the Governors and the teachers of agriculture all over the country. The people must be taught to realize their responsibilities in this matter. They must be brought to understand that unless elements of fertility are preserved, unless soil erosion is controlled, these fundamental resources, more fundamental than all other resources together, will become greatly depleted and will be able to sustain only a relatively small population.

You will ask the question, if I am right, how is it that the crops grow well in China and Japan and in Germany? In Japan especially, and to some extent in China, all the fertilizing element produced by animals and by man goes back into the soil. If this is done, the phosphate may be used over and over again and the fertility of the soil in phosphate may be perpetually maintained.

I dwell upon this subject at perhaps too great length because it seems to me to be one of the great fundamental questions before us and comes not only in connection with the matter of soil but also in connection with the report of the Conservation Commission which refers to education. This is one of the questions which the Commission in Wisconsin has taken up with reference to the question of its State, but you can readily see we cannot take it up in our State without thinking of the situation in the Southern States and in the Western States. No other subject shows more clearly how our future welfare is interlocked and how the Nations and the States and the individual must coöperate in this matter of retaining and conserving our natural resources.

Mr. R. H. Richards, president of the American Mining Congress, followed with a short talk upon the necessity for popular education along the lines of conservation of resources, referring to the necessity, also, for changes in laws governing mining and mine operation, so that the man underground may have the same legal and constitutional protection as the man above the ground. He was followed by Gov. N. C. Blanchard, of Louisiana, who commented at length on the report of the Section of Lands. Governor Blanchard took issue with Governor Johnson as to the impending exhaustion of iron ore deposits, and stated that it was his belief that the Governor of Minnesota was unduly optimistic in his views. He made a strong appeal for legislative action on the part of the different States, saying that through such action the great masses of the people of the country would be better and more quickly informed as to actual, present conditions than in any other manner.

Governor Blanchard was followed by Chairman Teal, of the Oregon State Conservation Commission, who read the report of that Commission.

ADDRESS OF J. N. TEAL

THE Governor of our State appointed a commission, of which I had the honor to be elected chairman. That commission has prepared a report and has printed it and filed it with the National Commission. There is one thing, however, that we discovered, which doubtless any State conservation commission will discover if it will go into the matter, and that is the tremendous wastage of our natural resources. Without going into that question at all, I think it is conceded that that is the fact. The next fact, which is also conceded, is that there must also be a stoppage of this waste.

The third question of law, which ought to be conceded, and if it is not conceded there is little good of going any further, is a question upon which we can all work with safety, and that is that we are trustees of a trust, that we have no more right to dissipate the principal of the fund that has been placed in our hands while we are temporarily here upon earth, any more than a trustee under a will, or a guardian, has a right to dissipate the funds of the children who have been placed in his charge.

Now, that is a fundamental fact. To illustrate. You take the question of a great water

power, which certainly is something which has been produced by divine Providence. The idea to me is entirely abhorrent that there is any legislative body that by itself, by its *ipsi dixit*, by the passage of a law, can make it possible for me to go and file in some county clerk's office and thereby acquire that water power forever and ever, and after me my children and their children, to own it forever and ever. I say that it takes an egotism, and such a depth of egotism that we do not often see, to accept that as a legal proposition or as a fundamental fact, or as a thing that is right; such an egotism that I, at least, have not reached yet.

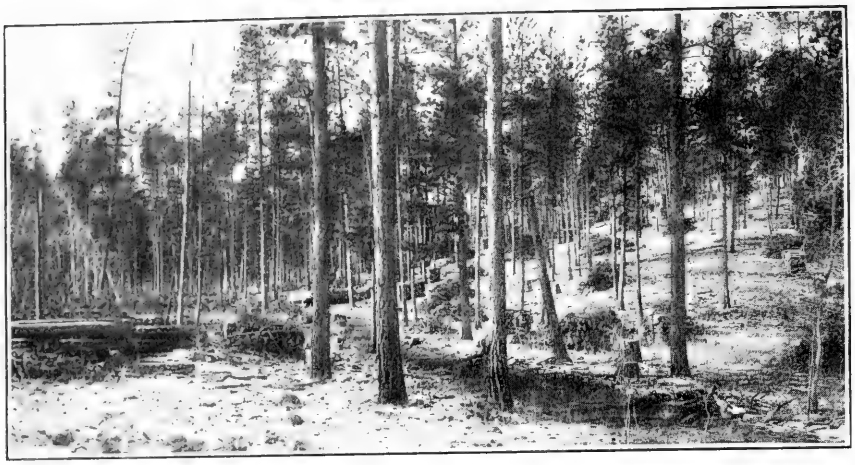
I do not mean by that to say that these powers should not be used. I would like the freest kind of use of them. But it should always be a beneficial use. There never should be any such thing as a monopoly of the powers of a great State in that direction or in any other direction, if I had the power.

In fact it is a good deal like resolutions that we pass. We believe in honest men and virtuous women, of course we do. We believe in the conservation of the natural resources. Of course we do. But how are we going to get at them? I believe that, before this convention adjourns, there ought to be some practical scheme devised, some basis upon which we could rest hereafter. And I have a basis. Many others may have other bases better than mine, but still I have one that I would like to suggest. I believe there should be a resolution passed, offered by some Governor—not by the representative of some Governor, but by some Governor—first, that the National Conservation Commission should be made a legalized body resting upon exactly the same basis of legality and right to exist as any other great department of the Government, with sufficient funds to enable it to carry on its work properly.

I believe that there should be the closest relationship between the States and the general government. I believe that the States should, through their Governors, make the connecting link between the National Conservation Commission and the State Conservation Commissions. I believe that the State's powers and the United States' powers should be coördinate, should work together.

If we do that, we will have a consciousness, anyway, of doing everything we can, of passing down to the future unimpaired the trust which has been placed in our hands.

Following talks by G. E. Condra, of the University of Nebraska, acting as representative of the Governor of that State; Doctor Rothrock, chairman of the Pennsylvania State Conservation Commission, and one or two others, the Conference adjourned until ten o'clock Thursday morning.



THURSDAY MORNING SESSION

Section of Forests

SUMMARY OF SECTION REPORT

THE United States now has 550,000,000 acres of forested lands, or about one-fourth of the total land area of continental United States. The original forests covered not less than 850,000,000 acres. Publicly owned forests cover one-fourth of the total and contain one-fifth of the timber standing; privately owned forests cover the remaining area and contain the remainder of timber standing. Scientific forestry is now practiced on seventy per cent of the publicly owned forests and on less than one per cent of the privately owned forests. The total yearly growth of our forests is less than seven billions of cubic feet; we take from the forests each year, including waste in logging and manufacture, 23,000,000,000 cubic feet, or more than three times the annual production. We use annually 100,000,000 cords of firewood; 40,000,000,000 feet of lumber; more than 1,000,000,000 posts, poles and fence rails; 118,000,,000 hewn ties; 1,500,000,000 staves; 133,000,000 sets of heading; 500,000,000 barrel hoops; 3,000,000 cords of native pulpwood; 165,000,000 cubic feet of round mine timbers, and 1,250,000 cords of wood for distillation. Not less than 50,000,000 acres of forest land is burned over annually, and since 1870 forest fires have each year destroyed an average of fifty lives and $50,000,000 worth of timber. One-fourth of the standing timber is left or otherwise lost in logging; the boxing of long-leaf pine for turpentine has destroyed one-fifth of the forests worked; the loss in the mill is from one-third to two-thirds of the timber sawed, and the loss in the mill product, from seasoning and fitting for use, is from one-seventh to one-fourth. In other words, only 320 feet of lumber is used for every 1,000 feet that stood in the forests. Our lumber cut has increased less than fifteen per cent in the last seven years, but the average price at the mill, for all kinds of lumber, has risen forty-nine per cent, and the rise continues. We invite by over-taxation the misuse of our forests, and we destroy by fire in one year timber enough to supply the whole Nation for three months. We should plant, to protect farms from wind and to make stripped and treeless lands productive, an area larger than that of the States of Pennsylvania, Ohio and West Virginia combined; so far, lands planted to trees make a total area less than Rhode Island. By reasonable thrift we can produce a constant timber supply beyond our present needs, and with it conserve the usefulness of our streams for navigation, power, irrigation and water supply. The conservation of public forests is the smaller task before the Nation and the States; the larger task is to induce private owners—three millions of men—to take care of what they have, and to teach woodusers how not to waste. We must stop forest fires; we must, by careful logging and other methods, reduce waste and leave cut-over lands productive; we must make the timber logged go further, by preservative treatment; we must avoid needless waste in the mill, the factory, and in use. We must plant up those lands, now treeless, which will be most useful under forests; we must

so adjust taxes that cut-over lands can be held for a second timber crop, and we must recognize the fact that timber costs no less to grow than to log and saw. We must continue and perfect, by States and Nation, the preservation by wise use of the forests already publicly owned, and we must extend the same treatment to other mountain forests more valuable for the permanent benefit of the many than for the profit of the few.

AT THE opening of the morning session of Thursday, December 10, the chairman suggested that the Conference direct the limiting of speeches to ten minutes, which was done. The chair also announced the appointment of a special committee from the Conference to attend a meeting of the Senate Committee on Commerce. Following this routine business, Senator Reed Smoot, of Utah, chairman of the Section on Forests, spoke.

ADDRESS OF SENATOR SMOOT

I TAKE it that we are here this morning for the purpose of seriously considering the vital questions affecting the conservation and preservation of the forests of this country. It is a subject greater than any man, greater than any State. It is as great as the Nation itself. Every man, woman and child of today, and everyone yet to be born, is interested in this great question. You have noticed in the discussions here that there is no doubt that the question of the conservation and preservation of the forests has played an important part, and therefore I am not going to make a speech and particularly call attention to any of the great resources of any particular State, because I take it every Governor here can sing the praises of his own State and speak of the wonders of its natural resources; but I will call to your particular attention and emphasize, if possible, some of the points that have been made in the report of the Conservation Commission to the Governors and which will be made to the President of the United States.

God has been lavish in placing in this land of ours all that makes life worth living. No country on earth has so many blessings naturally given to it, and it seems to me we have been, in the past, lax indeed in trying to preserve them, not only for ourselves, but for posterity.

Gentlemen, you heard the report of the Committee read in your presence on yesterday, in which it was stated that an inventory of our forest resources, the best we have ever possessed, has just been completed. This inventory is the result of the combined and vigorous effort of all the State and federal agencies concerned.

The facts which flow from this great accumulation of knowledge regarding our forests will soon be made common knowledge, as they ought to be. From these facts three great conclusions spring: The first, that the forest problem before the individual, the State and the Nation, is grave and urgent; the second, that we can solve this problem if we will act unitedly, vigorously and at once; the third, that if we fail to act, the possibility of a satisfactory solution will be rendered doubtful or even wholly removed. The time has passed for us to be content to dabble with the vital internal question which the right handling of our forests presents. It may well be our pride that no nation has a more wholesome and enthusiastic public sentiment for the right use of the forests than our own. But it may well be our shame that no nation takes poorer care of its private forests than our own country.

This is not the time for harsh criticism of the agencies which have brought about the deplorable condition of our forests. But it is the time for prompt, effective and united effort to remedy this condition. The time has long passed when the only need for the conservation of our forests was in order that we might fulfill our duty to those who came after us. The time is already here when for our immediate welfare the conservation of all forests, in private as well as in public hands, is absolutely essential. Forestry no longer makes its appeal to the American people solely through their sense of public duty. Its appeal now rests upon a firm conviction and foundation, not only of public duty, but of urgent and imperative industrial and commercial necessity.

I wish at this time to direct your attention to some of the special items of the commission's report, so that you may each be impressed with the importance of these particular facts. Consider the situation! This Nation began with half its area under forest. Today, barely one-fourth of our country is covered by forest growth. Only one-fifth of the standing timber which remains is in public ownership, and therefore belongs to the whole people. Four-fifths of what remains is in private hands. Year by year we take more and more wood from our forests, and year by year, by careless cutting and by fire, we lower their capacity to produce again. The yearly production of our forests by growth is seven billion cubic feet, a volume of timber so vast that the mind can scarce comprehend it; but a volume of timber over three times as large is taken from our forests each year. Nor is

this the complete indictment against us as a Nation, for our misuse of the forest. We invite, by over-taxation, the destructive handling of forest lands. We should plant, to protect farms from wind and to make stripped or treeless lands productive, an area larger than Pennsylvania, Ohio, and West Virginia combined. But so far lands successfully planted to trees make a total area smaller than Rhode Island.

It seems to me one of the most destructive elements of our forests comes from forest fires, and if the Governors can in any way, upon this point of view, educate the indivdual who owns the forest, this meeting will not have failed.

I was visiting the Appalachian country a short time ago and was upon the great Biltmore estate, and one of the party asked Dr. Schenck, the man in charge, if he had five million dollars, the interest on which was to be used by him for the preservation of forests, what he would do with it. His answer was, without hesitation, "I would use every dollar of it for a fire patrol." Asked again if he had twenty million dollars what he would do with that, he said, "I would increase my fire patrol just four times."

Since 1870, forest fires have each year destroyed an average of fifty lives and fifty million dollars' worth of timber. Not less than fifty million acres of forest is burned over yearly, and, as I heard one very prominent man in West Virginia testify before the committee but a few days ago, the forest fires of West Virginia alone this year have cost the State in the loss of timber five million dollars, and when we begin to figure on that great loss, we find that the fire patrol would have cost the State of West Virginia one hundred thousand dollars a year, and that that sum would be ample to protect it against forest fires. Think of it, gentlemen! The loss in one year is sufficient to patrol the State of West Virginia for fifty long years!

One-fourth of the standing timber is left, or otherwise lost, in logging. The boxing of the long leaf pine for turpentine has destroyed one-fifth of the forests worked. The loss in the mill is from one-third to two-thirds of the timber sawed. The loss in the mill product, through seasoning and fitting for use, is from one-seventh to one-fourth. The damage done by destructive forest insects is enormous and largely preventable. Only 320 feet of timber are used to each 1,000 feet, which stood in the forest.

Nor is the indictment yet complete. By the needless destruction of our forests we impair the value of our streams for navigation, irrigation, water supply, and power. We spend millions of dollars in river and harbor improvement to repair damage which, at the cost of mere thrift and foresight, could have been avoided. We deal with the effects and we ignore the cause. We discuss the exact scientific relation between the forest and the stream, when each year the total quantity of silt carried by our rivers as the result of forest denudation and poor soil management, would cover one foot deep a surface of more than nine hundred square miles. In our blindness, we have failed to take advantage of the lessons which the history of other nations contains. Most other countries have learned through bitter experience that forests which are not conserved will be used up, and they are taking care of what they have. We are among the last to learn it.

So much for the indictment. Every clause in it is absolutely true. What would you think of the business capacity and the foresight of an individual against whom such an indictment might be justly read? So much for where we stand. Now let us consider what must be done, and where might we stand if it were done.

These are the things which we must do; they involve no intricate machinery of law or practice; they are simply incontrovertible conclusions based upon the conditions which now exist and which must be remedied: First in importance is the conserving of forests in private hands. Private forest owners, which means three million men, and individual forest users, which means everyone, must practice reasonable economy in the woods, in logging, in milling, and in the use of timber. Above all, they must protect their forests from fire. This they can do at an annual cost equal to one-fifth of the damage forest fires do each year, not counting injury to young growth. And it is this young growth which, if preserved, would grow a constant supply of timber for those who come after us.

I do not ask of the private owner and user that he apply any economy which is not entirely practicable, and which does not mean present as well as permanent profit. I ask only that he protect his forest from fire, that he log it conservatively, and that he plant uplands suited only to forest, which have been so denuded of trees that they now fail even to pay the taxes levied upon them. To justify private owners in applying these measures, two main conditions are necessary, both of which exist today: the one, a knowledge of the central fact that these measures are needed and that they will pay; the other, the availability of knowledge as to how these measures may best be applied. If anything that I could say to the Governors today seems more important than another, it would be to return home to your States and educate the people.

One of the urgent tasks before the States is the immediate passage of tax laws which will enable the private owner to protect and keep productive under forest those lands suitable only for forest growth. In our discussion as a committee of the whole there was a question raised by some one present as to this recommendation, claiming that it was or would be at least the means of great monopolies securing more land and holding it where the timber would not be taxed.

I have studied this question in foreign lands, in Germany and Switzerland in partic-

SECTION OF FORESTS

Hon. Reed Smoot
Hon. A. J. Beveridge
Hon. Chas. P. Scott
Hon. Champ Clark

J. B. White

Gustav H. Schwab

Henry . Graves

O. W. Price

Wm. Irvine
Hon. N. C. Blanchard
Chas. L. Pach
Irving Fisher

ular, and I find that the result has been exactly the opposite. It does seem to me that the great monopolies which will try to control them can much better afford to pay taxes on great tracts of land than the individual man with scanty means at his command, who believes in reforestation and yet upon whom the tax would be a burden so great that it would be almost impossible for him to carry. I believe with all my soul in the tax laws as recommended in our report, and that they should be changed according to these recommendations. It is a shortsighted policy which invites through excessive taxation the destruction of the only crop which steep mountain lands will produce profitably. Taxes on forest land should be levied on the crop when cut, not on the basis of a general property tax—that unsound method of taxation long abandoned by every other great nation. Another urgent task before each great forest State is not only the passage of adequate fire laws, but their actual enforcement. More is needed to protect the forest from fire than a law upon the statute books. It requires the definite commitment of all the States to their inherent responsibility for the protection of the forests within their boundaries from fire, and that entails, and absolutely entails, the employment of a trained force whose first duty is fire patrol.

The Nation, through the Federal Government, confronts the urgent duty of conserving all, not merely a part, of the public forest lands by use. Until this standing timber is adequately protected and conservatively used, not only as at present on National Forests, but on all other public forest lands as well, its very existence is imperilled. Grave injury has already been done. It would be a national disgrace should it continue.

I have recently visited that great and beautiful forest region which lies within the Southern Appalachian Mountains, and I have this to say regarding the proposed purchase of a small portion of it by the Federal Government for the permanent use of the whole people. I believe as firmly as I believe that I am standing here on this platform, that unless adequate action is taken, and taken soon, the destruction now going rapidly on in the Appalachian Mountains will either become totally irretrievable, or retrievable only at an expense so vast in time and money that it would stagger this Nation. I do not believe that it is necessary or advisable for the Federal Government to acquire all mountain forests in this region, nor half of them, nor a fourth of them. The purchase of one-twentieth of these mountain forest lands, their protection from fire, and their conservation by use, would solve, and solve satisfactorily, this grave and urgent problem. But this entails, as every other effective national measure for the preservation of the forest entails for its success, the coöperation of the States concerned, through fire protection, and of the private forest owners concerned, through better care of forests in private hands.

These are the incontrovertible conclusions which flow from the knowledge of how we stand along main lines with relation to the forest. Unless we do these things, our forests will inevitably fail, and the failure of our forests means the erosion of soil upon the mountains and a falling off in the usefulness of our streams. Action upon each of these conclusions requires no vast expenditures, no upheaval in present economic conditions, but merely the exercise of reasonable foresight and thrift by individual forest owners and users, and all the States, and by the Nation. No one of these great agencies can alone solve our forest problem. They must work together, unitedly, vigorously, adequately, and at once. If they act, together and now, we need not worry greatly about our future timber supply. If they fail to act, it will mean inevitable and grave timber scarcity in the near future, an actual timber famine for those who come after us.

We can no more disregard, in our use of the forests, than in our use of the mine, of the stream, and of the farm, the fundamental truth that want follows close upon the heels of waste. But we should be thankful as individual forest owners and forest users, thankful as individual States, and thankful as a federation of States, that the time for the application of an adequate remedy is not wholly past. Grave injury has been done to our country, which cannot be repaired in a year, nor a decade, nor wholly effaced in a century. But the fact gained by our present inventory, above all other facts in importance, is that if we act at once we still have forest enough to produce under right management at least what timber we need.

The cause of practical forestry is a just cause. On the one side are established habits of wastefulness and of misuse. On the other side is the doctrine of common sense, of business sagacity, of public duty. Because I believe in the American people, I believe that they will follow the right course and turn away from the wrong in this, as in all other crucial questions, upon which depends the permanent welfare of our country.

After brief addresses by Messrs. Page, of Virginia, and Howell, of Wyoming, in which both speakers dwelt upon the magnitude of the task of preparing for a sensible, utilitarian method of conserving the resources of the Nation, and the absolute necessity for cooperation between the States and the Nation, Senator Edwards, a member of the Canadian Parliament, was called to the platform, responding with a short but interesting talk.

ADDRESS OF SENATOR EDWARDS

THIS is the first time I have ever appeared before an audience of the great Republic of the United States, and it gives me great pleasure, I assure you, to do so on a subject which is very near and dear to me, that of the conservation of our natural resources.

I am here at the instance of the Government of Canada, a government having the kindliest feelings of regard for everything which means the promotion of the good of the great United States.

Before leaving Canada, I asked his Excellency, the Governor-General, "Have you anything to suggest to me about what I shall say or to which I shall particularly refer?" He said, "No, further than to join with that great and progressive man, Mr. Pinchot, in promoting the object which he has in view in this gathering."

Before I overlook it in the short time I have to address you, I wish to mention now that I also asked our Prime Minister if he had anything special to mention. "No," he said, "I think you are full of the subject upon which you are going, but there is just one thing on which it would give me great pleasure, if the Congress which is to meet in Washington on the conservation of natural resources would pass a resolution, suggesting that the Government make most stringent laws with regard to railways, in regard to the prevention of fires, for in my opinion they are great disseminators of forest fires." His reason for making that suggestion is that if it should come authoritatively from this source, he would have it in his hand as a lever to enable him to pass a similar law in Canada.

I wish before proceeding, to congratulate, in the most hearty terms, your President and your worthy chairman for what they are doing in this respect, in the promotion of the conservation of the resources of your great country. I have heard, during the speeches and addresses here, matters which interested me intensely. I am repaid for coming here, if to have heard nothing at all but the presentation of the first report and inventory of your natural resources, and I would have gone many, many miles to have heard it and many miles to have heard many of the other speeches.

The question this morning is that of the conservation of your forest resources. Like ourselves in Canada, you have been prodigal with your resources. You have unduly destroyed that great resource, and so have we. A speaker a short time ago said, however, that twenty times as much had been destroyed by forest fires as ever was destroyed by the lumberman's axe. I subscribe to that. That is my opinion. Therefore, the greatest means of preventing that great destruction is the prevention of forest fires.

What is the meaning of preserving our forest resources? Not only their conservation for the people, but also the conservation of our waters for power and the many other purposes to which water may be applied. In Canada we are devoting ourselves today to the same objects to which you are devoting yourselves—aided and promoted very largely by our friend the chairman, who occasionally visits us in Canada on this very important subject.

We have heard something of your inventory in other resources as well as those of lumber. Your country, of course, is a very large one, and your resources in respect to lumber have been greater than ours, but today we are supposed still to have 535,000,000 acres of forest lands. Out of this quantity of forest lands, the government has set aside, as forest reserves, 121,000,000 acres. I do not know how that compares with yours, but I will say this: Thanks to forestry, thanks to the initiative which has taken place with regard to the conservation of our resources in that respect, if Canada takes the lessons that it should take from such gatherings as this, and even at this late day awakens to the necessity of conservation and promotion of forestry. Canada, in so far as her own needs are concerned, need never want for a supply of timber. I am not of the opinion that Canada can be a large exporting country for many years to come, but it will be a great thing for Canada if she is able to conserve lumber for her own needs. Let us hope that the great American Republic will do the same thing, and I believe it will do so, if regard is paid to the lessons which are here taught, if this country becomes imbued, as I hope it will, with this great necessity; and if this comes, I think possibly the United States also need never want for a lumber supply.

In listening to the speeches that have taken place here, two things have been very forcibly impressed upon my mind. I never thought before of the important part water may take in the conservation of your coal supply and in the conservation of our coal supply. Our coal supply and your coal supply may become exhausted. Your iron and our iron may in many years become exhausted; but our water supply, if we preserve the headlands in our forests, never will become exhausted. We are doing exactly what you suggest; we are beginning to impound our headwaters to conserve our water supply. If you do what you can do in that respect, look at the great possibilities that there are of today beginning to conserve your coal, which is a disappearing quantity.

Another thing which impressed me was, what are we going to do when our iron supply becomes exhausted? I was a little surprised to hear that in the middle of the present century iron, as used today, of the quality used today, will become exhausted. To my mind there is one article anyway that can be considered in the way of conservation of iron ore to a very great extent, and that is the use of cement. I am a lumberman, and a lumber-

man on somewhat of a large scale, but I do not build one single structure today of lumber. Every structure that I build is of concrete and steel—largely of concrete. I built a large mill of concrete this very summer, and built a large factory establishment also, all of concrete. It sounds strange for a lumberman to advocate anything of the kind, but I am one of these lumbermen who believes strongly in the conservation of our forests.

Just before I part from you, there is one thing I desire to say to you. Canada has the advantage—and I am surprised to be in position to tell you so, and you will be surprised to hear it, many of you—Canada has the advantage of having secured a large portion of her lumber supply this year from the United States. I am a lumberman and it sounds strange to come from me, but I want you to send it on. Keep sending it to us. Our timber will grow in the meantime, and we will profit later on.

Mr. Lathrop, representing the State Conservation Commission of Alabama, was then recognized for a brief address. He stated that the leading timber authorities are at one in stating that former estimates of Alabama's timber resources are entirely at fault. He stated that not more than ten per cent. of the original timber stand of the State remains, and that the denudation is progressing at an alarmingly rapid rate. Much of the remaining timber, he stated, is second growth, immature trees such as, if properly cared for and scientifically lumbered, would constitute a constant timber resource; but he added that, under existing conditions and with present methods, by far the larger part of this immature timber is being destroyed and wasted. Of the thirty-five counties of Northern Alabama still containing merchantable timber in commercial quantites, he stated that one-third would, within the next six to ten years, be cut over and converted to the uses of agriculture. About one-half of the lands in the territory mentioned are unfit for cultivation and should be made into State or National forests.

A short address by Mr. Andrew Carnegie followed:

ADDRESS OF MR. ANDREW CARNEGIE

CIRCUMSTANCES over which I have no control have prevented me from being with you before. I want to tell you how enthused, how elevated, how delighted, how instructed I have been by this meeting. I have not enjoyed a morning like this at a meeting for a long time, and I will tell you why.

The great obstacle to the reforms that we work for today, the conservation of our resources, lies in a Federal system of government, the general government. None of us would part with that. The relation of the Federal Government to the States is a matter of decided importance, of course. That relation should continue. We must have it. The great obstacle today, as you see, is to get the States and the Nation to work together. That is the one obstacle we must overcome. I told the Waterways Commission a story to show how rapidly we are advancing and sinking the State into the Nation—not obliterating it, however. We are all citizens of some of the States, Pennsylvania, Alabama, South Carolina, Virginia, Minnesota, and others. We are something higher and wider than that. We are all Americans! Let us remember that.

I asked Mr. Blaine once, "What is the most effective speech you ever heard in Congress?" "I will tell you," he said. "It was the first time that it was proposed to appropriate National money for fresh water improvement, and the House became excited and angry. Governor Ritter, of Pennsylvania, had been elected a member of Congress. He had never spoken and had never risen, but to the astonishment of the Speaker, the old gentleman arose. The House hushed in a moment. Everyone asked, 'What is coming?' Governor Ritter said:

"'Mr. Speaker, I do not know anything particular about the Constitution, but I know this: I would not give a cent for a constitution that would not wash just as well in fresh water as it did in salt water.'"

The House did what you did, gentlemen. It burst into one storm of applause, and that bill was passed, and that is the foundation of our whole fresh water improvement today. Go on in that direction. Let us go further and further in that direction, and all will be well.

I wish to say something to the gentleman from Canada. I am a broad American. No lines confine me in that respect. The city of Winnepeg has a library. They founded a historical society, and the first honorary member was your humble servant. I wrote them telling how delighted I was, first, because

they were Scotch, and second, they were our great neighbors, and they were going to record their history as they made it—they are up to date. Then I said that I always figured that Canada occupies with reference to the United States the proud position that Scotland occupies with regard to her southern neighbor, England. Scotland, through its King, annexed England and has ruled it ever since for England's good.

Now, that is the destiny that I predict for North America. Canada will play the part of Scotland; she will annex her southern neighbor and do incalculable good to us in giving us more of the strain of that invaluable element which has made North Carolina and South Carolina so great, the Scotch.

Gentlemen, that is all I wish to say to you, but remember one thing—and it is an audience like this that will promote it. You are State people; but, thank God for this, even above your love for your State you have the greatest empire that ever the sun shone upon, and you are progressing splendidly, you are marching forward rapidly! You people here, you performers, and you, my dear friend, Mr. Pinchot, think we are not driving fast enough. We are driving pretty fast, gentlemen, we are driving well, and there is no limit to what this great continent is to be in the future.

Following the speech of Mr. Carnegie, the chairman called on former Governor George C. Pardee, of California. Doctor Pardee, in his remarks, placed President Roosevelt among the three American Presidents who stand head and shoulders above the others—Washington, who created the Nation, Lincoln, who saved the Nation, and Roosevelt, who has done more to perpetuate the comfort and assist the progress of the Nation than any other Chief Executive.

Doctor Pardee spoke of the effects of deforestation, and cited for examples the Holy Land, China, Spain, and other Old World countries. The fate that has befallen these countries, he said, through destruction of the forests, is the fate that will befall our own country if we fail to heed the warnings we have had, and if we do not profit by the experiences of the countries that are now suffering because of the disappearance of their wooded areas.

"We put on the uniform; we shoulder the musket, we follow the flag in time of war, and we do not hesitate to suffer for the good of our country. But there are greater crises than those of war. There are problems of peace; and it is one of these problems that confronts this country now, as we of the West know better, perhaps, than you of the East and the South. One of the problems that confronts us—one of the greatest importance in its bearing upon the present and the future—is the salvation of the country through the salvation of its forests. The perpetuation of those great natural resources which have made, which are now making, and which will, if we save them, continue to make us great—this is what the salvation of the forests means. And that can only be done when the people of the States remember that, while the States are great, the American Republic is greater than them all."

President Evans, of the American Automobile Association, and a member of the Pennsylvania State Conservation Commission, followed Doctor Pardee with a talk on good roads, in which he referred to the work that is being done along the line of permanent highway improvement by the various States, with particular reference to the Eastern States. He urged the need of uniform legislation in regard to roads and their maintenance. He referred to a remark made by a Pennsylvania farmer, who said that he did not object to using four horses to haul a load uphill, but thought it was going too far to be compelled to use four horses to pull it downhill, and said that that condition of affairs was typical of much of the highway system of the United States. The speaker concluded with the remark that he hoped soon to see the National Conservation Commission in touch with the practical, everyday necessities of the people in many phases of economic work and thrift which do not lie strictly within the borders of the great, broad subject of forest preservation, mining or the other branches of conservation work.

State Forest Commissioner Whipple, of New York, followed with a stirring address. Running past his time limit of ten minutes before the conclusion of his address, the Conference unanimously agreed to an extension of time, to permit Mr. Whipple to finish his remarks.

ADDRESS OF COMMISSIONER WHIPPLE

I AM very much in doubt whether a plain, practical man ought to take much of the time of a convention like this, where there seem to be so many scientific men; but to me it has always seemed that what we call in Western New York common horse sense is so much better in working out a difficult problem than, sometimes, technical knowledge alone is, that perhaps you can stand a little just now.

Forestry in this country is very young—practical forestry, that is. I have listened here for two days, and I listened last spring at the other conference, to splendid things said and great thoughts pronounced; but very few men have suggested remedies that it seemed to me we could apply our hands to and do something.

The paper on forestry this morning was a splendid paper; but I have to say, Senator, that you left out the one great, important thing, after all, and I hope you will pardon me for saying it—you have not said a word about how to reproduce forests, practically.

Now, it is all nonsense to talk about our having forests enough by natural reproduction, and you all admit it. You say that we are cutting off our forests three and a half times faster than nature reproduces them. If that is true, that is the whole proposition, is it not? How long is it going to be before you have no forests, however carefully you handle them?

The gentleman from Alabama thinks that they have forests enough, if practically handled, to take care of the interests down there for some time; but do you not know that you are cutting forty billion feet a year out of the United States forests, and a billion five hundred million feet out of my own State's forests, and if you will look at the charts, you will see that that is a small part of it, and still it is more than three and one-half times the growth. If you admit that fire is sweeping away more than you cut; that one-third of what you cut is loss; that your population is increasing so fast that in fifty years you will have two hundred million people in America; that the demand for timber is increasing faster than your population, and that the supply is decreasing much faster than either, what are you coming to in America? That is the question I am asking.

You are using yearly two billion feet board measure for newspapers alone.

In the State of New York there is standing today only about forty-one billion feet of saw timber. We are cutting it five times as fast as it is produced. The State owns a million six hundred thousand acres of that timber land that must be deducted. What is our situation? In twenty years, at the rate we are going, not one sawing stick will stand in the State of New York; and we are even now getting eighty-eight per cent of our pulp wood from Canada, even if our good friend does insist that some lumber goes back to Canada.

What is the remedy? That is the question. We cannot take it out in resolutions and talk; we have to do something.

We have to get out, every mother's son of us that has an acre of land that is not good for agricultural purposes, and plant trees. It will not do to set land aside to the National Government and the States as forest reserves alone; we must economize in every way possible; but above all we must plant trees.

Germany has planted trees for a thousand years, and all of its forest is a planted forest park. The German people produce one hundred thousand feet board measure upon a single acre. The best timber in this country, East and South and West, until you get to the great trees of the far West, will not run over twenty thousand feet to the acre. We have got to be practical. We have got to use common horse sense.

What ought you Governors to do? Allow me to speak just as plainly as I can, in the Western New York way. Go home and establish a Commission, if you have not done it already and put a Pinchot at the head of it. Then furnish it money, and don't get down on your knees, or anywhere else, and implore the National Government to set aside some State land as a National forest; do it yourselves.

You may kneel at the shrine for years and you won't get it done. The way to do it is to do it yourselves. It is in your own hands. Get a little State forest preserve. And then handle it freely. Don't do it as we are obliged to do under the Constitution of the State of New York; that is, let it stand here and rot and burn up, and not be able to take out a single stick. Be practical about it! Build some tree gardens and put the last dollar into it that you can raise. Plant every year some millions of pine trees. Hard woods reseed themselves; they come up from the sprout; but the coniferæ in this country must be planted, as every practical man knows. You sweep away a pine or a spruce or a hemlock forest and it will never grow again; those trees must be planted. In Canada and some other places it does reforest pretty well, but not in our country. Be practical. Don't

do so much wishing and resolving, but do business.

The next thing you want to do is to go among your people; go out as missionaries among the people. Do not get it into your heads that all of our people, and even our legislators, know about this business, for they don't know about it. None of us have known much about it except for a few years.

In 1885, in the State of New York, the first Commission in the United States was organized. At that time not one single educated forester lived in the United States, not one forestry school existed at any college of the United States. Twenty-three years ago! And it took us twenty years to do the preliminary work, and it is only within the last three years that we have aroused the whole people in the State of New York. How did we do it? We got out among them, at their homes, and made speeches; told them of the wonderful cut of timber, and the great amount it was over the natural production. We told them of the history of China, and of France, and of the other countries, where the timber has been swept from the hillsides and the land denuded and made worthless for agricultural purposes, as the Governor from California told us about a moment ago.

You cannot have a country worth living in without forests, and the proof of it is the history of the whole world. You cannot have water flowing from the uplands without forests.

You are talking about conserving forests. New York City has spent $150,000,000 to build a reservoir at Kingston to get water for the four million people in the City of New York. If New York City does not protect the trees upon those historic hills, the Catskills, that reservoir will have been built in vain, and they will have to go somewhere else for their water supply. Why? Because, when you destroy God's reservoir under the trees, man can never build one as good. It takes that natural reservoir to keep and hold the water, and you can only keep that on the hillsides by keeping the trees there.

Someone in the report of this Commission has said that there is as much water as there has ever been, and that we could not create water. Those men that drew the original report of this National Commission are mistaken. You let a spring dry up on a mountain side because you have taken the trees away. That water is gone. It has gone from thousands of our springs today. But you reforest that hillside and you will reproduce the water. Those springs dry out because the forests are gone, but you reforest the hillsides and the water will come back.

There is too much to the subject for any man to undertake to cover it in ten minutes. You have to have forests in the country, ladies and gentlemen, because of a hundred things. First, it affects the climate. It affects the rainfall. It is valuable to the agricultural industry.

Without forests, in a rolling State like New York, or like Pennsylvania, you cannot have producing agricultural land. Am I not right? If water is not absolutely necessary to good farm lands, tell me why it is that the arid lands of the West do not produce without it. Tell me why it is that that far-famed, beautiful valley of the Euphrates, that we have heard so much about in song and story, that was once as beautiful as a dream, because of its forests and streams, is today a howling waste? Simply because the forest trees were cut away and the waters dried up.

You must have water. You must have the forests in order to have the water.

Now, hear me. You men from Kansas and from Ohio, and from Indiana, or any level State, do not need the forest trees for agricultural purposes so much as we do in New York and Pennsylvania and the East. Why? Stop and think. In New York State all but four of the great rivers of the State head in the Adirondacks and Catskills, in that two thousand feet high upland plateau. The streams, when not protected, run rapidly away and the water is wasted. It does not even have a chance to evaporate. But on the level plains of Kansas it falls upon flat land and it soaks into the ground; it saturates the soil, it produces moisture necessary for weeks and for months, for the crops to grow upon the land.

We of the East must have the forests. You can get along out there if you don't have so much forest.

So it is rather a local question in respect to the farm lands of the country. We have got to have forests because of their effect upon the healthfulness of a country. Do you not know that the forest trees are constantly pouring off into the air great quantities of oxygen; that they take up the things that are poisonous to your life and grow upon it, and that they furnish that which we must have? Do you not know that they have a wonderful effect upon the temperature of the country? Can anyone tell me why it is twenty-five degrees cooler in July at Lake Placid or Saranac than where I live in the Alleghenies, in the same altitude, two hundred miles further south? For no reason in the world except that splendid forest that covers the upland in the northern part of the State of New York.

Let me make it perfectly clear to you by the simplest illustration. If forests are not as valuable as I say to a country, what would be the condition if today, through some great force in nature, every tree and shrub should be swept from the face of Pennsylvania or New York State? Would not chaos reign tomorrow? Would not the home of every wild bird and every wild animal be destroyed? Would not every stream be uncovered? Would not the surface of the land be like the roof of this building, for the water to fall on it and run immediately to the stream and down to the great sea and be lost forever? Would not the price of agricultural land in those two States depreciate in

fifty minutes fifty per cent? If it would not, then the history of China is a lie; then the history of France is false. Three hundred years ago France swept the forests from its hillside, and its soil was eroded and washed into its harbors. If what I say is not true, then France has spent $200,000,000 since then to reforest its mountainsides for nothing.

The country that does not have forest growth is like a house without a roof—uninhabitable and worthless to the people.

You may talk about preparing your Mississippi for transportation of the products of the country. You may talk about the conservation of your coal and iron and gas and oil and all that. Coal, iron, gas, oil and other minerals are only created once in the creation of the world, and all you can do is to handle them as carefully and as economically as you can; you cannot replace a pound of them. But your forests—the great objective point, it seems to me, in these splendid conferences we are having—must be saved, and you can only save them by careful handling and by planting.

Now, go home, and get your legislatures to furnish the money. Build your tree gardens. Go amongst the people and relieve their land, that is dedicated to forests upon the farms, from taxation. Encourage your people. Give them the trees free. Let the State furnish its people with the trees free of charge in order to encourage them, and then relieve them from taxation on the land dedicated to the forests, and you will get every farmer to raising trees.

Think of what we in New York are doing. The pioneer in the work, twenty-three years old. Held up sometimes as an example. We are doing a lot of things that we do not ask the National Government to help us in. We know we would not get its help. We are going to take care of it ourselves. We are spending $500,000, $600,000, $700,000, $800,000, $1,000,000 a year in buying land, and we are going to keep it up.

Get your farmers to planting trees. We are building tree gardens all over the State, raising millions and millions of pine trees. We don't plant the poor kinds of trees. We get the best commercial tree, that grows the fastest. The hardwoods will take care of themselves if we let them alone and keep the cattle out. Plant pine trees, plant spruce trees, plant in the South the tree that grows the best there and is the best commercial tree. But you have all got to plant.

What are we doing? Every Christmas we are cutting off two million conifer trees, and the State last year planted one million nine hundred thousand of them. So we went back one hundred thousand trees last year in that respect. As I have said, our State is the pioneer in this. We are asleep in America on this question. We have to get practical and get down to business and plant trees or in twenty years our children will curse us for our negligence.

Mr. Whipple's address was so frequently interrupted by applause that the continuity of his remarks was somewhat broken. At the conclusion of his talk Governor Johnson arose and asked for time to interrogate the speaker. He asked that he be enlightened as to the remedy for existing conditions. He said:

"Plant trees! I heard that last May, at the White House Conference, until I was black in the face. I have heard it out in my part of the country for the past ten years! This thing of planting trees is all right. We have got to plant the trees; but the Governor does not own the farms of the people of the State of Minnesota any more than does the Governor of the State of North Carolina, or any of the other Governors. He cannot go home and make the legislature do whatever he wants with the public moneys of the State, because the legislature in the State is the custodian of the public moneys and that is true in every State in the Union.

"We want these discussions; we want all the information we can get on this subject, and I was very glad that the last speaker mentioned the matter of exemption from taxation of forested lands as means for encouraging the planting of trees. It is about the only reasonable and practical suggestion I have heard here.

"With regard to the matter of forestry, I think there was offered at the White House Conference last May the best suggestion that has been made, either here or there. Unfortunately it introduces a political question. But are we going to avail ourselves of the vast areas of Canada, by reciprocal trade relations, or are we going to continue the barrier in the way of an imaginary line, which will not permit us to bring in Canadian lumber as a means of protecting our own timber supply?

"I know full well that there are men here attending this Conference who are personally interested in the manufacture of lumber in the United States, and

who are doing all they can to make this country continue to refuse to take any action that looks toward the bringing together of the great interests of Canada and the United States, and I hope the Conference will be big enough to look clear over the heads of any men who have a personal and selfish interest.

"I would be glad to have the suggestion of a specific and definite remedy. In my judgment we must retrace much of the ground we have already covered—and lost. I know something of the preserves where ten per cent of the trees must remain, and in my judgment, Mr. Pinchot, that remedy is an absolute failure, because the ten per cent., lacking the protection of the surrounding trees, either die, break down or eventually give way.

"It seems to me that it would be better to preserve great tracts of timber. But there is so little that any of us know—even, I think, the gentleman from New York, who failed to name a specific remedy—that we ought to be willing to learn; and I would like to take home with me one great idea and say to the legislature, 'Do that!' If the gentleman from New York will give me the opportunity to do it, I shall be his servant forever."

The speaker was compelled to wait several minutes, until the applause died out, when the session was, for a time, turned into a sort of joint debate between Governor Johnson and Commissioner Whipple, the chair at times taking a hand in the discussion. The discussion continued for some time, and during the talk several interesting points were brought out, that perhaps would have been overlooked but for Governor Johnson's insistence upon something specific.

Following short talks by Governor Blanchard, of Louisiana, Professor Rene, chairman of the Massachusetts State Conservation Commission, and others, the session adjourned.

(To Be Concluded in February Number.)

THE RIVERS AND HARBORS CONGRESS

Fifth Annual Session, Held in Washington, D. C., December 9, 10, 11, and 12—Five Thousand Delegates Present Congressional Support Pledged

THE fifth annual session of the Rivers and Harbors Congress was held in Washington, at the New Willard Hotel, December 9, 10, 11 and 12. Five thousand delegates were in attendance, among them many of the Governors and others who were in Washington for the Joint Conservation Conference; and more actual work was done, bringing into view more tangible results, than at any session of the Congress yet held.

Among the speakers were some of the most widely known men in the public, political and scientific life of the United States; and one of the most interesting talks of the three days' session was that by Ambassador Bryce, of Great Britain. Vice-president Fairbanks, Andrew Carnegie, Samuel Gompers, Bishop O'Connell, Governor Chamberlain, of Oregon, Seth Low, of New York, Senator Higgins, of Delaware, Speaker Cannon, Joachim Nabuco, ambassador from Brazil, Senator W. C. Edwards, of the Canadian parliament, Governor Dineen, of Illinois, Senator Owen, of Oklahoma, Governor Broward, of Florida, Hon. James Wilson, Secretary of Agriculture, J. Horace MacFarland, president of the American Civic Association, and others, made up the distinguished list of speakers who addressed the sessions of the Congress. Representative Joseph E. Ransdell, of Louisiana, president of the Congress opened the sessions. In his opening address President Randsell stated that the time has come for immediate Congressional action, as the people of the country demand that the Nation's waterways shall be improved at once.

"Practically the entire press of the country has favored us," he said; "and thousands of articles advocating our cause have been printed in every section of the land. And yet the definite results we have in view are still far from attainment. In spite of the fact that at the last session of Congress there was not a dissenting voice, the session closed without the passage of a rivers and harbors bill, and we have, so far, no positive assurance of any better treatment at this session. I am convinced that we should insist in the strongest manner possible, on the prompt passage by Congress of an adequate rivers and harbors bill, and on the commitment of Congress to a broad and liberal policy of internal improvement, that will carry an annual appropriation of not less than fifty millions of dollars."

President Randsell fell in line with the ideas of President Roosevelt, as advanced at the Belasco Theater meeting opening the Joint Conservation Conference, when the President declared for a bond issue sufficient to cover the cost of the work. He also advocated the plan of appointing a commission of nine members, to study our inland waterways and to suggest to Congress plans for improving them.

Vice-president Fairbanks, the next speaker, also lined up with the advocates of the bond-issue idea, saying that, as a large part of the benefits accruing from a comprehensive plan of internal improvement would fall to future generations, a reasonable share of the cost of the work should be borne by those generations. He believes, he said, that the importance and the magnitude of the work of improving the waterways of the country are so exceptional that the country will be fully justified in anticipating future income

by a reasonable and adequate bond issue.

Ambassador Bryce, following the Vice-president, spoke of the program of internal improvement, as to waterways, that is being carried out in England. He said that ultimately the improvement of rivers and canals, instead of being inimical to railroad interests, would be found to have been of benefit to them. In conclusion he said:

"I need hardly say that the circumstances of continental Europe afford more to you in the way of practical suggestions than England can supply, and I would specially recommend to you the splendid system of internal navigation that has been created in Germany. The Rhine now carries an enormous traffic, although on each side of it run trunk lines of railways.

"Nature has given you a larger river system than exists anywhere else in the world, except in the tropical forests of South America, and in the consideration of the great plans to which your attention is now being called, you will have the interest and sympathy of every one who feels that this superb gift of nature ought to be turned to the utmost advantage for the development of the unqualified natural resources which your country possesses."

The last speaker of the morning session was Andrew Carnegie, who promptly "made good" with the Congress by declaring his advocacy of the bond-issue plan. He said that not even the strictest constructionist could logically object to the improvement of the inland waterways by the Nation, and he warned those present, as well as the entire country, against the consideration of sectional projects, saying that plans of Nation-wide scope are needed.

At the afternoon session the report of the credentials committee was presented, and after the transaction of some routine business the Congress quickly got down to work. Judge George Hillyer, of Atlanta, Ga., was the first speaker, his subject being "Overland Canals a Necessity." He said that in Europe great freight blockades have been done away with by a proper division into water and rail freight of traffic. The transportation problem, he said, has been solved by shipping bulky and non-perishable freight by water, while costly freight goes by rail.

"Given the canals, rivers, and water routes," he said, "by which the bulky, cumbersome, and heavy freights can be shipped, the situation in any freight blockade would be at once relieved and the recurrence of the same evil at once prevented. It is true that if enough money were spent on the railroads they could be so increased in capacity as to meet the present needs, but that would involve an expense of $50,000,000 for immediate needs, with no guarantee for the future, whereas one-fifth of that sum, judiciously expended in the improvement of the rivers and harbors and in the construction of canals, would solve the problem."

Following the appointment of the committee on resolutions, with George E. Smith, of Boston, as chairman, and the committee on nominations, of which the chairman was John L. Vance, president of the Ohio River Improvement Association, Samuel Gompers, president of the American Federation of Labor, addressed the Congress.

"The men of labor," he said, "are deeply interested in the improvement of the waterways, and as far as we can help in the general result we are with you from now on. The men of labor never have joined in the howl against the railroads and other combinations of industry, but we realize that the building of a railway extends to it the right of way without any competition over the same railway, while on the other hand the improvement of a harbor, the digging of a canal, or the deepening of a river gives an equal opportunity to every man in the country.

"In the great works of National character the American workingman should have an opportunity. So far as it is possible, let American labor and American material enter first into these great National schemes. I would

patronize the American manufacturer, and I would employ the American laborer, and give them a chance before I turned to any one else.

"We should make for the arts of peace," he said, "rather than for the arts of war, and devote more time to the schoolhouse than to the arsenal and the navy yard."

The next speaker, representing the great Pacific Northwest, was Gov. George E. Chamberlain, of Oregon.

The speaker said that improvement of the waterways was no longer a political, but had become an economic question, and he then read from both the Democratic and Republican platforms planks pledging these parties to river and harbor improvement.

He reminded the audience that the President and the next President also had expressed themselves strongly in favor of a plan of improvement, and said that if out in his country a Congressman voted against a good plan for waterways improvement, he need not come back expecting to be re-elected.

Governor Chamberlain said that the Northwest had no pet scheme to propose, but was for a general plan, believing that the improvement of any of the great waterways would be for the benefit of the entire country. Nor would the Northwest, he said, oppose any plan for the improvement of a river because that plan might happen to greatly benefit some local interest somewhere else.

Former Mayor Seth Low, of New York, spoke of the importance of steam hauling of freight by water, saying that the Erie Canal fixed the rate on every pound of freight going from New York City west of the Alleghenies. He emphasized the necessity of planning and completing the work of developing our inland waterways promptly, and decried the shortsightedness of dragging the work out when it can be better and more effectively done in a shorter period of time.

Ex-governor Saunders, of Louisiana, spoke of the Mississippi River as it affects his own State, more particularly, and told of the enormous sums that are spent yearly in holding the river within its banks, and in providing for the needs of navigation.

Representative Champ Clark, the next speaker, aroused great enthusiasm by his statement that Congress stands ready and willing to support with adequate appropriations any comprehensive and feasible plan for waterway improvement.

"To say that Congress is opposed, or ever was opposed, to rivers and harbors improvement, he said, "would be to dub us all a lot of idiots. There has been talk enough about this going on for a long time, and now the time for action has come. I began making river and harbor speeches and listening to them seventeen years ago at Denver, and I have been keeping it up ever since."

Mr. Clark described the great resources of his own district, and said no section of the United States needed water transportation more, and then he made the formal statement again:

"If you gentlemen will devise and present to the National Congress a feasible and comprehensive scheme, and one that will take in the entire system of rivers and harbors of the country, I firmly believe that Congress will enact it into law."

An address by W. D. Lyman, president of Whitman College, Walla Walla, Wash., concluded the session.

SECOND DAY'S SESSION

Speaker Cannon Declares Against Issue of Bonds for Waterways Improvement—Other Speakers Heard—Election of Officers

AT THE morning session of the second day of the Congress, Speaker Cannon, who made the principal address, created excitement and at the same time threw a chill over the enthusiasm by stating that if the Rivers and Harbors Committee reports a bill for a bond issue of a billion dollars, for waterways improvement, he will not vote for the bill or give it his support. The Speaker's statement, coming as it did after repeated declarations from men high in public life, all favoring a bond issue, cast a decided damper upon the Congress.

Former Senator Anthony Higgins, of Delaware, was the first to address the Congress, his talk being along rather conservative lines. He announced his advocacy of the Atlantic deeper waterway plan, but said that careful consideration must be given to all plans for internal improvement before any definite action can be taken.

President Ransdell then announced that he would introduce the man who could give more help to the project of deep waterways and good canals than any man in the United States, not excepting either the President nor the Vice-president. He then introduced Speaker Cannon.

The Speaker said that possibly what he would say would come as a disappointment to some of the delegates. "But at the close of the short session," he said, "you may say that at least one Representative did not lie to you." He said that he voted for the rivers and harbors bill in 1883, which was vetoed by President Arthur, and came near being defeated for reelection on account of it.

He said that he was firmly in favor of the improvement of the rivers and harbors of the country. Continuing, he said:

"I have no doubt that some of these people who, a quarter of a century ago, tried to stamp out my political career for voting for the river and harbor bill in 1883, over the veto of President Arthur, will say that I am a reactionary—a kind of fly in the ointment—and that I stand in the way.

"Talk is cheap, but action is another thing. But we want to go slowly and to have the work done sanely and safely. If in the construction of the Panama Canal we had omitted to have a safe project and a well defined policy, the entire civilized world would have been laughing at us."

He said that he felt sure he would give his support to any river and harbor bill reported to Congress by "that practical and safe man, Chairman Burton, of the rivers and harbors committee."

"If we enter upon policies faster than we are ready and expenditures are extravagant, there is not one of you that would come out and take the stump in my district," he continued.

"Now, what I mean to say is that I agree with you that the great waterways of the country and the rivers and harbors should be efficiently improved. There are twenty-five persons to the square mile in the United States. When we are thickly settled, as in Europe, there will be 500,000,000 people in this country, or 125 to the square mile, and from this time to that time,

as we can safely and sanely do the work, the work that is necessary to carry on our great internal commerce and foreign commerce, I have no doubt that, conservatively speaking, we will have expended from $15,000,000,000 to $20,000,000,000.

"Now, nobody here wants Congress in the next sixty days to commit this country to an expenditure of $20,000,000,000, and for this purpose to issue bonds. I am always in favor of the United States paying its debts, and if it is necessary for its great work in peace or war, I stand ready to say, Issue bonds. But expenditures must be safe and sane. I would not want to do this work or any other work, except as it can be sanely done."

Speaker Cannon said that, after all, legislation was a matter of compromise. He said he believed ultimately there would be a fourteen foot channel from Chicago to St. Louis, and personally he favored it. But, he said, when action was taken to consummate this project, there would be gentlemen here with "flaming brands to get something for the Ohio River, and some to get something for the Missouri," and for other projects.

"I am not saying that these improvements ought not to be made. I am saying that we would not be practical, safe and sane to embark upon them now.

"I am not ready to do so. I want to be entirely frank with you. If it were possible, and I do not regard it possible, that the rivers and harbors committee, and we have to follow the lead of the rivers and harbors committee, should report a bill to Congress providing that there should be issued bonds for the next ten years, year by year, to meet the expenses of these projected improvements, I would not vote for it"

Following Speaker Cannon's address, Senor Joachim Nabuco, ambassador from Brazil, spoke to the Congress. Other speakers at the session were: Secretary of the Interior Garfield, James W. Van Cleave, president of the National Manufacturers' Association; Hon. J. A. Ockerson, of the Mississippi River Commission; James Rawlins, representing the Commercial Travelers of America; Calvin Tompkins, of the New York Board of Trade; Frederick Skene, state engineer of New York; Gov. Charles S. Deneen, of Illinois; Representative J. T. Lloyd, of Missouri; Senator Robert L. Owen, of Oklahoma; Col. C. P. Goodyear, of Georgia, and others.

The report of the committee on resolutions, in its report, made a number of strong recommendations, all of which were adopted by the Congress at the session of December 12.

These resolutions provide, first, for a bond issue of $500,000,000 for the improvement of the interior waterways of the United States, to be issued on the same lines as those of the Panama Canal bonds, the money to be available when necessity demands.

Second, they call upon Congress for immediate action in the way of appropriations to complete certain work already begun, and to inaugurate new work as recommended by the board of army engineers. Third, they demand a liberal appropriation for continuing contracts on rivers and harbors during the present session of Congress.

The resolutions then empower the appointment of a committee of Congress to draft bills for introduction, first, to provide for a bond issue, and, second, for a commission to study waterway conditions abroad, in order that the very best plans for foreign waterway improvements may be used by the United States in its treatment of its own waterways.

The following officers were elected, most of them being reelections:

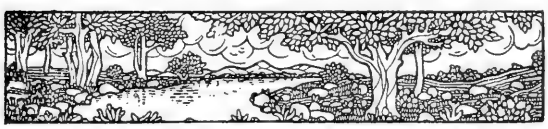
President, Joseph E. Ransdell, of Louisiana; secretary and treasurer, J. F. Ellison, of Cincinnati. Directors: Atlantic seaboard, William H. Lincoln, Boston, Mass.; Olin J. Stephens, New York; J. Hampton Moore, Philadelphia; Frank D. La Lanne, Philadelphia; Rufus K. Wood, Baltimore, and Herbert C. Warren, New Haven, Conn. South Atlantic Seaboard, D. U.

Fletcher, Jacksonville, Fla.; E. J. Hale, Fayetteville, N. C.; L. B. Dozier, Columbia, S. C.; W. B. Stillwell, Savannah, Ga.; Charles Swift, Columbus, Ga., and John C. Freeman, Richmond, Va. Gulf seaboard, T. G. Bush, Birmingham, Ala.; M. J. Sanders, New Orleans; S. Taliaferro, Houston, Tex. and Lee Estes, Texarkana, Tex. Entire Mississippi valley district, Gov. J. A. Johnson, St. Paul, Minn.; Thomas M. Wilkinson, Burlington Iowa; W. P. Kennett, St. Louis, Mo.; W. K. Kavanaugh, St. Louis, Mo., and Charles Scott, Rosedale, Miss. Great Lakes District, Edward T. Wyler, Chicago, Ill.; George T. Eichelberger, Chicago, Ill.; James H. Davidson, Oshkosh, Wis.; Robert A. Downey, Oswego, N. Y.; E. W. Wickey, East Chicago, Ind.; H. C. Barlow, Chicago, Ill.; Edward H. Butler, Buffalo, N. Y. Ohio valley district, W. B. Rodgers, Pittsburg, Pa.; Henry Reisenberg, Indianapolis, Ind.; Albert Bettinger, Cincinnati, Ohio; John L. Vance, Columbus, Ohio; W. H. Keller, Evansville, Ind. Tennesee and Cumberland district, M. T. Bryan, Nashville, Tenn.; J. A. Patton, Chattanooga, Tenn. Arkansas valley district, John A. Fox, Blytheville, Ark. Missouri valley district, I. P. Baker, Bismarck, N. Dak.; Lawrence M. Jones, Kansas City, Mo. Pacific coast district, N. G. Blalock, Walla Walla, Wash.; A. H. Devers, Portland, Oreg.; George C. Pardee, Oakland, Cal.

The night session was characterized by several strong speeches. Among them was one by Gov. Broward, of Florida, who said the people should say to Congress:

"You do not have to pay the bill, and we do; therefore, we demand that this work shall be done."

The session was closed with a finely illustrated lecture on waterway improvement and beautification, by J. Horace McFarland, of the American Civic Association.



THE ANNUAL MEETING

ANNOUNCEMENT has been made in the two preceding issues of CONSERVATION of the 28th annual meeting of the American Forestry Association. This will be a very important gathering of those interested in forestry. Great issues are pending. We are just beginning one of the greatest educational movements of American history—that of the better use and conservation of our natural resources. The program of the meeting, while not arranged in all detail, is far enough completed to warrant the statement that its educational value will exceed that of any other meeting ever held by the Association, unless, indeed, it be the memorable Forest Congress held in 1905. No person interested in forestry as a National question, and especially no one concerned with the care and use of the forests, can afford to miss this meeting.

The sessions will be held in the Red Room, on the ground floor, of the Willard Hotel, as for the past two years. Sessions will be held at 10 a. m., 2 p. m., and 8 p. m., January 13, and 10 a. m. and 2 p. m., January 14.

It is expected that the morning session on January 13 will be opened with an address by Hon. James Wilson, Secretary of Agriculture, and President of the Association. A condensed report by the Board of Directors on the Association's work during the year, and also the report of the Treasurer and the appointment of committees will follow. This business, which in the past has taken a large part of the morning session, will be much curtailed. Another address of great importance which it is expected will be given at this session will be by Mr. Gifford Pinchot on "The Meaning of the Conservation Movement." All readers of CONSERVATION familiar with the work done by Secretary Wilson in the advancement of agriculture in the United States in the past twelve years, and with the work of Mr. Pinchot during almost the same period in developing a National system of forestry, and more recently in the leadership of the movement for the conservation of natural resources. These two addresses will set a high standard for the meeting. Following them, in accordance with the past custom of the Association, will occur a number of brief addresses by prominent members and visitors.

The afternoon session will be devoted to the subject of "Forest Fires and Their Control." The first address will be "Forest Wealth and Fire Losses." Other addresses of this session will be on "Problems Connected with the Handling of Cut-over Lands," and "Lumbermen's Fire Protective Associations," such as have been organized and successfully maintained in some of the Northern States during the past year.

One of the most important features of this session will be a synopsis of legislation and practical work necessary for the control of forest fires. This synopsis will be presented by a commission which has already been appointed, consisting of the following men: Prof. H. H. Chapman, of the Yale Forest School, Mr. J. S. Whipple, Forest, Fish and Game Commissioner of New York, Dr. J. T. Rothrock, Pennsylvania Forest Reservation Commission, Mr. Alfred Gaskill, State Forester of New Jersey, Dr. C. A. Schenck, of Biltmore, N. C., and Mr. W. T. Cox, of the Forest Service. All of these men have had wide experience in dealing in a practical way with the fire problem, and their report will undoubtedly be the most mature presentation of the subject up to the present time. In all probability a

definite program of principles will be advanced for the Association to consider and possibly adopt.

An especially attractive program has been arranged for the evening session of January 13. The first address will be given by Hon. John E. Ransdell, Representative in Congress from Louisiana, and president of the National Rivers and Harbors Congress. Mr. Ransdell will speak on "Forests and Inland Waterways." Representing as he does a great National organization for the improvement of the waterways, an organization which represents a policy, not a project, Mr. Ransdell's address will be of especial importance. The other address of the evening will be an illustrated one by Mr. Bailey Willis, of the Geological Survey, on "Some Results of Deforestation." Probably no other man in America has studied the question of erosion as broadly and as deeply as Dr. Willis. He is not only familiar with the problem as it affects almost every section of our own country, but has studied the subject in Europe and Asia. His illustrations will be drawn in large part from these countries.

The morning session on January 14 will be devoted to the subject. "State and National Forests." An important address of this session will be on "The Government, the State, and the Individual in Forest Conservation." Other papers to be presented by prominent speakers at this session will be on the White Mountains and the Southern Appalachians. There will be a commission report at this session on "Principles in the Acquirement and Management of State Forests." Some of those appointed on this commission are: E. M. Griffith, State Forester of Wisconsin, Prof. Filibert Roth, professor of Forestry, University of Michigan, H. S. Conklin, Commissioner of Forestry of Pennsylvania, F. W. Beasley, State Forester of Maryland, and P. P. Wells, of the Forest Service.

The concluding session will be held January 14 at 2 p. m. on the subject of "Forest Education," and will be one of the most important sessions of the meeting. Some of the subjects to be presented will be the "Forests and the Industries." "The Press as an Aid to Education in Dealing with Forests and Other Resources," "Forestry and the Public Schools," and "Federal Appropriation for Teaching Forestry." Among those who are expected to give addresses are: Senator Beveridge of Indiana, Dr. Albert Shaw of the *Review of Reviews,* Prof. W. N. Clifford of Philadelphia, Prof. H. S. Graves of the Yale Forest School, and Prof. S. B. Green of the University of Minnesota.

Near the close of this session will come the report of committees, election of officers, and such other business as the Association may desire to consider.

EDITORIAL

The Conservation Conference

PROMISE of great and lasting good is contained in the report of the Joint Conservation Conference, and in the reports of the four sections into which the National Conservation Commission is divided. Up to the present time the program of conservation of natural resources has been chiefly educational. Most persons who take an interest in the work have begun asking what the Commission is likely to accomplish in practical results. Everyone is agreed upon the proposition that the conservation of the Nation's natural resources is of the greatest and most vital importance to the welfare of the country and to its continued prosperity; but it is equally true that people believe it is time to do something more than hold conventions and furnish newspaper and magazine material. The general public believes that those who are behind the conservation movement should presently give to the lawmakers some definite plan, at least, for beginning the great work about which so much has been written and spoken. The educational work of the conservation movement has gone forward with more enthusiasm and less interruption since the organization last June of the National Conservation Commission than ever before. The establishment of this commission was really a welding together of activities along several closely inter-related lines—a new organization of the broad and rather incoherent movement for inland waterways improvement and conservation of natural resources.

Organization of the Commission

FOLLOWING the conference of the Governors at the White House last May, President Roosevelt merged the Inland Waterways Commission, created by him in March, 1907, into the National Conservation Commission, it forming the Section of Waters of the new body. The remaining three divisions are those of Forests, Minerals and Lands. Chief Forester Pinchot is chairman of the Commission, and Thomas R. Shipp is secretary. The first work of the Commission was the inventorying of the resources of the country—a task which occupied the time of hundreds of able men during the whole of last summer and fall. The result of these herculean labors—labors performed, as the President says, without thought of personal inconvenience or personal advancement or profit—is contained in the report to be submitted to President Roosevelt, and which will be transmitted by him to Congress within a short time. It is not wide of the mark to say that never in the history of this or any other nation, has a statement so valuable been compiled and prepared; never in the world's history, perhaps, has any nation known with such definiteness just where it stands with regard to natural resources. No generalization; no flights of fancy; no stupendous statement with nothing tangible to back it up. Instead, the facts are there, in dollars and cents—the board feet of lumber, the tons of coal, the acres of land, the horsepower of waters, the cubic feet of natural gas, the barrels of oil—all these are set forth, in figures and statement, in the plainest of English, in the report of the Commission. It might be said that, even if the Commission does no single other act, its existence would be fully justified by the work it has done during the months just past.

Definite Work Ahead

THIS report and the reports of the four sections, were presented to the Joint Conservation Conference, composed of the members of the National

Conservation Commission, the Governors, their advisers, the members of State Conservation Commissions, and representatives of the great State and National organizations, at the conference held in Washington on December 8, 9, and 10. Speeches, addresses, papers, discussions and arguments there were in plenty at that conference, and out of the mass of manuscript, out of the volume of discussion and talk, has come the germ of action. Ideas that have all the elements of practicality were advanced, and recommendations were made which, followed to a conclusion, means the actual beginning of work, and that at no far-distant day. The period of propaganda is past; the preliminary education of the thinking, doing portion of a great nation is complete, and now the time has come when we, as a people, shall demonstrate to the world our fitness and our right to the adjective "great."

The Way Out

THE chief objection urged by those opposed to putting into effect a policy of conservation, with its concomitants of internal improvement, closer relations between the States and the Nation and an apparent broadening of Federal power and authority, has been the cost. But this objection can no longer be urged successfully, as has been the case in the past. President Roosevelt went to the heart of the matter in his speech at the Belasco Theater, when he said:

"Pay for these (internal) improvements out of current revenues, if possible, but if this is not possible, issue bonds."

The President referred to inland waterway improvement more particularly, but the permanent improvement of our inland river system, so as to fit it for navigation and traffic, involves every other branch of conservation work. Rivers may not and cannot be permanently improved without the maintenance of forests at their headwaters to protect the river sources and to keep from the streams the silt and sand accumulations that cut channels, build bars and make dredging a constant necessity. Other things are necesary, it is true, if this work is to be permanent in character; but forest protection and reforestation are of vital importance, as, without them, no work of this kind can be made permanent and enduring. The forests are the keystone of the arch of conservation; upon them rest largely the other stones that go to make the complete structure. Save the existing forests and create new ones, and then the rivers can be made permanently navigable. At the same time soil erosion will be largely prevented; and, by navigating the rivers and building canals, the principal drain upon the coal and iron resources of the country can be reduced. And the answer to the question, "How may we do these things?" is contained in the advice of the President—"Pay for what we can and then issue bonds!" This is the way out; this is the way to begin and to complete the work.

Magnitude of the Undertaking

THE most thankless task a statesman is called upon to perform is to advocate a bond issue in time of peace; and no other single thing, perhaps, is a more infallible indication of true statesmanship than the ability to recognize the necessity for issuing bonds under such circumstances, and boldly pronounce for their issue in the face of public disapproval. Thus, at the very outset, the task before the Nation becomes a stupendous one, because of the fact that a tremendous inertia, in the form of deep-grounded prejudice, must be overcome before the initial impetus can be given to the work. The opposition to a bond issue commensurate with the magnitude of the work will be both loud and long-continued, but the utterances of those who possess the ability to see beyond the narrow confines of to-day will certainly be as loud, and their approval as hearty, so that the fact that opposition is certain need not give pause to the work. If half a billion of dollars is

required then let us have that amount, and as we need it; if more, let us have more. If the interior of the country is to have a network of navigable rivers and canals, whereby to relieve the congestion of rail traffic and reduce the cost of transportation, the result will be worth all it costs. And the bonding of such an enterprise is the proper way in which to finance it. This plan of improvement, if it is worth the breath that has been spent on it, must be permanent. It must not be for to-day or to-morrow, but for the centuries to come. If this is true—and that it is true not one thinking man will for a moment deny—why should we of to-day bear the whole cost? Why should not our children, and our children's children, and all the generations of men to come, have their share in payment, as well as their vastly greater share in benefits? Not one single logical, tenable argument can be advanced in support of the negative. The proposition, while of first magnitude, is essentially of the simplest nature. It means just this: Issue bonds for whatever sums may be needed, and as they are needed; then, after due preparation, convert our at present useless rivers and waterways into a network of navigable streams, reaching from the Allegheny Mountains on the east to the Rockies on the west, and from the Lakes of the north to the Gulf of the south. Prepare these waterways for the fullest use as means of transportation for all our heavy traffic, thus relieving the railroads and lessening the drain on our coal and iron deposits. *And make the work permanent.* A mighty undertaking, but one with every element of simplicity, as is the case with most ideas that are truly great.

Not a Political Question

THIS is not a political question. The conservation movement is the one great question that is not in politics. Both the great parties stand committed to it in their latest platform declarations, and, fortunately, there seems no indication of the injection of politics into any Congressional debates on the subject. In the words of President Roosevelt, in that memorable address of his at the Belasco Theater, "If an appropriation for internal improvements is to be made a part of the political 'pork barrel'—if every Congressional district is to receive a share, regardless of whether it has any streams to improve, then it were better to stop before we begin." But it is inconceivable that such a view will be taken of the question—that any man will be so blind to the broad, actual needs of the Nation, as to consider an appropriation for such a purpose merely a more ample Rivers and Harbors appropriation, to be divided up according to the demands of constituents and without regard to the necessities and the fitness of the case. It is simply a question of the greatest good to the greatest number for the longest time—there isn't a shred of politics anywhere about it.

A Noble Legacy

JUDGE TAFT, in his address at the Belasco, joined with President Roosevelt in advocating the issue of bonds for permanent internal improvement. He said that it would be a good thing for the sons and the grandsons of the present generation if we of to-day leave them a legacy of debt—debt incurred in developing an adequate system of waterways and great, permanent internal improvements, that will outlast the centuries, and grow more valuable with the passing of time. And Judge Taft spoke truly. Suppose we do leave to the generations to come this legacy of debt; and suppose that we also leave to them at least the substantial beginnings of a system of waterways that will be adequate to handle, at vastly reduced freight rates, all the heavy traffic of the country; will those generations not rise up and bless the foresight of the men who were able to plan and to carry out the scheme? On the other hand, suppose we continue to trifle with the mat-

ter; suppose we put off and procrastinate, sinning away our day of grace, and leaving the land impoverished, tax-ridden, sterile, barren, devoid of forests, with diminishing streams, the sport of floods and inundations; what then will those who come after us say of the generation of to-day? Can there be more than one answer?

The Work Will Be Done

BUT there will be, let us hope, no more procrastination; no more temporizing, no more placating of divergent political factions. The work will be done. We shall set about developing our waterways; we shall set about caring for forested uplands, reforesting devastated areas and protecting the sources and the banks of the streams. We will make channels in the Missouri and the Mississippi, and the Ohio; in the Tennessee and the Wabash, and in every river that is capable of bearing traffic and is needed for that purpose. We will in time construct storage reservoirs for the handling of flood waters, and we will construct canals—a deep waterway from the head of Lake Michigan down across the State of Illinois, into the Mississippi and thence to the Gulf. We will construct other canals, wherever the necessity for them shall be shown. We will have the coöperation of States and the Nation, because in that way the work will be soonest and best done. We will do these things, because they are the right, and the wise, and the logical things to do, and because we, as a people, have the wisdom and the foresight to realize that they are the right things. We need not wait for the preparation of a complete plan for internal improvement; we can begin on the work as soon as the people of this Nation say the word. There are things to do, as President Roosevelt said, that will fit in with any right plan, and we will do these things. We will make a start, and millions now living will see the great scheme well on the way to completion. And millions yet unborn will look back to this generation, and the men who lived in it with a reverence as great as, or greater than, that with which we regard the men who laid the foundations of our Nation. The work of the Joint Conservation Conference has begun to make ready the way. Let us prepare to walk in it.

The Appalachian Matter

THERE rests with the House Committee on Agriculture a heavy and definite responsibility, and one which they can by no means evade, for in the hands of the eighteen members of this Committee lies the fate of the Appalachian-White Mountain Forest bill, carrying with it consequences of the gravest importance to the Nation and the Nation's future!

The hearing on the bill before the Committee on December 9th seems to show that this responsibility is not realized by the Committee, for questions asked, and suggestions made, serve to show that the "masterly inactivity" hitherto the Committee's leading characteristic, will be maintained if possible, and that if any action be had or is contemplated, it will be along lines that are totally inadequate to remedy the serious conditions, again so clearly and forcefully shown by advocates of this legislation. There is hope in the situation, however, although it may take an optimistic eye to see it, for the forest perpetuation idea has gained such ground as the thing that must be done, as a duty that the Government owes to itself, as a matter of plain common sense and common honesty, that we shall finally get, in spite of the lack of foresight at present existing in this Committee, not only the most complete preservation of the Appalachian-White Mountain region possible, but the preservation of forest areas at the headwaters of important streams wherever they may be constitutionally established, under a systematic and progressive forest policy to which the Nation will finally come.

To the Agricultural Committee of the House there is presented an opportunity of signally serving the whole Nation by promptly passing the Senate bill, or one equally as effective—of abandoning individual opinions and impractical plans based on incomplete knowledge or misconception of the forest and forest functions; of rising to the real level of patriotic and far-sighted statesmanship. Will they grasp the opportunity before it is too late?

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Speaker Cannon in the Open

AT A meeting of the Chicago Bankers' Club on Saturday, November 7, Speaker Cannon, if the press dispatches are to be believed, made an open avowal of his stand in regard to conservation as well as some of the other big policies to which the United States stands committed. A special dispatch from Chicago to the *Washington Herald* gives an outline of the Speaker's remarks. The dispatch follows:

Uncle Joe Cannon, speaking before the Chicago Bankers' Club Saturday, declared himself against the conservation of public resources and the expenditure of large sums for the completion of the Panama Canal. Before the speech was delivered newspaper men were requested to leave the room. Then the Speaker, declaring that they were all hard-headed business men, and not doctrinarians, said that the province of the Government was the protection of life, liberty, and prosperity.

"Let it perform those functions," he said, "then let every man take care of himself."

"There are great problems to be solved by the next Congress," said Speaker Cannon, "and they are not going to be solved by the emotional hysteria of the country."

Mr. Cannon referred to the canal first of all.

"This is not a time," he said, "for the expenditure of large sums of money for the completion of the Panama Canal. Discreet care should be used in the endeavor to build a deep-water way from the Lakes to the Gulf."

He said that great engineering problems were involved, and that they might be better left to future generations. Newspapers, magazines, specialists, doctrinaires, women's clubs, and school children, he said, signed memorials to Congress for the issuance for bonds for millions, to be used in all sorts of plans.

"Because I happen to be one Congressman who is in a position where my judgment is brought to bear on these subjects, some think I should be killed altogether."

He said that many people blamed him for opposition to the reforestation of the Appalachian range. There is a question, he said, as to whether the Nation had the police power to prevent the destruction of forests. He said that he thought that police power remained with the State. He declared that there was also a question as to the advisability of reforestation, and criticised magazines and newspapers for their articles on the waste of coal and timber.

The completion of the Panama Canal, he declared, might come when the Nation had reached 500,000,000 inhabitants.

Transcontinental railroads might be completed, he thought, when the Nation got to be 100,000,000 or 200,000,000. It would be a serious thing, he said, for the country to go ahead now and make mistakes.

The friends of conservation have long known of Speaker Cannon's opposition to the whole program looking toward reforestation, extension of waterways, forest conservation—in fact, the entire program of conservation of natural resources. The Speaker has not, however, heretofore put himself on record; his utterances before the Chicago Bankers' Club are the first in which he has openly declared opposition to the policy of taking care of the resources which we have left and making every effort to replace those resources which we have wasted.

CONSERVATION

OFFICIAL MAGAZINE OF THE AMERICAN FORESTRY ASSOCIATION

FRANK GLOVER HEATON, *Editor*

CONTENTS FOR FEBRUARY, 1909

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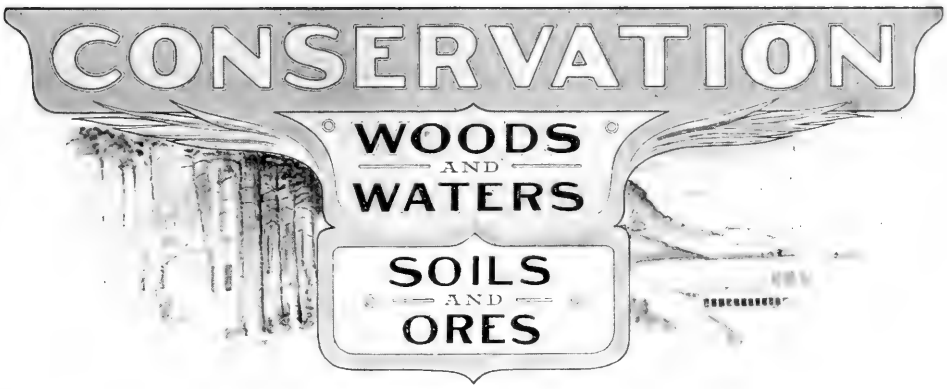
SCENE IN THE SOUTHERN APPALACHIANS

Present Indications Are That a Bill for the Establishment of a National Forest in This Region Will Pass the Present Session of Congress



Vol. XV FEBRUARY, 1909 No. 2

TWENTY-EIGHTH ANNUAL MEETING

"Anti-Forest Fire Congress" of the American Forestry Association Held in Washington, D. C.—New Officers Elected—President Wilson Retires—Reports of Directors, Treasurer, etc.—Plans for Effective Work

THE twenty-eighth annual meeting of The American Forestry Association was held in Washington, D. C., on January 13 and 14, in the red room at the New Willard Hotel. While, in point of attendance, the 1909 meeting may not have equaled former meetings, the interest was intense, and the meeting developed into one of the best ever held in the history of the Association, if judged from the viewpoint of work planned and increased scope and effectiveness of organization.

The meeting was marked by the retirement of the Hon. James Wilson, Secretary of Agriculture, who for ten years past has been the President of The American Forestry Association. The newly elected President is the Hon. Curtis Guild, Jr., former Governor of Massachusetts. A complete list of new officers, directors, etc., will be found in the usual place in this magazine.

The 1909 meeting was styled an "Anti-Forest Fire Congress," and several able and intensely interesting papers were read on the subject of forest fires and their control. Considerable discussion along this line developed in the meeting, and the address of Frank H. Lamb, member of the State Board of Forestry of Washington, together with the conclusions of the committee on forest fires and their control, will probably be pronounced the ablest contributions to present-day thought along these lines that have been offered before any organization, either State, National or private.

The opening session was called to order at 10:30 a m., January 13, with Col. William S. Harvey in the chair. Welcoming in a few words the members present, Chairman Harvey announced the retirement of President Wilson, and paid a high tribute to the efficiency of the man who has done

more to build up the Department of Agriculture than any Secretary who has ever held the portfolio. The chairman spoke feelingly of the long association of President Wilson with The American Forestry Association and voiced the sentiments of every individual member when he said that the determination of President Wilson to sever his official connection with the Association was deeply to be regretted, even if absolutely necessary. The chairman then introduced Mr. Wilson, whose address follows.

ADDRESS OF HON. JAMES WILSON

Retiring President of The American Forestry Association

THERE are one or two thoughts in my mind that I want you people to take up and look over with regard to forestry. We are using our woods faster than they are growing. It is necessary that we should grow more woods. There are mountain ranges in our country, that are not fit for agriculture, that should be growing wood. There is much land that we cannot spare in the corn and blue grass belt of the West, along the upper Mississippi, and the prairie country. That land is needed to furnish bread and beef for the people. But in every other part of the country there is much land lying idle that might be growing wood.

I remember being in the foot-hills of Mount Rainier a couple of years ago. I counted on what might have been an acre, twenty of those great firs, that would each cut 15,000 feet of lumber. Twenty of those firs, and in addition to them a great many cedars and other trees of less value. I looked over what might have been an acre, as I went past, and became satisfied that if you uprooted and took away every tree, one of those acres would not support a single sheep. You could step all over that acre from one rock to another. However, that is the home of the tree. The roots go deep down to get nutriment for the tree. We have much of that kind all through the mountain ranges of the country.

We have been wanting Congress to take hold of the Appalachian and White Mountain ranges, but Congress does not see its way clear to do so and does not do it. The American people can do a great many things without Congress; a very great many things. I think it will be wise to have the States of the Union, as units, take hold of these mountain ranges within their borders, and plan to grow woods upon them. It will be impossible for every corporation in the country that uses wood to get hold of these cheap lands. The cheapest lands in America now are those that still grow woods and will not succeed very well in growing grass, because the grass roots do not go away down to the water table to get moisture, while the tree roots do. We have some plants like alfalfa that do go down great distances. They are not at home everywhere in those mountains that will grow wood. The corporations that are going to need wood should get hold of these cheap lands and plant and grow wood —that is what they should do. The farmers should take their lands under consideration in these countries, in these parts of the United States that are not designed to grow grain, or produce meats, and put such parts of their land into wood as will be most profitable in woods. You do not produce as fast from land growing wood but it comes finally. If it does not come in your lifetime it will come in the lifetime of the next generation.

You will remember Sir Walter Scott's shrewd observation, telling of the man who when he came to die, called his son to him to hear his last words. It is quite interesting to know what his last will and testament was to Jock, his son. He said, "Jock, never put out your hand farther than you can bring it in again. Jock, do not drink brandy in the morning; it fires the stomach;" and finally the crowning advice that he gave to the coming generation: "Jock, in planting a tree, remember that it will grow while you are sleeping."

Now, every man looks to the future. He looks to the welfare of his family. He wants to leave something behind him. Why not leave growing trees behind him? Let us not sit down and make faces at Congress, because they will not buy these Appalachian and White Mountain ranges. They are not going to do it this winter—of course, I am merely guessing—and I do not know whether they will ever do it; but that does not prevent the States from taking hold of the matter. It does not prevent associations of men from taking hold and planting trees. It does not prevent the farmer from providing a legacy for the next generation by planting trees on the land that will not grow grasses or grains but will grow trees. The foot-hills of Mount Ranier grow the finest trees I ever saw, growing the most wood on an acre of soil, where you could not graze a single sheep if you took the trees off.

Let us be practical, each of us in our own locality, and let us get our own people to

do the right thing along these lines. We did plant in Iowa, when we went there first, which was over half a century ago. The winds had a magnificent sweep there at that time. It was so bad I have been driven off a haystack many times. I could not stay on the haystack long enough to get sufficient hay for a team of horses half a century ago. We began planting trees, and we planted them along the lines of the road; we planted them along the sub-division lines of the farms. We planted the first thing we could get, which means we went to the bottoms and got cottonwoods. They have been despised, yet they are valuable. We are discovering now how to prepare those soft cottonwood trees so they will last. Then we thought the white willow was better and we planted many of those. I have had as much as five miles of white willows on my home farm. Then along came the automobile men, and they went to the legislature and got them to enact a statute compelling us to cut all those hedges down to four feet in height, so they would not hold snow and keep the roads in bad shape for the automobile people, and so we had to begin cutting and slashing those trees that broke winds off of us in Iowa.

The next question is how to get tree seeds to grow, particularly out West in the forest ranges. We have 168,000,000 acres now. Last summer I went out West among the trees, as I have been doing for two summers. A question has been in our minds, how to get reforestation done. Of course you can plant seeds in a bed and then take them up with a spade and set them where you want them set, and all that; but, if the Department of Agriculture had all the army and all the navy, they never could get it done in time. We have probably 5,000,000 acres to plant. We ought to be reforesting a quarter of a million acres a year—think of that! You can never in the world do that with a spade! Nature's plan should be followed in this sort of work. I recollect the first time I went out West and discussed this proposition with some of the people there. If I were wanting to get a field to grow grass that had no grass on it, I would sow the grass seed on the last snows in the spring, and the seed would sink down in the soil and would be moistened and would germinate before the moisture from the spring rains and snows deleteriously affected the roots. That is the way we get pastures quickly. Sow the seeds in the last snows in the spring, and you will get results. "I wish you would try that with regard to reforestation," I said to them. I was then in the Black Hills, speaking to some of our forest people. They said they would try it. I told them to get their seed in ample quantity in the fall, take an eighty-acre tract in the spring, and sow on the last snows. I was out there again last summer. It was three years since I had been there and made that suggestion, and they had carried it out. I drove thirty-five miles to see that eighty-acre tract. It seemed to me that every seed had grown, and that was a mile above the level of the sea. I saw at once that the plan was a success a mile above the level of the sea; but last summer I was at places where they were over two miles above the level of the sea. Will it work there? That is the problem for my people in the Forestry Bureau to solve. Can we do that away up near the timber line, which is generally 10,000 or 11,000 feet above the level of the sea? That is a practical question for our people to solve. They are working on it now in the effort to demonstrate whether or not it is feasible.

It is difficult to get seed to plant as much as we should plant. We will have to search the ends of the earth to get tree seeds of almost any kind that promises to do us any good, and try to get these mountains, that are entirely bare now, in a reforested condition.

Let me go back to my original proposition, because that is the one thing I arose to say to you to-day. If it does not please Congress, in its wisdom, to take hold of these mountain ranges, let us take hold of them ourselves, as citizens of States, as members of associations, of corporations, and societies, and as individual farmers. Let us take hold of the problem and push it. The time is coming when trees are going to be as scarce as diamonds—yes, as scarce as diamonds. They are getting scarcer and scarcer every day. We have 40,000,000 acres in the Philippines that the Government is holding for the Filipinos. We may go there some day and get some of that; we may hunt the world over for wood, and all that sort of thing. It will not take us a great while, at the rate we are now going, to reduce the supply of wood all over the world; but we are not doing our duty. This Association has been doing much, but we must not depend too much on Congress to do for us. We must set our heads and set our faces and set our teeth with the determination that we are going to get reforestation in this country, and that we are going to get trees enough growing if we have to do it ourselves, for that is the best way to get things done.

Following Secretary Wilson's address, and the appointment of committees on by-laws, resolutions and nominations, the Rev. Edward Everett Hale addressed the meeting. Doctor Hale, in his address, emphasized the fact of the fundamental necessity for reforestation, both as a National and State proposition and a private enterprise also. His address follows.

ADDRESS OF THE REV. DR. EDWARD EVERETT HALE

I HAD the honor of speaking in this place one year ago; I believe I said but two things at that time, and I am going to say only those two things now.

I like to say what I began saying twenty-eight years ago, when, at the junction between here and Baltimore, I met Doctor Loring, who was then Secretary of Agriculture. He was coming to Washington from Cincinnati, and said he had been at the most important meeting which would be held in the nineteenth century, which was the meeting at which this society was formed. He understood it then as we understand it now, and as it is our business to make 90,000,000 people of this country understand it.

When I was a boy in college, we had, among other studies, St. Baptiste's book on political economy, which was a science comparatively new then. It was called the dismal science, and with very good reason, for the political economy of those days was founded on the Devil's philosophy, which is "the Devil take the hindmost and everybody cut throats for himself." We have now gotten well beyond that.

In St. Baptiste's book, he says that in America they have introduced the valuable custom that on the marriage of every young man a forest is planted. I do not know how many young men were married in that year, but I venture to say there was not a forest planted by any one of them when St. Baptiste wrote this down.

If you or I could get any power to compel every young man married in this country, in the United States, in the next year, to plant a forest, that is what we should do. It is not, as Secretary Wilson has so well said, for Congress to do. It is for the American people to do.

I was to a certain extent in at the birth of the State of Kansas. I belonged to the New England Emigrant Aid Society, and we used to send peach stones in barrels out to Kansas for the purpose of planting Kansas with peach trees, because peach trees grow faster than anything—faster even than cottonwood.

I have only two things to say this morning. I can say them quite within the time which the Association may give me.

The first is about this business to which Secretary Wilson has alluded—the denudation of our forest lands. I have myself, as I said last year, slept under trees which were ten or twelve feet in diameter, when as a boy I was on the Geological Survey of New Hampshire. Two years ago my friend Mr. Carter took me over the same ground, and there is not a tree there now as big as my cane. That is because the present system of paper making has to provide for the volumes of paper which are printed every year, and it is cheaper for a pulp maker to give orders to his men to cut down everything than it is to pick out the large trees and leave the small ones. What happens when you cut down everything? The rain descends and the floods come, and they take away the whole soil, and you cannot get your seed to grow on the rocks after the soil has all been taken away. Then follows the water, rushing down in freshets, and the sweeping away of everything in those freshets, which fact my friends in the Carolinas are finding out, as we have found out in New England long ago, and which must necessarily follow forest denudation.

The President of the United States, in his careful review of the resources of this country, sent an annual message this year, as every President has done since George Washington. In that annual message the President gave a pathetic account of the denudation of China by the rains which have fallen there and the ruin which has been affecting the provinces of China, larger than the largest American State. The President accompanied that message with printed drawings, which I have here, giving every one of Mr. Wilson's agents' pictures of the denudation of that region. The President was wise in putting this before the country. I do not dare to ask the ladies and gentlemen in this room how many of them have read that portion of the President's message. I do not dare to ask how many of them have seen the pictures with which he accompanied it. The press of the country dislikes Presidents' messages always. They take up a great deal of room which might be occupied with forgeries or crimes or other things which are supposed to be more interesting to the public. It happens that I have not seen any reference in any journal to the fact that the President of the United States considered this business of denudation of such importance. But it is the business of the people of the United States to understand the significance of this. It is their business, as St. Baptiste said, when-

ever they marry a young man and young woman, to plant a forest.

Here is this problem before you and me as to how a quarter of a million acres shall be planted every year—not by the spade, as Secretary Wilson has so well said; not by the spade, as Scott's hero expected to do, but by encouraging man, woman and child, state, corporation and everybody else, to go into the business of forestry as necessary for the welfare of the future.

Just at this time, in the *National Geographic Magazine,* they have been publishing some most pathetic letters which ought to be read and known everywhere, which Mr. Hunt, our Consul-General in Asia Minor, has been writing, with regard to Asia Minor. If you went into a tolerably well equipped high school and asked who was the richest man ever known in the world, they would say Croesus. Croesus is considered as the monarch of wealth. We always say Mr. Morgan or Mr. Walsh is a modern Croesus, because Croesus is the image of the wealth of the classical world. This classical world Mr. Hunt describes to you as he journeyed up and down through Asia Minor, where Croesus was one of the sovereigns. It is an abomination of desolation now. Ruin upon ruin exists there, and you will find, in the midst of great amphitheaters, where 40,000 people sat 3,000 years ago, a shepherd with three goats, all the result of the denudation of the forests of Asia Minor, the cutting down of trees there, the abolishing of forests, in exactly the same way and with the same greed with which the people of America are cutting down their forests to-day.

Why do not individuals rush in? I might take any enterprise which means profit and carry it into Wall Street, or carry it among your business men here, and they would be sure to ask, "how soon will the profit come?" Men of business experience tell me that it is impossible to float any enterprise where the profit is not to begin within eight years. That old Scotchman, to whom Secretary Wilson referred, found that out. He told his son to plant forests; but the Secretary very wisely did not repeat what he said to his son further, which was: "My father told me this when he was dying, but I have never had time to attend to it from that time to this." That is the condition of the average capitalist. He has not time to attend to enterprises which are to bring their results the other side of eight years.

But states are immortal. That is what the word "state" means, something which is established. A state is immortal. The State of New Hampshire is immortal; the State of Mississippi is immortal in the eyes of the people who live there—and God grant that be true. So that states can invest in forests prudently and wisely when an individual cannot invest in forests prudently and wisely.

Suppose I were a rich man and bought 2,000 acres of land in New Hampshire. I cannot make laws by which a loafer shall not throw a friction match into a pile of leaves; I cannot send a man to arrest that loafer when it is discovered what he has done. The State of New Hampshire can do that. If, therefore, the States of Massachusetts, New Hampshire or Vermont can make an investment in forests, they make an investment which they themselves can take care of and watch. That is one of the reasons why states should invest in forests. The other reason is that they will want the money fifty years hence, and the state, being immortal, can provide money for fifty years hence, as my friends around me do not think it is worth while to do with the millions in their bank accounts. The state can make an investment in good faith and wisely which the individual cannot do.

I brought before this Association a year ago the statistics which show how the European states have profited by that arrangement. Bavaria, Prussia and all those European nations which are good for anything, owe the credit which they have in the financial market to the fact that their revenues from their forests are as large as they are. I should say, therefore, to any man who has any influence in state government, that if he can persuade the state treasurer to invest the sinking funds of that state in forests, he would do a thing wise and prudent, and he would help this great national movement.

I will not say anything more, further than to suggest that all this is much more the business of the people of America than it is the business of any Congress or any President or any special department. The people of America did a great thing when they made 6,000 people members of this society. Now, if we all go to work and circulate the documents which are presented to us, such documents as our friend Secretary Wilson published this last year on the Appalachian and White Mountain reservations—if we will circulate the constant information which we are receiving from all parts of the country as to the increasing need of forests, and if we will give that to the people who do not die—for corporations do not die, while every individual does—there is no one of us but can help forward this great enterprise.

The Judiciary Committee last year issued a sort of edict warning us that we must not buy land for the purpose of raising trees; that that was unconstitutional. It turned out, on a moment's inquiry in the Navy Department and in the Interior Department that more than 100 years ago this Government began buying land at the South, because it wanted live oak timber, and my friend who was here could tell us what became of some of that land.

The precedent was entirely established and can be shown with documents on file.

We do not want to put our trust in princes. We want to put our trust in the Lord God who made this earth and made the land of it; Who has called us His children and has set us to work in this business of preserving these forests. He did not set any king at that work, nor any queen, but He set all His children everywhere to preserving the means by which He fed his children and gave them water for their thirst. We had here a great meeting of people who wanted to preserve the water channels of America; a most commendable effort, but it reminds me of Mrs. Glass' direction with regard to cooking a hare. She said, "First catch your hare," which is a very good rule. If you have to cook a hare, to have him ready for dinner, catch the hare first. I could not help thinking when these gentlemen were conspiring or agreeing with regard to water navigation, that it would be a good thing first to catch the water; and as long as the water is abundant, as the Lord God in His omnipotence has pleased to send us rain enough, it would be as well to catch it and preserve it so it may come down in streams which are available, instead of letting it all rush off the hills in the spring and waste the lands which are below.

The two things to be said are, stop denudation, plant trees, and make the people who own funds in the future invest them in the forests.

The reading of the reports of the Board of Directors and the Treasurer, followed. These reports, giving in figures and in detail the work of the Association during 1908, will be found in another part of this issue, and every member of the Association should carefully read the information contained in them. The report of the Auditing Committee was also read, together with a supplemental report, and the suggestion was made that a permanent Auditing Board be provided for in the By-laws of the Association, and that such a board be created. It was explained that the work of auditing the accounts of the organization and those of CONSERVATION has grown to such volume that the few hours at the disposal of a specially appointed committee is too short a time in which to perform the work in a proper manner. On motion, the suggestion was adopted and referred to the Committee on By-laws, and a permanent Board of Auditors will be named within a short time.

Following the transaction of this routine business, the session was given up to discussion and brief addresses on a number of topics, J. H. Finney, secretary of the Appalachian National Forest Association; Doctor Rothrock, of Pennsylvania; George Ward Cook, of New Hampshire; former Secretary Will, and others taking part, and the session closed at noon.

THE AFTERNOON SESSION

THE afternoon session opened with an address by T. H. Hodge, of Philadelphia, representing the Pocono Protective Fire Association. The general topic for the afternoon being, "Forest Fires and Their Control," Mr. Hodge's address, detailing the work of this organization, was heard with interest. He said the Pocono Protective Fire Association was incorporated in November, 1902, its purpose being, as far as possible, to prevent fires on Pocono Mountain, at the headwaters of the Lehigh River. The Lehigh is the principal tributary of the Delaware River, and as a result of the almost complete denudation of the Pocono Mountain some years ago, and the consequent silting up of the channel of the Lehigh, as well as the Delaware below Philadelphia, the United States Government is compelled to spend millions of dollars for dredging and deepening these channels. The mountain is now, however, becoming covered again with timber, and to protect and promote the growth of this new timber cover is the work of the association represented by Mr. Hodge. He stated that the district in which the

association operates covers about 200,000 acres, while the membership of the organization represents holdings to the amount of about 60,000 acres; and while, said the speaker, this area is insignificant as compared with the vast expanses in other parts of the country, the members of the association believe that its practice and policy may be followed advantageously in much larger fields. Mr. Hodge spoke of the practice of berry pickers, who every year burn off the hillsides, to promote the growth of huckleberry bushes, and he told of the carelessness of campers, picnic parties, hunters and others, who pay no attention to the damage that may be caused by carelessly left fires. He spoke, also, of the part played by railroads in spreading forest and brush fires. He then detailed the plan on which the association operates, stating that advantage was taken of the Pennsylvania law which provides that on application of twenty taxpayers, the courts shall appoint deputy constables who have all the authority of fire wardens. Under this plan, he said, the association now has fire wardens in the nine townships in Monroe County in which the association operates. Notices printed on strong muslin are posted along roadsides and in conspicuous places in the woods, warning against the starting of fires and offering fifty dollars reward for information that will lead to the arrest and conviction of parties guilty of allowing a fire to gain headway. This offer of a reward was given wide newspaper publicity, and was afterward increased to $100; while the association has pledged itself to pay with all possible promptness the men called out by fire wardens to fight fires. As a result of the association's activities along these and similar lines, fires are of much less frequent occurrence, are far more readily handled and extinguished, and the general results bear full testimony to the value of the work. The speaker said that so far the total expenses of the association have been $2,151.37, an average of about $358.56 per annum.

At the conclusion of Mr. Hodge's address, Mr. Luebkert read an extract from a letter written by Mr. George S. Long, president of the Washington State Forest Fire Protective Association. The extract follows:

> "I wish to add that to-day there is a gathering in Spokane, Washington, of he representatives of the Forest Fire Association in Washington, Oregon, Idaho and Montana, and this gathering contemplates the organization of a Fire Protective League, which will embrace all of the territory west of the Rocky Mountains, and we feel that we are inaugurating one of the largest movements that has yet been entered upon on the Pacific Slope for forest protection, and it is the unanimous sentiment of this gathering that forest conservation and the forest fire protection stands hand in hand equally as the most important problem that concerns the people of the Pacific Slope."

Mr. Frank H. Lamb, of the Washington State Board of Forestry, was to have read a paper on "Forest Fire Protection on the Pacific Northwest." Owing to business affairs, Mr. Lamb was unable to be present, but his paper was read by Mr. Luebkert, and the paper is given here complete.

PAPER BY FRANK H. LAMB

A STATEMENT of the work that has been accomplished in fighting forest fires in the territory embraced in the states of Washington, Oregon and Idaho, must be of unusual interest in this meeting, in view of the fact that in these three states there is fifty per cent. of the standing timber of the United States. A significant fact is that this work, although still in its infancy, is probably as well organized and as liberally supported as similar work in any part of the United States. The forests of Washington and Oregon have been drawn upon for the past twenty or thirty years to a limited extent to supply the timber necessities of less favored regions, yet the lumber industry of the Northwest as an important factor in the lumber industry of the country, is of comparatively recent growth. In the other lumber states of the East and middle Northwest, the work of protecting the forests from fire has been taken up only after the

greater part of the forests have been cut into lumber. In the Pacific Northwest we are taking up the work while the forests are still standing. This may be due to the experience the lumbermen of these states have had in the other lumber states, or as a result of the campaign of education which has been carried on during the past few years for the conservation and protection of our natural resources, including timber.

If the total timber stand of the United States is taken at fourteen hundred million feet, as given in various estimates, we are justified in assuming that the four states, Washington, Oregon, Idaho, and Montana, comprise about 700,000,000 feet of this amount, or practically fifty per cent. Added to this is the additional factor of the low estimates prepared in the past, due to the fact that because of very low prices for timber products at the mills, the standing timber of the Northwest has had a comparatively small value, and therefore estimates have included only that material which could be profitably handled at present prices. With increased prices, which must necessarily come about as the timber is removed from other sections of the country, cutting can be conducted more closely and our estimates will naturally be greatly increased.

Losses from forest fires in the region covered by this paper have in years past been very heavy. The Indians were accustomed to burn large tracts of forest in order to provide more open spaces. In the settlement of the country the farmer and the rancher looked upon the timber on his land largely as a hindrance. It was slashed and burned, and quite often the burning extended to the adjoining timber and vast damage resulted.

The beginning of logging operations also introduced a great menace to the timber of these States. Most of the logging is done by steam engines and log transportation is by logging railroads, so that the timber country is full of spark-emitting machines, and, owing to inadequate protection by spark-arresters, each one constitutes an eternal menace during the dry season. The logger also leaves behind him large tracts of cut-over lands, on which probably more than fifty per cent of the actual material of the forest is left on the ground as waste. In various ways fire reaches these slashings, where it finds plenty of material to feed upon, in proper condition for burning, and the result is a conflagration that continuously gains headway until finally it reaches the live timber.

The fire hazard of standing timber in these states varies greatly, as does also the result of the ordinary forest fire upon the growing forest. Along the coast of Washington and Oregon, is the fog zone, a belt twenty-five miles or so in width, the live timber of which is practically immune from forest fires, except in cases of unusual conditions, or when a slashing fire has obtained sufficient headway to dry out the forest ahead of it and render the destruction possible. Fires in this zone are usually confined to cut-over lands, and the great majority of these are burned over almost annually. Owing to the accumulated quantities of material and its damp condition throughout most of the summer, this debris is not consumed to any great extent by any one fire, but constantly recurring fires tend to place it in better condition for burning each season. The result is that on our cut-over lands we find these annually recurring fires, which absolutely prohibit any reproduction.

Fire in the green timber of this belt generally kills the timber, usually developing into a tree-top fire. In some cases logging operations are able to follow and the result is not a total loss.

Extending inland from the fog belt to the summit of the Cascade Mountains is a region that becomes much drier during the summer. The forests of this belt are confined to the ridges of the Cascade Mountains, or the interior river valleys. It is here that we have the greatest fire risk, and when a fire is once started, it is most difficult to control. The accumulation of debris is very great, and the standing timber becomes dried out for long periods during the summer, so that any fire losing control, usually gets into the standing timber and, unless checked, does a great amount of damage.

East of the Cascade Mountains and in the northern and eastern portions of the state, adjoining the Idaho and British Columbia boundaries, we have a pine forest, which constitutes the third class of hazard. The forest is essentially an open pine forest of mixed ages. The accumulation of debris on the ground is much smaller than that west of the Cascades, but fires travel much faster in the more open regions of this section. In a great many cases the standing timber is not entirely killed by being overrun by forest fires. In other cases the damage is a total one, and it has been found that in both Idaho and Washington, the borer, so common throughout the fire-swept regions of the middle Northwest, has commenced to follow the path of the forest fire. And as the prevalence of this worm is increasing each year, it is only a question of time before any timber burned by forest fire will be rendered useless within the course of a year or so.

The Panhandle district of Idaho and the forest regions of northern and central Montana are very much similar in their nature and in their risk to the forests of eastern Washington just described.

In the year 1902 occurred the most destructive forest fire known in Washington and Oregon since settlement took place, the damage to standing timber in Clarke and Cowlitz Counties, Washington, alone being $2,000,000, and for the states of Oregon and

Washington as a whole has been estimated at $5,000,000. The legislatures of these two states, meeting in 1903, with this experience fresh in mind, took up the matter, and the first Washington forest fire law was passed. This law provided for a complete system of state officials, including a State Fire Warden and deputy wardens in each county. The law provided adequate punitive measures, and for the issuing of permits by deputy wardens to those wishing to burn clearings and slashings during the closed season. Owing to the inability to secure an appropriation, the duty of State Fire Warden was imposed upon the State Land Commissioner, and the duty of county deputies was imposed upon the county commissioners of the several counties. There being no funds available and no one particularly to handle the work, but little was accomplished except in the creation of sentiment and in the reduction of risk through the permit system.

A somewhat similar law was prepared for Oregon, passing the legislature, but was vetoed by Governor Chamberlain, owing to the fact that it called for a small appropriation.

In the session of 1905 a new law was introduced in the Washington legislature, providing for a State Forestry Board of five members, State Fire Warden, for deputies in the several timber counties, for the employment of outside aid in controlling fires, and for the issuing of permits by the county deputies for the burning of slashings. The sum of $7,500 was appropriated to carry on this work for the years 1905 and 1906, besides $2,500 for the use of the State Land Office, which was expended under the direction of the Chief Fire Warden. The entire appropriation was consumed the first year. Deputies were maintained in the timber counties during the dangerous season, and good results were accomplished, especially in the creation of sentiment and in the bringing about of a respect for the officers of the law, several arrests and convictions having been made for violation of the law.

During the year 1906 the Washington work was carried on by voluntary subscription, amounting to $12,000, by lumbermen and timber-land owners. In the session of 1907, the appropriation for the two years of 1907 and 1908 was $26,000. The expenditures for 1907 were $9,454.28, and for 1908, $13,617.20.

The Idaho legislature in the session of 1905 enacted a law which provided in the main for the control of the forest fire work under the supervision of the State Land Board. It provided for violations of the punitive features of the law, but made no specific appropriation for the carrying out of its provisions. In the year 1907 a new law was passed, facilitating the formation of private protective associations in the principal timber districts of the state, and allowing for the participation of the state in this work upon the basis of the cost for the acreage owned by the state in those districts.

In 1905 the Oregon legislature passed a law providing for a State Board of Forestry, drawn from the different affiliated boards of the state and from timber owners, and providing for the formation of volunteer organizations for the purpose of fighting fire, the expense of which was to be borne by the members of these associations. The sum of $250 was appropriated for the expenses of the State Board for the past two years.

The State of Montana has, as yet, no special forest fire legislation, either in the way of providing state machinery for the work, or for the facilitating of private associations in their work.

We have in the Pacific Northwest three agencies engaged in forest-fire protection:

First, the National Government, through the Forest Service;

Second, the different states, through their various forest-fire systems; and,

Third, private timber-land owners, through associated work, and also through private initiative.

The protection of the National forest and the work of the Forest Service does not come properly under the heading of this paper; and of the state work, in the area under discussion outside of the State of Washington, the results show entirely in the work of the private associations, which will be taken up later.

The work of the Washington Forest Fire Service has been encouraging in its results, but its effectiveness has been largely handicapped by the low salaries provided for in the law. It is impossible to obtain competent county wardens at $3 per day. It has been the policy of the State Board to expend the meager funds at its command largely in the support of the organization; that is, the employment of the county deputies and the State Warden's office. Nature has been very kind to us during the past four years, and we have not been called upon to meet a very dangerous situation. However one fire in Stevens County, in the year 1908, called for the expenditure by the state of nearly $5,000. When it is realized that the appropriation for one year's work was only $13,000, and that the work must be distributed over twenty-two counties, and for an average of nearly 100 days of the season, it will be seen that there is available in each county only about $5 per day, which is certainly a most inadequate amount for the protection of resources of such magnitude.

At the beginning of the season of 1908 there was formed the Washington Forest Fire Association, comprising a membership of 130 owners of western Washington timber land, and representing an acreage of approximately two and one-half million acres. The object of this association was to supplement the work of the State in

protecting timber from fire, and the organization of its forces was largely along the same lines. During the past season the two forces cooperated with entire harmony and with vast advantage in the work. The expenditures of this association were about $23,000, the larger part of which was expended in salaries and expenses of the regularly employed patrolmen. The beginning of the season indicated a very disastrous one, but copious rains on August 25 saved the situation, and had it not been for that fact, both the Forest Fire Association and the state appropriation would have been wholly inadequate to have handled the situation, and both would have been compelled to expend more money to handle the situation.

Under the Forest Fire Law of 1907 there has been formed in northern Idaho four private forest protective associations, known as the Clearwater, the Potlatch, the Pend d'Oreille, and the Coeur d'Alene. The acreage covered by these and the amounts expended during the past season are shown by the following table:

Idaho Protection Associations

	Number of Members	Acreage	Expenditures	Timber Burned 1908
Pend d'Oreille	23	300,839	$8,670.06	Practically none
Clearwater	9	288,780	7,127.69	4,000,000 ft.
Coeur d'Alene	13	358,060	26,748.98	25,000,000 ft.
Potlatch	12	314,658	9,739.36	60,000 ft.
Totals	57	1,262,337	52,286.09	29,060,000 ft.

Cost per acre, .0422; value of fire loss, $500,000; loss per acre, .40.

Each of these associations maintains a regular corps of officers, a paid chief warden, and sufficient rangers or patrolmen to cover the territory embraced within their limits. Two of these associations during the past season were singularly free from forest fires. The Pend d'Oreille and Coeur d'Alene Associations had a very disastrous season, and had it not been for the system of patrolmen and the money spent in controlling fires, the season would have witnessed a great loss to the forests of northern Idaho. These four associations have united in the organization of the North Idaho Forestry Association, by which it is hoped to obtain more uniformity in the work, to encourage the formation of associations for timber areas not covered by those already organized, and to carry through the next legislature needed amendments to the law, the principal one of which is to secure the cooperation of the state on a more direct basis than what has been possible heretofore.

Under the Oregon law the State Board of Forestry consists of seven members and provides for the division of the state into forest areas, and for the formation of cooperative patrol systems in these forest areas. No reports are available as to the exact amount of work or the actual expenditures made under these cooperative associations during the past year. Many of them are of a very informal nature and their membership is only made up of two or more of the larger timber owners, one of which, usually the one located closest to the area, conducts the patrol system and handles emergencies as they arise, the cost of which is borne on an acreage basis by the different owners. In the vicinity of Pokegama an association of this sort last year patrolled 200,000 acres of pine forest, which has heretofore been considered practically immune from fire, but which at many times during the past season was in grave danger, and wholesale destruction was only averted by the work of the association. The cost was $2,700, or a little over one cent per acre.

Similar cooperative work has been done by the Booth-Kelly Lumber Company, near Eugene, and the results are most satisfactory. In the Tillamook Valley and in Coos Bay, some of the larger owners united in this way, besides which there were several other agreements of which no reports are available. The total cost for this work in the past year was probably in the neighborhood of $25,000. This, of course, does not include the expense of logging companies in protecting their own lands from fires.

In northern California the McCloud River Lumber Company partly in cooperation with the California Board of Forestry, has developed a system of patrol and of logging that is more detailed, and has accomplished more in results than probably any other similar associated work in the United States.

Every one of the agencies employed in protecting the forests of the Pacific Northwest from fire are preparing plans for the enlargement of their work. The Washington State Board has suggested minor amendments to the law, and are asking for an appropriation of $50,000 for the coming two years. This will enable them not only to maintain the state and county organizations, but will leave a considerable sum for emergencies and for the employment of outside help for serious fires.

The Washington State Forest Fire Association is increasing its membership and hopes to enroll nearly four million acres for 1909. It is the intention to raise at least $50,000 and to expend this mainly in the enlargement of their patrol system. Any amount needed for emergencies can be utilized and paid by the members in assessments on the acreage basis. Through these two agencies it is contemplated that the western portion of Washington will be patrolled during the dangerous season by at least two hundred men, and western Washington will be given a forest-fire protection probably more extensive than that enjoyed by any other timber section in the United States.

On the eastern slope of the Cascades and along the British Columbia and Idaho boundaries is a vast area of open pine lands, in which it is hoped that private associations will be formed which will accomplish as much for that area as similar associations have for northern Idaho.

In northern Idaho it is proposed to organize one or more additional associations. Those already formed, with added experience and larger sums at their command, will be able still further to prevent loss.

Lumbermen of Montana, taking a lesson from those of Idaho, are urging their legislature to enact a law similar to the Idaho statute, and in case it is done, private associations will be formed covering various areas in that State.

In Oregon the State Board is asking for an appropriation to provide a State Fire Warden and county deputies. The formation of private associations on a larger scale is contemplated, which, it is hoped, eventually will cover the entire timber area of the state.

To accomplish the aims set forth above there are various organizations, each working in their particular sphere; but to embrace and to supplement all of these, there has recently been formed the Pacific Northwest Forest Protection and Conservation Association. This association will appeal to the public from the standpoint of the public's interest in the timber lands. All of these States, with the exception of Oregon, are owners of large tracts of state school timber lands, Washington, for instance, having about 700,000 acres of timbered land belonging to the state schools. Idaho and Montana also have a large acreage, the extent of which is difficult to determine. The legislatures of these states will be urged, as a matter of business policy, to appropriate money for the protection of this state property. The state timber lands of Washington to-day are worth $20,000,000, and an appropriation of $25,000 per annum would be little more than one-tenth of one per cent upon this valuation.

A campaign of education will also be inaugurated, by which it is hoped to prove to the people of the states that whereas when one thousand feet of timber is burned the stumpage owner may lose from $1 to $2 per thousand feet, the citizens of the state will lose in labor and for the necessary supplies for converting the standing tree into timber from $8 to $12. The great fire of 1902 caused a loss to the timber owners of Oregon and Washington of approximately $5,000,000, but it annihilated a resource that would eventually have returned to the citizens of those states $50,000,000 in business.

The association will also devote its attention to the subject of taxation, not in a spirit of opposition to the carrying of just burden in the maintenance of government, but in an endeavor to show that, when timber land is taxed beyond its fair proportion, the tendency is to accelerate its manufacture into lumber, which often entails great waste. It is hoped that in the future some practical scheme can be devised by which cut-over lands may be exempt from taxation as far as growing trees are concerned, and that taxes may be collected whenever any forest product is taken from them. In this way it is hoped that the private holding of cut-over lands for future forest crops may be made possible.

A further effort will also be made to incorporate under state control the systematic management of the state timber lands to the extent that, whenever the timber is sold from them, logging may be conducted in such a manner as to promote the reproduction and the land held as producers of a future forest crop.

The timber owners of the Pacific Northwest realize that their timber holdings constitute the last resource of standing timber of the United States. They wish also that the industry may become a permanent one; that when the virgin forests are gone their mills may not be shut down through lack of raw material; that the experience of other regions with its dismantled plants, its smokestacks whose fires have long since gone out, may not be repeated in the Pacific Northwest. To that end it is hope that eventually every acre of cut-over land that is not more valuable for agriculture or for other purposes may be devoted to the growing of another timber crop. It is especially fortunate for the Pacific Northwest that these ideas are held, not solely by theorists and dreamers, but have the endorsement and financial support of its progressive lumber and timber industry.

Prof. H. H. Chapman, of the Yale Forest School, was the next speaker, his address dealing with practical methods for the suppression and control of forest fires, and suggesting a number of points for remedial and preventive legislation. A summary of Professor Chapman's paper follows.

SUMMARY OF PROF. H. H. CHAPMAN'S SPEECH

THE suppression or control of forest fires must necessarily precede the execution of any plan or scheme for forest conservation or forest establishment. It is useless to expect any one to plant trees for profit, or undertake conservative forest management, until a reasonable assurance can be given that his investment will not be lost through fire.

It is the duty of the state in the interest

of the general public and of future generations to provide the needful laws and to enforce them, and to undertake vigorously whatever lines of action promise to secure the desired result. Protection from fire should be accorded to all woodland without respect to ownership.

An efficient fire service can be secured only by the expenditure of money, but the cost of reasonable protection need never be more than a fraction done by uncontrolled fires.

LAWS DEFINING OFFENSES

1. For the protection of woodlands, state laws should declare it a misdemeanor to set fires either on one's own or another's land, either willfully or carelessly, whereby the property of another is injured or destroyed.

2. State laws should provide a closed season covering months in which there is extra danger from fire. During this season it should be unlawful to start fires on one's own land for any purpose except on ploughed ground and at least 200 feet from woodlands, without the written permission or presence of a fire warden.

3. Proper restrictions should prescribe the use of camp fires, their location and extinction, which restrictions should be posted conspicuously.

4. Penalties for violation of such laws should be either fines, imprisonment, or both, in the discretion of the court, but the minimum fine should not be too severe. Large minimum fines often deter a court from imposing any penalties. The important thing is the deterring effect of punishment, not necessarily its severity. All fines collected should be disposed of in accordance with existing laws.

5. A definite form of procedure should be provided, conformable to the law and practice in the state concerned. This should specify the courts in which complaints shall be made, how they shall be heard, the form of process to issue, the manner of delivering and recording a judgment. Wherever possible, avoid trial by jury or provide for a change of venue. Provide for appeals and a method of execution.

LAWS CONTROLLING RAILROADS

1. The use of coal or wood by railroads is a constant source of danger and is the cause of a large percentage of the forest fires throughout the United States.

2. Railroads should be held responsible for the starting of forest fires to the same degree as individuals.

3. Spark-arresters are an effective means of lessening the damage of forest fires, but no law should be so framed that their use would relieve the railroads of responsibility for setting fires.

4. Railroads should be required to maintain effective fire lines along their right of way. They should be given power, under proper limitations, to enter upon private lands, in order to construct a firebreak of effective width.

5. In regions where it is not possible to construct safe firebreaks, railroads should be required to patrol all portions of their lines which pass through woodland. Such patrol should be under the direction and control of state and town fire wardens.

6. The state forest service should be given power to enforce the carrying out by railroads of any measures for the suppression of forest fires.

7. Penalties for violation of such laws should be sufficiently severe to act as a deterrent on railroads, and make it cheaper for them to comply with the law than to ignore it.

OFFICIAL MACHINERY FOR ENFORCEMENT OF FIRE LAWS

1. The enforcement of forest-fire laws must be in the hands of special officials best known as forest-fire wardens.

2. At the head of every state system of fire wardens should be a state fire warden, who should be appointed by the Forestry Board, if such exists, and be reappointed during efficient service. He should have no other duties than to superintend the work of local fire wardens, should spend most of his time in the field, and be responsible for the efficiency of the fire-warden service.

3. The state fire warden should have the power of removing from office inefficient local fire wardens. He should approve the appointment of all fire wardens. He should audit the accounts of local fire wardens, especially if the state pays part of these expenses. He should be required to appear personally or by deputy as prosecutor in behalf of the state against any one who violates the forest-fire law.

4. A system of town or township fire wardens should exist, whose duty it is to extend fire protection to all lands regardless of ownership.

5. These town fire wardens should be appointed, and should be kept in office during efficient service. It is impossible to secure efficient service from fire wardens when the duties of the office are added to those of some other public and elective office, as town supervisor.

6. Town fire wardens should be appointed by the town governing board whose local acquaintance enables them to select the best local warden. Where local governments are not organized or the state has large land holdings, state fire wardens should make these appointments.

7. Town fire wardens should have the power to appoint district fire wardens when needed, these appointments to be confirmed by the state fire warden.

8. Game wardens may be given the duties of fire wardens, but such a system cannot be substituted for a system of town and district fire wardens properly appointed and looked after. It should be regarded merely as an adjunct.

9. Fire wardens should have the power to summon any able-bodied resident to assist in fighting fires, and to requisition the use of teams and equipment. Failure to respond should incur a penalty.

10. Fire wardens should have the power of arresting without a warrant any one caught in the act of violating any laws for the protection of the forest.

11. Prevention of fire is cheaper than suppression. Fires should not be allowed to start, or, if started, should be extinguished before they gain any headway.

FIRE PATROL

1. Town fire wardens, whose duties are confined to extinguishing fires, cannot take the proper measures to prevent them.

2. In sections where the danger is great, a paid fire patrol of men, whose entire time when employed is devoted to patrolling definite areas for the prevention and detection of fire, is the only system which will prevent the starting of fires and insure their prompt discovery and suppression.

3. Fire patrol should supplement the system of town fire wardens, but on account of expense, must be introduced gradually and in localities where it is most needed and will be most effective.

4. Fire patrol can be confined to dangerous months, thus limiting the expense.

5. The expense of maintaining fire patrols should be divided among the state, the railroads, the town, and land-owners.

6. The state should patrol state lands and bear the full expense of such patrol.

7. Railroads should be required to patrol those portions of their right of way subject to fire danger, and should bear the expense of such patrol.

8. Owners of land should be encouraged by the state to employ fire patrols to protect their own property. This may be done:

By encouraging the formation of associations of land-owners for the purpose of employing fire patrols, thus reducing the expense and increasing the efficiency of fire protection;

By appointing such employes of land-owners or associations, as state and local fire wardens, with the usual powers;

By financial aid, as state supervision of the work of such fire patrols, or in paying part of their salary. Such state cooperation is justified by the public benefits secured by fire protection.

9. Fire wardens should be required to enter adjoining towns or counties when necessary in fighting fire, and such towns or counties should be required to pay the bills for such outside assistance.

DISTRIBUTION

1. The payment of firefighters should be at a rate equal to that received by ordinary labor. Fire wardens should receive liberal compensation, since they should be men of greater earning power than ordinary labor.

2. Payment should be by the hour, since the most efficient work can often be done at night. A minimum of five hours' pay should be allowed to those who are officially summoned and leave their occupations to attend a fire.

3. The possibility that compensation will encourage incendiary fires cannot long continue:

Where the local fire warden employs only reliable help from those persons interested in the suppression of fires;

Where the penalties for setting fires are rigidly enforced;

Where public sentiment is against fires.

4. The expense of local fire protection should be shared by the state and the township or county. If the town bears the entire expense, the poorest towns, where fire protection is most needed, bear an undue burden. If the state should bear the whole expense, towns would be indifferent to the size of fire bills, and it would be hard to avoid dishonesty.

5. Payment of fire bills should be prompt, and long delays in the auditing and payment of bills are especially to be avoided.

6. Wherever practicable the state should pay fire claims directly and collect from counties or towns.

Professor Chapman stated, at the close of his address, that it was the purpose of the Association, in appointing the committee of which he was a member, to have its conclusions drawn up as a sort of platform to be adopted by the Association, if it saw fit; and after considerable discussion, participated in by the chairman, by F. W. Besley, of Maryland, Alfred Gaskill, of New Jersey, Doctor Rothrock, Prof. F. W. Rane, state forester of Massachusetts, J. H. Finney, and others, the motion was made and seconded that the platform contained in Professor Chapman's address be adopted, the motion being carried unanimously, after which the session adjourned until 8 p. m.

THE EVENING SESSION

THE evening session was taken up almost altogether with an address by the Hon. J. E. Ransdell, of Louisiana, and an illustrated lecture by Dr. Bailey Willis. Representative Ransdell's address dealt with the necessity for the development, to the fullest possible extent, of the inland river system of the United States, together with the correlated subject of development of freight traffic routes on the great lakes, systematic work on the harbors of the Atlantic and Gulf coasts; and the speaker, who is President of the National Rivers and Harbors Congress, gave vivid and enlightening statistics showing the vastly decreased cost of heavy freight traffic when our rivers and waterways are developed to their full carrying capacity. Representative Ransdell's address is here presented in full.

ADDRESS OF HON. J. E. RANSDELL

I FEEL honored at being invited to address this great Association, which in my judgment, is engaged in one of the greatest works now confronting the American people, to wit, a proper conservation and preservation of our forests, one of the most valuable of our national assets. I wish I were sufficiently familiar with the subject which especially interests you, to speak to you intelligently on it, but I am sorry to say that in my busy Congressional life, devoting myself, as I have done, almost exclusively to the study of waterways, I have not been able to give that careful consideration to the study of forestry which its importance demands of any one who attempts to speak to a forestry association.

From my youth I have taken much interest in this subject. I observed, when a boy, on my father's Louisiana plantation, that as the lands were cleared, the sloughs, bayous, lakes and lowlands rapidly filled up. Places that I used to wade and fish in as a little boy had ceased to be watercourses when I returned to the farm after receiving my education, and as I think about that I am impressed by the fact that as the forests are removed and the lands put under cultivation, a very great change comes over the physical face of the surrounding country. I infer from that fact in regard to the farms and the surrounding waters that when forests are denuded, even if the lands are not placed in cultivation, there is a very great effect upon the adjacent streams, whether they be the little shallow lakes and sloughs and bayous of my boyhood days, or the mighty watercourses on which we have palatial steamers floating. I think there is a very intimate relationship between forests and waters, and feeling that, I am much pleased to receive an invitation to come to-night and speak to you on the subject which I have studied for years, the improvement of our navigable waterways.

I wish to say, before taking up the navigation end of my discourse, that my own State, Louisiana, is very much interested in your work. Louisiana to-day, I believe, enjoys the unenviable notoriety of being the second lumber producing State in this nation, exceeded only by the State of Washington, if I am correctly informed. I say "unenviable" advisedly, for it is truly a source of sorrow to all patriots to know that that valuable product is being so rapidly dissipated. It is only a few years ago that States in the Northwest were producing more lumber by odds than Louisiana and the Southern States. The scefter has passed from them because of the very rapid manner in which the timber was consumed there, and I assume that in a few years this scepter, this unenviable scepter, will pass from Louisiana. I hope your society may be enabled to persuade the lawmakers of Louisiana to do something that will prevent the rapid denudation of their forests. I wish to say that within a very few months the Governor of my State, acting under a law passed by the last session of the legislature in June of the past year, appointed a conservation committee, and the president of it is a prominent lumberman of my district, Mr. Henry E. Hartner, a man who has been trying to handle his work in an intelligent manner. I drove for several miles with him through the forests last year and noticed that on nearly every acre of the land two or three seed trees had been left and quite a number of small trees. I saw some lands which had been cut over about fifteen years ago and already there was sufficient growth upon them to make

the lumber thereon commercially valuable, two or three thousand feet of commercial timber at least in that time, and trees rapidly growing, so that I would say at the end of fifteen or twenty years more the land will be very valuable. The contrast was painful to that a short distance beyond, where you could see a rabbit run for 300 to 400 yards through the woods from the train window; where there was not a vestige of anything left, not a sapling as big as my arm—nothing! The land was completely denuded of every kind of tree or life of that sort.

I would like to see laws passed in Louisiana, and in all the States where they can be passed, similar to the law in Maine, where I am told men are obliged to leave trees below a certain size. You gentlemen are so much more familiar with that than I am that I will not attempt to refer to it; but I sincerely hope that something of that kind can be done in those States of the Union which still have a large heritage of timber wealth. I would like to see the Congress of the United States pass the laws which you gentlemen are urging so strongly to protect the headwaters of our streams, and I pledge you all the support that I in my humble way, as a Member of Congress, can give you.

Just what the connection is between forests and navigable waters, I am not going to try to say. The doctors differ so much upon this subject that it does not seem to me it would be fitting in a layman to attempt to pass thereon. But I am convinced that there is a most intimate connection and relationship between the forests at our headwaters and the waters themselves, and feeling that I would like to see our Government, I repeat, do what you gentlemen want them to do in the protection of those forests, and I would like to see every State in the Union pass similiar laws.

You are connected with one great branch of the conservation movement and I with another, and I shall now attempt to say something about that with which I am a little familiar, the navigable waterways of the country. Many of you have heard, doubtless, of the National Rivers and Harbors Congress, an organization created in the city of Baltimore in 1901, for the purpose of arousing a public sentiment throughout this nation in favor of a broad, liberal, comprehensive policy for improving the waterways of the country, to the end that transportation charges may be cheapened, and that there may not be the fierce congestion in the movement of freight such as has existed in this country within the past two years. This organization since that time has acquired a great many members in every part of the country and has become, I may say, a living force. At that time waterways were not properly treated. We were treated as orphan children by the American Congress. The other great appropriation bills, for instance, such as those for the army, the navy, the pensions, the post office, the executive, legislative and judicial department, and others of that character, were passed every year, were on an annual basis, and carried very large sums. The bills for improving the waterways were passed every three years and carried small sums. When it was necessary for Congress to economize, no man ever thought of suggesting that we should leave off one or two battleships or pay smaller pensions or diminish our army or pay smaller salaries to the various officers of the Government and members of the legislative bodies; but it was always said, "Oh, leave off the waterways; they can get along without any improvements; they do not do much good, anyway." That was the sentiment ,and our magnificent rivers have been so neglected that we have actually less commerce on them to-day than we had fifty years ago.

Now that is a very unnatural state of affairs. It should never have been allowed to grow up, and the only way it can be accounted for, is the fact that in the rapid growth of our Americanism, in our rapid movement to the far West, in our attempt to grow with speed such as pleases Americans, we have forgotten these waterways. We thought that movements by river were too slow, that the iron horse was the only thing that culd keep up with the rapidly moving American. We neglected our rivers, and it is only within a few years that we have begun to see the fruits of our neglect. Ought we neglect all of them? No! There is one great system of waterways in this conutry which have been well improved—the great lakes—and bear this in mind, my friends, when I speak of the great lakes; not only are they magnificent watercourses, not only do they bear a great commerce, greater than any system of waters on earth, but they are railroad terminals. They connect with and are a part of the magnificent railroad system of this country. It is a fact that many of the lines on the lakes are owned, operated and controlled by the railroads and in connection with the railroads.

Another fact I wish to call to your attention in this connection is that while we have been neglecting the internal rivers, we have not neglected the harbors of the seaboards. The harbors were also railroad terminals. Proper attention has been paid to most of them. Now they may have been purely an accident, but I wish in passing at any rate to make the point.

What has been the result of the splendid improvement of the great lakes? The commerce of those lakes is accurately kept by the United States Engineer Corps. In 1907, according to the reports of these engineers, there passed through the Sault Ste. Marie Canal, which, as you know, is that

waterway connecting Lakes Superior and Huron, upwards of 58,000,000 tons of commerce, which was carried an average of 828 miles, at a total freight charge of eight-tenths of one mill per ton-mile, equal to $38,000,000.

I hope you will bear patiently with me while I use a good many figures, because it is necessary to use figures in order to explain this subject, and I will try to take the official figures.

"Fifty-eight million tons" rolls glibly off the tongue, but, my friends, that is three and one-half times as much as the total commerce passing through the Suez Canal. That is more than ten times the commerce that will pass through the Panama Canal for several years after its completion. That is a truly collossal commerce and a commerce in which every citizen of this Republic is interested. Without that splendid commerce through the Soo, composed largely of iron ore from the famous Mesaba Range in Minnesota, you would not be able to purchase iron and steel as cheaply as you do now. But for the commerce passing through that Soo, that Soo made navigable by large expenditures of this government, the people in the far West would suffer a great deal more from cold than they do now, because the vessels returning from the East to the West, after discharging a cargo of ore, carry a cargo of coal back to the West with them. Every citizen in this country is interested in that improvement, and that wonderful commerce is carried at one-tenth of one mill per ton per mile. How now does that compare with the average railroad rate—the average, I mean, for all the railroads of the country?

According to the Interstate Commerce Commission, the railroad rate charged in 1907 was 7.59 mills per ton per mile, practically nine and one-half times as high as the water charge on the lakes. Now suppose this great commerce of 58,000,000 tons had been carried at the average railroad rate; instead of paying $38,000,000 for it, the charge thereon would have been $364,000,000, or $325,000,000 in excess of what was actually paid.

So, my friends, the improvements of the lakes and the development of the waterborne commerce of the lakes resulted in benefitting the American people in cheapened rates through that portion of the commerce which passes through the Sault Ste. Marie Canal in the splendid sum of $325,000,000 in one year, an dit is going to continue to increase that amount, for the commerce of the Soo has been growing by leaps and bounds for many years.

Now bear in mind that the commerce through the Soo is only a portion of that of the great lakes. Official figures show that through the Detroit River, that same year, the commerce was 71,000,000 tons, or 13,000,000 tons in excess of that through the Soo; and there is also a vast commerce on the lakes which does not pass through the Soo or through the Detroit. There is also a considerable commerce on Lake Ontario. I am convinced, after a most careful study of the subject, that if the commerce of the lakes, in which all of us, I repeat, have an interest—that wonderful frain of the west which is brought East on the lakes, that wonderful ore of the West which comes for a thousand miles from Duto Conneautluth to Conneaut and Ashtabula, and thence 1135 miles by rail to the factories in and around Pittsburg, practically at the door of the coal field—if that wonderful comerce of the lakes, I say, had to be carried by rail, it would cost the American people nearly $500,000,000 per annum more than they now pay. So it seems that it is a pretty good investment we have made in improving those waterways.

How much did we spend on them? About $80,000,000 on the lakes. Ah! but, you say, that is all right as to the lakes; nature has done a great deal there, a great deal. Certainly it has. That is a system of waterways that no other country on earth has any to compare with. We ought to be proud of them, and we are proud of them. But is there any other place in the country where we could get like results by improving our waterways? Yes! The Mississippi River and its wonderful tributaries would also give us relatively as cheap rates if they were as well improved as the lakes. Now, bear in mind this statement: The lakes carried very little commerce until our government had, at an expenditure of about $80,000,000, deepened the harbors and improved the connecting channels through the Detroit River and the Sault Ste. Marie. They have been splendidly improved. Vessels drawing twenty-one feet can pass from any harbor on those lakes now to practically every other harbor. How is it on the Mississippi River? How is it on the Mississippi River's tributaries? How is it on the great Ohio, with its head at Pittsburg? Pittsburg, the greatest manufacturing city on earth; Pittsburg, which annually generates a commerce equal to the combined commerce of New York, Liverpool, London, Antwerp and Hong Kong! That is a big statement, but it is true. The Pittsburg commerce is composed of coal, iron ore and steel, and the products of iron and steel, and you must remember, my friends, that when it comes to a freight-moving proposition, it costs as much practically to move a ton of coal as it does to move a ton of silk or a ton of diamonds. I do not pretend to intimate for one moment that the Pittsburg commerce is as valuable as the commerce of the city of New York or the city of London or any of these other cities, perhaps, that I have named; but it exists in tons, and when we are discussing the question of transporta-

tion, that great commerce is a very important problem.

Now, with Pittsburg at the head of the Ohio River, what is the present condition of the Ohio River? Our government undertook to improve it is 1876, thirty-two years ago, so as to give a navigable depth of six feet at all periods of the year, by means of a system of locks and dams. In thirty-two years we have accomplished the magnificent feat of completing one-tenth of that project. Ought we not to be proud of our efforts? One-tenth of the Ohio River has been completed in thirty-two years! Now, several years ago, Congress practically adopted a plan of deepening the river to nine feet between Pittsburg and Cairo, instead of six feet as originally intended. The engineers tell us that it will cost $63,000,000 in addition to what has been spent to properly improve this great river by means of a system of locks and dams, fifty-four in number, slack-water navigation between the head and the mouth of the river.

I would like to submit this mathematical problem to this audience: If it takes the greatest country on earth thirty-two years to complete one-tenth of a project for six feet of navigation on the Ohio River, how long will it take that country to complete nine feet of navigation? I cannot say. I do not believe anybody in this audience can work it out. Certainly not until all of us will long since have been gathered to our fathers, unless the present system is changed.

Now, is there a commerce on the river worthy of the expenditure of $63,000,000? Why, according to the reports of the Engineer Department, the commerce on that river in the year 1906 was over thirteen million tons. We have no official figures to show the cost of carrying coal down the river and down the Mississippi River to New Orleans, but Major William L. Seibert, one of the most accomplished members of the Engineer Corps of the Army, now a member of the Panama Canal Commission, made an elaborate study of that subject and said that in 1905, in the then very unsatisfactory condition of the river, when it was navigable for very uncertain periods and only for a few months of the year, coal could be carried from Pittsburg to Louisville at .76 of one mill per ton per mile, and from Louisville to New Orleans at .67 of one mill per ton per mile. Bear in mind that in 1905 the railroads charged 7.60 mills per ton per mile, so that the average rates on the Ohio River were, respectively, one-eleventh and one-tenth of the railroad rate that year, on this 13,000,000 tons of commerce.

Now, if there were 13,000,000 tons with the river in that condition, how much would there have been with the river properly improved? I visited the city of Cincinnati three or four months ago and was told that at that time there were only two feet of water on the bar. It is literally the truth that at periods of low water there are points in that river which the boys and girls can wade. Is not that a shame? Is not that a disgrace, to think that a river like that should have been so neglected, a river which is a perfect bee-hive of industry, with over 100,000,000 tons of commerce every year generated at Pittsburg; with cities like Cincinnati, Louisville, Evansville, Cairo, and many others on its banks—a river which passes through the geographical center of this Republic, the center of population being very near its banks, the center of manufacture being very near its banks? And what is true of the Ohio, my friends, is true of all the other rivers. The Tennessee and Cumberland Rivers have been neglected in like manner. The upper Mississippi above St. Louis has been similarly neglected. Steamboats have entirely left the Missouri. I had the humiliating experience a few years ago, when a member of the Rivers and Harbors Committee, of hearing it said that there was no such river in this country as the Missouri worthy of being improved. Legislation was undertaken by the American Congress which practically put that river off the map, and for business purposes the men of Kansas City, led by that splendid business man, Mr. Lawrence M. Jones, at very considerable personal sacrifice to themselves, placed a steamboat line on the Missouri River between Kansas City and St. Louis two years ago, in order to do what? To demonstrate to the American Congress that the Missouri River still exists and can do business!

I wish to give you one striking illustration down in my own section of a comparison between rates by rail and water. For several years the people who live on Trinity River in Texas have been imploring the American Congress to deepen that little river by means of locks and dams, so as to give them cheap transportation to the city of Dallas, the head of their river. Dallas is one of the fine cities of the southwest. Cotton is the principal product of that section, and Dallas is the basic point for about one and one-half million bales of cotton every year. It costs to get that cotton to Galveston, the nearest seaport, about $3 per bale. Now, I live on the banks of the Mississippi River about 300 miles from New Orleans, and Dallas is about 300 miles from Galveston. Where I live we can get cotton shipped to New Orleans sometimes at 50 cents per bale, sometimes at 75 cents per bale; rarely, if ever, more than $1 per bale; so that the people of Dallas have to pay three times as much as we in Louisiana who happen to live on the banks of the Mississippi River. Now, these Dallas and Texas people generally said to Congress: "Give us $5,000,000 to improve the Trinity River, and instead of shipping our cotton; our cotton, which goes to the

marts of the world; our cotton, which annually pours into the hands of the American people more money than any other article of export—hundreds of millions of dollars coming in from the outside world to us every year as the purchase money of our cotton—instead of shipping our cotton by rail and paying exorbitant rates, we will be enabled to ship by water at reasonable rates." All of us, all of you who are before me now, use cotton. It enters into the everyday life of every man, woman, and child in the Republic, and that Texas cotton has to pay $2 a bale to the railroads more than it would have had to pay if Congress had been willing to spend the pitiful sum of $5,000,000 properly to improve that river.

See what a splendid investment it would have been. A saving of $2 a bale on 1,500,000 bales, a saving direct and immediate of almost $3,000,000 on one article alone. But is that all? No, my friends; it is an axiom of political economy that the products returning into an agricultural section, bought with the crop of the agricultural section, costs fully twice as much as it does to market the agricultural product; so if there was a saving of $3,000,000 on the outgoing cotton there would be a saving of fully $6,000,000 on the returning product—and that expenditure of $5,000,000 by Congress on the Trinity River would have saved the people of Texas and, therefore, the people of the whole United Staets, fully $6,000,000.

I do not want to bore you too much with details of this kind, but I must give you a few illustrations in order that you may understand the policy of the American Congress in this respect and may understand whether it has been necessary for organizations similar to the National River and Harbors Congress. I want to give you one more illustration closer at home. I do not want to convey the impression that the West and South have been badly treated and the people in the East have been well treated in regard to their waterways. That is not so. In 1873, Congress undertook to improve the Harlem River in the city of New York, within the very shadow of Wall Street, so as to give it a depth of fifteen feet, with a width of 250 feet, the estimated cost being $3,700,000. In the thirty years that have elapsed since that project was begun, just exactly one-half of the appropriation has been made and the work is about one-half completed. Think of that! On the Harlem River, which the year before last—I have not the figures for 1908—had a commerce of 10,000,000 tons, valued at $270,000,000, in thirty years, Congress, pursuing the niggard policy which it has always pursued toward our inland waterways, has appropriated only one-half of the money necessary to finish this great work. Can you understand it? I cannot, and I call upon you, my friends, to aid us in having a proper, comprehensive, businesslike policy adopted toward our waterways. I promise you in return, as one member of the waterways crowd, to do all I can to help forestry, because I believe the forest and water are twin brothers. They must stand or fall together.

I wish to say that in this great Republic of ours nearly all questions are political; but, thank God, this waterway question, like the forestry question, is not a political one. The last platforms of both the two great political parties of this country declared in the plainest and strongest language in favor of a businesslike policy toward these waterways. Let me read to you very briefly from those platforms.

That of the Republican party, adopted in Chicago, says:

"We indorse the movement inaugurated by the administration for the conservation of natural resources. We approve all measures to prevent the waste of timber. We commend the work now going on for the reclamation of arid lands and reaffirm the Republican policy of the free distribution of available areas of the public domain to the landless settler. No obligation of the future is more insistent and none will result in greater blessings to posterity. In line with this splendid undertaking is the further duty equally imperative to enter upon a systematic improvement, upon a large and comprehensive plan, just to all portions of the country, of the waterways, harbors, and great lakes whose natural adaptability to the increasing traffic of the land is one of the greatest gifts of a benign Providence."

And the Democratic platform says:

"Water furnishes the cheapest means of transportation, and the National Government, having control of navigable waterways, should improve them to their fullest capacity. We earnestly favor the immediate adoption of a liberal and comprehensive plan for improving every watercourse in the Union which is justified by the needs of commerce, and to secure that end we favor, when practicable, the connection of the Great Lakes with navigable rivers and the Gulf through the Mississippi River, and the navigable rivers with each other, and the rivers, bays and sounds of our coast with each other by artificial canals, with a view to perfecting a system of inland waterways to be navigated by vessels of standard draft. We favor the coordination of the various services of the Government connected with waterways in one service for the purpose of aiding in the completion of such a system of inland waterways; and we favor the creation of a fund ample for continuous work which shall be conducted under the direction of a commission of experts to be authorized by law."

In accordance with the platforms of their respective parties, I had the pleasure of witnessing at the great Waterways Convention in the city of Chicago Mr. Taft and Mr. Bryan assembled there in a spirit of brotherly love and the broadest statesmanship,

standing on the same platform in the greatest friendship, advocating in the plainest language the same great policy of waterway improvements, forgettitng all the rancor of politics for a day, and pledging themselves and the parties which they represented to this broad, liberal, comprehensive policy of improving every deserving waterway in the land.

I read during the last session of the American Congress no less than three messages of Mr. Roosevelt on this subject—Mr. Roosevelt, who, I wish to say, has been one of the most constructive and broad-minded men who ever occupied the White House. He has grasped this great business question as he grasped that great question of irrigating the arid lands of the West and of constructing the Panama Canal. He sees how important it is to us as business people. He sees how beneficial it will be to us, and he wants to see the work carried on in a business-like way instead of the desultory, unbusiness-like manner we have pursued in the past, which I have illustrated to you in the cases of the Harlem River, the Ohio River, and the Trinity River, and which I could illustrate, if I had time, by a hundred other cases.

Now, my friends, many of you, I know, are interested as shippers of lumber. Lumber is a very bulky, heavy product, a product which requires cheap transportation. I say to you, without fear of successful contradiction, that just as the waterways of the Great Lakes and the Ohio River carry freight at one-ninth, one-tenth, and one-eleventh of the average railroad rate, so, if you will develop, as they can be developed, as they should be developed, and as I believe some day they will be developed, the great internal waterways of this nation, you will find freight carried at rates not exceeding one-sixth of the average railroad rate. Now, certainly, that would be beneficial to every man, woman and child in this Union, for all of us are interested in transportation. Transportation enters into the daily life of every one of us, and anything that will cheapen the grain that makes our flour, anything that will cheapen the iron and steel that we use; anything that will cheapen the lumber that goes into the house that covers us, will benefit us, and we should take an interest in it.

I have heard it said that Germany is one of the most advanced countries on this globe in the preservation of its forests. I believe it is conceded that the Germans are a wise, far-seeing people. Let me say to you that not only does Germany protect its forests, but it protects and develops its waterways.

In Germany, according to Mr. O. L. Sparker, it costs, to carry freight on the Elbe, 3.3 mills per ton per mile; on the Oder, 2.5 mills per ton per mile; on the Rhine, 1.8 mills per ton per mile; the average being about 2.25 mills per ton per mile, as compared with our rate of .8 of one mill over the Great Lakes.

But here our railroads carry freight at about 7.2 mills, and in Germany in 1905, the time these figures were given for, the Germans' rail rate was 11.7 mills, so that the average water rate there was about one-fifth of the average rail rate. All the waterways of Germany have been as fully developed as possible. Berlin, which, as you know, is an interior city, is connected by canals with every part of the Empire, and such splendid canals run to the sea that to all intents and purposes it is a seaport. Between Antwerp and Paris there are seven distinct water routes. The French, the Hollanders, the Belgians, as well as the Germans, have seen the benefit of water transportation. So thoroughly have they developed their waterways that it is said you can load a barge in any part of either of those four countries and carry it to every other part without breaking bulk, at water rates about one-fifth of the average railroad rate.

Has that driven the railroads out of business? No! The waterways carry the low-class heavy bulk freight, such as coal, ore, lumber, farm products, iron and steel, and the manufactures thereof; the railroads carry passengers and the higher class products which will stand a higher freight rate. They have all prospered, and it is a well-established fact that along the banks of the Rhine and the Oder and the Elbe and other rivers in Germany, railroads are paying a better interest charge than the roads of the interior are paying. Simliar results would happen here.

The great New York Central Railroad is one of the best paying roads in this country, in spite of the fact that it parallels the Hudson River, then the Erie Canal, and then the Great Lakes. Another connected fact is that a few years ago, when the people of the Empire State had submitted to them the problem of having voted $101,000,000 to further enlarge and deepen the Erie Canal, the New York Central Railroad, the greatest taxpayer in the State, voted for that bond issue, although it has four tracks side by side paralleling the canal. Why did it do it? It took the ground that the cheap water transportation would cause such an influx of population and business enterprises of many kinds and manufacturies of every kind to the shores of that canal, that it could well afford it, because of its increased passenger and high-class traffic business. That, in my judgment, would be the result of a proper improvement of the general waterways of the country.

I wish I had time to go into that more fully, but I know you are getting tired, and there is another speaker to follow me. I wish merely to make this suggestion in closing, that as you are interested in this great conservation movement of improving the forests, so you should be interested, and I believe all of you are interested, in its kindred subject, improving the waterways. Let us all pull together for our joint end. If we

can pull together, we will be irresistible. Bear in mind, my friends, that there is a deficit facing Congress to-day, a deficit of $58,000,000 of last year, a reported deficit of $114,000,000 for the fiscal year ending June 30 next, and an estimated deficit of $143,000,000 for the following fiscal year, and that Congress is a little chary about making a liberal appropriation for forests, for rivers and harbors, or for anything which seems to be able to wait. Now, the friends of the waterways, foreseeing this deficit, foreseeing the trouble in hand, have been asking and are now asking that Congress issue $500,000,000 of bonds in order properly to improve every deserving waterway in the country. We do not want this issue to be emitted at once. We wish it to be authorized in order that the bonds may be sold and about $50,000,000 a year for the next ten years may be expended. I hope you will help us in that. If you do, I believe that you will develop something that will benefit every cititzen of the country and put Congress and the American people on a much higher plane of prosperity than they are to-day.

An illustrated lecture by Dr. Bailey Willis followed, the slides used being magnificent ones. Doctor Wills said, in part:

"We have behind us in the known recorded history of our race, some 4,000 years of experience since the time when we started from Central Asia and began our migrations westward, ever westward, absorbing the people native to the lands as we came, and passing on, ever on, until, passing across the Atlantic, we came toward the last land toward the West which we might occupy. In that land we came face to face with the old problem of how much we shall use of its natural resources. We have inherited from these 4,000 years the practice of abusing them instead of using them; but with modern science and modern purpose, we are turning our eyes toward purposeful use, toward proper conservation, and it is to be hoped that we shall learn the lesson in time to use them wisely and to save them from destruction.

One part of our lesson, however, is to look backward, to see what has been done in other lands and what is the result of our action and of various other causes in regard to these important questions, the forest and the waterways, which are so intimately linked.

I shall ask you to cast your thoughts far, far back. I shall ask you to accept my statement that there has been a time when all of Asia and all of Europe and all of North America were covered with forests. I shall ask you to accept my statement that the forests are older than the mountains which now diversify the land; that there was a time when those lands were plains, when there were no considerable heights on any of the continents, and when the climate was a genial Southern temperate climate from far South as far north as Greenland.

Under those conditions the forests prevailed over Asia, over Europe and over North America, and some of the species of trees which lived in those ancient forests are living to-day. For instance, the magnolia and the tulip tree, which is one of the gems of our southern forests in North Carolina and Georgia.

In consequence of the changes which have come over the earth's surface, mountain ranges have been upraised, climates have been changed, and the great uniform condition which existed in that ancient time has given place to one of great diversification. In the course of these changes the forests have met with certain influences which they could not withstand. A tree must have moisture, or it cannot grow.

Where the climate has become too arid, the forests have gone. In other regions, the climates have remained moist or have become even more moist than they were then, and there is a prevailing jungle which nothing can destroy. But between those two extremes there is a wide range of climate, particularly in the temperate zones, where the trees can survive if they meet no other enemies, but where, if to the trying conditions of climate there are added the activities of man and the effect of his herds of sheep and cattle grazing upon the young trees and the sprouts, then the forests vanish from those regions and they become like the

more arid regions—desert. It is in those areas where the effect of climate has been supplemented by the effect of man and his herds, that man has transformed the face of the earth from a garden to a desert. I shall ask you to go with me across such regions from China, through Asia, through Asia Minor, into Europe, and to look upon the experience which the race has had in that long migration."

The lecturer then proceeded to illustrate the effect of denudation in various countries of Asia and Europe. The plains and mountains of northern China, where climatic conditions are critical and where the activity of man has been most destructive, were described, and views were shown giving the barren aspect of hills which have been deforested within the last two centuries.

Scenes in central Asia, where the deserts have overwhelmed the cities of the most ancient populations, were followed by others in Asia Minor. Here the scant herbage and wretched peasants in the foreground of far-reaching, utterly denuded plateaus and mountains scarcely served to suggest the lands of Assyrian and Babylonian and Persian civilization. Through these districts, where marched the armies of Xerxes and Alexander the Great, a camel train now finds scarcely enough water.

Again the scene was shifted westward to Italy and the lecturer described the Northern Appenines and the bare slopes of Dalmatia, where the Romans obtained the timber for their ships of commerce and war. With characteristic thoroughness they left not a tree upon the hills.

In Southern France, in the valley of the Durance, bare slopes and the overloaded river bore testimony to the same relations of deforestation to excessive erosion.

And finally, a view of an utterly denuded area in northern China was placed in contrast to the superb forests of the southern Appalachians, and the question was put: "Which shall we pass on as the heritage to future generations?"

THURSDAY MORNING SESSION

THE first business of the morning session of Thursday, January 14, was the report of the committee on nominations. The committee's report was read and adopted without change, and the chairman was instructed to cast one ballot, for the Association, for the ticket, which was done.

Mrs. Donald McLean, president-general of The Daughters of the American Revolution, was the first speaker of the session, her address being on the subject of "The Daughters of the American Revolution and the Conservation Movement." Mrs. McLean's address was punctuated with sallies of wit that enlivened the session and put those present in the best of humors. In part Mrs. McLean said:

"I was in the Adirondacks a year ago, and while there I met a charming young forester, whom I dubbed 'Robin Hood'—as I might dub any of you gentlemen here present 'Robin Hood.' He represented the State of New York, in the preservation of the Adirondack forests. Until that time, outside my own natural, sentimental interest in anything and everything pretaining to my country, I had known very little of the processes of conservation, and I must say that I was extremely impressed with two points, namely, the minutia with which everything must be arranged to bring results, and the absolutely necessary courage to believe the results from the minutia. We were told all these things, and were supplied with literature upon forestry, and then we were told about a wonderful forest reserve, away up in the woods. I became anxious to see it, and at last I was taken up there. I looked, and looked, and looked everywhere. Of

course my eyes were naturally raised, and I could see no signs of any forest. I dropped my eyes, and kept on dropping them farther and farther, and after while I discovered a thousand or so little trees that I really think were no bigger than very small bushes, which were being nursed and cared for under the tender, brooding care of that forester. 'This is my nursery!' He said it with the same air with which a woman would say 'These are my jewels.' When I looked at those little slips, and learned that there were 5,000 trees in that enclosure, being cared for and grown to protect the great Adirondack forests, it gave me a great respect for the courage that could believe in it. * * * Representing, as our organization does, over 70,000 members, located in practically every town in every State of the Union, when we become inspired with the idea of preservation, or creation, or building, or marking, or whatever it may be, we, in our great numbers and our power, of controlling sentiment, bring about results. When the Daughters of the American Revolution take in hand the cultivation of the sentiment which you gentlemen are putting into active commission, you will have the best combination of forces to bring about the result that it is possible to achieve. * * * I come to you bearing the greetings of the American women of this country, the American women who, perforce, in belonging to the Daughters of the American Revolution, must have the purest strain of American blood that permeates the veins of the citizens of this country. We do not presume to place ourselves on a pedestal, but we do believe that the descendants of the earliest, truest lovers of their country must necessarily be those who love it best now. * * * I beg of you to allow the women to feel that they have had something worthy to do with your undertakings, not necessarily because they are auxiliaries or committees or appendages to your work, but because in their hearts is a real love for that country to the aid of which you can come, as did the knights of old, and bring it to its highest triumph of glorious victory."

At the conclusion of Mrs. McLean's address, on motion of the chairman, she was unanimously elected an honorary member of the Association, the adoption of the motion being greeted with prolonged applause.

Following the report of the Committee on By-laws, and the supplemental report of the Auditing Committee, the meeting was addressed by F. W. Rane, State Forester of Massachusetts, his subject being, "Principles in the Acquirement and Management of State Forests." Mr. Rane's address follows:

ADDRESS OF F. W. RANE

THE difficulty which your committee has had is in drawing up a policy which can be applied to different States. There is nothing which is so vitally affected by local conditions as a State forest reserve policy. One might almost say that a separate policy should be drawn up for each State.

The State of Massachusetts is at present, and I presume will be for a long time, not only committed, but confined by strongly developed public sentiment to a policy of State reserves wholly for the purpose of encouraging private forestry. This is distinctly not true of those States which have gone farthest in establishing State forest reserves, though it does characterize New England as a whole.

New York's reserves are dictated by a policy of protection of watersheds and entirely dominated by a distinctly anti-forestry sentiment favoring the preservation of these reserves as wild parks in their natural state. But the function of the State as a land owner is clearly recognized.

Pennsylvania is the most advanced of the Eastern States, and her reserves, while founded on the need of watershed protection, are accepted by the public as true forest reserves for the production of timber and its utilization. The principle here recognized is that large areas of waste land can best be reforested by the State.

Michigan's struggle to establish forest reserves is being waged along exactly similar lines, only here we have the vital question of choice between agriculture and forestry. The lands are sandy and largely too poor to

farm, but are good fields for unscrupulous exploitation by land sharks. The forestry movement is based on the platform that the State should hold all tax lands and acquire large areas for the production of timber by the State.

Wisconsin clearly recognizes the principle that the State may go into the business of timber production. Their 300,000 acres of land, while located largely around stream headquarters, is distinctly for timber production. William Irvin, whose company gave to the State some thousands of acres of cutover lands, said that in his opinion the State was the agent to reforest lands and grow timber for the future—"the individual never will do it." These instances are cited to emphasize the difference between the point of view of these States and that of New England, where it is recognized that the individual can grow timber and that the State's function should be confined to such measures as will encourage the development of private forestry.

The formal report of the committee is as follows:

To the American Forestry Association:

Your committee, appointed to report on the following subject, "Principles in the Acquirement and Management of State Forests," begs to present the following report:

(1) It is believed that all States should have a well defined policy of acquiring and managing forest lands. This policy will necessarily differ in different States.

(2) Forest reserves can be made to serve the State in the following ways:

(a) By being of educational value in demonstrating what may be accomplished.

(b) By properly utilizing waste or non-agricultural lands in the production of timber.

(c) By conserving our waters through the protection of our watersheds and steep slopes.

(3) The forest interests and policy of a State where large forest reserves are a possibility, should be safeguarded from politics by being supervised by a non-political board, a majority of whose members are preferably named in the law as occupying certain positions, such as heads of educational institutions or other particularly well known, stable and public spirited bodies or organizations that take an interest in true forestry work.

(4) State forest reserves should be under the direct management of a technically trained forester or one with adequate training for successful management.

(5) State forests should be protected from fire by instituting a definite forest fire policy. Forest patrols, fire lines, telephone communication, and fire fighting equipment, etc., should be had where possible. Adequate fire protection is absolutely essential for success.

(6) To secure fire protection a force of State forest rangers should be employed. These rangers should perform or superintend all other work connected with the proper administration of State forest reserves such as road and trail building, planting, timber cutting, etc., under proper supervision of the forester in charge.

(7) The forestry board should have the authority to employ all necessary assistance for the protection and management of State forest reserves, and also to utilize by sale or otherwise all the natural resources of such reserves including timber in such a manner that the forests thereon may be maintained in a productive condition.

The discussion was continued by R. S. Conklin, Commissioner of Forestry of Pennsylvania, who spoke of the generally recognized necessity for the creation of State forests and the difficulty of creating a sentiment that will permit their creation and maintenance. He stated that in 1893 the first legislation was secured in Pennsylvania recognizing the necessity of forestry work; but that it was seven years after this first act was passed before the State actually secured the first acre of forest reserve land. He detailed the various steps that have been taken, all leading up to the present comprehensive plan, and urged the necessity for much more work and much more legislation in addition to that already placed on the statute books of Pennsylvania, laying particular stress upon the point that the States themselves must very largely work out their own salvation, and that the Federal Government can not and should not be looked to altogether, although cooperation of State and Federal Governments is advisable. During the course of discussion that followed his remarks, Mr Conklin stated that Pennsylvania has received from its forest reserves revenue amounting to about $22,000, and that within a few years it was confidently expected that a considerable annual revenue would be received from these reserves. Doctor Rothrock, Robert C. Lippincott, of Philadelphia, and others took up the discussion, which continued until adjournment.

THE AFTERNOON SESSION

THE first order of business at the opening of the session of Thursday afternoon, January 14, was the report of the Committee on Resolutions. The report was taken up section by section, each portion of the resolutions being fully discussed, and the vote was taken by sections. The resolutions in full, as finally adopted, are given below.

REPORT OF COMMITTEE ON RESOLUTIONS

1. WHEREAS, the position of the American Forestry Association has consistently been one opposed to entering into questions political, and,

WHEREAS, the Association has not heretofore expressed by resolution any attitude towards the question of tariff on lumber or wood pulp.

Resolved, that it is the sense of this meeting that this policy of non-interference in matters political be approved and continued as the future policy of the Association.

2. The need for education in forestry increases with the opportunities for its practice. But a sharp distinction must be made between the instruction which has for its object the raining of professional foresters, that which aims to qualify farmers and other woodland owners to manage their own properties intelligently, and that which is offered for the enlightenment of the general public.

Recognizing the fact that various classes of learners are often confused, be it resolved:

First, That the American Forestry Association advocates the widest dissemination of all facts relative to forests and forestry, but distinctly discountenances the making of reckless, unsupported and doubtful statements as harmful to the real interests of the cause.

Second, That it endorses and recommends the passage of Senate Bill 7772, Sixty-sixth Congress, second session, providing for instruction in forestry at the agricultural schools of the various States, *with the clause* that no part of the appropriation shall be used for technical instruction, and not withtion therefor of a law providing that timber out it.

3. That the American Forestry Association urges the repeal of the law known as the Timber and Stone Act, and the substitution therefor of a law providing that timber and stone shall be sold at its actual value and the proceeds devoted to the purchase of forest lands whose protection is necessary to safeguard navigable rivers.

WHEREAS, the necessity of improving and utilizing, to the utmost extent, the internal waterways of the country has become a measure of both commercial importance and of national safety, therefore:

Be it resolved: The American Association urges the National Congress to authorize as speedily as possible the accomplishment of this work, and if need be, to issue bonds in payment for the same, as recommended by President Roosevelt and President-elect Taft.

Resolved: That copies of this resolution be respectfully transmitted to the Senate and House of Representatives.

4. WHEREAS, Protection of the watersheds is of vital importance to the future of every State, and,

WHEREAS, the owners of such watersheds are usually financially unable to give adequate protection to the non-agricultural portions thereof, therefore:

Be it resolved: That the Members of the American Forestry Association urge upon he Legislatures of their respective States, the wisdom and the necessity of their States purchasing such non-agricultural lands and converting them, as speedily as possible, into well-timbered State Forest Reserves.

5. WHEREAS, no law is equitable or just which obliges the owner, or owners, of forest lands to pay all the taxes upon land fro mwhich he or they receive no more benefit than the State at large, and,

WHEREAS, no law is equitable which imposes a greater tax upon a crop of growing timber than it does upon a crop of growing corn, or other grain, therefore:

Be it resolved, That the American Forestry Association recommends that its members do all in their power to secure within their respective States the enactment of such laws as may be constitutional therein as will remove the tax from standing timber, and substitute instead of such tax, an income tax when the timber is cut.

Resolved: That we welcome the assistance of and heartily commend and endorse the organization and work of the Woman's National Rivers and Harbors Congress. Its aims, as stated in its construction, being "The promotion of the meritorious waterways, rivers, harbors, and canals, the preservation of the forests and the conservation of all the other natural resources."

REPORT OF BOARD OF DIRECTORS OF THE AMERICAN FORESTRY ASSOCIATION FOR THE YEAR 1908

THE Board of Directors of the The American Forestry Association herewith submits its report for the year 1908.

The customary campaign for new memberships was actively conducted the first part of the year. The following results for the year have been obtained:

The membership of the Association, December 31, 1907, was 6,555—composed of three patrons, 237 life members, eighty-nine sustaining members, 6,226 annual members. During the year 1908 there were added a total of 1,086—nine life members, ten sustaining members, and 1,067 annual members; and during the same period there were lost by death, resignation, etc., five life members, eleven sustaining members, 652 annual members, making a total of 668 lost, or a net gain for the year of 468, making a total membership of the Association at December 31, 1908, of 6,973 members.

In the conduct of this membership campaign, in 1908, there were sent out 30,403 folders and 34,903 form letters.

Of the declared objects of the Association, one of the chief is the diffusion of knowledge concerning Forestry and related subjects. To the furtherance of this work the Association has diligently applied itself.

The publication of the magazine, whose purchase was last year reported, has been continued. The scope of the publication has been broadened to include the general field of conservation of all natural resources, notably those with which the forests are connected. nIn harmony with this course the name of the magazine has been changed "Forestry and Irrigation" to "Conservation." Each members receives a copy.

The system of press bulletins, instituted in 1907, has been further employed in 1908 with good results. By this meanse some 1,600 newspapers and, through them, an inderterminate but unquestionably large reading clientele, have been reached. The extent to which, as shown by clippings and marked copies returned, such matter has been used, is at once a proof of a rapid rise, in the tide of public interest in foresry and conservation, and a factor in further promoting this essential interest.

Educational work through public lectures, begun last year, has been continued and greatly developed. In 1907 the Secretary, in addition to certain isolated addresses, made two extensive lecture tours, speaking thirteen times in four Southern States, and twenty-two times in six Western and Middle States. These addresses were ordinarily given under the auspices of boards of trade, chambers of commerce, women's clubs, educational institutions and the like, the audiences averaging about 300. In 1908 the Chautauqua field, now so important a medium of popular education in the great Middle West, was entered. Illustrating his subject with lantern slides, the Secretary spoke six times per week in four States—Wisconsin, Minnesota, Iowa and Missouri—to a total of sixty-four audiences averaging at least 1,000 in number. More than 60,000 people were thus reached. A number many times larger was, in addition, reached through the press, in which the lectures were fully and accurately reported. Aside from the Secretary's salary the total expense of this campaign to the Association was $66.92. Opportunity now exists not only to continue this important work before Chautauquas, but to extend it to the Lyceum field.

The Secretary has also contributed freely to the periodical press, and conducted a large correspondence.

The movement for the preservation of the forests and related interests in the Southern Appalachian and White Mountains has been pressed with vigor and aggressiveness. New England, the South and the West have cooperated as never before. A multitude of associations and individuals have devoted time and effort to create and arouse sentiment, and focus it upon the National Congress. On January 30, the day following the last annual meeting, a one-day hearing was had before the Committee on Agriculture of the House of Representatives. There were present some 200 friends of the measure from twenty states. Among these were many of the most influential representatives of business and professional associations and citizens' organizations, including a number of governors. The delegations were led by Governors Smith, of Georgia, and Floss, of New Hampshire. The evidence presented was practical, comprehensive and conclusive. Chairman Scott declared that every committee man was impressed with the importance of the measure.

In the House of Representatives the question of constitutionality of the proposed legislation was raised, with the result that the bill was referred to the Committee on Judiciary of the House. A hearing was had before this Committee on February 27.

On April 22, the Committee adopted the following resolutions:

"*Resolved*, That the Committee is of the opinion that the Federal Government has no power to acquire lands within a State, solely for forest reservation; but

under its constitutional power over navigation, the Federal Government may appro priate for the purchase of lands and forests reserves in the States, provided it is made clearly to appear that such lands and forest reserves have a direct and substantial connection with the conservation and improvement of the navigability of a river, actually navigable in whole or in part; and any appropriation made therefore is limited to that purpose.

"*Resolved*, That the bills referred to in the resolutions of the House, H. R. 10,456 and H. R. 10,457, are not confined to such last-mentioned purpose and are therefore unconstitutional."

To meet the requirements of these resolutions the following bills were promptly introduced in the House; The Pollard Bill, H. R. 21,220; the Weeks Bill H. R. 22,221, and the Lever Bill, H. R. 21,357. None of these was passed. On May 16, the Senate passed the Brandgee Bill, S. 4,825. On May 21, the House passed the Scott Bill, H. R. 21,936, providing for State cooperation and the appointment of a Commission to investigate still further, during the recess, the conditions existing in the Southern Appalachian and White Mountain regions. Neither of these bills, however, became a law. On December 9, another hearing was had before the Committee on Agriculture of the House. One of the most important features of the work now before the friends of forest conservation in the United States is the aggressive pressing of the Bill 4,825, already passed by the Senate, that it may become a law before the exppiration of the life of the present Congress on March 4, next.

In June, the office of the Association was removed from 1311 G Street N. W., to 1417 G Street N. W., where much larger and more commodious quarters were secured at a slight decrease in rental.

Mention might well be made of the splendid work now in progress in the increasing number of forest schools and forestry departments in colleges and universities, in the forestry offices in the various states and, notably, in the great and rapidly growing Forest Service. The wide publicity, however, which, happily, the general work of forestry is now receiving, has already made this progress reasonably familiar; and in the interest of brevity, detailed review is here omitted. It may however, be said that never before in our history has there been such an earnest sentiment favoring forestry and conservation, and never before has such effective work been done. Most noteworthy of all is the great conservation movement inaugurated by the White House Conference of last May.

Inland navigation, deeper waterways, waterpowers, and economical manufacturing therewith, floods, soils, irrigation, drainage, and the public health, as shown in detail by one of our folders, are all fundamentally dependent upon and related to Forestry. This larger field of conservation and utilization of all our natural resources plainly places upon our Association duties which should be heartily assumed, and diligently discharged.

In closing, it should be said that, in comparison with the work remaining to be done, the work already accomplished by all the forestry forces combined is slight. Destruction of resources proceeds without abatement. Sentiment now developing should be intensified, and focused upon local, state and National governments, that legislation and administration may accomplish the ends without which all our efforts are vain.

The American Forestry Association is a leading agency for general propagania in this field. Its efforts are strictly limited by its means. Where it receives hundreds, it should receive thousands of dollars for the prosecution of the great work before it. For this arm of power it looks to its members. Their dues are practically its only resource. Each member may, however, enlist other members, and by so doing, render to his country a patriotic economic service of great value.

Following the adoption of the resolutions, the chairman read a telegram from the newly elected President of the Association. The messags follows:

"I accept with pleasure the Presidency of the Association. I only wish I better deserved such a high compliment. Please express my appreciation and earnest desire to cooperate in the work."

Prof. W. N. Clifford, of the Southern High School, of Philadelphia, then addressed the meeting, his subject being, "Forestry and the Schools." An abstract of Professor Clifford's address is given below.

ADDRESS OF PROF. W. N. CLIFFORD

IT IS my purpose to speak to you upon what can be done in educating the coming generations in the care of our National Forests. It is a true saying that "it is hard to teach an old dog new tricks," and never. up to the present time, has very much been said to the young people of this country about the necessity of preserving our forests. Man is greedy, and ever since America was discovered he has felt free to absorb for his

own interests whatever came into his possession by right and sometimes whatever he could secure, whether legal or illegal. Men have taken possession of our mines and our forests by settlement or purchase and have felt free to remove or destroy them for their own personal benefit. It may be possible to restrain the men of this generation by active and positive legislation; it may be possible to awaken the legislatures of the states and of Congress to the great need of wise laws along these lines in time to save some of our primeval resources.

The great hope is that in the case of the forests we may educate our people to replant so that coming generations may see the hillsides and much of the valley covered with valuable timber. The reason why this matter is not fully presented in our schools is because of the lack of information on the part of our teachers. The teachers cannot teach what they do not know themselves, and many of these teachers belong to a time when but very little was thought of what we call nature study. This matter can be presented in connection with geography, history and botany. An outline covering the important subjects may be placed in the hands of the teachers through the school officers. It is the plan of the Forest Service, through men who are interested in the Department of Education, to furnish such an outline and with it the subject-matter, so that teachers can easily become familiar with the material and, at the same time, have it on hand for class work. The writer has been conducting a large personal correspondence, and finds teachers are anxious to do this work. He also finds that it is possible with matter already printed by the Forest Service to get much of this information into the hands of the teachers at an early date. It is easy to theorize; it is much more important to tell what can be done from the Chapter of Experience.

The writer is connected with the Southern Manual Training High School, in Philadelphia, and plans to give some definite instruction to a class of boys every week. One of the first things to have in the school room for help is the new Forestry Map, which gives the pupils a definite idea of the location and vast area of our National Forests. The Forest Service is willing to furnish the Primer of Forestry, written by Gifford Pinchot, National Forester, which will give the teacher and pupils much information that is important. It is the plan with the class in our High School to make excursions so that they will have practice in identifying trees by their trunks and winter buds, then later to recognize them by their leaves. An attempt will be made to collect cross sections of medium-sized trees so as to show the bark and the annual growth. At the same time to collect pieces of wood showing the natural veining so that finished lumber can be easily recognized. In order to do the best kind of work in any school, it will be necessary to have a good reference library.

Prof. Hugh P. Baker, of the Pennsylvania State College of Forestry, presented a paper on the subject, "Forest Schools." Dwelling upon the necessity for rigid and comprehensive training in any and every line of work, and the increasing tendency toward specialization, Professor Baker laid stress on the importance of giving full care and attention to the education and training of foresters—not, perhaps, on account of any great financial rewards that may be secured through following the profession of forestry, but because of the urgent necessity for trained, practical men, capable of handling in an efficient manner big projects in forestry work. The paper was a thoroughly interesting one, and in a later issue of CONSERVATION it will be published in full. A number of other papers, read during the meeting, and omitted because of lack of space in this issue, will also be incorporated in early issues of this magazine.

The business of the meeting having been transacted, and the program completed, the session adjourned.

THE AMERICAN FORESTRY ASSOCIATION

Report of Treasurer for Year Ended December 31, 1908

WASHINGTON, D. C., *January 22, 1909.*

The Board of Directors, The American Forestry Association.

GENTLEMEN: I have the honor to submit herewith my report as Treasurer of your Association for the year ended December 31, 1908, including two exhibits, to wit:

STATEMENT OF ASSETS AND LIABILITIES

As at December 31, 1908.....*Exhibit "A"*

REVENUE ACCOUNT

As at December 31, 1908.....*Exhibit "B"*

I beg leave to call your attention briefly to the following items in the Balance Sheet:

Bond Investments—$6,162.80

The Bonds owned by the Association are carried on the books at the purchase price.

Dues Outstanding—$1,206

Of this amount some dues have been paid since the closing. It is estimated about one-half of the amount outstanding will be collected.

Advance to Conservation—$4,100

This represents the amount advanced to the Magazine Department for working capital, and it is well to call attention here to the fact that this asset is subject to reduction, as the total of $4,100 cannot be realized. The amount to be written off cannot at the present, however, be determined.

Furniture and Fixtures—$680.49

The purchase of furniture—desks, typewriters, chairs, etc., during the year amounted to $230.49. As the furniture is all practically new and in good condition, nothing has been written off for depreciation this year.

Advance on Postage—$150.08

This is an expenditure made during 1908, but properly chargeable against the year 1909, being the cost of stamped envelopes for Treasurer's bills, 1909.

Bills Payable—$6,000

This item is composed of a demand loan of $5,000, for which the bonds of the Association have been given as collateral; and $1,000 borrowed on the Association's notes unsecured. The $1,000 have been paid since the end of last year.

Educational Fund—$219

This is an amount of money received in response to the appeal for funds to be used in special educational work; $194 being the balance for the year 1907, and $25 added during the year 1908.

Dues Unearned—$724

This amount has been received in payment of dues in advance, of which $25 applies against Sustaining membership 1909, and the balance to Annual membership of 1909, 1910, 1911 and 1912.

Surplus Account—$5,786.02

The Surplus Account on January 1, 1908, was $6,905.76. During the year there was an amount of $135.24 adjusted on account of the 1907 period; and a decrease of $510, caused by the dropping of members for the non-payment of 1907 dues, leaving a balance of $6,531. The *Net Loss* for the year of 1908 was $744.98, which, deducted from the balance, brings the Surplus at December 31, 1908, to $5,786.02.

Referring to the Revenue Account, herewith, you will find the amounts received from various sources and also the expenditures classified.

Respectfully submitted,

OTTO LUEBKERT, *Treasurer.*

EXHIBIT "A"

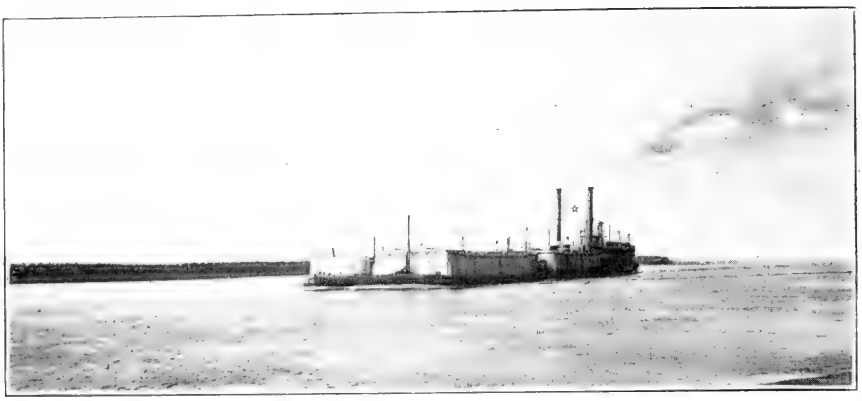
Balance Sheet as at January 1, 1909

ASSETS			LIABILITIES		
Funds	$81.44		**Bills Payable**		
rent Funds	208.18	$289.62	Demand Loan, Union Trust Co.	$5,000.00	
Investments (Purchase Price)			Personal Notes, 2 @ $5,000.00	1,000.00	$6,000.00
hicago & Eastern Ill. 5's	2,305.00		**Accounts Payable (Contingent)**		14.05
linneapolis & St. Louis 4's	1,982.50		**Educational Fund**		219.00
apanese Imperials 4½'s	1,875.30	6,162.80	**Dues Unearned**		
utstanding			Annual	699.00	
ual	1,056.00		Sustaining	25.00	724.00
aining	150.00	1,206.00	**Surplus Account**		
Accounts Receivable			Balance as per Ledger	6,531.00	
osit Pot. Elec. Power Co.	5.00		LESS, NET LOSS, for year as per EXHIBIT "B"	744.98	5,786.02
servation Department	64.36	69.36			12,743.07
e to Conservation					
per Ledger		4,100.00			
re and Fixtures					
per Ledger		680.49			
Accrued		84.72			
Paid in Advance		150.08			
		12,743.07			

EXHIBIT "B"

Revenue Account for the Year Ended December 31, 1908

DEBITS			CREDITS		
es of Secretary's Office			**Income from Memberships**		
gazine	$8,143.68		Annual Dues	$13,010.64	
aries and Clerk Hire	4,541.61		Sustaining Dues	2,181.25	
tionery and Printing	1,331.50		Life Memberships	900.00	$16,091.89
stage	1,171.77		**Contributions**		389.00
nt and Telephone	325.23		**Miscellaneous Income**		
aveling Expenses	81.68		Sale of Proceedings	15.30	
scellaneous	396.59	$15,992.06	Exchange on Checks	5.86	
es of Treasurer's Office			Sale of Circulars	3.68	24.84
aries and Clerk Hire	504.65		**Balance, carried down**		938.42
tionery and Printing	75.30				17,444.15
stage	371.86				
scellaneous	55.00	1,006.81			
Publicity Soliciting		445.28			
		17,444.15			
			Interest on Investments		267.66
e, brought down		938.42	**Interest on Bank Deposits**		11.20
t on Bills Payable		85.42	**Balance being NET LOSS carried to Surplus Account, EXHIBIT "A"**		744.98
		1,023.84			1,023.84



THE JOINT CONSERVATION CONFERENCE

(Concluded from January Number)

Section of Waters

SUMMARY OF SECTION REPORT

THE annual stream flow—by which is meant the volume of water annually passing into the sea—is approximately 70,000,000,000,000 cubic feet, for continental United States. Of this, less than one per cent is restrained and utilized for municipal and community supply and related purposes; less than two per cent (or about ten per cent of that in the arid and semi-arid regions) is used for irrigation; about five per cent is currently used for navigation, and less than five per cent is utilized for the production of power. From eighty-five to ninety-five per cent of the total volume of water is wasted in floods. The mainland United States has 282 streams that may be navigated for an aggregate of 26,115 miles, and as much more might be navigated with proper improvement. There are also forty-five canals, with an aggregate mileage of 2,189.05 miles. On lake and sound routes there is large traffic, but river navigation is too small for definite record. The cost of water carriage averages about one-fourth the cost of rail carriage. As our rail freightage reached 217,000,000,000 ton-miles during 1906, at an average rate of 0.77 cent, the shipping of one-fifth of our freight by water would have saved to producers and consumers over $250,000,000. The theoretical power of the streams of mainland United States is over 230,000,000 horsepower; the amount actually in use is 5,250,000 horsepower. The amount available at a cost comparable to that of steam installation is estimated at 37,000,000 horsepower; this thirty-seven million horsepower exceeds our entire mechanical power now in use, and would operate every mill, drive every spindle, propel every train and boat, and light every city, town and village in the country. The direct yearly damage by floods since 1900 has increased steadily from $45,000,000 to $238,000,000; the indirect loss, through depreciation of property, is still greater; while the largest loss is that arising from the impediment to navigation and terminal transfers. The soil matter annually carried into the lower rivers and harbors during freshets reaches the quantity of 783,000,000 tons. Its removal seriously impairs the productivity of upland farms, while it also increases channel-cutting and bar-building. It is estimated that the annual damage to farms through such erosive action of flood waters is not less than $500,000,000. We should adopt at once a broad plan of waterways improvement extending to all the uses of the waters and the benefits to be derived from their control, including the clarification of the water and the abatement of floods for the benefit of navigation, the extension of irrigation, the development and application of power, the prevention of soil-wash, the purification of streams for water supply, and the drainage and utilization of the waters of swamp and overflow lands. Rough estimates of the cost of such practical improvement place the figure at $50,000,000 annually, the conclusion being reached that the work could be done in ten years. If this work were to be done at the cost of the people, the additional tax burden would be 62½ cents per year per capita, or $6.25 in all. Estimates of the total benefits resulting from such improvements place the figures at one billion dollars, or $12.50 per capita, annually; that is, twenty times the cost.

IN THE absence of Hon. Theodore E. Burton, chairman of the Section of Waters, the chair called upon Dr. W J McGee, secretary of the Inland Waterways Commission and erosion expert in the United States Bureau of Soils, to read the report of that Section. The Section of Waters was the Inland Waterways Commission, and the report was one of the most interesting of the entire Conference. The address is given below.

ADDRESS OF DR. W J McGEE

MR. CHAIRMAN, and gentlemen of the Conference, I shall do no more than ask attention to a few primary ideas with respect to our waters.

In the first place, I would like to emphasize, and have you all join me in emphasizing the great fundamental fact that our water is a resource. Hitherto it has not been our custom to regard water as a resource of a definitely limited quantity. We have been accustomed, after the manner of the ancients, to think of it as one of the four elements, of which water is one. We have been accustomed to think of it as free and abundant as the air or the light of the sun, or the amplitude of the earth. The primary idea which we are desirous of impressing is this, that there is just so much water and no more. In this connection it is necessary also, as we conceive it, and as I hope you will all agree, to apply the quantitative method of dealing with water, the same method which we employ in dealing with coal or iron ore, or any other resource. That, indeed, is requisite to the forming of a clear idea concerning water as a resource—water of which there is only a certain amount and no more. The application of the quantitative method is absolutely essential.

In the report of the National Conservation Commission, which you heard read yesterday, the quantity of water and the sources of the water with which we are blessed were set forth in considerable detail. I shall not trouble to repeat the figures, but merely to render clear the primary idea of water as a resource, and I am referring, of course, to fresh water. Let us have it in our minds that the sole source is the rain which descends from the heavens. That boon, after reaching the earth, is divided, and half of it is re-evaporated, and a portion of this half may be reprecipitated as rain. We need not follow that half further than to say that after reaching the surface of the globe, it is again evaporated. One-third of the entire amount flows down to the sea through the rivers, of which many are navigable. One-third of the total amount—let us have this clear in mind—flows down to the sea. There remains one-sixth, and that is consumed or absorbed. On one-sixth, in the last analysis, depends the habitability and productivity of our country, of every acre of our farm land and of every acre of our forest land. Its productivity is dependent on this remaining fraction of water. Nor do we often realize how large a quantity of water is consumed in plant growth and in animal existence. We do not often realize that each average adult man of one hundred and fifty pounds takes into his system in the course of each year no less than one ton of water. We do not realize that on the average each bushel of corn requires in the making something like fifteen or twenty tons of water. This is an illustration of the fundamental importance of water to the productivity of our land.

Now to return for one moment to the quantity of water which we receive from the heavens. It is rainfall, and an average of thirty inches of rainfall all over the entire length and breadth of the land means a quantity equivalent to ten Mississippi Rivers, and that is all we have. Without it, no acre of our land would be habitable. Without it, no industries, of course, could exist, and without that one-sixth of it which is consumed and absorbed in vital processes, the land would be unproductive and stale and not fit to form the home of mankind.

The effective fraction of the water descending from the clouds is not that which flows off over the surface during storms; on the contrary, it is that which seeps into the earth in such fashion as to form ground water. Let us have clearly in mind this idea of ground water as a part of the great resources made up of the total quantity of water. How much ground water have we? Of late, we have been considering the matter with some care, and we estimate that within the first one hundred feet of the surface there is an accumulation of a body of water, which ought to be permanent, but which is not quite, equivalent to a reservoir sixteen or seventeen feet in depth, spreading over the three million square miles of the surface of our land. That subsurface reservoir is the value on which we must depend for agricultural production, forest maintenance, and for the development and continuation of all our industries. That subsurface reservoir of ground water, equivalent to a layer of water spreading over all our surface sixteen or seventeen feet in thickness, is the supply upon which we must depend.

When you speak of that vast reservoir spreading over our land from the Atlantic to the Pacific and from the lakes on the North to the gulf on the South; when you think of that as the sole source of supply for agriculture and all other activities; when you think of it as the sole source of all our streams, which we are feeding slowly from seepage through the ground in the springs or other-

wise; when you think of this reservoir in its extensive applications, you must realize that it is no less a national and interstate possession than the air itself. It belongs to all of us. It is the common property of the entire Nation, and there are those of us who conceive that it must be so administered, and that, proceeding from the navigable streams which we hold should be so improved as to relieve the traffic congestion of this country, we may deal with every aspect of this quantity, this great resource, this resource on which the value of all the rest depends. It is a natural possession. It is the possession of the several States jointly. The States hold an individual interest in this great commodity.

This, Mr. Chairman, is what I wanted to say, merely in the way of getting before you a great subject. I desire to add that Governor Noel, who is on this platform; Governor Ansell, Governor Deneen, who will rise shortly afterwards, and Governor Hoggett of Alaska, are among those who have the energy to express the convictions of their respective commonwealths concerning the value of this fundamental resource; and in addition, I will mention Governor Stubbs of Kansas, forgotten for the moment only because Kansas is the central State of the Nation, the hub of the entire country. We are hopeful also that the chairman of the commission, Mr. Burton, will shortly be with us.

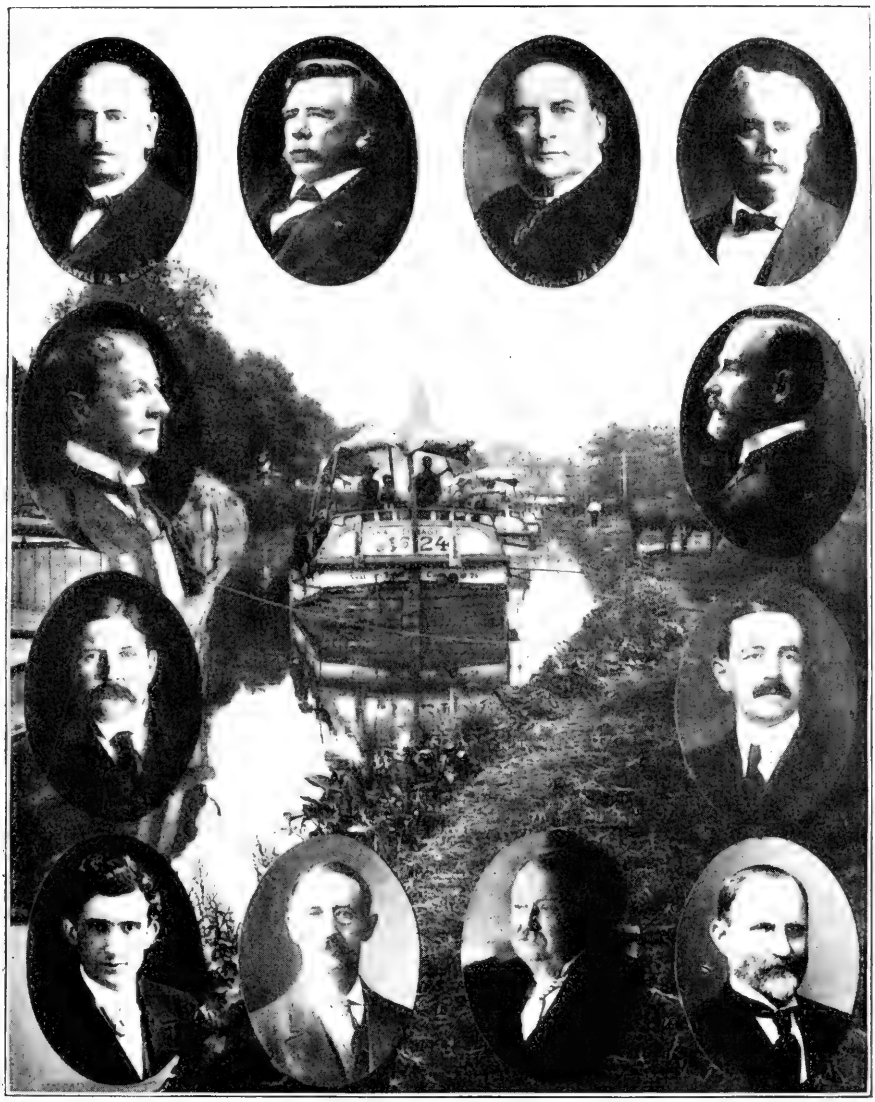
The chair then called on Governor Hoggett, of Alaska, for a talk, the Governor responding with a brief address on the natural resources of that far-away part of Uncle Sam's domain. Governor-elect Stubbs, of Kansas, was next called upon, responding with a talk, the keynote of which was, "Do something—don't waste further time in talking." He spoke of the necessity—the urgent commercial need—for the development of an adequate system of waterways and water transportation. He said that the development of a fourteen-foot channel 1,500 or 2,000 miles up the Missouri, and as far up the Mississippi as it could be taken, would result in a reduction of the cost of transporting heavy traffic by fully seventy per cent.

"This is the greatest economic problem before the American people to-day. It is necessary only to apply to it simple, sound business laws," he said. "Do you suppose that if a private organization or corporation was going to build a trans-continental railroad they would build a mile a year, or five miles a year, for a hundred years? Would they ever get anywhere at that rate? In the name of Heaven, what does it mean, that the great American Nation, the greatest Nation of the world, should dillydally and play like children with the greatest problem that has ever confronted them in legislative matters?

"I say to you there is no trouble about doing this work. It is not a question of how to do it; it is a question of getting the money to do it with. You ask how shall we do this great work? I say to you, you can improve the Mississippi River throughout its entire navigable length, and the Missouri River for 1,500 miles, and all the tributaries of these rivers; you can improve your eastern rivers and your western rivers, and you can do it as easily in eight years as you can in eighty years, and get some benefit out of the rivers. How will you do it? Issue bonds at two per cent., and then authorize President Taft to go ahead with the work and do it as a great railroad corporation would do it.

"What would it cost? Suppose it cost a billion dollars; that would be the merest bagatelle in comparison with the benefits that would accrue. Suppose you invest a billion dollars in the development of this great river system at two per cent. for fifty years, it would cost $30,000,000 a year to pay off the debt. What would this great waterways system pay in the way of return? The highest authorities say it would yield not less than $300,000,000 a year—ten times the annual cost—and I believe this statement is a conservative one."

Mr. Stubbs concluded his remarks with the statement that he fully agreed with Secretary Taft's idea that no better legacy could be left to the uprising generation that a bond issue for such internal improvements. "Let us," he said, "Leave to our descendants this great project, at least partially completed If we do that, it will mark this as the greatest epoch in the history of the American people."



SECTION OF WATERS

Hon. Theodore E. Burton
Hon. Francis G. Newlands
Hon. Jonathan P. Dolliver
Thomas R. Shipp

Hon. Wm. Warner

Hon. G. F. Swain

Hon. John Bankhead

W. L. Marshall

Dr. W J McGee
F. H. Newell
Herbert Knox Smith
Hon. Jos. E. Ransdell

Governor Deneen, of Illinois, was the next speaker, telling the Conference what his State has done along the line of improving waterways, and giving figures as to the benfits resulting from the contruction of the great Chicago drainage canal, referring also to the recent election at which the State was authorized to issue bonds to the amount of $20,000,000 for the further extension of a waterways system. His remarks, while not at great length, were extremely interesting, as showing what can be done by the individual States when they are determined to do it.

Governor Broward, of Florida, was called upon at the conclusion of Governor Deneen's very interesting statement. He spoke to the Conference on the importance of educating the people of the whole country as to the real condition of the natural resources of the land, saying that there are many, even yet, who will not believe—who think the advocates of a rational policy of conservation are on a wild goose chase—and that there is no real reason for taking care of our resources or seeking to replace those that have been exhausted by improvident, extravagant use or criminal abuse. He stated that, within twenty years, at the present rate of cutting and turpentine-boxing, the great yellow pine forests of Florida will have entirely disappeared. He stated that he has twice recommended to the Florida legislature that five districts should be established, and that some immediate action should be taken to protect the forests from fire, with a view to reproduction, but that as yet no resuls have been obtained. In common with practically all of the other speakers, he urged the necessity for cooperation between Nation and State in the solution of the problem.

Governor Woodruff, of Connecticut, followed with a short talk on conditions within his own State, saying that Connecticut stood ready to cooperate with the other States in a program of conservation, saying that it is simply a matter of education.

Former Governor Van Sant, of Minnesota, was the next speaker, and, as a former steamboat captain, spoke briefly as to the necessity and the commercial importance of an inland waterways system. Governor Ansell, of South Carolina, was also called on, responding with a brief talk on waterways. He emphasized the importance of protecting the forested uplands and stream sources, for the prevention of silt deposits in the lower reaches of the streams and in the harbors.

At the conclusion of Governor Ansell's remarks the report of the Committee on Resolution was called for. The report follows:

REPORT OF COMMITTEE ON RESOLUTIONS

THIS joint Conservation Conference, in session assembled in the City of Washington, on this tenth day of December, in the year 1908, representing the several States and Territories in the United States through Governors of States, State Conservation Commissions, delegates, and representatives of State and National organizations dealing with natural resources, does hereby resolve and declare:

Having heard the report of the National Conservation Commission read, and having fully deliberated thereon, we hereby indorse the said report as a wise, just, and patriotic statement of the resources of the Nation; of the thoughtless and profligate manner in which some of these resources have been and are being wasted; and of the urgent need for their conservation in the interests of this and future generations, to the end that the prosperity and perpetuity of the Nation may be assured.

We especially approve of the principle of coöperation among the States and between these and the Federal Government, as laid down in that report and in the earlier report of the Inland Waterways Commission, and urge both State and Federal legislatures to enact such laws as may be necessary to extend and apply such coöperation in all matters pertaining to the use and conservation of our resources.

We especially commend and urge the adoption of the policy of separate disposal of the surface rights, timber rights, and mineral rights on the remaining public lands of the United States; and we approve the disposal of mineral rights by lease only, and the disposal of timber rights only under conditions insuring proper cutting and logging, with a

view to the protection of growing timber and the watersheds and headwaters of streams used for navigation and other interstate purposes.

We also especially approve and indorse the proposition that all the uses of the waters and all portions of each waterway should be treated as interrelated; and we emphatically urge prompt and effective legislation providing for the immediate and proper development of the waterways of the country for navigation, water supply, and other interstate uses, preferably by direct Federal appropriations; otherwise by the issue of bonds.

Fully approving the policy of improving the waterways of the country for navigation and other interstate uses of the waters, we urge the prompt adoption of the broad plan recommended by the Inland Waterways Commission for waterway development under an executive board or commission appointed by and acting under the direction of the President of the United States.

The destruction of the timber on the watersheds of the rivers of the United States causes the flow of water to fluctuate between floods, which cause incalculable damage and extreme low water, which destroys the utility of the rivers for navigation, water power, and water for domestic use and irrigation.

That we recommend that the several States enact laws regulating the cutting and removal of timber and slash on private lands, to the end that the continuity of the forests of our country may be assured, that damage from floods may be prevented.

That a more uniform flow in rivers may be maintained for the benefit of navigation, water power, and water for domestic use and irrigation.

Approving those portions of the report pointing out the need for continued investigation and more extended scientific research, we also urge that this policy of gaining more definite and specific knowledge relating to our resources be adopted by the several States, no less than by the Federal Government.

Especially commending the portions of the report dealing with diminished national efficiency due to disease and premature death among our citizens, we urge the adoption of the policy of protecting life and health by States, municipalities, and communities no less than by the Federal Government; and we urge further investigation of all other means whereby the efficiency of individual citizens, and hence of the States and Nation, may be increased.

We favor the maintenance of Conservation Commissions in every State, to the end that each commonwealth may be aided and guided in making the best use of those abundant resources with which it has been blessed.

We also especially urge on the Congress of the United States the high desirability of maintaining a National Commission on the Conservation of the Resources of the Country, empowered to coöperate with State commissions, to the end that every sovereign commonwealth and every section of the country may attain the high degree of prosperity and the sureness of perpetuity naturally arising in the abundant resources, and the vigor, intelligence, and patriotism of our people.

After considerable discussion the report of the committee was adopted, and the request was made that delegates present who had prepared papers for reading before the Conference, and who had not been able to present these papers, send them in for incorporation in the final report of the Conference.

A paper was read by Edward G. Acheson, president of the American Electrochemical Society; E. E. Wickey, representing the Farmers' National Congress, addressed the Conference briefly, and, on motion of Governor Ansell, the Conference, at 5:30 o'clock, adjourned *sine die*.

THE WOMAN'S NATIONAL RIVERS AND HARBORS CONGRESS

By LYDIA ADAMS-WILLIAMS, Corresponding Secretary of Woman's National Press Association Vice-president of Woman's National Rivers and Harbors Congress, and Chairman of Waterways Committee of D. C. Federation of Women's Clubs

THE first biennial meeting of the Woman's National Rivers and Harbors Congress was held at the New Willard Hotel, Washington, D C., December 9 10 and 11, 1908. A large attendance, comprising delegates representing over twenty States, the Pacific coast and Hawaii, combined to make the success of the congress surpass the most sanguine expectations. The membership includes women of National prominence, writers, lecturers, philanthropists and other well-known club women who have for years been working not for individual, but for National welfare—not alone for the present generation but for posterity.

The congress was called to order by the president, Mrs. Hoyle Tomkies, who delivered an able address, in which she said that the greatest authority on waterways in the United States, the Hon. Joseph E. Ransdell, had created a faith in his policy and for that, woman is ready to sacrifice her comfort and go to work. "Through their training in household economics, which lie at the basis of all government, social and political, the women grasped the idea," said Mrs. Tomkies, "and saw in this work for waterways and forests the duty of the hour.

"It was thus, with earnest purpose and determined effort, the women organized the Woman's National Rivers and Harbors Congress. We stand for the development of our inland waterways and harbors and for the extension of our forests as one problem."

Hon. Joseph E. Ransdell, who has for the third time been elected President of the National Rivers and Harbors Congress, on July 24, wrote Mrs. Tomkies as follows:

"I agree with you in the wisdom of linking waterways and forests as one problem. There is the closest connection between the two. Ambassador Jusserand said: 'No forests, no rivers,' and it is true. * * * In my judgment the forestry people will welcome your assistance as much as the waterways people. Mr. Gifford Pinchot, Chief Forester of the United States, is one of the strongest friends of waterways in the country."

The following is an extract from a letter of Mr. Pinchot to Mrs. Tomkies:

"You are to be congratulated upon your organization of the Woman's National Rivers and Harbors Congress I am exceedingly glad you have included in its platform the preservation of forests. Forest preservation is very closely allied to waterway improvement; in fact, the two go hand in hand and are very important parts of the whole movement for the conservation of the country's natural resources. You have my best wishes for success in the important work you have undertaken."

At the meeting in Washington, the constitution of the congress was amended to read as follows:

"The objects of this congress shall be the promotion of the improvement of the meritorious inland waterways and harbors, the preservation of the forests and the conservation of the natural resources; and to secure proper legislation, both National and State, and ade-

quate appropriation for such purposes."

Mrs. Tomkies stated that Mrs. Hurd of Bay City, Tex., had contributed $100 toward the objects of the congress. A rising vote of thanks was tendered Mrs. Hurd for her generous donation.

The annual dues for membership are for individuals, $1 per annum; firms, $3; for organizations, municipalities, or corporations, up to 500 members, $3 per annum; over 500 members, $5. Dues must be sent to the recording secretary, Mrs. A. B. Avery, 254 Stoner avenue, Shreveport, La.

A very interesting and well-written paper was read by Mrs. A. F. Knudsen, of Hawaii, who came 5,000 miles to aid in the work of the woman's congress. Mrs. Knudsen spoke of the importance of Pearl Harbor as a coaling and supply station, a half-way point in the vast commerce, which will mark the completion of the Panama canal. She said: "Deep inland waterways imply trans-oceanic commerce. A deep waterway from the Lakes to the Gulf contemplates an Isthmian canal; an Isthmian canal contemplates trans-Pacific trade and travel; and trans-Pacific commerce contemplates a way station; and hence, as if especially contemplated and placed there by Providence, rests Hawaii, not only the 'Paradise of the Pacific,' but the Gibraltar of the Pacific as well."

Mrs. Gerard, of South Norwalk, Conn., chairman of the forestry committee of the General Federation of Women's Clubs, told of the splendid laws relating to forestry and State lands in Connecticut, and said forestry enthusiasm in her State is wide-spread.

Mr. Gifford Pinchot addressed the congress and stated that he had had much experience in meeting with women's clubs and addressing them. He said that women are a power in any work which they undertake. "When women organize," said Mr. Pinchot, "they are in earnest; they have the matter at heart, and they will work for its success." Mr. Pinchot made the point that there should be a campaign of education; that we should educate the children and through them, the mothers; or, as he further explained, by interesting the children in the schools in the matter of saving what is left of our soils, minerals, waters and forests, the mothers, and fathers, too, will take up the work. Mr. Pinchot modestly gave all the credit for the conservation of resources to President Roosevelt. At the conclusion of Mr. Pinchot's remarks, a member rose and read an extract from the President's address before the National Editorial Association, at Jamestown, June 10, 1907, in which he said: "In all four movements my chief advisor, and the man first to suggest to me the courses which have actually proved so beneficial, was Mr. Gifford Pinchot, the Chief of the National Forest Service."

In line with Mr. Pinchot's remarks, the congress voted to appoint two committees, one on education, of which Mrs. P. S. Peterson, of the Peterson Nursery, Chicago, will be the chairman; and a committee on publicity, of which Mrs. Lydia Adams-Williams was elected chairman.

Mr. F. H. Newell, chief of the Reclamation Service, gave an interesting and instructive address before the congress, in which he eulogized the part women are taking in National welfare work, and spoke of the need of their taking up the work on a large scale and the good that might be accomplished through them. Mr. Newell showed the inseparable relation between forests and streams and the reclamation of the arid lands. He traced the forestry movement from its inception, about twenty years ago, at a meeting with a handful of people—"mostly women, who loved trees," said Mr. Newell—to its present great proportions; from a small bureau of about thirty to now nearly 3,000 workers; from an annual appropriation of $30,000 to now over $3,000,000; from 1892, when the first forest reserve, of about 50,000 acres, was created, to the present, with 155 National forests, embracing over 160,000,000 acres. Mr. Newell told of the great strides made

in the reclamation work and gave much credit to the earnest hard-working men who have made possible this great progress in both movements; "and," said Mr. Newell, "when I say men, of course, I mean women also."

The work that women may do toward the sanitary purification of streams, and, as a secondary consideration, the beautification, by tree-planting, of the banks of rivers and streams, was spoken of by Mrs. Lovell White, of California. Mrs. White has for many years been interested in philanthropic work and is State chairman of forestry for California. She has the distinction of being the Governor's appointee to the Governors' conference with the National conservation commission. Mrs. White made an address in which she told the story of the Calaveras Grove of Big Trees of California, the oldest living things on the face of the earth and which are in danger of destruction through private greed. She spoke of the difficulties encountered in the efforts to pass the bill for their preservation, now pending before Congress. Mrs. White also spoke of the need of better fire protection for our forests and told of the burning this summer of the "Mother of the Forest," one of the largest and most stately of the Calaveras trees. Fire menaced the entire grove, and, although heroic efforts were made to save the beautiful tree, the fire at last caught in the topmost branches and slowly ate its way down to the heart of the tree, leaving the "Mother of the Forest" dead, charred and blackened.

Governor Freer, of Hawaii, who was in attendance at the joint conservation conference, gave much encouragement to the women who are leading the great work for conservation of all resources. Governor Freer said "The importance of forestry has for many years been clearly recognized in Hawaii. Because of the peculiar conditions of climate and topography in these islands, irrigation is a necessity over a large part of the area under cultivation. The necessity of forest protection is generally recognized in Hawaii. In 1903 the legislature of Hawaii provided for the creation of territorial forest reserves and a Division of Forestry. Since 1904, sixteen forest reserves have been set apart. The reserves are created as protective forests on the water-sheds of streams that are needed for irrigation, power development or domestic supply. Extensive tree planting for construction timber has been going on in Hawaii for the last thirty years. The trees planted are eucalyptus, Australian ironwood, silk oak and the Japanese cedar."

Miss Janet Richards, widely known for her current topics talks and lectures, ably represented Mrs. William Cummings Story, vice-president for the State of New York.

Mrs. J. F. Allison, of Cincinnati, State vice-president for Ohio, and wife of J. F. Ellison, secretary of the National Rivers and Harbors Congress, was chairman of the revision committee and gave the congress invaluable assistance in arranging for the convention.

Missouri was very ably represented at the congress by Mrs E. C. Ellis.

Massachusett and the forestry interests of that State were represented by Mrs. Emmons Crocker, who is a fluent speaker and a ready parliamentarian.

Mrs. Lydia Adams-Williams addressed the congress, and made a plea for the conservation of all natural resources.

The corresponding secretary, Mrs. Frances Shuttleworth, gave an interesting report of the work she had done and proved herself one of the earnest, competent, and efficient workers.

At the joint session of the National Rivers and Harbors Congress and the Woman's National Rivers and Harbors Congress, Mrs. Hoyle Tomkies, president of the latter, outlined the objects of the Woman's Congress and told of its organization June 29, 1908, and its growth in five months from seven members to a strength of over 1,500. "We endorse the bill of the National Rivers and Harbors Congress

asking for an annual appropriation of $50,000,000 for the improvement of the Nation's waterways," concluded Mrs. Tomkies, "and I say to you, uninstructed, that I believe that if the Woman's National Rivers and Harbors Congress had one-twentieth the appropriation for its work that the National Rivers and Harbors Congress has, we would create such a demand for your bill that our National legislators could respond only as the gentleman from Colorado responded to solicitations from the women of his State in regard to the Pure Food Bill, when he wired Mrs. Decker, president of the General Federation of Woman's Clubs, 'Call off your women. I'll vote for your bill.' "

At the conclusion of Mrs. Tomkies' talk, Mr. Fox, of Arkansas, moved that $500 be appropriated from the treasury of the National Rivers and Harbors Congress to the Woman's National Rivers and Harbors Congress to further the work. This motion was enthusiastically and unanimously adopted.

The resolutions as presented by Mrs Mary M. North, chairman, embodied the interest of the congress in conservation, and expressed appreciation of the courtesies of the press and the people of Washington. Thanks were extended to the various speakers, including Rev. Wallace Radcliffe and Col. John L. Vance, of Columbus, Ohio, president of the Ohio Valley Improvement Association.

The following officers were elected to serve for the ensuing two years:

President, Mrs. Hoyle Tomkies, 980 Jordan street, Shreveport, La.; Honorary Vice-president Mrs. L. C. Allen; Vice-president, Mrs. Lydia Adams-Williams, Washington, D. C.; Recording Secretary, Mrs. A. B. Avery, 254 Stoner avenue, Shreveport, La.; Corresponding Secretary, Mrs. Frances Shuttleworth, 621 Cotton street, Shreveport, La.; Treasurer, Mrs. Susie McKellop, Muskogee, Okla.; Auditor, Mrs. John Lathrop Mathews, No. 9 Beacon street, care Boston City Club, Boston, Mass.

The following were elected State Vice-presidents:

Alabama, Mrs. O. C. Wiley, Troy; California, Mrs. Lovell White, San Francisco; Connecticut, Mrs. Edward A. Houseman, Danbury; Delaware, Mrs. Charles N. Jolls; Florida, Mrs. T. M. Shackleford, Tallahassee; Hawaii, Mrs A. F. Knudsen, Kekaha; Illinois, Mrs. La Verne Noyes, 130 Lake Shore Drive, Chicago; Indiana, Mrs. N. L. Agnew, Valparaiso; Iowa, Mrs. J. L. Kennedy; Louisiana, Mrs. W. A. Wilkinson, Coushatta; Maryland, Mrs. Mary M. North, Snow Hill; Massachusetts, Mrs. Emmons Crocker, 48 Mechanic Street, Fitchburg; Missouri, Mrs. E. C. Ellis, 2456 Tracy Avenue, Kansas City; Montana, Mrs. David G. Brown; Nevada, Mrs. J. K. Logan, Reno, Nevada; North Carolina, Mrs. E. J. Hale; New York, Mrs. Cummings Story, 307 W. Ninetieth Street, New York City; Oregon, Mrs. Cleveland Rockwell; Ohio, Mrs. J. F. Ellison, Cincinnati; Virginia, Mrs. Henry N. Castle, Norfolk; Texas, Mrs. Louella S. Vincent; West Virginia, Mrs. James A. Hughes; Idaho, Mrs. E. C. Atwood, Hailey, Idaho; District of Columbia, Mrs J. Eakin Gadsby, Washington, D. C.; Kansas, Mrs. Isabell Worrell Ball, 1519 Thirteenth Street, Washington, D. C.; Pennsylvania, Mrs. T. M. Rees, 226 N. Negley Avenue, Pittsburg; Vermont, Mrs. Genette Valentine, Bennington; Tennessee, Mrs. Benton McMillin, 125 Seventh Avenue, N., Nashville; Oklahoma, Mrs. Lilah D. Lindsay, Tulsa; South Carolina, Mrs. Mollie J. Perry, Box 217, Lancaster.

THE APPALACHIAN-WHITE MOUNTAIN HEARING

THE public hearing on Senate bill 4825, which was passed by the Senate toward the close of the last session of Congress, was granted by the House Committee on Agriculture on December 9th, at which time before a quorum of the Committee, Chairman Scott presiding, there appeared in advocacy of the measure a large delegation from New England and the South, uniting in an earnest and forceful presentation of the merits of the project and the urgency of prompt action thereon.

The delegation was headed by Governor Guild of Massachusetts as the distinguished chairman (the Governor coming to Washington solely for this purpose), and was made up of statesmen scientists, engineers, representatives of National organizations, commercial bodies, etc., representing the National demand that the establishment of this forest area was essential to the welfare of the Nation and that further delay was unnecessary and deplorable to the last degree.

Chairman Scott, who had recently returned from a week's visit to the Southern Applachians called the Committee to order at 10:30 and briefly outlined the points he desired covered. The principal one being the relation of the forests to "regulation of stream flow of navigable rivers," his statement being that the opinion given by the House Judiciary Committee last winter had confined the constitutional bounds of purchase of forest lands by the Government to such areas as could be "clearly shown" to be of aid to navigation.

A number of resolutions from chambers of commerce and similar bodies—a particularly strong one passed the previous day by the Southern Commercial Congress—voicing some sixty organizations in fifteen States, were then presented, Governor Guild then opening with a lucid, clean-cut and patriotic presentation of the matter, saying that the delay had already menaced the Nation from many standpoints; that the public health was involved; that the forests were rapidly disappearing; that water supply, water power and navigation were seriously affected in both sections.

He urged immediate action by the Committee as a patriotic duty, closing with a beautiful allusion to the fact that the advocates of the measure were appearing under the same flag as that first flown by the Continental troops when Washington took command, the flag first flown by the American Navy was a white flag bearing on its field a pine tree!

The venerable and beloved Edward Everett Hale, chaplain of the Senate, spoke feelingly of the forests of the White Mountains now and their contrast with conditions when as a boy he had helped to survey them, and able and forceful addresses were made by ex-Governor Pardee of California, Hon. D. A. Tompkins, of Charlotte, N. C., president of Appalachian National Forest Association, Representative Currier, and others.

The "Stream Regulation" side was well presented by Dr. C. E. Van Hise of the University of Wisconsin, Prof. George F. Swain of the Massachusetts Institute of Technology, Mr. W. S. Lee of the Southern Power Co., and Mr. C. C. Goodrich, and other phases taken up in some detail by earnest and well informed men, the Committee adjourning at 4:30, after agreeing to incorporate the matter presented in the previous hearings as a part of the day's proceedings.

It is doubtful whether the hearing on December 9th has given them any new insight, or has presented any strictly new phases of a subject that has been so strongly and so forcibly presented many times before, on which a patriotic committee may base remedial action, though rarely has the matter been more earnestly presented and the real need and the real sentiment of the people so clearly shown.

The Committee on Agriculture was seemingly much impressed with the testimony presented and with the earnestness and disinterestedness of the petitioners—who were there as Mr. Tompkins well said, "not in advocacy of any particular measure or methods, but were there to urge that a start should be made towards doing a thing that was a national duty—that ultimately the Nation had to perform, in justice to itself for its own protection." That meant "if the Brandegee bill was the right one, and the proper plan, it should be reported by the committee—if a better bill could be framed by the committee, let the committee frame it Action of some kind was imperative along the broadest possible lines that would in time make possible the preservation of all forest areas that may be "constitutionally" established either under the commerce clause as affecting "navigation" or the "general welfare" clause as affecting the Nation's life, whether they be in the Southern Appalachian or New England or in Kansas, under a definite and systematic and progressive National forest policy! Surely there must be a beginning of National sanity in this regard, and this beginning should be made at the most critical point—where the most damage is involved—and this area seems to be the Southern Appalachian and White Mountains beyond a question of doubt.

The Nation is rapidly grasping the underlying principles of the "Conservation idea," and the sound, common sense that is its foundation; there is rapidly growing in the mind and conscience of the Nation the belief that conservation of the natural resources is a duty owed to ourselves and to posterity, that the Nation and the State, and the individual cannot evade.

As the keystone of the conservation movement lies the forest question and the reason is perfectly obvious to all who give the matter thought so that the demand for immediate action on the Appalachian-White Mountain Forest Reserve, as the *first* thing to be done, voiced so splendidly by President Roosevelt in his Belasco Theater address, and confirmed by the National Conservation Commission in its report, is based on the realization of its fundamental importance to, and its intimate connection with, the co-related matters covered in the conservation idea. That forest preservation is one of the largest economic questions faced by the Nation, and that their perpetuation must ultimately be undertaken by the Nation admits of no question.

It ought not to be difficult for a committee composed of thoughtful and patriotic men, as is this committee, to grasp the real situation and to suggest, not a makeshift, but an effective remedy that can be at once applied.

Our own experience with the National Forests in the West points to the only effective way—a prompt purchase of all the area possible to acquire in both regions, their effective management and use under restriction of the Forest Service as a start towards a forest policy that will lead the States and individuals into a hearty and effective cooperation with the Federal Government, and ultimately make possible their complete preservation.

It ought not to be difficult for the Agricultural Committee to see that dollars spent now will mean the saving of hundreds required later for systematic reforestation, such as France is doing as an absolutely necessary step in saving the nation from disaster. It ought not to be difficult for the Agricultural Committee to see the real profitableness of scientific forestry as a National invest-

ment from its financial side alone, to say nothing of the blessings that unquestionably would come to the whole people from forest preservation.

It ought to be easy for the Committee to see that the Nation is demanding this legislation in no uncertain way and that in the long run it will finally get it.

We believe that the committee will act, and that we shall soon see our fight for the forests, won!

—

FROM SEASHORE TO SANDHILLS

By HELEN MAR D'ANBY

FROM fierce wild wind, that pierces,
And howls in wrath and might,
To soft, sweet breezes crooning
Like voices of the night
From gleam of white-sailed commerce
O'er blue waves passing by,
To glittering pine-tops, tossing,
Sun lighted 'gainst the sky

For the wide blue, that stretches
(Like to God's patient love,)
To meet the deep on deep of blue,
That bends serene above;
The sweet encircling fragrance
Of forest, hill, and mead,
The tender whisper of the leaf,
The drop of nut or seed

For silver sea gull, poising,
With breast and wing of snow,
The black, majestic buzzard,
Alert-eyed, circling low;
For lessening fisher dory
Afar o'er tossing brine,
The lakelet boat, with mirrored oars
Adripping, and ashine.

For roar of rocky cavern,
And moan of surf-worn sea,
The soft sweet silence of the fields,
With mocking birds aglee.
For cradle lined with shell tints,
Where infant day is born,
All dimpled, from his ocean bed,
A radiant fresh made morn.

The half grown kisses of the sun,
Through pine tops o'er the hill,
Aglint with shadows, where the stream
Is playing with the mill;
Ah! who so bold and blind, to breathe
A prayer for purer bliss,
In other, far off, mystic worlds,
Than may be had in this?

Who hopes for brighter heaven,
Than in this world below,
Has never caught its meaning,
Has never learned to know
The violet from the cowslip.
Has never learned to read
The lesson of the brookside fern.
Or of the wayside weed.

All nature sings its anthem,
A love song, soft and clear,
And he who will but listen,
Shall surely know and hear;
Each pebble has its secret,
Each grain of sand its lore,
Each pine-engirdled hill slope
Has kinship with the shore.

EDITORIAL

The Magazine's Owners

WHO are the owners of this magazine? That is a question easily answered—the members of The American Forestry Association. They are the ones who, absolutely and without question, own the magazine. Of the whole body of owners, however, only a portion exercise the right that is theirs—the right to make suggestions and the right to see that these suggestions are carried to execution. In the case of any publication it is the same; the editor, or those in charge of the production of the publication, can only know the wishes of the owners when those wishes find expression. If a certain portion of the readers of a publication take the trouble to write to the editor, telling of their appreciation and approval, while another portion fails to say anything whatever, either in approval or disapproval, it is fair for the editor to conclude that he is, at least in great measure, producing the sort of publication his readers wish—there is nothing else for him to conclude, as there is no other ground upon which to base conclusions than the expressions received from readers in the editorial correspondence.

Members Should Help

IT IS the duty of every member of The American Forestry Association to take an active interest in the affairs of the Association and in the conduct of the magazine. Members should bear in mind the fact that it is not for the fees they pay that they are valuable to the Association and to the conservation movement generally. The membership fees are the very smallest part of the value of a connection with the Association; it is the active, helpful cooperation of interested members that makes the Association a power, and that enables it to do whatever of good it does and has done. No organization can be truly influential or really worthy of continued confidence if its membership is not actively interested in the objects for which it stands—interested to the point of taking an active part in shaping its policy, suggesting improvements in its methods, and working earnestly for its success. Will all our members take this to heart, and will they act on the suggestions contained herein?

The President's Message

THE special message of President Roosevelt, embodying the report of the National Conservation Commission, has been sent to Congress, and the country knows the approximate condition of our natural resources—knows the wasteful extravagance, the criminal carelessness, that has characterized our exploitation of timber, mineral, water and land resources. The meat of this message was given in the report of the Joint Conservation Conference, printed in the January issue of CONSERVATION; the report of the Section of Waters, crowded out of our January issue, being published in this number of the magazine. These reports, and the message of the President, based upon them, constitute the gravest indictment that has ever been returned against a civilized people. We have ravaged our forests as a horde of devastating savages never would have done; we have given away, and have permitted to be stolen, hundreds of thousands of acres of forest lands that have now passed forever beyond the control of the Government, away from the public, and

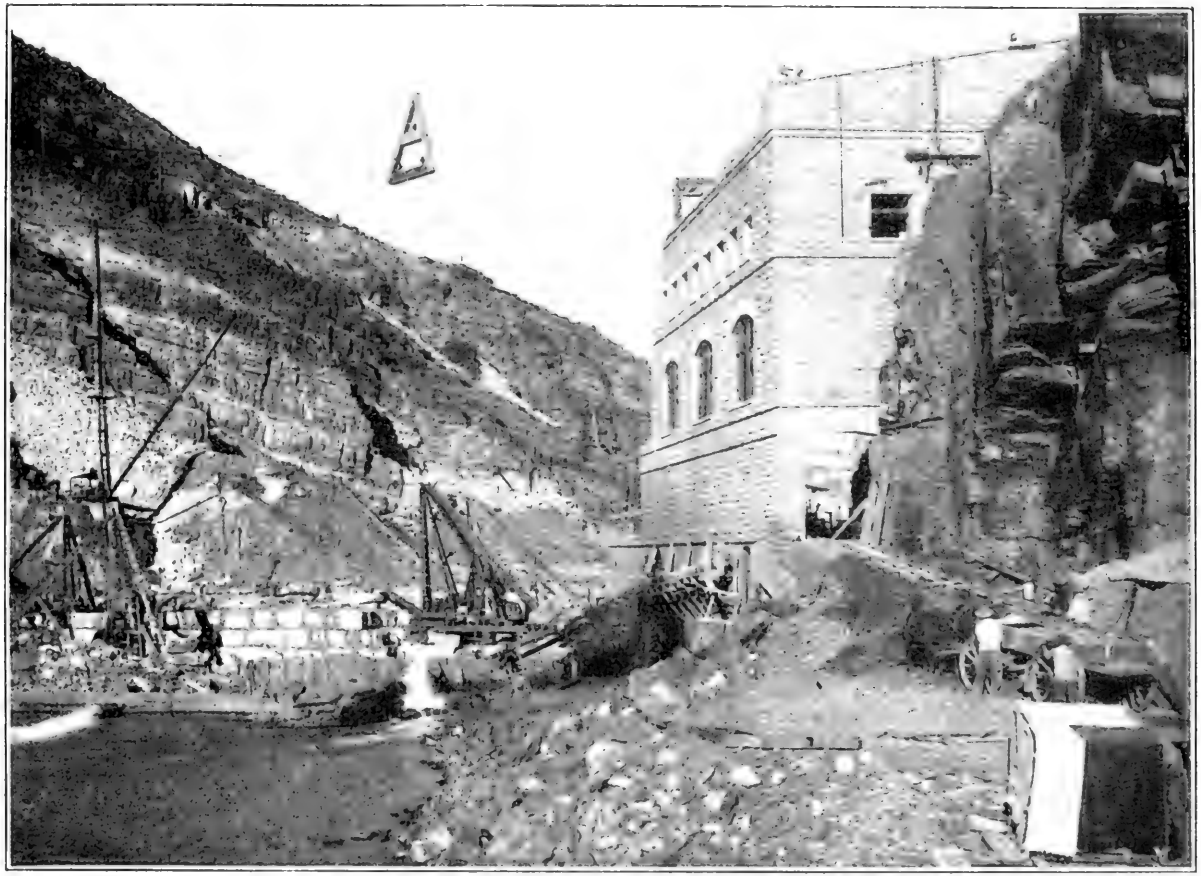
into private ownership. We have wasted, like a royal profligate, the resources of mines that a few short years ago were considered inexhaustible, until we are now within sight of the end of our coal resources, our iron resources, and other mineral wealth upon which the abiding prosperity of a manufacturing nation must primarily rest. We have allowed our waterways to go to ruin; we have neglected the most magnificent river system that ever blessed any nation; we have given no heed to the wasting water-powers of the land, sufficient in number and volume to turn every wheel, operate every mill and factory, and drive every train and vessel within the confines of the Nation, with power to spare. We have permitted our soils to wash, unchecked, into the rivers and thence into the ocean; and we are now face to face with the consequences of our criminal negligence. We are now face to face with the conditions that confront France; we are face to face with the conditions that have made of the greater part of China a howling waste; we are face to face with the conditions that inevitably confront the nation that does not take heed for the morrow—that morrow that comes sooner or later to the sons of men who waste and ravage and destroy with criminal heedlessness the slowly replaced, or the unreplaceable, resources of nature.

What Are We Going to Do About It?

AND now, what are we going to do about it? We know now the condition of our natural resources. For years men of science have been preaching the gospel of conservation, have been shouting from the housetops the story of our awful wastefulness. For years the warning has been given; given to ears that heeded not, to eyes that saw not, and to men who believed not. "Empty theorizing," people called it. But now it is "a condition, not a theory, that confronts us." It will not do to throw aside the statements and the figures that show to what extent our resources have been wiped out. Simple contradiction will not do; it has done for years, but its day is past, and the enemies of resource conservation will have now to resort to other means. The question is up to the people of this great country; it is for them to say what shall be done.

Keep What We Have

OUR timberlands are mostly gone, save those that are still owned by the several States and the general government, in the National Forests. Our mineral lands—our resources of coal and iron—have passed from public to private ownership, and are beyond control. But we have still a resource the value, which must be kept within the control of the people. Let us keep these, and we will have done well, even if our other resources have been wasted. But there is work to do—work for every thinking, patriotic man and woman of America. This one remaining national asset will have slipped out of our grasp if we fail to guard our birthright. Ask the Forest Service, and the Reclamation Service, and the Department of the Interior, as to the activities of certain of the great corporations. Ask the heads of these departments what is the gravest problem now confronting them; they will tell you, "The problem of how to keep certain corporations from grasping the water-powers of the country." As recently as last autumn one single power-producing corporation was under indictment, on nearly fifty counts, in the State of California alone, for fraudulent entry of water-power sites. At this present time over 200 cases are being investigated in which wealthy corporations are known to have resorted to fraud in securing water-power sites, the value of which is incalculable Not only are these corporations active in the West; the East, as well, is the scene of their resourceful activity. The entire resources of the



IRRIGATION AND WATER POWER

Dam and Power House on the Salt River, Ariz., Project, Now Practically Completed. One of the Largest Government Projects

National Government are inadequate to checkmake them; the help of every public-spirited citizen is needed if we are to keep what we have.

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Eternal Vigilance

CORPORATIONS do not die; neither do they neglect any opportunities. The resources of the Government, kept by designing politicians to the lowest possible figure, are often insufficient to uncover and to secure proofs of corporate villainies. Therefore it behooves all who love their country, and who have a real interest in that country's future, to be equally vigilant. "Eternal vigilance is the price of liberty;" and eternal vigilance is the price of freedom from corporation ownership of our sole remaining natural resource that is of real and abiding value. We must work for reforestation wherever it is needed—and where does the need not exist?—we must work for the conservation, by rational development and exploitation, of our forests and our mines; we must prevent the terrible waste and loss of productiveness of our farming lands, due to soil erosion; but we must also, with sleepless and never-ceasing vigilance, guard from the hand of the pillager the waterways and the water-powers of the country. The day will come when our coal will be gone, when the mines will be emptied and when fuel for power-production and for the generation of heat and light will be practically at an end. On that day the people of this country will turn to the water-powers for salvation. If we, the people of to-day, do not take steps, do not do all within the power of mortals, to safeguard those water-powers we and our children and our children's children will suffer for our criminal neglect and blind fatuity.

Two Striking Comments

BELOW we reprint two editorials, clipped from recent issues of two metropolitan daily newspapers. The editorials are printed just as they appeared, with their original headings; they show with what unanimity the really strong newspapers agree on the subject of natural resource conservation. The first is from the *Washington Post*, the second from the *Washington Herald*.

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A Nation's Prodigal Waste

IF THE National Conservation Commission were to dissolve to-day, without doing anything more, it would still deserve the gratitude of every thinking man in the United States for drawing up the indictment of the whole people for the crime of waste. The report forwarded to Congress by the President is commanding in its warning to the country. The figures presented are of astounding proportions. Evidently, the United States is a Colossus in profligate waste, as it is in other respects. But there is an end to every excess, and no fortune is so great that a spendthrift cannot squander it.

With a useless waste of $1,000,000 a day in mineral products, $1,000,000, a day in preventable fires, $2,000,000 a day through the ravages of insects, $1,500,000 a day in soil erosion, and other waste and losses running into millions a day through plant disease, forest fires, floods, animal depredations, soil deterioration, etc., etc., it is possible to understand why the United States, the richest land under the sun, with the most enterprising and energetic people, finds itself facing the exhaustion of many of its resources while still in its youth. It is living upon its capital. "Neither the increase in acreage nor the yield per acre has kept pace with our increase in population," says the Commission. This statement, taken in con-

FLOOD PREVENTION WORK

Sand Bags Used to Protect Weak Spots in Levees Built to Protect Low Farming Lands in the South

nection with the fact that the exhaustion of the iron supply may be witnessed by children now living, is nothing else than a formal notice that the people of this country must learn thrift or suffer the prodigal's fate.

Ten acres constitute a farm in some parts of California, keeping a man busy and yielding more profit than 160 acres in the Middle West. Two acres in France are made to yield more than fifty in this country. The forests of Germany are not only made self-renewing, but are a source of profit. The soil of England is undergoing a process of refertilization that will make it more productive than virgin American acres. Japan leads off with a thrift in fisheries and forestry that is a lesson to the world. But the United States, in the forefront of civilization in other respects, riots through its patrimony like a drunkard and a wastrel.

The President's message, commenting upon the report of the Conservation Commission is the essence of statemanship. It is in the line of state building, of planning for the future. His words are in the nature of a farewell message to the people, and they convey a warning that cannot be ignored. The people as a whole must shorten sail. The carnival of extravagance must come to an end.

The Conservation Commission

CONSERVATION of natural resources by the conscious and concerted action of national and State authorities, probably the most brilliant piece of constructive statesmanship initiated by the Roosevelt administration, is knocking at the doors of Congress

for official recognition. The President asks that the Conservation Commission be legalized, and that a fund be provided for its maintenance and the continuance of its work, hitherto conducted at private expense. The sum needed is $50,000, less than one-tenth the amount added to the national expenditure by the private pension bills enacted at the first session of this Congress as a perquisite of membership in either House. Let the thoughtful citizen judge whether the Roosevelt policy of conservation is less worthy of consideration and of a moderate tax on the public Treasury than the Congressional policy of grinding out private pension bills to help out the folks in "my district." The one is a national policy and the other parochial, and the difference between the two illustrates the diametrically opposite angles of the Executive and the Congressional viewpoints.

In his message of transmittal, Mr. Roosevelt refers to the Conservation Commission's report as "in a peculiar sense representative of the whole Nation and all its parts." If this is true, will it not be singular if Congress, supposed to be similarly representative of the whole Nation and all its parts should be unresponsive to the eloquent appeal of the Chief Executive in behalf of a fundamental task upon which he believes the Nation should at once enter, and enter with the guidance and assistance of the commission that has formulated in detail the policy of conservation? In no way, as the President says, will the appropriation of so small a sum prove of such benefit to the Nation as by its employment in elaborating means for the development and preservation of our material resources in mine and forest, in soil and waterways. And no act would be more creditable to this expiring Congress than that of giving form and permanence to the policy of national conservation of those material elements which are the foundation of national greatness.

HOPE FOR FORESTRY LEGISLATION

IT IS with extreme gratification that CONSERVATION is able to present to its readers the hopeful outlook for legislation at this session of Congress on the important forest reserve measure looking toward the establishment of national forests on the watersheds of navigable rivers.

The Weeks bill—a substitute for the Brandegee bill passed by the Senate at the last session, amended and materially strengthened into what is the best measure yet presented—has been reported out of the House Committee on Agriculture by a vote of 11 to 6, and is now on the calendar of the House for debate and action.

This bill provides for protection from forest fires; for the appointment of a strong Forestry Commission; for the acquisition by purchase of forest areas at the head of navigable streams, where this Commission finds them necessary; it utilizes the receipts of the Forest Service therefor to the extent of $1,000,000 during the fiscal year beginning July 1, 1909, and $2,000,000 yearly thereafter for nine years.

It is an excellent measure, framed on broad and correct principles, meriting and receiving our strong endorsement.

It seems to meet the approval of the Speaker of the House, and in the opinion of its advocates, will, if other important legislation will permit, be considered by the House within the next ten days, and be finally passed and enacted into law at this session.

IN A GEORGIA FOREST

Flood Conditions, Due to Deforestation at Stream Sources. The Establishment of the Southern Appalachian National Forest Will Largely Prevent These Conditions

COMMUNICATIONS

The Blight on Chestnut Trees

EDITOR CONSERVATION:

The article in the November number of CONSERVATION on "The Blight on Chestnut Trees," by Prof. John Mickleborough, impels me to offer a suggestion for those who seek a remedy.

I judge from the article that all efforts thus far have been toward the destruction of the so-called enemy, the fungi which encircles the branch under the bark, cutting off the circulation and causing the branch to wither and die. Professor Mickleborough says, "It finds lodgment where the bark is abraded." I have examined the photographs illustrating the article, but am unable to discover any young chestnut trees. It occurs to me that a young tree of vigorous growth might be immune, and that the real trouble precedes the fungi referred to. This I know to be the case with the cottony scale on soft maples. Treat them as a gardener does a pot-bound plant in a greenhouse —shift to a larger pot with fresh soil. The plant immediately turns from yellow to green and the insects disappear. With the tree, dig up well, mulch and cover the surface with shrubbery to maintain its aeration and absorb the rainfall, holding dead leaves, etc., and the tree becomes immune. This scale appears to feed on the return sap which is coagulated and deficient in consequence of insufficient assimilation of the necessary elements.

Chestnut trees in Wisconsin, surrounded by "civilization," go all to pieces after they attain a large size; every wind storm tears off a piece, exposing decay. The bark is invariably broken, apparently by winter freezing. Were the fungi to take possession and finish the job in short order, it would get the blame. However, I am inclined to think that all troubles which at first sight appear to be caused by some insect or vegetable growth, are due to some deterioration from causes unnoticed, which produce conditions peculiarly adapted to the growths of which we complain. They are in the nature of scavengers. The tree outgrows the capacity of its environment to sustain in normal condition; then nature immediately starts pulling it to pieces, to construct something in its place. The faster or most rank growing trees usually come to grief first, particularly if they be smooth barked.

If Professor Mickelborough finds young chestnut trees in fresh soil escaping the trouble he may be sure that proper cultivation of the tree will cause the fungi to disappear. When people ask me how to keep dandelions out of their lawn, I say "cultivate grass;" then I prove to them that they pay and pray for grass only, but everything they do to the lawn favors the dandelion. Just as soon as the chestnut tree's characteristics go ungratified, so-called disease will surely set in, one variety after another, until the tree finally disappears. I believe energy spent in fighting is waste; the way to overcome the evil is to cultivate the good. The environment which maintains the desirable will always starve the undesirable.

C. B. WHITNALL.

More About the Blight

EDITOR CONSERVATION:

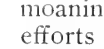
Reading in your current November number the article on "The Blight on Chestnut Trees," in which is reaffirmed the failure to discover a remedy for that blight, I believe you may be interested in what seems to have been a successful remedial course of treatment of a "blighted" small, scattered chest-

nut grove near Charlottesville, Va. It was applied about four years ago, just after the excessively rainy spell that summer. The treatment consisted: first, in baring some of the roots of the trees; second, in spraying the foliage with what I believe was "Bordeaux Mixture;" and, third, in heavy doses of calomel, deposited in auger holes bored through the bark into the boles for several inches.

Last summer I observed that some of the trees had died; some were suspiciously "stag sapping," and some were thrifty. If the slap-dash treatment mentioned was helpful it probably was through the mercury used. The treatment was resorted to after the Agricultural Department of the United States had stated to me their lack of remedial knowledge in the case.

DeCourcy W. Thom.

Baltimore, Md.



Cats and Birds

Editor Conservation:

In an article written for the magazine, Conservation, on the subject of birds, their many enemies, and the great importance of their conservation as insect destroyers, cats were mentioned as being among their most active enemies. This may be true in some instances, but if not "cats," how soon would the rodents multiply and make the life of the birds intolerable by their marauding instincts?

One person who loves the birds, who has had bird houses built for them among the trees of the orchard and lawn and who takes pains to scatter crumbs in convenient places, has no fear of losing her pets by the devouring instincts of the cat.

When the winter months are over and gone, this bird lover immediately makes provision for these feline members of the household, keeping them in partial durance while the nesting season is in progress. At first it was rather difficult, for there is no creature less willing to be restrained than the cat, and yet she submits to the inevitable with a good grace if she knows that the restraint is not to be continuous.

From the laundry-room of the old-fashioned house, which had several sunny but low windows, the cats, two in number, had been in the habit of leaving their dormitory for the garden in the morning hours by means of one of these windows which was left open for their convenience. One morning, however, they found that the space about the window was covered with wire, and a runway leading from this along the foundation of the house for about ten feet was also covered, but in this space was a carpet of leaves and straw. At first there was the usual bemoaning of their fate and vigorous efforts made to be released, but the household was deaf to their entreaties until a certain time in the day when they could be watched in their garden gambols and scolded if they even looked at a bird with longing eyes.

It was but a little while before they grew perfectly contented with the arrangement of the sun-parlor, often lying asleep in one another's arms in their contentment, while the birds built their nests all about the garden and sang in the trees without the slightest molestation.

These well-disciplined cats even seemed to seek this sun-parlor after awhile as a place of safety. Here they could sleep unmolested and not with one eye open to watch for dogs or bad boys, and all the birds seemed to know that here was a veritable bird paradise, where no enemy would be allowed to interfere with their enjoyment.

Jeanie Oliver Smith.

Johnstown, N. Y.

THE DESTRUCTION OF AMERICAN FORESTS

By RICHARD H. DOUAI BOERKER

IN TWENTY-FIVE years the timber of the United States, on Government reserves and private holdings, at the present rate of cutting, will be exhausted. It is utterly beyond the possibility of the Forest Service to meet the situation and prevent trouble. One hope entertained is the Appalachian Forest." This is the startling statement recently made by our Chief Forester, Mr. Gifford Pinchot, and it strikes the key-note of the deplorable condition of affairs now existing in this country. It is a situation, that, if not met soon, will cause unheard-of desolation and misery. France some years ago experienced a timber famine, and to-day she is spending $34 an acre to reforest her watersheds. The same neglect is costing Italy $20 an acre. Why can't we profit by the mistakes of other nations, and meet the situation at once? Unfortunately, the majority of people in our country cannot reconcile themselves to the fact that, if this destruction continues, they will be the ones to suffer. Let us analyze the situation more closely.

We lay the destruction of our forests to two general causes: first, to the irrational policy now in vogue for the conservation and use of our timber supplies, and, second, to the wasteful lumbering methods which are used throughout the country, and the poor protection given the forests against fires, insects, and animals.

Under the irrational policy now in use we find two taxes that may be called the greatest enemies of our forests. The one is the tax on standing timber, which compels the holder of timber land to level his woodlands or lose on his investment. This system of taxation taxes the timber as though it were a series of crops, whereas, it is really but one crop. The other tax which is helping to destroy our forests is the export tariff on wood pulp. This tax encourages the American dealer to send his wood for pulp to the European market and there sell it, often at a greater profit than he could in America. Thus we see that, in helping nations who are in a worse predicament than we, we are hastening our own ultimate shortage.

While these taxes doubtless cause the greater part of the slaughter, still, the failure to use economic and conservative methods in dealing with the forests results in the waste of enormous quantities of valuable timber. Let us see what some of these wasteful methods are. When cutting timber, usually every available tree is used, regardless of its age, instead of cutting only the older ones and leaving the young ones to mature. In trimming the branches from the logs, the brush is allowed to remain wherever it happens to be thrown, instead of being piled up and burned, to make room for the young seedlings to grow. A great deal of waste results in cutting the tree too far from the ground. The stumps, whenever it is convenient, should be as short as possible Often large logs fall in disadvantageous positions, and since it is no loss to the party cutting the timber (he paying so much per thousand feet drawn out) it is left to rot. By far the greatest portion of the wooded area of this country is without protection from fires, insects and animals. In the Government reserves, where such protection is given much attention, we find that only one one-thousandth of

one per cent. of the reserves were devastated by fires last year, causing the small loss of $76,000. Comparing with this the millions of dollars worth of timber consumed annually by fires in private holdings, one gets an idea of what conservative methods mean. It is very evident, then, that as long as we do not apply the principles of forestry in preserving and using our woodlands, we cannot hope to stave off that inevitable famine which will leave desolation and misery in its wake.

The result of this pernicious cutting of our forests is only too apparent. A timber famine is at our very door. Floods, caused by denuding mountainsides of their forests, are causing enormous loss of life and property. Turbulent streams carry with them gravel and silt and deposit them in harbor and river channels, seriously menacing navigation. Rivers rise to from fifteen to twenty feet above normal height in the spring, but are only chains of stagnant pools in summer. This inequal flow seriously affects the factories and mills along these rivers, because such establishments depend upon a regular flow of water. Water used for domestic purposes becomes polluted and insufficient. Our far-famed mountain regions are being deprived of their glory and grandeur; soon their beauty and recreative influences will be entirely destroyed. Where does this destruction end? In what part of the country do we not notice its results?

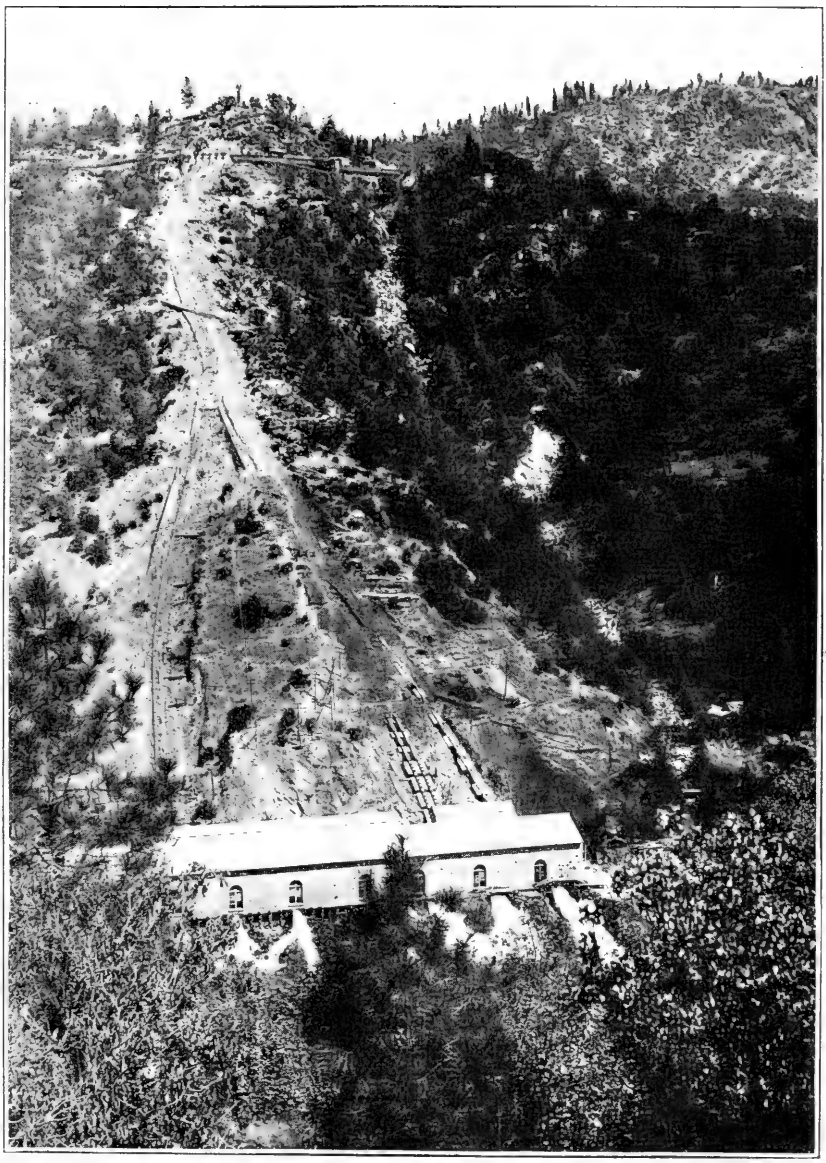
Let us now, by taking a familiar exemple, get a more definite picture of the situation. Let us consider present conditions in the East. The conditions here doubtless form a more striking picture than those in any other part of the country. It is here that the need for reform is felt the most. Seven-eighths of our population live here, and hence about seven-eighths of the commerce and industry of the country is carried on here. Here, too, are situated the forests which, it is hoped, will some day supply the entire country with certain kinds of wood. Practically all the wood-pulp used for the manufacture of our newspapers is made from the wood of these forests. The East has, also, the only hard-wood forests in the country. Can, then, their commercial value be overestimated? Besides being of great value commercially, these forests regulate the stream flow of the largest rivers in the East. The Merrimac, Connecticut, Hudson, Delaware, Potomac, Savannah, and Ohio revers are among the most important that rise in the Appalachian mountains. Hundreds of cotton mills, pulp mills, and factories of various kinds are dependent upon the regular flow of these rivers.

The Merrimac alone drives mills worth $100,000,000, employing 80,000 people upon whom another 350,000 are dependent for support. In the Carolinas and Georgia, over $40,000,000 is invested in cotton mills which must depend upon the equable flow of some of these rivers. In these mills over 60,000 are employed, upon whom 250,000 are dependent for support. If we could collect similar statistics of all the Eastern states we would see that we people in the East—about 70,000,000 in number—are all dependent more or less directly upon the wood and water of the Appalachian forest region. What happens when we deprive these mountains of their forest covering is very evident. Floods in the southern Appalachians alone have in a single year destroyed over $20,000,000 worth of property, and have impoverished many thousands of people. Last year Pittsburg experienced floods which caused enormous losses of life and property. Congress appropriates several million dollars annually for dredging river and harbor channels in the East. Instead of appropriating the millions for preserving the forests on the watersheds of our Eastern rivers, Congress spends them in paying for the damage done by their misuse, or, in other words—millions for tribute, but not one cent for defense. This destruction not only robs us of our future wood supply, to say nothing of causing destructive floods and loss of life, but it deprives the mountains of their value as summer resorts, where thousands of care-worn

minds seek recreation annually. In the White Mountains more than 90,000 acres of forest land have been laid bare in the last fifteen years. Is this world-famed mountain region, incomparable for its magnificent mountain scenery; are these snow-capped peaks of the North which rise so sublimely into the beautiful, clear New Hampshire sky; are these snow-clad hills of the "Granite State" which are an endless source of pleasure and recreation to thousands every year, are they to be marred completely by the woodman's malicious ax?

We have analyzed, more or less completely the condition of affairs now prevalent in our country. We have seen what is causing the destruction of our forests and have noted—by way of example—the more important results of the destruction. Let us now consider a few of the means by which the prominent men of our country hope to solve this serious problem. First of all, the tax on standing timber and the tariff on wood-pulp, the greatest enemies of our forests, must be repealed. Money must be appropriated by the Federal and state authorities for the preservation of forests areas. Not only must we learn to make the best permanent use of our standing forests, but we must also plant new ones. We can readily see that every means of saving the American forests is dependent upon whether or not these destructive taxes are repealed. Practically everything hinges on this. A beginning of reform has already been made The tax on standing timber has been repealed in many states, and it has already succeeded in saving much valuable timber. The Government has already bought up over 160,000,000 acres of forests for prservation. Several years ago a bill appropriating $5,000,000 for preserving the forests of the Appalachian and White Mountains was introduced into Congress. Up to the present time it has not been passed. The representative newspapers and magazines of our country are helping the cause greatly by bringing before the people indisputable arguments why the forests should be preserved. The leading railroad companies and many important corporations are planting forests for their own use. The United States Forest Service and the American Forestry Association are doing everything in their power to make forestry a household knowledge in the United States, and to convince holders of timber land that conservative lumbering methods are the best, most economic and most permanent in their results.

Although we are experiencing an era of reformation in the policies which control our timber and timber supplies, yet there is still lacking the public sentiment and interest which ought to be manifested in an issue of so much import. The little that is being done is insignificant as compared to that which remains to be done. Unfortunately, the people do not realize the gravity of the situation. If they did, would they neglect such an important bill as the Appalachian Forest Bill? Or would they spend millions in dredging channels and not one cent for preventing the silting up of those channels? Prominent men have ascribed this inactivity and illogical method of procedure to the lack of initiative among the people and those that represent them. One man says it is due to the "inertia of a great people, to disinterestedness and to indifference." These men maintain that, although it is not within the power of the average working man to aid the cause financially or through the press, yet he is capable of voicing his sentiments to his friends and demanding their fulfilment on the ballot. This would help solve this important problem. There may, however, be several different avenues of approach in solving this problem, but whichever one we select, to quote the words of the editor of FORESTRY AND IRRIGATION, one thing is certain—the United States must adopt, and that speedily, a rational policy for the conservation and use of her timber supplies." It rests, then, with the American people to adopt and enforce such a policy.



ELECTRIC POWER DEVELOPMENT

Power-house and Penstocks on a Western Mountainside. As Our Coal Supply Nears Exhaustion We Must More and More Depend on Water for Power, Heat and Light. Let Us Look After Our Remaining Water Powers

NEWS AND NOTES

Forest Trees of the Pacific Slope

THE appearance of "Forest Trees of the Pacific Slope" does not in any way fall short of what was expected. At the present time forest trees are playing an important part in our national conservation, and information on this subject of a practical nature is what the public seeks. There are numbers of tree books before us, but with few exceptions, and these too expensive for the average student, they are too technical or too incomplete. A book to be of real value as a text-book must be direct, simple, and comprehensive. These elements are very evident in "Forest Trees of the Pacific Slope." The plainly worded and accurate descriptions, together with the natural-sized illustrations, cannot fail to accomplish the purpose for which the book was written. Too much attention cannot be directed to a matter so vital as our forests and it is highly gratifying that the Forest Service authorizes the distribution of such valuable literature. Volume II will be devoted to trees of the Rocky Mountain region, and two others will take up the trees of the East and of the South. It is supposed that the shrubs of North America will be dealt with as fully as the trees. Particular interest is felt in the Rocky Mountain volume, as this covers the Southwest territory where so little has been done to acquaint us with the arborescent flora of that important region. Mr. Sudworth's ability to accomplish the arduous task assigned him is unquestioned. Any literature on trees bearing his name inspires enthusiastic interest among students and teachers, and the deference of his fellow-workers in the science of forestry.

To Connect the Atlantic with the Gulf

THE Mississippi Atlantic Inland Waterway Association at its convention at Columbus, Ga., last month, declared itself strongly in favor of connecting the Gulf of Mexico with the Atlantic Ocean by the construction of a ship canal across the Peninsula of Florida. The estimated cost of such a canal is $50,000,000; it would shorten the route from the Atlantic to the Gulf ports by over five hundred miles, and it has been calculated that it would attract a traffic of 60,000,000 tons a year. Such a canal would be of enormous benefit to southern and central American commerce, and in a few years, when the Panama Canal has become an actuality, this benefit would be immeasurably increased.

The proposed Florida canal, however, is only part of a larger project which is thoroughly deserving of support and which only waits the favorable action of Congress. All the way southward from the Bay of Massachusetts the topography of the coast facilitates and invites the creation of a series of waterways which will make it possible for sea-going vessels to pass from Boston to New Orleans nearly the whole distance through natural or artificial inland channels. Some of the necessary work has already been accomplished by private enterprise. Canals which only need to be deepened to serve as links in the chain traverse New Jersey and Delaware, while a private company is engaged in opening a passage across the narrow, sandy strip of land which now compels the making of a long detour around Cape Cod. Steps have also been taken toward the enlargement of the Chesapeake and Delaware Canal to the extent demanded by the requirements of modern commerce, and it may be expected that Congress, whose failure to act in the matter at its last session did it no credit, will not much longer delay to provide the legislation upon which the project waits.

It will be the less likely to do so if those who appreciate the immense desirability of the vast improvement in contemplation will resolutely keep up and energetically prosecute the agitation in which they are engaged. That

is the only way to accomplish the desired result. Congress will not act except under the pressure of public opinion, and every section which has a direct interest in the inland waterways program should make its voice heard and its influence felt in this connection.

Pan-American Irrigation Congress Suggested

IN THE course of his address on irrigation in Latin America at the National Irrigation Congress at Albuquerque, last October, Hon. John Barrett, Director of International Bureau of American Republics, urged that Central and South America be included in the future activities of the Congress. Along this line Mr. Barrett said:

"I want to make a recommendation which may be worthy of your careful consideration. It is that the National Irrigation Congress meeting here in Albuquerque, New Mexico, in 1908, take steps toward holding two or three years from now, or at some date in 1910 or 1911, a great International Pan-American Irrigation Congress, to which each one of the twenty Latin American republics will be invited to send delegates and experts.

"Such a proposition carefully directed would surely meet with favorable response by our sister nations and would be the means of vastly benefiting, by mutual exchange of views and reports, irrigation undertakings in all America. It would be highly advisable that a committee should be appointed by this convention to consider the carrying out of this plan and to ask the National Congress at Washington to make a reasonable appropriation to cover the participation of the United States.

"Such appropriation would give a government sanction and require the appointment of government delegates, which would insure the actual interest and participation of the other American republics. As a *special corollary* to this main proposition, I would suggest further, as a step of international courtesy which would please not only our great and prosperous neighbor, Mexico, but all Latin America, that the national and private irrigation interests of Mexico be particularly invited to cooperate with those of the United States in preparing for, and extending invitations to, such a Pan-American gathering.

"With this idea, moreover, goes the highly tempting possibility of holding this international congress in Mexico City, the great capital of a nation which is second only to the United States in planning and supporting the movement for reclamation of arid areas and for the conservation of natural resources. The years 1910 or 1911 are mentioned, instead of 1909, because it would be impossible to do the preliminary work necessary and secure the acceptance of foreign governments prior to 1910."

Miami and Erie Waterways to Become Ship Canal

THE work of converting the Miami & Erie Canal, running northward from Cincinnati across the State of Ohio, into a ship canal has progressed so far that Charles Nauts, Superintendent of the Northern Division, states that by next May the first fifty miles of the canal from Cincinnati north will be ready for use by craft of 150 tons capacity. Mr. Nauts states that the new locks in course of preparation are ninety feet in length with a sixteen-foot waterway. It is not proposed to widen the channel materially, but it is being made considerably deeper. It is also announced that the work of enlarging the canal throughout its entire length will be prosecuted vigorously, and, while no definite dates are set, it is believed that within the next five or six years the canal will be in operation from the Lakes to the Ohio River.

Mr. Pinchot and the Farmers

IN A letter written to Hon. Frank C. Goudy, president of the Sixteenth Annual Irrigation Congress, held at Albuquerque, N. Mex., in September, Hon. Gifford Pinchot, United States Forester, after expressing his regret at being unable to attend the congress, added some expressions of opinion in regard to the American farmer, irrigation, or otherwise. Mr. Pinchot has for so long been believed, by certain elements in the West, to know nothing about anything but forestry—and, according to *Field and Farm*, Judge D. C. Beaman and others, not much about that—that it will come as a surprise to

read what he has to say in regard to the farmers of the country. His letter to Judge Goudy follows:

Hon. Frank C. Goudy, President, Sixteenth National Irrigation Congress, Albuquerque, N. Mex.

My Dear Judge Goudy: As I have already written you, I regret more than I can easily say that I cannot be with you at Albuquerque this year. For a number of years past I have attended every session of the National Irrigation Congress, and at the more recent ones I have been honored as the bearer of a message from the President, whose interest in irrigation never flags. This fall, under his orders, I am trying to do certain work on the National Conservation, and the Commission on Country Life, and that is why I am unable to come.

Ever since I came to have first-hand knowledge of irrigation, I have been impressed with the peculiar advantages which surround the irrigation rancher. The high productiveness of irrigated land, resulting in smaller farm units and denser settlement, as well as the efficiency and alertness of the irrigator, have combined to give the irrigated regions very high rank among the most progressive farming communities of the world. Such rural communities as those of the irrigated west are useful examples for the consideration of regions in which life is more isolated, has less of the benefits of cooperation, and generally has lacked the stimulus which has sent the men whom this congress represents so far along on the road to the ideal country life. It is for this reason that I venture to send you the following considerations bearing on the work of the President's Commission on Country Life—because you have gone so far on the road he wants others to follow.

The object of education in general is to produce in the boy or girl, and so in the man or woman, three results. First, a sound, useful, and usable body; second, a flexible, well-equipped, and well-organized mind; alert to gain interest and assistance from contact with nature and cooperation with other minds; and third, a wise and true and valiant spirit, able to gather to itself the higher things that best make life worth while. The use and growth of these three things, body, mind, and spirit, must all be found in any effective system of education.

The same three-fold activity is equally necessary in a group of individuals. Take, for example, the merchants of a town, who have established a Chamber of Commerce or Board of Trade. They have three objects: First, sound and profitable business; second, organized cooperation with each other to their mutual advantage, as in settling disputes, securing satisfactory rates from railroads, and inducing new industries to settle among them; and third, to make their town more beautiful, more healthful, and generally a better place to live in. Take a labor union as another example, and you will find the same three-fold purpose. A good union admits only good workmen to membership in its sound body; the members get from the union the advantages of organized cooperation in selling their labor to the best advantage; and in addition they enjoy certain social advantages often of overwhelming importance.

The practical value of organization and cooperation is obvious, and they are being utilized very widely in nearly every branch of our national life. But what is the case with the farmer? The farmers are the only great body of our people who remain for the most part substantially unorganized. The merchants are organized, the wage-workers are organized, the railroads are organized. The men with whom the farmer competes are organized to get the best results for themselves in their dealings with him. The farmer is engaged, usually without the assistance of organization, in competing with these organizations of other groups of citizens. Thus the farmer, the man on whose product we all live, contends almost single-handed against his highly organized competitors.

How have the agricultural schools and colleges and the departments of agriculture of state and Nation met this situation? Largely by the assertion, in word or in act, that there is only one thing to be done for the farmer. So far as his personal education is concerned they have tried to give him a sound body, a trained mind, and a wise and valiant spirit. But so far as his calling is concerned they have stopped with the body. They have said in effect: We will help the farmer to grow better crops, but we will take no thought of how he can get the best returns for the crops he grows, or of how he can utilize those returns so as to make them yield him the best and happiest life.

It is not wise to stop the education of a boy or a girl with the body, and to neglect the mind and the spirit. But we have done the equivalent of that in dealing with farm life. We have done more, and have done it more effectively, for the farmer along the line of better crops than any other nation. But we have done little, and far less than many other nations, for better business and better living on the farm. Hereafter we shall need not only the work of departments of agriculture in state and nation, such as we have now, but we shall need to have added to their functions such duties as will make them departments of rural business and rural life as well. Our departments of agriculture should cover the whole field of the farmers' life. It is not enough to touch only one the three great country problems, even though that is the first in time and in importance.

Of course, we all realize that the growing of crops is the great foundation on which

the well-being not only of the farmer but of the whole Nation must depend. First of all we must have food. But after that has been achiever, is there nothing more to be done? It seems to me clear that farmers have as much to gain from good organization as merchants, plumbers, carpenters, or any of the other trades and businesses of the United States. After we have secured better crops, the next logical and inevitable step is to secure better business organization on the farm so that each farmer shall get from what he grows the best possible return.

Consider what has been accomplished in Ireland through agricultural cooperation. The Irish have discovered that it is not good for the farmer to work alone. Since 1894 they have been organizing agricultural societies to give the farmer a chance to sell at the right time and at the right price. The result is impressive. In Ireland there are 354 creameries producing about half the butter exported. There are 40,000 farmers in the societies for cooperative selling, which, as we know, in this country, means better prices. There are 261 agricultural credit societies with a membership of 15,000, and a capital of more than $200,000. There are other agricultural societies with 20,000 members. In a word, in Ireland, which we have been apt to consider as far behind us in all that relates to agriculture, there are 925 agricultural societies with an annual business of $50,000,000. Since 1894 their total business was more than $300,000,000.

But after the farmer has begun to make use of his right to combine for his advantage in selling his products and buying his supplies, is there nothing else he can do? As well might we say, that after the body and the mind of a boy have been trained, he should be deprived of all those associations with his fellows which make life worth living, and to which every child has an inborn right. Life is something more than a matter of business. No man can make his life what it ought to be by living it merely on a business basis. There are things higher than business. What is the reason for the enormous movement from the farms into the cities? Not simply that the business advantages in the city are better, but that the city has more conveniences, more excitement, and more facility for contact with friends and neighbors—in a word, more life. There ought then to be attractiveness in country life such as will make the country boy or girl want to live and work in the country, such that the farmer will understand that there is no more dignified calling than his own, none that makes life better worth living. The social or community life of the country should be put by the farmer, for no one but himself can do it for him, on the same basis as social life in the city, through the country churches and societies, through better roads, country telephones, rural free delivery, parcels post, and whatever else will help. The problem is not merely to get better crops, not merely to dispose of crops better, but in the last analysis to have happier and richer lives of men and women on the farm.

I have ventured to lay this statement before you because irrigators are natural leaders in this great movement, and to urge you to add this problem to the others in which the interest and activity of the National Irrigation Congress have been of such effect and value to the whole Nation.

With all good wishes for the success of the Albuquerque meeting, and with renewed regret that I cannot be with you, I am,

Very sincerely yours,

(Signed) GIFFORD PINCHOT.

Investigations of Water Resources of the Ohio Valley

THE United States Geological Survey will continue its investigations of the water resources of the Ohio Valley during the fiscal year beginning July 1, 1908, and will add several important special researches in this area.

The work involved consists principally of the daily measurement of the flow of rivers and their small tributaries, in order to get an authoritative record of the amount of water that passes out of the rivers into the main stream during the several seasons of the year. Data of this character must from the basis of all important water-supply developments, such as improvements for the prevention of floods, the development of water power, and the improvement of navigation.

The Ohio Valley work has become so important that the area has been included in a special district, which during the coming year will have the exclusive attention of a picked corps of men. Headquarters for the work have been established in the Federal Building, at Newport, Ky., which is close to the geographic center of the area and is in convenient communication with all the tributaries of the Ohio.

For a long time it has been evident that more minute studies of stream flow should be made in the tributaries of the Ohio that run off the Appalachian Mountains. With the funds at the command of the Survey it is not possible to undertake all of this

work at the present time, but a beginning has been made by selecting the Kanawha drainage basin for special study, and during the next year, if the appropriations to be made by Congress will permit, the work will be extended to adjacent basins, such as the Monongahela, Kentucky, Green, and Cumberland.

The Ohio Valley is commercially the most important of all the interior river countries, and as this valley has been visited by extremely destructive floods, the work of the Survey will be of great value. It is also becoming evident that the enormous amount of water power available in this area has not been generally realized and a part of the Survey's work will be to determine more accurately the extent of this power and the points at which it may be advantageously utilized.

Deep Well-drilling

FOR many months a big well-drilling machine had been boring into the dry ground of the Black Hills region of South Dakota alongside the track of the Burlington Railroad at Edgemont. Down went the drill—500, a thousand, 2,000, 2,500 feet—until the native onlookers wondered whether the railroad company had fixed no limit to the bore and was simply "going it blind" indefinitely. The company's intention was very definite, indeed. Its officials had been informed by a geologist of the United States Geological Survey that a good supply of water would be found in a certain stratum of rock that lay at a depth of about 3,000 feet. This geologist had made a study of the surface outcrops of the rocks of the region, and had based his prediction on that study. And having faith in the prophecy, the company determined to drill to that depth. It was not necessary, however, to bore quite to the depth of 3,000 feet, for when the drill had gone down 2,980 feet water gushed out at the rate of 350 gallons a minute and the faith reposed in the judgment of the geologist was justified. This water supply fills a need which is so urgent that if anything should happen to destroy this well, the railroad company would not hesitate to bore its counterpart.

That appeal should be made to the science of geology to state positively the occurrence, location, and character of various deep-lying formations and from a study of only the surface formations to designate a water-bearing stratum at a depth so great as this well was driven seems incredible to the lay mind; but such determinations are common. Extensive areas have been thus mapped underground by the Geological Survey, and the maps have been accompanied by descriptions of the character and age of the different rock and earth strata so definite that it would seem as if the regions so surveyed must have been sampled with a core drill at frequent intervals. The great Dakota artesian basin, which extends over an enormous area, has been accurately mapped, as have also many other smaller but hardly less important basins.

Water is the most useful and necessary of our mineral resources. Unlike most of the others, it is renewable and can be utilized over and over, again and again, by man so long as the phenomena of evaporation and precipitation continue; but this does not mean that the conservation of the resource is not necessary. River supplies can be largely diminished through the destruction of the sources by forest denudation and otherwise, and artesian basins also can be exhausted or seriously injured through wasteful misuse. Local statutes that require the capping of wells when not in use should, if necessary, be enacted and strictly enforced to prevent such waste—such statutes as have been enacted in many sections for the prevention of waste of natural gas and petroleum. Artesian basins are of especially great value, since many of them are located in regions where the surface water supply is very scant.

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CONTENTS FOR MARCH, 1909

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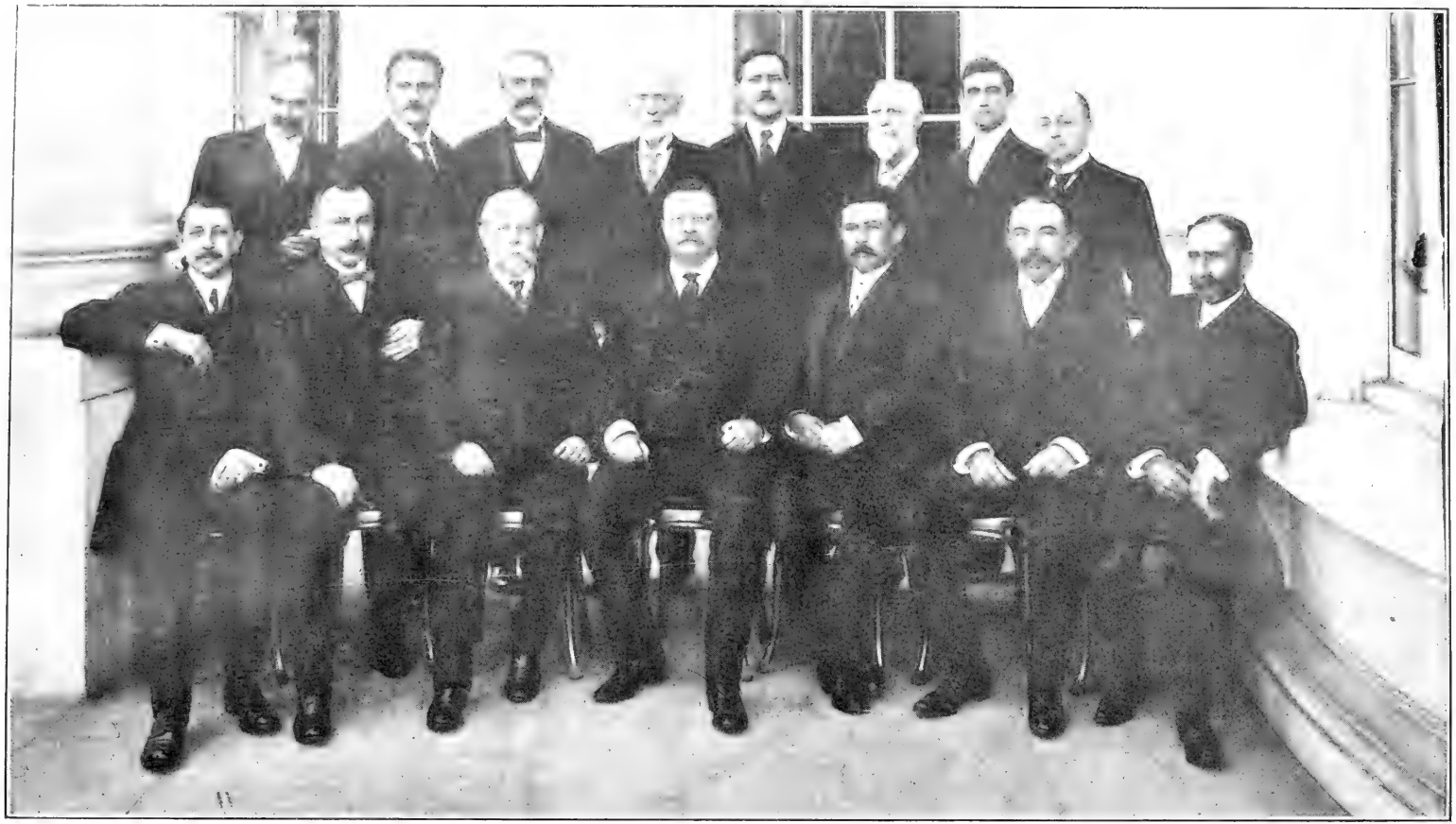


Standing, left to right (in photograph): Mr. R. E. Young, Secretary of the Canadian Delegation; the Secretary of State; Mr. Gifford Pinchot, Chairman of the United States Delegation; Senator Cullom; the Secretary of the Interior; Ambassador Bryce; Mr. Thomas R. Shipp, Secretary of the United States Delegation; Senator Knox.

Seated, left to right (in photograph): Dr. Henri S. Beland, Hon. Clifford Sifton, and Hon. Sydney Fisher, Chairman, of the Canadian Delegation; President Roosevelt, Hon. Romulo Escobar, Hon. Carlos Sellerier, and Hon. Miguel A. de Quevedo, of the Mexican Delegation.

Vol. XV MARCH, 1909 No. 3

JAMES WILSON, SECRETARY OF AGRICULTURE

By THOMAS ELMER WILL

On December 10, 1908, Hon. James Wilson, Secretary of Agriculture, retired from the presidency of the Board of Directors of the American Forestry Association.

For some time it has been felt that the private, voluntary forestry movement, on the one hand, and the governmental, on the other, should no longer be officially connected. As early as April 24, 1907, Mr. Gifford Pinchot wrote to Secretary Will a letter resigning his position as chairman and member of the Executive Committee of the Association, saying, among other things, "It is my strong conviction that the Association should stand upon its own feet, and be independent of the Forest Service in all respects. While I hope strongly that the Forest Service will continue to contribute all it can to the cause which the American Forestry Association so well represents, I believe it to be unwise that the two institutions should continue to be merged to the present extent by the officers of one acting also as officers of the other."

At the meeting of the Board of Directors, January 28, 1908, Mr. Pinchot stated that, to avoid confusion in the public mind between the American Forestry Association and the Forest Service, he felt that he should no longer continue as a member of the Board of Directors of the Association, and requested that he be not renominated. With very great regret, his request was complied with. At the same board meeting, and for the same reason, Secretary Wilson desired to retire from the presidency. He was, however, urged to continue until an eligible successor could be found. Action was accordingly deferred until December.

Thus ended a term of service cover-

ing almost exactly a decade, Secretary Wilson having been elected President of the Board on December 14, 1898.

Ten years ago, our National forest policy was in its small beginnings. The government forest work was scattered among three offices: the General Land Office controlling the reserves, the Geological Survey surveying and mapping the forest areas, and the Division of Forestry, in the Department of Agriculture, maintaining the scientific foresters. To-day this work is concentrated in the hands of the great Forest Service, whose work is known of all men.

In 1898, the establishment of National forests had but fairly begun with the proclamation, on February 22, 1897, by President Cleveland, of the reserves recommended by the National Academy of Science, covering 21,379,840 acres. At the end of 1908 the National Forests comprised 168,681,039 acres, an area almost eight times as great.

Then, the Appalachian-White Mountain movement, which originated with the organization, at Asheville, North Carolina, November 22, 1899, of the Appalachian National Park Association, had not yet begun. To-day the tide of favorable public sentiment has risen so high that that measure cannot much longer be successfully resisted.

Then, the establishment of National Forest Reserves was met, especially in the mountain States and farther west, with hostility; to-day, it is generally applauded.

Ten years ago, State forestry work was in its infancy, to-day it has reached proportions to indicate which would require an article.

Then most lumbermen and woodusers regarded forestry as a fad; now, a host of them recognize it to be a necessity.

Ten years ago forest fires raged practically unchecked; to-day, on the National Forests, they are under control and a source of minor concern.

In 1898 the American Forestry Association had a membership of 892; it maintained no office or organ of its own; as a means of publicity it used *The Forester*, a twenty-six page monthly. On December 31, 1908, its membership numbered 6,973; it has a six-room office and a force of paid helpers; it owns and publishes CONSERVATION, an eighty-page monthly; it is affiliated with ten forestry and wood-using associations, and it conducts activities which make it a force in the forestry movement of America and the world.

Among the other agencies now promoting the forestry movement, almost all of which have sprung up within the decade, should be noted three forestry associations, National in scope, and thirty-three state organizations, three postgraduate and nine undergraduate schools of forestry, and numerous other institutions giving courses in the same subject.

In the promotion of all this work, the influence of Secretary Wilson has been far-reaching. His throne has been the office of the Department of Agriculture. The present may offer a fitting opportunity for a glance at the work of this mighty institution.

Historically, the era of primitive freedom once passed, agriculture has constituted the lowest stratum of the industrial and social pyramid. The tillers of the soil have been the pariahs and "mud-sills" of society. Their type has been Gurth, "born thrall of Cedric, the Saxon;" or the serf who, toiling in his fields by day, has by night beaten the ponds and marshes lest the frogs disturb the slumbers of his master. The land has been primarily a pleasure ground for the rich, and only secondarily a source of sustenance for man. In importance, the chase by the lordly hunter has far out-ranked the labor of the producer. The first claimant upon the crop was the game-bird or animal in whose pursuit idlers found amusement. To kill a hare was to be hanged: to spread nets for pigeons was a capital crime; to aim at a stag was to be tied alive to its back. Henry IV. of France "signed the sentence of death upon peasants guilty of having defend-

Skidding Logs in Adirondack Forest in Winter

ed their fields against the devastation of wild beasts." Simply to drive away a herd of deer or wild boars destroying his harvest was to bring upon the head of the rustic swift and certain vengeance.

Further, the tools and implements of husbandry have, till yesterday, been of the rudest and crudest sort. In fact, in Oriental lands they are to-day substantially the same as those with which the reapers of Boaz harvested his barley, or the peasants of the Nile produced the crops which Joseph gathered into Pharaoh's corn-cribs; while famines still claim their millions.

Not only so, but from every item of the paltry crop produced in such circumstances, a heavy tribute was ruthlessly exacted. While the widow of whom Carlyle wrote has been gathering nettles for her children's dinner, the perfumed seignior, delicately lounging in the Oeil de Boeuf, has been devising an alchemy whereby he might extract from her the third nettle and call it "rent."

Little wonder agriculture has lagged and languished!

But look at it in the United States! In 1904 our crops equaled five times the total output of our mines, including those of gold, coal and iron. In 1907 they had increased by twenty per cent., and amounted to the sum of $7,412,000,000. Estimating our population at 80,000,000, and grouping these into families of five, this would mean a volume of agricultural produce alone amounting to $463.25 for every family in the United States.

For machinery, farmers of this country paid in 1904 as much as Jefferson paid for Louisiana and, in addition, laid aside several hundred millions more than the gold reserve maintained by the National treasury.

For many, agricultural life in America is still hard; yet, beside that of our Colonial forefathers, to say nothing of that of Old World delvers, it is well-nigh ideal. Good roads and trolley lines are connecting the farmer with his local market. The telephone, rural free mail delivery and daily paper keep him in touch with the world. In many instances he has a piano and library, keeps a bank account, rides in an automobile and puts his sons and daughters not only through the public schools, but through the Agricultural College or State University. Western bankers complain that farmers compete with them as money-lenders.

For this astounding progress credit is, in no small measure, due to James Wilson, Secretary of the United States Department of Agriculture. Assuming charge, twelve years ago, of a department whose faintest possibilities had barely been dreamed of, he set to work to make that department an engine for the practical uplift of the rural population—an agency whereby the farmer might be enabled more effectively to help himself. In contrast with the "scientific" pedant, who cannot see the woods of actual life and crying human needs for the trees of his books and apparatus, and who scorns the practical as "unprofessional," Secretary Wilson was a breeze from the ocean in August. To a bureau chief he said, on assuming charge: *"Don't tell me now about your laboratories. Tell me what you are doing for the man at the plow, out in the fields with his coat off!"* There, in little, we see a giant entering upon a giant's work.

What is the United States Department of Agriculture? Let him who would know its alphabet at least study its Year-Book. Then, if practicable, let him see the department itself; its multitudinous offices scattered over blocks of territory, and its majestic new building gradually taking shape. Then he should see some of the other agricultural institutions of the country, which more or less closely co-operate with the department at Washington; the fifty-nine agricultural experiment stations distributed among all the States and Territories; the sixty-five agricultural colleges, one or more in every State, and in every Territory save three, with their 66,193 students and their 6,243 salaried workers; the

Scene in a Longleaf Pine Forest

fifty state and territorial departments of agriculture, the stock breeders' associations, the sanitary offices in charge of live-stock interests, the horticultural and kindred societies, the state highway offices and the like.

But let us turn to the department proper.

Here is a Weather Bureau, foretelling frosts, storms and floods; and by signals, bulletins and mail and telephone service, informing the people that they may protect their interests.

A Bureau of Soils has surveyed and mapped 147,107 square miles of land in forty-seven states and territories. It studies methods of improving soils and rendering them most productive.

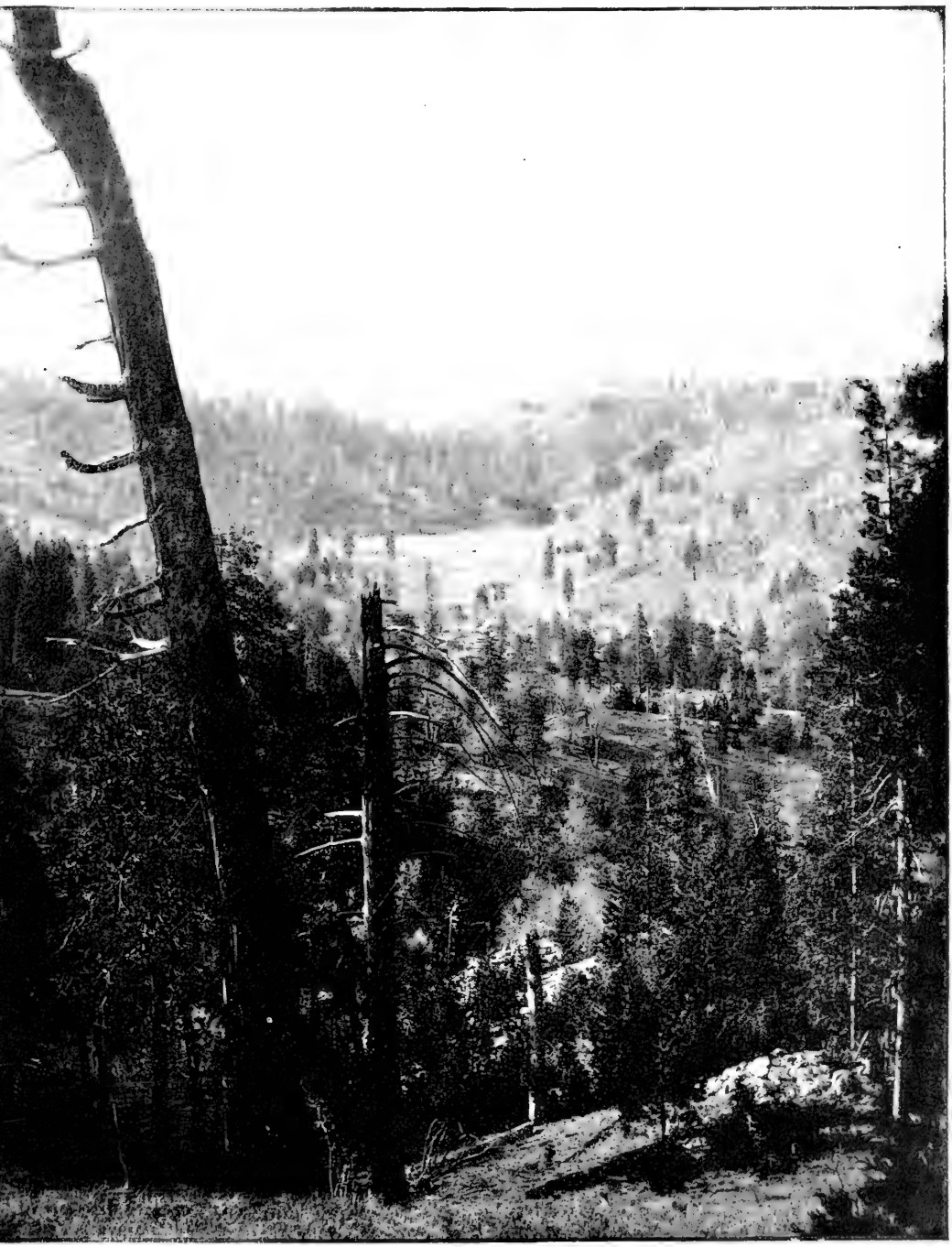
The Bureau of Plant Industry investigates the best methods of farm management, of crop rotation and the selection of soils; it studies plant diseases and methods of combating them. It seeks to improve the grade of corn, wheat, etc., by breeding, as the grade of stock is improved by breeding. For certain crops, it restores wasted soils by drawing nitrogen from the air and making it available to plants as food. It ransacks the planet for plants which will meet American needs. Blackberries and currants have been imported from Northern Korea, and apples from Northern Manchuria; a collection of twenty-four pears from North China, while bush cherries, plums and peaches have come from Northern Siberia. From Russia and Africa was brought the durum wheat for dry land culture. At an initial cost of $10,000 this now produces a crop worth $30,000,000, in regions where once "the steer roamed over twenty acres to find his living." An Arabian alfalfa yields from seven to twelve cuttings per year.

The Bureau of Animal Industry seeks to cure the ills to which live-stock is heir. Of these, Texas fever is a type. Its cause is traced to a tick; its cure, to the destruction of this parasite by methods wholly practicable, as dipping, spraying and the like. This bureau inspects meat under the law of June 30, 1906. In 1907, inspection was conducted at 708 establishments in 186 cities and towns and covered 50,999,034 animals. Imagine 50,000,000 animals! Picture them lined up, ten feet allowed for each! The line would reach almost four times around the world.

The Bureau of Chemistry alone is worth to the country far more than the entire cost of the Agricultural Department. In the protection of the public health against unwholesome foods, through the enforcement of the act of June 30, 1906, it is rendering a priceless service. More than twenty years ago, when sugar beet culture in the United States was infantile, the chief of the bureau indicated the areas in which that plant would thrive. In the nine years ending with 1907, the value of its product increased by 543 per cent., and amounted to $45,000,000—almost four times as much as the entire appropriation for the Department in 1907. The sugar beet farms and factories in the United States were worth, in the same year, $60,000,000. Between 1900 and 1905 the acre value of such farms of medium sort increased from $99.47 to $141.96, a gain of $42.49.

Insect pests annually consume and destroy in the United States values beyond estimate. The "vegetable bugs" alone lay upon the farmer an annual tax greater than that involved in the maintenance of the entire United States government. Against such pests, the Bureau of Entomology wages a relentless and unceasing war. It is estimated that this bureau saves the farmer in some single years from $300,000,000 to $400,000,000.

Even to outline all the work of this great department would far exceed the limits of this paper. The Forest Service, with which the readers of CONSERVATION are so familiar, is but one of its numerous bureaus. But mention must be made of the publicity feature. This department runs a great publishing house, sending to the farmers, in compact form, the specific information they need in their business. In 1907,



Reservoir Site at Houston, Southern California. Scattered Forest Growth

forty-two new bulletins were issued, the copies printed numbering 1,100,000, while 443 reprints of bulletins were made in editions aggregating 5,369,000. Bulletins to the number of 55,125,000 have been printed and distributed since 1889.

But the department is surpassing itself. It is meeting the requirement of the man from Missouri. In addition to sending bulletins, it is sending men, actually to show the people how to farm by staying for a season in their midst and doing the work before their very eyes.

And the cost of it all? The appropriation for 1907 was about $14,000,000—less than the cost of one of the battleships Congress seems about to authorize. A Congressional investigation had in the same year showed that the annual value of the department to the general public is nearly a quarter of a billion dollars—a return of $16.50 on every dollar appropriated.

Under two Presidents and through three administrations, Secretary Wilson has pushed this titanic work; and, in no uncertain tone, the people have declared that he must continue to do so. He must break the longest, as he has already broken the greatest term of departmental service. Though, on a historic occasion, he was willing to be "sacrificed for General Grant," the farmers are unwilling that he, and the cause of agriculture, shall, for any reason, be sacrificed together. Mark Hanna is quoted as saying, "We must keep him where he is, even if we have to run him on a separate ticket." The farmers will keep him there, regardless of tickets. They know a "good thing," and will take no chances on a change.

That the American Forestry Association must lose from its presidency a man of such ability and fame affords ground for sincerest regret. At the same time, there is cause for congratulation that it has so long enjoyed his wise counsel and direction; and that, under these, it has reached a point where it may not only maintain itself in independence of the National Government, but may even extend to the Government a measure of assistance in furtherance of the common cause.

Frederick Haynes Newell, Director U. S. Reclamation Service

THE SACRAMENTO VALLEY

By FREDERICK HAYNES NEWELL, Director U. S. Reclamation Service

THE problem of the Sacramento River for years has been one of absorbing interest to State and Federal engineers. The commercial and property interests are so vast, the potential possibilities of the immense areas embraced in California are so great, and the engineering features are so varied and stupendous, that the problem of river control and utilization naturally has received thoughtful consideration by experts and engineers.

Unfortunately, this consideration has been devoted principally to local conditions. The study of all the economic problems involved has been more or less desultory. Intelligent consideration by various experts has been given separately to questions of transportation, removal of mining debris, and reclamation by drainage and irrigation. Recently there has come an awakening to the need of a more comprehensive study of the whole drainage basin. It is realized now that the investigations of the past must be coordinated. The problem must be considered in its entirety and not piecemeal, if a satisfactory solution is ever to be reached.

A vast fund of information concerning the Sacramento and its basin has been gathered as the result of the numerous investigations in past years. These data should be assembled and studied by an efficient commission representing all interests, but restricted to none, in order that a comprehensive plan of deveolpment may be laid out and presented for the consideration of the state legislature and of Congress

Okanogan Project, Washington. Completed Portion of Concrete Lined Canal, Showing Lands on Pogue Flat to Be Irrigated under Canal

The need of such action is emphasized by the recent destructive floods which have wrought disaster and ruin to the valley. No permanent relief can be expected except through concerted action upon lines which will include every important feature of controlling the whole river.

The state for many years has carried on various special investigations, and a number of commissions have studied the problem from different standpoints, but the most impressive fact is that up to the present time there has been no one body or commission authorized to go at the entire matter in a large way.

The Federal Government is interested in the river primarily on the side of navigation. The Sacramento and San Joaquin, and their tributaries, form one of the great systems of inland waterways in the country. They should and can be made so that the products of the great valley can be moved at the minimum of cost.

The Federal Government is also interested in the stream through its control of the National Forests. They cover the mountain areas from whence comes the greater part of the stream flow. The National Forests have been set aside largely for their beneficial effect upon the rivers.

The Government is also interested through the operations of the Reclamation Act. Reservoirs have been surveyed to hold flood waters, and a beginning has been made on the construction of one of these near Orland. It is hoped and expected that under the operations of the Reclamation Act, all of the reservoirs useful in irrigation may ultimately be built.

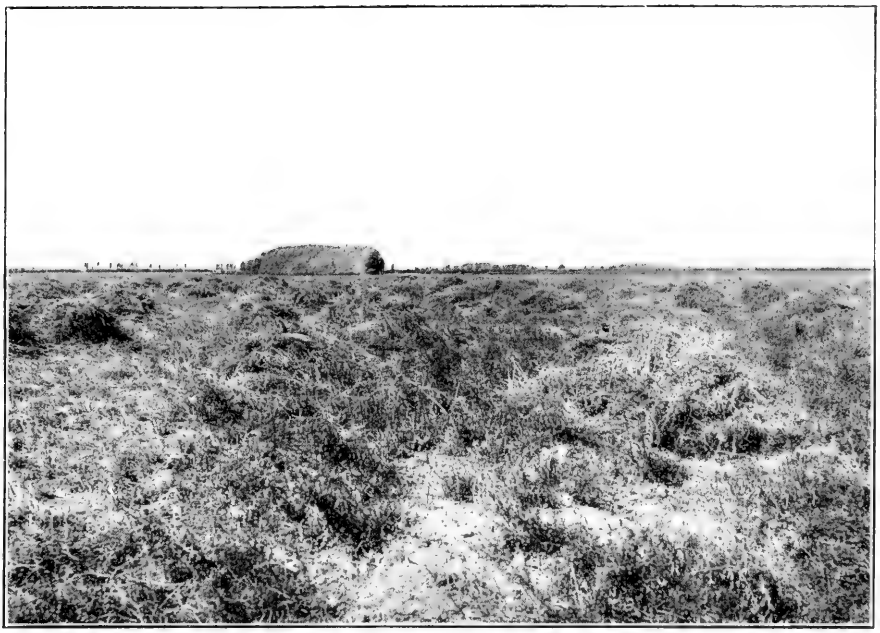
The Government is also interested in the control of the mining debris, and large expenditures have been made in investigating the problem.

It is also investigating, through the Geological Survey, the behavior of sand and similar materials washed down by the streams, and has obtained facts of value on this subject.

Grand Valley Project, Colorado. Raising Vegetables between Rows of Young Trees While Growing an Orchard near Grand Junction, Colorado

Grand Valley Project, Colorado, July 17, 1908. Fruit Lands in and about Palisades, Colorado, $300 to $1,000 per Acre. Orchards and Farms under Grand Valley Project

Prune Orchard on an Irrigated Ranch, Two One-half Miles West of Mentone. Uncomphagre Project, Colorado



Alfalfa Field, Uncomphagre Valley, Colorado

Yuma Project, Arizona. Harvesting the Third Crop of Hay in the Yuma Valley

The United States Geological Survey is also making maps of the mountain areas in which are located the reservoir sites, and also of the valley lands which may be irrigated, and of the swamp and overflowed lands. These maps are among the most comprehensive and carefully made in the world and bring together a vast amount of information needed for a comprehensive study of the situation.

This Survey is also, through its Water Resources Branch, making measurements of the flow of various tributaries in high and low water stages, and obtaining data of quantities of water occurring at various times of the year.

Some years ago an eminent foreign engineer after visiting the Sacramento Valley expressed unbounded astonishment that the various reclamation districts were each building levees and carrying on work totally regardless of the larger public needs. It was incomprehensible to him that Americans, with their reputation for business sagacity, should be expending large sums of money in these works without any control by State or Nation, such as would produce the best results to the greatest numbers. He was mystified at the apparent incongruities and conflicts of diverse interests. National, state, and private organizations all seemed to be oblivious of the operations of each other and working at cross purposes.

The best results and the greatest good to the greatest number can result only from full knowledge of the possibilities, and by following well-conceived and far-reaching plans. For over a quarter of a century the people of the Valley have been discussing the matter, yet there is still an apparent lack of unity on fundamental propositions. Starting originally with the idea that the Federal Government should pay for everything, there has been a gradual evolution to a point where many of the people are beginning to see that if the Federal Government furnishes the means, the beneficiaries should pay the cost of reclamation and of flood protection.

The theory underlying the Reclamation Act by which the Government makes the surveys and examinations, advances the money and collects the cost from the landowners in ten annual instalments, seems to provide the most businesslike way of carrying out any broad scheme of utilizing the arid or overflowed lands of the Valley. To attain the best results broad plans must be made, beginning with the control of the National Forests in the interest of the water conservation. Next to this should come the construction of reservoirs to hold water for irrigation and to exercise a beneficial effect in modifying floods. Next, the general scheme of levees should be consistent with the best maintenance of the waterways. The drainage plans should be laid out with reference to the general system, the debris problem worked out on the basis of the latest information, and finally, the navigation channels maintained with the aid of the general works.

THE MANGYANES: A PROBLEM OF FOREST PROTECTION

By MELVIN L. MERRITT, Forester, Philippine Bureau of Forestry

FOREST protection is as much a problem in the Philippines as elsewhere; and although forest fires, in the usual acceptance of the term, are practically unknown in parts of these islands, other problems, equally acute, present themselves for solution. The task of dealing with the uncivilized and timid people known as Mangyanes, in the Island of Mindoro, is such a problem.

This island is located about 120 miles south of Manila. It is the seventh island of the archipelago in size, and has an area of 3,850 square miles, or more than one-half that of New Jersey. Extending through its central part, from north to south, and covering about two-thirds of its entire area, is a broad and rugged mountain chain, reaching an altitude of nearly 9,000 feet at Mt. Halcon, in the north central part. Covering most of this high mountain region and in many places extending down nearly to the coast is, normally, a heavy forest growth, which, in places, has been destroyed. According to the 1905 census, Mindoro has a population of 28,360, or about seven per square mile, a density of population about the same size as that of South Dakota. Of this population, 7,264 are Mangyanes, a wild mountain tribe. The civilized people live on a relatively small area along the coast, leaving the main central wooded part of the island to the Mangyanes.

The Mangyanes are probably the original inhabitants, who withdrew to the interior as coast points were occupied by the more civilized tribes. They are a simple, primitive people, with fair physical development and a timid and retiring disposition. Naturally wanderers, they seldom have fixed places of abode, but move from place to place in search of game, food, and the few products which they use themselves or use in barter with the coast people. In trading they are greatly imposed upon. On one occasion when the writer bought from one of them a quantity of rice which usually sells for about 60 cents, several small coins of various denominations were offered in payment, but the Mangyan returned all but two coppers worth only 1 cent, saying that this was what people usually paid him. They are cheated even more when selling other products the real value of which is not known so well.

Apparently they live in groups of twenty to thirty persons. Although there is but a small part of the interior mountain region over which the Mangyanes do not roam, one group will not ordinarily range outside of a fairly small and well-defined area. Every year they make clearings in the forest, sometimes small, but often covering several acres, upon which they raise small quantities of rice, sweet potatoes or "camotes," and various other roots and vegetables. Each succeeding year, or at least every few years, they make new clearings. These "caiñgins," as they are called, made and abandoned at will, have worked incalculable damage to the forest. In many places no large trees remain, while in others, especially in the south and west sides of the island, grass-covered hills and mountain sides bear silent testimony to the work of destruction. Here, dry season fires burn over the grass lands, destroying seedlings and small trees. Without exaggeration, it would be safe to

Capt. George P. Ahern, Director of the Philippine Forestry Bureau

Mangyan Clearing by Baroc River, Mindoro, Foothills of Mountains. Shows Typical Clearing in These Places

Group of Mangyan Men. The Second and Third from the Left Were at the St. Louis Exposition

state that half of the timber has been destroyed in these parts of the island by this cause alone.

While there can be and is no objection to allowing these people all of the land which they need for agricultural purposes, the wanton destruction of timber such as has been going on in the past, and still continues, cannot be tolerated much longer if the valuable forests of Mindoro are to be saved. Not only does the destruction entail a large direct loss, but it affects as well the distribution of the water supply.

The problem is a difficult one. The object should be to prevent caiñgins rather than punish offenders, since the latter course would only tend to make the Mangyanes more timid and would not repair damage done. As an illustration of their timidity and simplicity of nature, the writers recalls an instance when he was camped and working daily in their territory for a month. The first day he saw a group of three, but after that saw no more until just a few days before his departure, although he noticed numerous houses, trails, fish-traps, and other signs of their recent presence. When at last a few were encountered accidentally, close questioning elicited the information that they had been told by some visiting Tagalog that they would be shot if seen by the "Americano." Upon being assured that such was not the case they asked if they would be permitted to live in their old homes, and seemed surprised and pleased upon being told that the Americans were not only willing but anxious for them to do so. The futility of attempting to arrest and punish such people in the usual way is self-evident, even though the law so provided, as, rightly, it does not.

It is believed that, could the Mangyanes be induced to live in permanent homes, a long step would be taken in solving this problem. The work of organizing Mangyan villages has now been commenced by a man detailed from the Bureau of Education, and ten small villages have already been formed. The Bureau of Forestry will cooperate with him in this work, and lay aside a tract of suitable land near each village, upon which the Mangyans will be permitted to make the clearings they may desire, leaving the allotment of individual places entirely with their local leaders. For instance, with a village of forty families, an allotment of 1,600 hectares would be made, which would allow sixteen hectares per family after providing for a growth to 100 families. By selecting areas not covered with the best forest growth, these settlements could be made without seriously affecting virgin stands. By carefully explaining the system to them, and by leaving the individual allotments and the punishment of offenders almost entirely with their own officers, who have great power and influence, it is believed that much can be done to prevent future damage.

A few impressive boundary notices in the Tagalog dialect, stating their rights and privileges, should be posted to lend dignity to the transaction and for the information of visiting Tagalogs.

THE CONQUEST OF THE COLORADO

By C. J. BLANCHARD, Statistician, U. S. Reclamation Service

THE work of closing the Colorado River, twelve miles above Yuma, Arizona, had a most spectacular finish. The Government engineers have been engaged here for months in building a dam the like of which this country has never seen before. On December 21 the channel of the river was closed, and the entire flow of the river passed through the giant sluiceways at either end of the dam. The supervising engineer wired to Washington: "The river is closed and we sat on the lid while a five-foot rise, carrying 40,000 feet of water, passed by."

The engineers encountered many difficult problems in planning the big irrigation systems which the Government is constructing in the arid West, but no more complicated conditions confronted them anywhere than in attempting to control the Colorado River in order that 130,000 acres of exceedingly fertile soil in California and Arizona might be made fruitful..

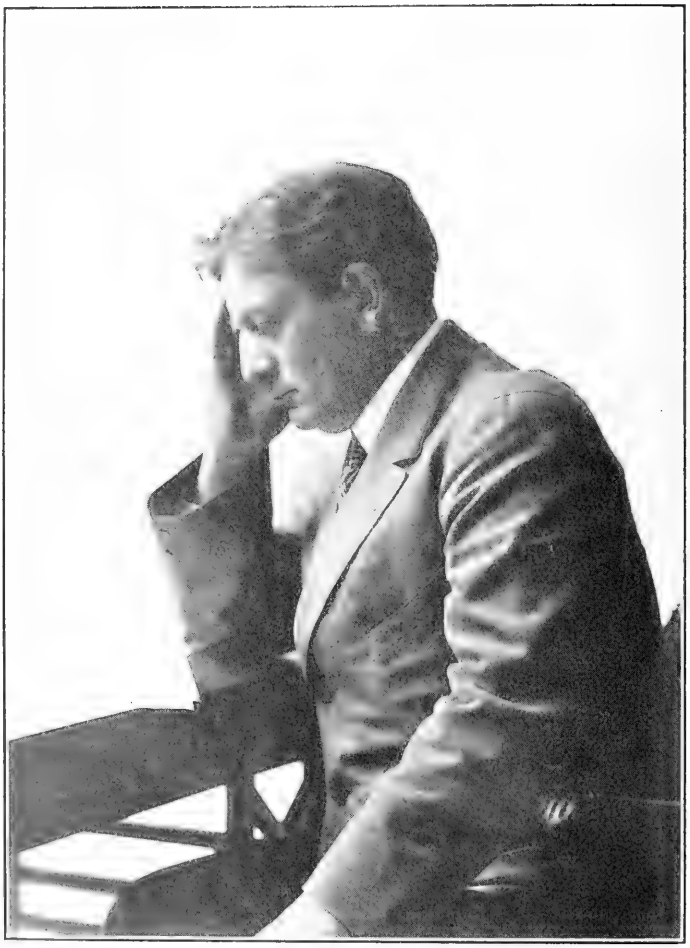
The size and uncertainty of the river, the shifting channel and unstable banks, the yearly recurring inundations, variations in volume from low water to flood heights and the immense volume of silt carried by its yellow waters, made the problem of the control of the stream unique in the history of American irrigation. With these difficulties fully understood and no bedrock for a base, the problem presented to the engineers was to build a structure on the sand and silt that would fully control the river, holding it within certain prescribed limits, and at the same time make some disposition of the silt, one of the most difficult features of the undertaking.

Constructing Engineer E. D. Vincent gives the following description of the structure:

"The most advantageous weir site was found to be at Laguna, twelve miles above Yuma, where granitic mountains encroach on the river valley, leaving an opening about a mile wide. The type of weir selected was one that has been in successful operation for many years in India and Egypt under practically identical conditions with those presented in Yuma Valley.

"Three concrete core walls 4,800 feet in length and fifty-seven and ninety-three feet apart extend from bluff to bluff. The crest wall with a maximum height of nineteen feet above the bed of the stream rests upon a row of six-inch sheet piling from twelve to twenty feet in length, incorporated in its base to cut off seepage. The space between the walls is filled with broken stone, and an apron of rock extends forty feet beyond the lower wall. The structure between the walls is capped with a concrete pavement eighteen inches thick. On the up-stream side of the weir a talus of broken rock, with an incline of two feet horizontal to one foot vertical, protects the concrete structure. The dam is 4,800 feet long between abutments, nineteen feet high in the river channel, and 226 feet in width up and down stream."

The dam will raise the water about ten feet, backing it up stream nearly ten miles and forming a settling basin covering approximately eight square miles. At the west end of the weir, constructed in solid granite rock and excavated to the depth of low water in the river, is a sluiceway 116 feet wide. At the east end the sluiceway, also in granite, is only forty feet wide.



C. J. Blanchard, Statistician, U. S. Reclamation Service

These sluiceways are closed by large gates operated by hydraulic machinery. These gates are of what is known as the Stoney type, the only other gates of the kind in the country being located in the Chicago drainage canal. They are of steel througout, and are eighteen feet high and thirty-five feet wide.

The diversion canals are taken from the sides of the sluiceways above the gates. The areas of the sluiceways being so great the movement of the water toward the canals will be slow, and most of the sediment will be deposited before reaching the canal intakes. When the silt has accumulated to a considerable depth the sluicegates will be opened, and the great volume of water which will rush through the sluiceway will carry out with it the sediment deposited above the intakes of the canals. As most of the silt is carried near the bottom of the river and the top is comparatively free from sediment, the water will be taken to the canals by a skimming process, over a long row of gates, so the canals can be filled by drawing but one foot in depth of water from the surface. In times of flood the Colorado River overflows its banks, inundating the country for miles around, and in order to protect the lower lands an elaborate system of levees has been built. These dikes have an aggregate length of seventy-five miles, and are considered the most perfect ever constructed. The dimensions of these embankments are those which experience on the Mississippi River during the past sixty years have proved to be the best. At base they are several times as wide as their height. The tops of the dikes are four feet above the highest known floods. The river side is protected at frequent intervals by brush defences to ward off the attacks of the river.

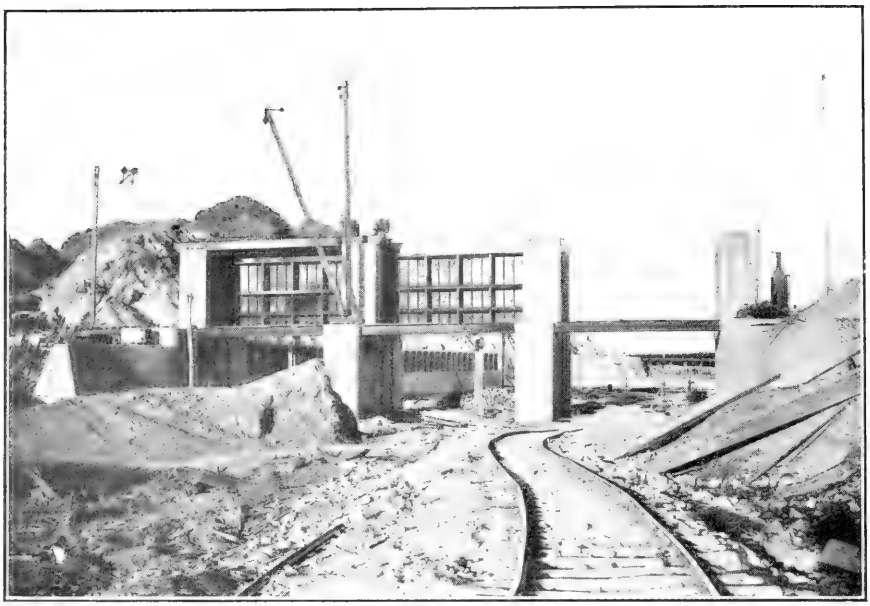
A portion of the waters of the main canal on the California side will be carried under the Colorado River by a siphon, and used for the irrigation of land near Yuma in Arizona. It is expected that considerable power will be developed here which will be used to pump water to the mesa lands. The farmers' pump and the big scoop wheel at Yuma are already furnishing water to several thousand acres of bottom land below Yuma.

For months the great weir which the Government is building across the river had been creeping out from either shore, the opening between the two ends gradually narrowing until only 600 feet remained. Two temporary railroad bridges, resting on piles driven deeply into the yielding sands and silt on the bottom of the river, were built above the dam, and from these rock was dumped by the car load until, on December 21st, the river channel was completely closed and the water was backed up until it flowed through the sluiceways previously prepared. The work of connecting the ends of the core walls was immediately commenced, and it is expected that the dam will be completed early in March.

Next October it is probable that 17,000 acres of land in the Indian reservation on the California side of the river will be thrown open to settlement. The date and manner of disposing of these lands will be announced by the Secretary of the Interior through the public press. The other lands, for which water will be available in 1909, are all in private ownership, but there are many tracts of excess holdings or farms whose owners do not reside in the vicinity that may be purchased.

In soil, climate, and agricultural possibilities the lands of the Yuma Project are singularly like those in the valley of the Nile. Date palms and Egyptian cotton have both proven well adapted to this section, and all the grains and fruits of the temperate and semi-tropical zones produce abundantly.

Alfalfa yields from seven to twelve tons per acre and sells at $6 to $10 loose in the stack. The baled hay brings about $15. Yuma oranges, grape fruit, cantaloupes and vegetables are the first on the market, and their quality is unsurpassed. On the experiment farm the Department of Agriculture has set out more than 200 varieties of the date palm which were imported for the purpose, and which will be



Yuma Project, Arizona. Sluicegates on California Side, 35 by 18 Feet Each. Sluiceways 200 Feet Wide on Bottom, Largest in World

Yuma Project, "View Showing a Barley Crop in the Yuma Valley, Six Miles Southwest of Yuma," Arizona

Yuma Project, Arizona. View Showing the Variety of Shrubbery Along the Driveway Surrounding the Orange Grove on the Mesa, One One-half Miles South of Yuma

transplanted to the rich bottom lands as soon as water is available. The experiments in cotton culture which the Department has been conducting on this little Government farm are most interesting. It has been found that Egyptian cotton of an excellent quality grows well in this section when once acclimated, a test plat in 1907 yielding about 1,000 pounds of cotton lint per acre. The average price during the year was 21.9 cents. We import about 62,000,000 pounds of this cotton annually, and it is estimated that 100,000 acres of such lands as are included in the Yuma Project easily would supply the looms of our country. On the small farm units each farmer could raise from three to five acres of cotton, his own family harvesting the crop. This would simplify the labor problem, give good returns, and allow a considerable acreage for other crops. The Agricultural Department has a limited supply of thoroughly acclimated seed which may be used by such farmers as are interested in this enterprise. Of interest in this connection is the fact that cotton was grown quite exensively in this region by the Pima and Maricopa Indians before the discovery of America.

The water supply is abundant and the lands, except in very limited areas, are practically free from alkali. The climate during the winter months is delightful. The summers are hot, the temperature sometimes reaching 120 in the shade. The sensible temperature, however, is not much greater than in Washington, where the percentage of humidity is so much greater. Sunstroke is unknown. The nights are not uncomfortable, and a large part of the population sleeps out of doors the year around.

EARLY CUTTINGS IN THE LODGEPOLE PINE TYPE OF ROCKY MOUNTAINS

By E. R. HODSON

LONG before the organization of the present National Forests there were heavy cuttings in many parts of the West. Where mining centers were developed these cuttings were particularly severe as the illustrations with this article show. Around the Butte mining center in the lodgepole pine region the cuttings were clear and on a large scale. The age of the cutting varies from about seven to twenty-five years. Near Butte itself there was some cutting done even prior to that time, but the majority of the larger areas were cut from ten to fifteen years ago.

The cutting was started at the stream and proceeded up the slope, clearing everything as it went to the top or so far as it was practicable to haul the timber. The brush was almost invariably piled in long, unbroken windrows fifty to seventy feet apart, the width of the windrows being about twenty feet. There was then by this method twenty to thirty per cent of the area covered by brush; and, as the photographs show, no reproduction has come up through it.

In all of the views shown the cuttings have never been burned and the reproduction on them is quite typical of unburned lodgepole pine clear cut areas. It will be noted that it is quite thin for lodgepole and it is also seen that the young growth is much more thrifty in the more favorable places toward the bottom of the slope and near the small side gullies. The thinness of the reproduction and the situations on which it thrives show pretty clearly that an unburned cutting is not an especially favorable one for reproduction. In the younger cuttings there is very little reproduction unless burned over soon after cutting. On some of the cuttings it does not seem to make much difference whether seed trees are near at hand or not. Even on narrow strips there are often no seedlings. The soil is of a limy nature and grass is quite abundant, tending to form a sod as soon as the stand was opened up, which perhaps explains the lack of reproduction.

Fig. 1 shows a clear cutting of lodgepole pine on a north slope. The stand was cut fifteen years ago and the reproduction which has come in here is about the best to be found on unburned cuttings. The brush is in windrows and very few seedlings have come up through it. Although the general appearance is good, especially at the lower part of the slope, the density is nowhere sufficient to insure a good quality future stand of lodgepole pine.

Fig. 2. A seven-year-old cutting in the lodgepole pine type. There is practically no reproduction except the few suppressed seedlings present before cutting. The conditions here are not favorable as it is near the lower limit of lodgepole.

Fig. 3. Clear cuttings with some unfinished strips in the center and to the right side. This cutting was made seven years ago and is on limy soil on a northeast slope near the lower limit of timber. Very little reproduction has come in.

Fig. 4. A windrow of brush on a fifteen-year-clear cutting of lodgepole pine. The brush is very little decayed and scarcely a single seedling has been able to come up through it. Clearly in these cases the brush has been no help to the reproduction while it is always to some extent a menace. When it is

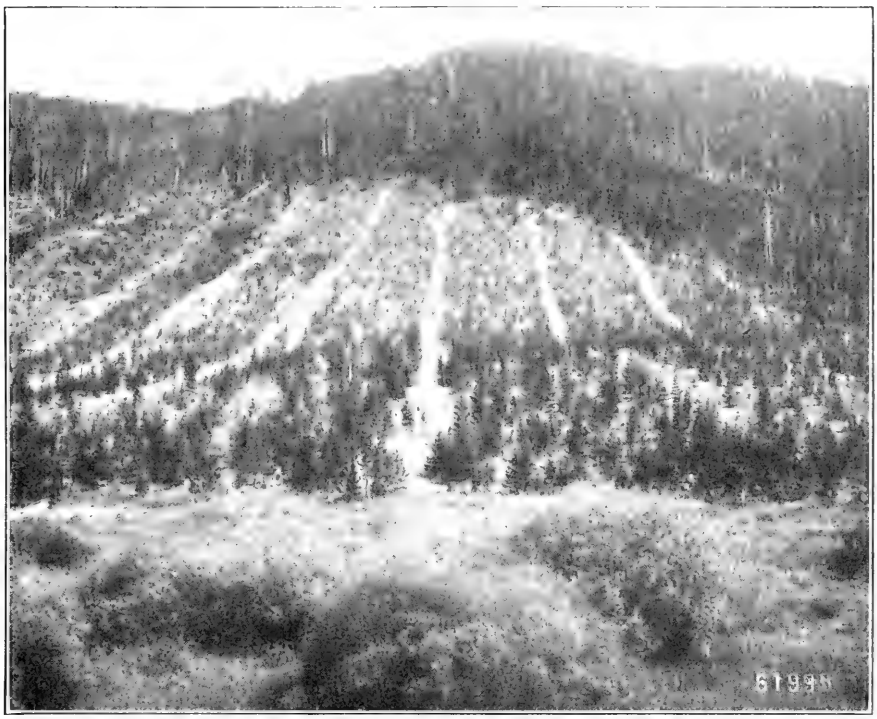


Figure 1 Clear Cutting of Lodgepole Pine Fifteen Years of Age, Montana

Figure 2. Clear Cutting of Lodgepole Pine Seven Years of Age, Montana

Figure 3. Clear and Strip Cuttings of Lodgepole Pine Seven Years of Age, Montana

Figure 4. Windrow of Brush on a Fifteen-year-old Clear Cutting of Lodgepole Pine

remembered that these windrows of brush cover twenty to thirty per cent. of the area, and that reproduction is excluded from the brush-covered area, it is apparent that the removal of brush is important.

The size of the cuttings ranges from a few hundred to many thousands of acres. The shape of most of them is very irregular, but invariably the lower slopes are cut and the best timber removed. Probably about 200,000 acres tributary to Butte were clear cut in this manner prior to the organization of the National Forests. At that time no adequate restrictions were placed upon the cutting and the results are shown in the amount and condition of the reproduction to-day. As lodgepole pine is one of the best species to reproduce itself under adverse conditions, much can be expected of it when managed properly. But even this prolific and well-equipped species has failed to do well when unrestricted clear cutting was practised. The old cuttings in the Butte mining region show this all too clearly.

Besides the wholesale slaughtering of the forest around the mining centers, there were other less severe cuttings wherever railroads pierced the country or mines were developed. Along all the railroads are many tie cuttings upon which reproduction is usually present but not in sufficient quantity to produce high-grade material. In the small mine cuttings this also applies. In most cases these classes of cuttings are selection, which system is not suitable for the lodgepole pine type.

Where fire has repeatedly run over the country the conditions are still worse. While a light fire at the right time may be beneficial to lodgepole pine reproduction, repeated fires are a decided injury.

It is pretty hard to predict the future of these old cuttings, but it is safe to say that one-half of their area will be without reproduction for a long time and that the greater part of the other half will have an inferior stand because of insufficient density of the young growth.

Before the inauguration of a vigorous forest policy by the Government through the Forest Service, this was the kind of cutting which prevailed in the West. Stands of timber were stripped off without a measure or even a thought for the future. In spite of the short time the Government forests have been under intelligent management the results are now beginning to be realized and are apparent to every one. With proper silvicultural treatment and protection, such as is given the National Forests, all this loss could have been prevented. Instead of the present barren areas and areas with sparse reproduction, there might be thrifty, well-stocked stands growing into a high-class future forest.

TWENTY-EIGHTH ANNUAL MEETING OF THE AMERICAN FORESTRY ASSOCIATION

(Concluded from February Number)

As promised in the February issue of CONSERVATION, matter connected with the annual meeting, but omitted, through lack of space, from that issue, was carried forward for future use. In this issue some of it appears.

FOREST TAXATION

The burning question of forest taxation came in for discussion. In the first session, Mr. Elliott, of Pennsylvania, said:

Secretary Wilson has always advocated tree planting, and it seems to me that is the only remedy there is for us * * * Let us go on and try in some way to get people to plant trees. And remember this one thing, that under the present laws of almost all the states of the Union, no man, no corporation can engage in tree planting, because if they do his property will be confiscated under the tax laws. These governors should have gone back from their meeting here and said to their people who sent them here, and particularly to the legislatures, "Gentlemen, you cannot encourage tree planting as long as you tax these properties as you do; let us put a tax upon the land as land only, vacant land with nothing on it. Then let the trees grow, and when they do grow to maturity and are suitable for manufacture, or are suitable for merchantable purposes, then let us put a tax on them ad valorem or according to the value of the timber, and make the consumer at that time bear the burden of the tax."

When the resolution proposing the removal of taxes from standing timber and the substitution, therefor, of an income tax on the timber when cut was read, the following discussion occurred in part:

Chairman Harvey:

That is one of the most important resolutions that has ever been presented before this Association. It is a subject that has been considered by many States which have endeavored to enact legislation that will relieve the situation. It is believed that the wisdom that is embraced in this Association, through some of those who are more familiar with this subject than many of us, is embodied in the preparation of this resolution.

Mr. J. A. Freeman:

I know of two concerns which own timber in the states of Minnesota and Wisconsin, and a similar amount of timber in Canada. The taxes of both those concerns last year in the state of Wisconsin aggregated about one hundred thousand dollars. The taxes on a similar amount of timber right over in Canada aggregated less than three hundred dollars.

Dr. J. T. Rothrock, of Pennsylvania:

We expect to pass that very bill in Pennsylvania this winter. Twenty years ago it was adopted as a resolution, and for twenty years we have voted it until at last we have it on a practical basis. It came within four votes of passing at the last session.

I want to say this, that we have gotten bravely over the idea that the lumbermen are our enemies. We never made a successful canvass in Pennsylvania until the lumbermen and the foresters became friends (applause), and since that time we have had our own way. Furthermore, forestry begins with the ax. What is the sense of allowing growing timber to fall and rot in the woods when it could be utilized? We want to get the most out of every acre, and when the timber man is aiding us in doing it, he is our friend.

I want to give you an illustration in point, and I will give you names and places. About twenty-five years ago, Dr. Stewart, of Fayette County, owned a fine tract of hemlock timber. He was assessed pretty high. In two or three years the assessor came around again and doubled the rate. The doctor thought it was a little high and said so. The next time the assessor came back he doubled it again. The doctor said: "Gentlemen, I will not allow this to go any further." They came around again and doubled it again. He said: "Gentlemen, I will cut the timber off and you may have the land," and Fayette County to-day has neither timber nor taxes on that land. That is the way it worked and it is to prevent the continuance of that condition that this resolution has been offered.

Mr. Elliott, of Pennsylvania:

The law which we are proposing to get enacted provides that when any party owning land proposes to put it into what we term an auxiliary forest reserve, he shall notify the Commissioner of Forestry of the state, who will send an expert there, a man learned in the practice and principles of forestry, to examine that tract, and if it is found suitable, with a proper amount of timber upon it, of any growth, he shall so recommend that condition, and he will report to the Commissioner of Forestry. If the Commissioner of Forestry finds it is in accordance with the rules for reforesting lands, he shall notify the commissioners of the county of that fact, and if the owner of that piece of ground shall enter into a written agreement with the commissioners of the county to cultivate that timber in accordance with the rules and regulations of the Commissioner of Forestry, the commissioners of the county shall notify the assessors that they shall assess that land at only one dollar per acre until that timber shall grow to be large enough for merchantable timber or sawed lumber. In the bill there was a time limit fixed during which he should not act. That was fixed for this reason: If you undertook to control the man's cutting of timber, you ran against a very serious proposition. He owns the timber and he has the right to do it, and I do not believe, notwithstanding the decision of the courts of Maine, that you can take away from any man the right to cut his timber if he sees fit.

We got at the very principle that the Maine decision wanted to get at, but we compensate the man by reducing his taxation. We do not take away from him any right of property without due process of law and compensation. Our State constitution provides against that, and I apprehend they all do. The National Government never takes a man's property without compensating him for it. The right of eminent domain does not conceive that. If he cuts his timber off before that twenty years has expired, or whatever time may be fixed as a limit, then the tax which would have accrued upon that property becomes due and payable. That is the penalty upon him for not holding his timber until it shall be fit to cut. That is giving to the man the right to own and control his property at a sacrifice if he wants to. On the other hand, it encourages a man to plant and care for his timber.

Mr. R. A. Long, of Kansas City, Missouri:

I was asked to prepare a paper on conservation of our forests, to be read before the conference last May. In the preparation of that paper I gave quite a little thought to the problem that is before us now. I am wonderfully impressed with the fairness of this resolution. I want to give you an illustration that I was at that time using, showing wherein the timber owner was not treated fairly as compared with other tax payers, and more particularly the farmer.

I found in my examination of the subject at that time that the farmer is taxed on his crop only once. It takes about one hundred years to produce a crop of timber. It is taxed every year until the timber is cut, which means 100 years of taxes. In order to arrive at an average of what the farmer would produce out of an acre of land, located in the district where we operate, namely in Louisiana, I took fifty years as an average basis. I found that the land was worth about $50 an acre, that land which produces cane and cotton. The land produced to the farmer about $7.50 per acre per annum exclusive of taxes. In other words, it was net to him, and figuring the average of the time, fifty years, would make fifty times $7.50 which would be $375 the farmer would get exclusive of taxes, out of his acre of land. After that the value of the land to start with, $50, should be added, making his one acre of land $425; while the lumberman, after paying a tax on his lumber the number of years he would hold it, would get about $120 per acre. That demonstrates, it seems to me, the fairness or the unfairness of the manner of taxation as applied against the lumberman. * * * I understand that taxes are levied against timber properties possibly to support half a dozen school children in a district where schools are scarcely needed. Taxes are levied against these properties for building roads where roads are not needed. These taxes become so hard to carry and so burdensome to the lumberman that, instead of having an inducement to hold on and preserve his timber, there is every reason why he should cut it off in order to avoid this excessive carrying charge.

PROFIT IN FORESTS

Can private owners afford to hold and improve forests? Light was thrown on this question by the following statement and colloquy:

Dr. J. T. Rothrock:

A few years ago we purchased from the lumbermen of Pennsylvania 14,000 acres of land, at a price, I think, of $2 an acre. These same gentlemen came to our office a short time ago and made a formal offer to us of five times as much money as they had received from the state, merely for permission to go on that land again and re-timber it—cut the timber off. It was stripped land when we got it. The price of lumber has gone up to such an extent that they were willing to give us five times as much as they had received for the land, and give us the land back, they only taking the timber.

I am free to say here that if the state of Pennsylvania, by legislative enactment, were to offer all the land it has in a block, a syndicate would be formed inside of a month that would take the whole of the state's holdings off its hands at twice what it paid for them.

Mr. William Canfield Lee:

Dr. Rothrock, if, as you say, these lands have advanced so in value that they could all be sold readily at a much advanced price, what becomes of the argument that private owners cannot afford to maintain and improve the forests?

Dr. Rothrock:

I do not think there is very much in that, except that they have to wait so long before there is any profit. My own belief is that any man who owns forest land can afford to take care of it, and he will get a good return in his lifetime. That is my belief, but you cannot get the majority of men to believe that.

View Showing the Remaining Portion of the Arizona Dam, Which Was Washed Away by Flood

A FREE HAND

The value of a free hand in accomplishing practical results was strikingly brought out by Dr. Rothrock in the following statement:

The great success of Pennsylvania forestry work is due to the fact that we are not a subordinate branch of the Government and that we have a department of forestry. It is coordinate in its importance with the Department of Internal Affairs, with the Department of Public Instruction, or with any other department of the state government, and the head of that department is a member of the governor's cabinet. *We have no one to consult, no one to hold us back,* but we are a department devoted solely and entirely to the forestry interests of the state and nothing else. It is a great step. It is the one potent lever that has enabled us to make the progress we have made.

FLOOD VERSUS DROUGHT

A notable example of the contrast between the superfluity of water at one time and its paucity at another was given by Dr. Rothrock in the case of Johnstown, Pennsylvania. Referring, first, to the flood of some twenty years ago, which practically swept the town out of existence, he said:

Last spring I passed by Johnstown. It is a great mining region. The hills around there are denuded of timber * * * There is nothing to hold the rain, and every hillside was weeping water. The whole surface was saturated with it, and the Conemaugh was a raging flood. Six weeks ago Johnstown, cursed by a previous flood and blessed last spring by a copious supply from the clouds, was in a vastly different condition. The people were glad to get their drinking water from the puddles around the town.

View of Missouri Pacific Railroad Bridge at Kansas City after the Flood

WOMEN AS WORKERS

The effectiveness of women in promoting the work of forestry and conservation was recognized at the annual meeting in several ways. Of these, one was the provision for the address by the President General of the Daughters of the American Revolution, Mrs. Donald McLean, and the cordial reception given it when delivered; another was the resolution welcoming the assistance and commending and endorsing the organization and work of the Women's National Rivers and Harbors Congress; and a third, the tribute paid by Dr. Rothrock to the women of Pennsylvania in securing the enactment, by the legislature of that state, of the law establishing the Pennsylvania Department of Forestry. He said:

I want to say right here that the State of Pennsylvania never would have had that department if it had not been for the organized efforts of the women of Pennsylvania. They made it possible. Somehow or other, it is not necessary to state how—it was perfectly clean and straight, however—but somehow or other, on the morning the bill for this matter was under consideration every desk in the house of representatives and in the state senate was flooded with petitions from the women and their husbands. I do not know how they got there exactly so nicely on time, but the president of the senate told me the bill never would have become a law if it had not been for the fact that the women of the state had made it impossible to kill it.

REPORT OF COMMITTEE ON NOMINATIONS

On the morning of the second day of the annual meeting the report of the Committee on Nominations was presented by Mr. Edwin A. Start, Chairman, as follows:

To the American Forestry Association:

The nominating committee presents the following nominations for officers of the Association for the ensuing year:

President—Curtis Guild, Jr., of Massachusetts.

Vice-presidents—N. J. Bachelder, Andrew Carnegie, Charles W. Eliot, B. E. Fernow, W. W. Finley, David R. Francis, Edward Everett Hale, Rutherford P. Hayes, James J. Hill, S. Weir Mitchell, George T. Oliver, George C. Pardee, George Foster Peabody, J. E. Ransdell, J. T. Rothrock, Albert Shaw, Charles P. Taft, Charles R. Van Hise, Andrew D. White.

Treasurer—Otto Luebkert, of Washington, D. C.

Directors—Philip W. Ayres of New Hampshire, Joshua L. Bailey of Pennsylvania, James H. Cutler of Massachusetts, Henry S. Graves of Connecticut, Curtis Guild, Jr., of Massachusetts, William S. Harvey of Pennsylvania, George H. Maxwell of Illinois, Charles F. Nesbit of District of Columbia, Henry A. Pressey of District of Columbia, Henry Riesenberg of Indiana, Cuno H. Rudolph of District of Columbia, George K. Smith of Missouri, Edwin A. Start of Massachusetts, James S. Whipple of New York, George P. Whittlesey of District of Columbia.

It will be noticed that for the first time in many years no official of the National Government is included in the list. This is not accidental. The Government officials who have been connected with the board in the past have been relieved from service at their own earnest request. It is agreed by those who have been closest to the work of the Association, in the Government departments as well as out of it, that the Association should be completely independent of these departments, so that it may be a helpful ally of the Government forestry and conservation work, and that neither may be hampered by the needs and obligations of the other.

In the early days of the Forest Service and the Association, when both were young and weak, their close connection was useful and inevitable. It has been good for both, and the debt of this Association to Secretary Wilson and Mr. Pinchot and their associates, who have borne so many of the official burdens, is great. Now, however, the Service is a great administrative division of the Government, and it cannot afford to carry, through its officers, any responsibilities of an outside organization. The Association, on the other hand, has also grown to be a power, and its mission has grown in even greater proportion, and it cannot be bound by limitations of official relations of the Government. The two must therefore be dissociated officially, while in spirit and purpose they continue to go hand in hand. We have depended much upon our officers in the Government service, who were permanently in Washington, and it has not been easy to fill their places. We have endeav-

ored, however, to present a well-balanced list of officers, who may be expected to give devoted and efficient service.

Respectfully submitted,

EDWIN A. START,
Chairman, for the Committee.

Supplementing the report of the Nominating Committee, Mr. Start said:

I wish to add to the report a personal word in regard to the candidate for president. For ten years this office has been distinguished by the great Secretary of Agriculture, whose farewell message we listened to yesterday morning. To name his successor was no light responsibility. We must have a man known to the people of the country and respected by them, a man of tried ability in high places; and one deeply, personally, and intelligently interested in forestry and conservation work.

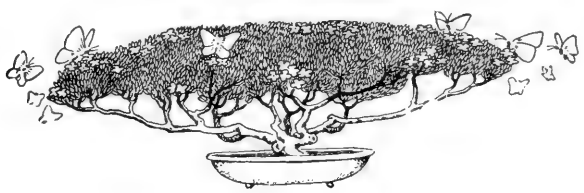
Of ex-Governor Guild's ability, integrity, and patriotism I do not need to speak, although I may say that, as Governor of Massachusetts, he has made a record worthy to be placed with those of a long line of great predecessors. What I do wish to say is that we have not named him for president of the American Forestry Association because he has been a successful politician, a good soldier, a brilliant campaigner, and a statesmanlike governor. We have chosen him because he is committed, heart and soul, to the cause of forestry and conservation, and because he is a doer of deeds and not a merely negative supporter. I have known more than any one else, perhaps, of the growth and strength of his interest in this cause. When he became governor three years ago he knew very little about it, but he has that quick grasp of such questions that enables a man to measure their importance; and he took it up not only willingly as a part of his duty as governor, but eagerly as a far-seeing American who caught the significance of the forestry gospel. During his term forestry as a state policy has made wonderful advance in Massachusetts, and our State Forester, Mr. Rane, will bear me out in saying that the sympathetic support of Governor Guild has been one of the chief factors in this progress. Our state forestry association has found in him a most cordial friend. What he has done for the Appalachian National Forests cause is known in part to the public, but its full importance is only known to one or two of us who have been in closest touch with him and through whom he has worked. Three years ago he enlisted in this cause, and he has never faltered in its support. This year, for the first time, the hearing by the House committee was given at a time when his duties as governor would permit his personal attendance, and you all know how well he bore himself as our leader. But in other years the splendid representation that Massachusetts has sent to speak for her has been due in a large measure to the personal efforts of her governor.

In this connection, let me recall the fact that at the hearing last month the Governor of South Carolina was beside the Governor of Massachusetts. When sounding some of the Association's prominent members as to the way in which the name of Governor Guild would be received, this letter came to me from another representative South Carolinian, Hon. Asbury F. Lever:

"I am in receipt of your letter of recent date, and in reply thereto permit me to say that I regard Governor Guild as preeminently the man for the presidency of the Forestry Association. I, for one, shall be very glad to support him. I see no reason why there should be any opposition to him from any source, for I am sure that he has been a most helpful influence in arousing and directing sentiment in favor of forest reserves in the Appalachian and White Mountains."

This testimony from South Carolina is peculiarly grateful to us of Massachusetts, and shows how much our forestry cause is doing to aid in binding the Nation together and make all sections one.

Now Mr. Guild is for a while a private citizen, free to give his virile energy and wide patriotism to this good cause which he has come to understand and to believe in, and we therefore feel confident that we made no mistake in presenting him for the presidency of this Association.



PUBLISHERS' NOTICE

THE subscription price of CONSERVATION is two dollars yearly, and this subscription includes membership in the American Forestry Association, at the option of the subscriber. Those who have paid $2.25 for their subscriptions, in accordance with an announcement temporarily made, will receive from the office a return of the balance paid over the subscription now in force.

The American Forestry Association desires to associate with itself as many persons as possible, who will remain with it as members, supporting its work by word and influence as well as by annual contributions. The magazine, CONSERVATION, is the chief instrument of the Association's work, and we intend to make it the leading magazine of the country in the great conservation movement. While, therefore, we wish to have as many subscribers as we can to CONSERVATION, we wish still more for that closer and more permanent alliance implied in membership in the Association, which carries subscription to CONSERVATION with it.

WANTED

Back numbers of Forestry and Irrigation and Conservation

The office of CONSERVATION desires for some of its subscribers a few copies of its issues for January, 1905, and November, 1908, and will pay for those needed 20 cents each. Any one willing to dispose of these will please advise us by postal card.

Preparing an Orange Orchard for Irrigation by the Furrow Method

THE NORTH AMERICAN CONSERVATION CONFERENCE

By TREADWELL CLEVELAND, Jr.

[*This account of the open proceedings and the conclusions of the Conference is introductory to an article by Mr. Cleveland on "The Conservation of World Resources," discussing the coming Hague Conference, which will appear in* CONSERVATION *for April.*]

THE INVITATION

A REALIZATION that in North America the problems of conservation, like the resources with which they deal, are not confined to any one of the three political subdivisions of the continent, and a conviction that these problems could be solved most effectively and economically by Canada, Mexico and the United States in cooperation, led the President, in December last, to invite Lord Grey and President Diaz to participate with the United States in a conference at Washington on the conservation of the resources of North America.

The invitations were delivered in person by Mr. Gifford Pinchot, the representative of the President, and were cordially accepted.

The President's letter to Lord Grey follows:

THE WHITE HOUSE

December 24, 1908.

My Dear Lord Grey:

In May of the present year the governors of the several states and territories of this Union met in the White House to confer with the President and with each other concerning the amount and condition of the natural resources of this country, and to consider the most effective means for conserving them. This conference included also the members of the Supreme Court, the Cabinet, and members of both houses of Congress, together with representatives of the great associations of citizens concerned with natural resources. The conference was followed by the appointment of conservation commissions on the part of the Nation and of a majority of the states.

A second conference of the National Commission with the governors, the state commissions, and the conservation committees of the great associations has recently been held in this city. It was called to consider an inventory of our natural resources prepared by the National Conservation Commission. Its most important result will doubtless appear in cooperation on the part of the Nation, the states, and the great associations of citizens for action upon this great question, upon which the progress of the people of the United States obviously depends.

It is evident that natural resources are not limited by the boundary lines which separate nations, and that the need for conserving them upon this continent is as wide as the area upon which they exist. In view, therefore, of these considerations, and of the close bonds of friendship and mutual aims which exist between Canada and the United States, I take especial pleasure in inviting you to designate representatives of the government of Canada to meet and consult with representatives of the State and other departments of this Government, and the National Conservation Commission, in the city of Washington on February 18, 1909. The purpose of the conference I have the honor to propose is to consider mutual interests involved in the conservation of natural resources, and in this great field deliberate upon the practicability of preparing a general plan adapted to promote the welfare of the nations concerned.

I have this day addressed a similar invitation to the Republic of Mexico, expressing my hope that representatives of that government also will be present and participate in the proposed conference on the conservation of the natural resources of North America.

The conclusions of such a conference, while wholly advisory in character, could hardly fail to yield important beneficial results, both in a better knowledge of the natural resources of each nation on the

part of othe others, and in suggestions for concurrent action for the protection of mutual interests related to conservation.

As my representative to convey to you this letter and invitation, and at your desire to consult with you concerning the proposed conference, I have selected an officer of this Government, chief of the United States Forest Service and chairman of the National Conservation Commission, whom I commend to your kind offices.

Sincerely yours,
(Signed) THEODORE ROOSEVELT.

February 18, 19 and 20 were the dates set for the North American Conference. The Commissioners were these:

United States

Gifford Pinchot, U. S. Forester, Chairman of the National Conservation Commission.

Hon. Robert L. Bacon, Secretary of State.

Hon. James R. Garfield, Secretary of the Interior.

Canada

Hon. Sydney Fisher, Minister of Agriculture.

Hon. Clifford Sifton, ex-Minister of the Interior.

Hon. Henri S. Béland, M. P.

New Foundland

Hon. E. H. Outerbridge.

Mexico

Hon. Rómulo Escobar, former Secretary of Agriculture, and former Commissioner of Forestry.

Hon. Miguel A. de Quevedo, Commissioner of Forestry and Engineer of the Sanitary Commission.

Hon. Carlos Sellerier, Secretary of Agriculture and Inspector of Mines for the Federal Government.

Representatives of the press were present only at the presentation of the visiting Commissioners in the East Room of the White House, and at the general session in the State Department immediately following. The subsequent sessions of the conference were closed.

Those who were invited to be present in the East Room of the White House when the Canadian and Mexican Commissioners were presented to the President, in addition to Cabinet officers, justices of the Supreme Court, the British ambassdor and the Mexican charge d'affaires, were as follows:

National Conservation Commission—Gifford Pinchot, chairman; Thomas R. Shipp, secretary; Theodore E. Burton, Francis G. Newlands, Jonathan P. Dolliver, William Warner, John H. Bankhead, Dr. W J McGee, Frederick H. Newell, Herbert Knox Smith, Joseph E. Ransdell, Dr. George F. Swain, Brig. Gen. William L. Marshall, Reed Smoot, Albert J. Beveridge, Champ Clark, Charles F. Scott, J. B. White, Prof. Henry S. Graves, William Irvine, Newton C. Blanchard, Charles Lathrop Pack, Prof. Irving Fisher, Gustav H. Schwab, Overton W. Price, Knute Nelson, Francis E. Warren, Swager Sherley, Herbert Parsons, Napoleon B. Broward, James J. Hill, George C. Pardee, Murdoe Mackenzie, Dr. T. C. Chamberlin, Frank C. Goudy, Charles Macdonald, George W. Woodruff, John Dalzell, Joseph M. Dixon, Frank P. Flint, Lee S. Overman, James L. Slayden, Philo Hall, Andrew Carnegie, Dr. Charles R. Van Hise, John Mitchell, John Hays Hammond, Dr. I. C. White, Dr. J. A. Holmes, Dr. O. P. Austin, Fred Dennett, Dr. B. T. Galloway, Dr. L. O. Howard, Dr. A. D. Melvin, Dr. C. Hart Merriam, Prof. Willis L. Moore, Dr. S. N. D. North, Victor H. Olmsted, Dr. George Otis Smith, Dr. A. C. True, Dr. Milton Whitney, Dr. H. W. Wiley, Morris Bien, M. R. Campbell, Charles G. Clark, Francis W. Clements, Frederick V. Coville, William T. Cox, Arthur P. Davis, Dr. D. T. Day, Dr. R. B. Dole, Dr. John A. Fairlie, R. C. Finney, Robert Follensby, Prof. S. Fortier, Prof. Henry C. Frankenfeld, Henry Gannett, L. C. Graton, William L. Hall, G. G. Hanger, Dr. C. W. Hayes, H. W. Henshaw, A. D. Hopkins, W. B. Hunter, R. S. Kellogg, M. O. Leighton, Waldemar Lindgren, C. L. Marlatt, Felden O. Martin, W. C. Mendenhall, E. W. Parker, A. F. Potter, Le Grand Powers, B. J. Ramage, Alexander C. Shaw, Hugh M. Smith, William M. Steuart, R. G. Valentine, F. B. Van Horn, Thomas L. Watson, Jasper E. Welchel, Philip P. Wells, Dr. Bailey Willis, H. M. Wilson, Albert F. Woods, N. A. Ziegler, Dr. W. L. Hornaday, Elbert F. Baldwin, Charles D. Walcott, Dr. H. A. Smith, William B. Pugh, C. E. Wright, Stephen W. Williams, H. H. Schwartz, Clarence Blanchard, C. A. Davis, A. L. Quaintance, W. J. Spillman, A. H. Brooks, C. W. Warburton, H. N. Parker, W. T. Swingle, E. C. Chilcott, H. B. Sackett, H. F. Weiss, A. C. Veatch, Dr. T. S. Palmer, J. G. Peters, John C. Hoyt, L. F. Hawley, Dr. George M. Kober, S. T. Dana, G. B. Sudworth, McGarvey Cline, C. S. Schofield, Dr. H. S. Bristol, Calvin W. Rice, Willis E. Hall, Wesley Bradfield, Dr. C. F. Langworthy, Dr. Charles J. Lavery.

THE PRESIDENT'S ADDRESS

Promptly at ten o'clock the guests were ranged in a semi-circle, and the President entered. In his address of welcome he said:

I wish to extend on behalf of the American people the heartiest welcome to the representatives of Canada and Mexico who are here present. I am sure I give expression to the feelings of my countrymen when I say that nothing has augured better for the development of this entire continent, on the lines along which it should develop, than this meeting. I appreciate the courtesy which has been shown by the governments of Great Britain and Canada, and of Mexico, in sending you gentlemen here as representatives.

The members of our own National Conservation Commission and the experts who prepared our inventory of national resources are present and are at any time at the service of you gentlemen, if you desire to hear from them, and any information that they have in their possession is at your disposal.

Gentlemen, this conference represents one of the many steps that have been taken of recent years looking toward a harmonious cooperation between the nations of the earth for the common advancement of all. In international relations the great feature of the growth of the last century has been the gradual recognition of the fact that instead of its being normally to the interest of one nation to see another depressed, it is normally to the interest of each nation to see the others elevated.

Fundamentally it is the same with nations as it is with individuals. You will find that, as a rule, the most prosperous man is the man who lives in a prosperous community; as a rule the man is prosperous who has prosperous people to deal with, who carries on his business with other prosperous people, who has prosperous people round about him. You know that of your own experience. You know that a poor locality is just the locality where it is hardest for the ablest type of man to do well. The ablest man will do best where his neighbors also do well. It is just so with us as nations. In commercial relations the trade of one nation is greatest not with the poor and backward nation, but with the rich and progressive nation.

Study the trade returns, and see where, on the average, the best customers of any nation are found. The best customers, on the average, are the prosperous nations. When one nation strides forward along the path of civilization, as a rule that progress means the uplifting of nations generally. (I am speaking subject, as one always must, to certain exceptions; occasionally a nation rises at the expense of another. What I say does not apply to such cases.)

The movement that you gentlemen are beginning, the national cooperation for the conservation of national and international resources, marks another stage in the advance along these lines. Each nation will be left absolutely free, of course, to exercise its own wisdom in dealing with the things that concern itself, but it will be given the chance to profit by the wisdom of other nations, and I know of no nation or no individual that cannot profit by the wisdom of others.

In addition, the opportunity will be given to all of us to join together in doing the work that can best be done in union, by all or some of us, as compared with doing it each one separately. With nations whose boundaries march along a great extent of land frontier, as with Canada, the United States, and Mexico, there are necessarily large tracts of land in which the welfare of the people depends upon the action not only of that country, but of the neighboring country.

This, of course, is especially true where our streams are concerned. You cannot cut down the forests on the headwaters of an international stream without having it hurt both nations. I am anxious to do all that in me lies to help you gentlemen in getting our several peoples to come together with the idea of working in harmony for the common good, instead of working each to get something at the expense of the other. Ultimately each of us will profit immeasurably if, instead of striving to advance by trampling down the other, each strives to advance by joining with the other for the common advancement.

I welcome you in behalf of our people. I think it is of good augury for the North American continent that you should be here, and I believe that the movement which you this day initiate is one of the utmost importance to this hemisphere, and may become of the utmost importance to the world at large.

The Secretary of State then introduced the Canadian and Mexican delegates to the President.

THE GENERAL SESSION

The commissioners to the conference, certain members of the Cabinet, several members of the National Conservation Commission and one or two others then began the general session in the Diplomatic Room of the State Department. Mr. Outerbridge, the commissioner from Newfoundland, did not reach Washington in time for this day's session.

Mr. Gifford Pinchot, Chairman of the United States delegation, opened the session by briefly outlining the history of the conservation movement from the formation of the Inland Waterways Commission down to the calling of the North American Conference. He said that the conservation of natural resources had become in the United States almost a religion. The ideal of the movement was national efficiency, and the material basis of that efficiency was, in last resort, the natural resources. He expressed the keen pleasure he felt that the well-beloved neighbors of the United States were represented, to lend their aid to the conservation movement. Mr. Pinchot then introduced Mr. James Wilson, Secretary of Agriculture.

Mr. Wilson alluded to the fact that one of the explorers of the Department of Agriculture had just returned from Siberia, bringing with him specimens of wheat and alfalfa which could withstand the colder climate of Northern United States. Should these plants prove of benefit to this country, he said, they could not fail to prove of benefit to Canada as well. The case was similar, he explained, with the successful experiments made by the Department in fighting the cotton boll-weevil and the cattle tick in the South, since Mexico and our other Southern neighbors might freely share in the advantages thus secured. It was impossible, he said, to make advances in agriculture in one part of North America without making possible similar advances in other parts of the great territory. He was convinced that Canada and Mexico had accomplished results which would be of great value to the United States, and concluded that in all efforts to increase the productiveness of the soil one nation could not work for itself alone, but that each nation must work for all.

Senator Smoot, Chairman of the Section of Forests of the National Conservation Commission, next addressed the conference. He applauded the objects and results of the conservation movement, and expressed regret that it had not been initiated fifty years ago. Last summer he had traveled in Europe, studying the methods of forest conservation practised there. He had visited the famous Sihlwald, the town forest of Zürich, Switzerland, which yields the town an annual net profit of $12 per acre from its wood, but is yet so carefully managed that it has kept up its productiveness unimpaired for more than 300 years. He confessed a feeling of shame that in his own country an example of equally good forest management was perhaps nowhere to be found. He did not know whether Canada or Mexico had wasted their forests as had the United States, but urged that the experience of the United States was a warning against similar waste of resources in other lands.

Mr. Pinchot then invited the Chairman of the Canadian delegation, Mr. Sydney Fisher, Minister of Agriculture, to address the conference. Mr. Fisher spoke, in substance, as follows:

Canada had been watching the course of the conservation movement in the United States with the keenest interest and the closest attention, not only on account of her concern for all that concerned America, but because she had, no doubt, many lessons to learn. What was good for our neighbor was good for us, he said, and what was good for us was good for our neighbor. The same was true of nations as of individuals, and the President, in emphasizing this point, had struck the key-note of true statesmanship. He hoped to profit greatly from the conference, and when the conference adjourned he anticipated that a great international movement would have been started, which would include not only all North America, but all the civilized nations of the earth.

Mr. Rómulo Escobar, Chairman of the Mexican delegation, was next called upon by Mr. Pinchot. In his address Mr. Escobar declared that not only President Diaz, but also the people of Mexico, were pleased with the

new idea of conservation and were willing and eager to cooperate with the United States and Canada in the solution of conservation problems.

Mr. Clifford Sifton, of the Canadian delegation, followed. He pointed out that, largely as a result of the conservation movement in the United States, special permanent committees on the different resources had been appointed in the Canadian Parliament. He hoped for the establishment of a permanent conservation bureau. Canada, he said, was looking to the investigations being made in the United States in hopes that her scientists might profit by their results. In this way the evils which were experienced in one country might be avoided by the others. One fruit of the conservation movement could not fail to be a better economic development of the resources of North America.

Following Mr. Sifton, Mr. Miguel A. de Quevedo, of the Mexican delegation, addressed the conference in French. He said that for some time Mexico had been watching with acute interest the great conservation movement that had been made a live, practical issue by President Roosevelt. He regarded it not only as a great economic question, but as vital to the life of the country. He applauded all that the administration had done along this line and appreciated the fact that yet more could be done by National cooperation.

Senator Newlands, introduced by Mr. Pinchot as "the Father of the Reclamation Act," thereupon addressed the conference. He laid stress upon the value of the work done by special commissions, and deprecated the criticism of them by Congress. He was convinced that Congress would change its attitude toward such commissions and come to realize that they represented merely a necessary specialization of work. Our successes in the industrial world were due, he maintained, to the fact that experts were employed to run industrial enterprises. The commissions prepared the way for necessary legislation by doing the expert work for which Congress had no time. He considered the conservation of natural resources the most important question of the day, and trusted that the press would lend its support toward forming the vigorous public opinion without which the required laws could not be passed.

Mr. Charles L. Pack, of the National Conservation Commission, was the last of the speakers. He recalled the estimates made twenty-five or thirty years ago of the timber then remaining in the United States. It was thought at that time, he said, that the forests would last for another two or three hundred years. Now it was well understood that the virgin supplies would be gone in thirty or forty years. He declared that the greatest present obstacle in the way of forestry was cheap stumpage, for as long as stumpage continued to be cheap, the forest would be carelessly used. For this reason he believed in the retention of a tariff on lumber.

The conference then adjourned till the afternoon.

WORLDWIDE CONSERVATION

At the afternoon session a proposal to embrace all nations in the conservation movement by means of an international conference on world resources at The Hague, next September, was broached, in the form of a suggestion from the conference to the President. The following statement upon this subject was subsequently issued by the Secretary of State:

> There is now assembled in Washington, in response to the invitation of the President, a conference of representatives of the United States, of Mexico, and of the Dominion of Canada, to meet the representatives of the United States of America for the purpose of considering the common interests of the three countries in the conservation of their natural resources. The cordiality with which the neighboring governments accepted the invitation is no less an augury of the success of this important movement than is the disposition already shown by the conference to recognize the magnitude of the question before them. While recognizing the imperative necessity for the development and use of the great resources upon which the civilization and prosperity

of nations must depend, they realize the vital need of arresting the inroads improvidently or unnecessarily made upon them. They comprehend also that, as to many of their national resources, more than a merely conservative treatment is required; that reparatory agency should be invoked to aid the processes of beneficent nature, and that the means of restoration and increase should be sought whenever practicable. They see that, to the task of devising economical expenditures of resources which, once gone, are lost forever, there should be superposed the duty of restoring and maintaining productiveness wherever impaired or menaced by wastefulness. In the northern part of the American hemisphere, destruction and waste brought other evils in their train. The removal of forests, for instance, results in the aridity of vast tracts, torrential rainfalls break down and carry away the unprotected soil, and regions once abundant in vegetable and animal life become barren. This is a lesson almost as old as the human race. The older countries of Europe, Africa and the Orient, teach a lesson in this regard which has been too little heeded.

Anticipating the wide interest which would naturally be aroused in other countries by the present North American Conference, the President foresaw the probability that it would be the precursor of a world congress. By an aide-memoire in January last, the principal governments were informally sounded to ascertain whether they would look with favor upon an invitation to send delegates to such a conference. The responses have so far been uniformly favorable, and the conference of Washington has suggested to the President that a similar general conference be called by him. The President feels, therefore, that it is timely to initiate the suggested world conference for the conservation of natural resources, by a formal invitation.

Such a conference might well consider a general plan for an inventory of the natural resources of the world, and devising a uniform scheme for the expression of the results of such inventory to the end that there may be a general understanding and appreciation of the world's supply of the material elements which underlie the development of civilization and the welfare of the peoples of the earth. It would be appropriate also for the conference to consider the general phases of the correlated problem of checking and, when possible, repairing the injuries caused by the waste and destruction of natural resources and utilities, and make recommendations in the interest of their conservation, development, and replenishment.

With such a world-inventory, and such recommendation, the various producing countries of the whole world would be in a better position to cooperate, each for his own good and all for the good of all, toward the safeguarding and betterment of their common means of support. As was said in the preliminary aide-memoire, "the people of the whole world are interested in the natural resources of the whole world, benefited by their conservation, and injured by their destruction. The people of every country are interested in the supply of food and of material for the manufacture in every other country, not only because these are interchangeable through processes of trade but because a knowledge of the total supply is necessary to the intelligent treatment of each nation's share of the supply. Nor is this all. A knowledge of the continuance and stability of perennial and renewable resources is no less important to the world than a knowledge of the quantity or the term remaining for the enjoyment of those resources which when consumed are irreplaceable. As to all the great natural sources of national welfare the peoples of to-day hold the earth in trust for the peoples to come after them. Reading the lessons of the past aright it would be for such a conference to look beyond the present to the future.

The conference continued its closed sessions on Friday and Saturday. The work before it was not, however, disposed of by Saturday evening, and additional sessions were held during Monday, February 22, at the residence of the Chairman of the United States delegation, 1615 Rhode Island Avenue, and during Tuesday and part of Wednesday at the Department of State. The conference then finished its work by signing the following Declaration of Principles, and adjourned *sine die*.

DECLARATION OF PRINCIPLES

We recognize the mutual interests of the Nations which occupy the Continent of North America and the dependence of the welfare of each upon its natural resources. We agree that the conservation of these resources is indispensable for the continued prosperity of each Nation.

We recognize that the protection of mutual interests related to natural resources by concerted action, without in any way interfering with the

authority of each Nation within its own sphere, will result in mutual benefits, and tend to draw still closer the bonds of existing good will, confidence and respect. Natural resources are not confined by the boundary lines that separate Nations. We agree that no Nation acting alone can adequately conserve them, and we recommend the adoption of concurrent measures for conserving the material foundations of the welfare of all the Nations concerned, and for ascertaining their location and extent.

We recognize as natural resources all materials available for the use of man as means of life and welfare, including those on the surface of the earth, like the soil and the waters; those below the surface, like the minerals; and those above the surface, like the forests. We agree that these resources should be developed, used and conserved for the future, in the interests of mankind, whose rights and duties to guard and control the natural sources of life and welfare are inherent, perpetual and indefeasible. We agree that those resources which are necessaries of life should be regarded as public utilities, that their ownership entails specific duties to the public, and that as far as possible effective measures should be adopted to guard against monopoly.

PUBLIC HEALTH

Believing that the Conservation movement tends strongly to develop national efficiency in the highest possible degree in our respective countries, we recognize that to accomplish such an object with success, the maintenance and improvement of public health is a first essential.

In all steps for the utilization of natural resources considerations of public health should always be kept in view.

Facts which cannot be questioned demonstrate that immediate action is necessary to prevent further pollution, mainly by sewage, of the lakes, rivers and streams throughout North America. Such pollution, aside from the enormous loss in fertilizing elements entailed thereby, is an immediate and continuous danger to public health, to the health of animals, and, when caused by certain chemical agents, to agriculture. Therefore we recommend that preventive legislation be enacted.

FORESTS

We recognize the forests as indispensable to civilization and public welfare. They furnish material for construction and manufacture, and promote the habitability of the earth. We regard the wise use, effective protection, especially from fire, and prompt renewal of the forests on land best adapted to such use, as a public necessity and hence a public duty devolving upon all forest owners alike, whether public, corporate or individual.

We consider the creation of many and large forest reservations and their permanent maintenance under Government control absolutely essential to the public welfare.

We favor the early completion of inventories of forest resources, in order to ascertain the available supply and the rate of consumption and reproduction.

We recommend the extension of technical education and practical field instruction in forest conservation, afforestation and reforestation, so as to provide efficient forest officers whose knowledge will be available for necessary public information on these subjects.

Believing that excessive taxation on standing timber privately owned is a potent cause of forest destruction by increasing the cost of maintaining growing forests, we agree in the wisdom and justice of separating the taxation of timber land from the taxation of the timber growing upon it, and adjusting both in such a manner as to encourage forest conservation and forest growing.

We agree that the ownership of forest lands, either at the headwaters of streams or upon areas better suited for forest growth than for other pur-

poses, entails duties to the public, and that such lands should be protected with equal effectiveness, whether under public or private ownership.

Forests are necessary to protect the sources of streams, moderate floods and equalize the flow of waters, temper the climate and protect the soil; and we agree that all forests necessary for these purposes should be amply safeguarded. We affirm the absolute need of holding for forests, or reforesting, all lands supplying the headwaters of streams, and we therefore favor the control or acquisition of such lands for the public.

The private owners of lands unsuited to agriculture, once forested and now impoverished or denuded, should be encouraged by practical instruction, adjustment of taxation and in other proper ways, to undertake the reforesting thereof.

Notwithstanding an increasing public interest in forestry, the calamitous and far-reaching destruction of forests by fire still continues, and demands immediate and decisive action. We believe that systems of fire guardianship and patrol afford the best means of dealing adequately with fires which occur, whether from natural causes, such as lightning, or in other ways; but we affirm that in addition thereto effective laws are urgently needed to reduce the vast damage from preventable causes.

Apart from fire, the principal cause of forest destruction is unwise and improvident cutting, which, in many cases, has resulted in widespread injury to the climate and the streams. It is therefore of the first importance that all lumbering operations should be carried on under a system of rigid regulation.

WATERS

We recognize the waters as a primary resource, and we regard their use for domestic and municipal supply, irrigation, navigation and power, as interrelated public uses, and properly subject to public control. We therefore favor the complete and concurrent development of the streams and their sources for every useful purpose to which they may be put.

The highest and most necessary use of water is for domestic and municipal purposes. We therefore favor the recognition of this principle in legislation, and, where necessary, the subordination of other uses of water thereto.

The superior economy of water transportation over land transportation, as well as its advantages in limiting the consumption of the non-renewable resources, coal and iron, and its effectiveness in the promotion of commerce, are generaly acknowledged. We therefore favor the development of inland navigation under general plans adapted to secure the uniform progress of the work and the fullest use of the streams for all purposes. We further express our belief that all waterways so developed should be retained under exclusive public ownership and control.

We regard the monopoly of waters, and especially the monopoly of water power, as peculiarly threatening. No rights to the use of water powers in streams should hereafter be granted in perpetuity. Each grant should be conditioned upon prompt development, continued beneficial use and the payment of proper compensation to the public for the rights enjoyed; and should be for a definite period only. Such period should be no longer than is required for reasonable safety in investment. The public authority should retain the right to readjust at stated periods the compensation to the public and to regulate the rates charged, to the end that undue profit or extortion may be prevented.

Where the construction of works to utilize water has been authorized by public authority and such utilization is necessary for the public welfare, provision should be made for the expropriation of any privately owned land and water rights required for such construction.

The interest of the public in the increase of the productiveness of arid

lands by irrigation and of wet lands by drainage is manifest. We therefore favor the participation of the public to secure the complete and economical development and use of all water available for irrigation and of all lands susceptible of profitable drainage, in order to ensure the widest possible benefit. Special projects should be considered and developed in connection with a general plan for the same watershed. In the matter of irrigation public authority should control the headwaters and provide for the construction of storage reservoirs and for the equitable distribution and use of the stored water.

LANDS

We recognize land as a fundamental resource, yielding the materials needed for sustaining population, and forming the basis of social organization. Increase in the productivity of the soil is a growing need, and the possession of the land by the men who live upon it not only promotes such productivity, but is also the best guarantee of good citizenship. In the interest of the homemaker, we favor regulation of grazing on public land, the disposal of public lands to actual settlers in areas each sufficient to support a family, and the subdivision of excessive holdings of agricultural or grazing land, thereby preventing monopoly.

The preservation of the productivity of the soil is dependent upon rotation of crops, fertilization by natural or artificial means, and improved methods in farm management. The quantity and quality of crops are also dependent upon the careful selection of seed. We therefore favor the distribution by Government bureaus of scientific and practical information on these points, and we urge upon all farmers careful attention thereto.

The national importance for grazing of non-irrigable public lands too dry for cultivation, and the public loss occasioned by overgrazing, are generally acknowledged. We therefore favor Government control of such lands in order to restore their value, promote settlement and increase the public resources.

The first requisite for forest or other covering which will conserve the rainfall and promote regularity of water flow is the retention of the soil upon watersheds. We therefore favor the construction of such artificial works as may effect this purpose and the encouragement thereof by remission of taxes, Government cooperation or other suitable means.

MINERALS

We recognize the mineral resources as forming the chief basis of industrial progress, and regard their use and conservation as essential to the public welfare. The mineral fuels play an indispensable part in our modern civilization. We favor action on the part of each government looking towards reduction of the enormous waste in the exploitation of such fuels, and we direct attention to the necessity for an inventory thereof. Such fuels should hereafter be disposed of by lease under such restrictions or regulations as will prevent waste and monopolistic or speculative holdings, and supply the public at reasonable prices.

We believe that the surface rights and underground mineral rights in lands should be separately dealt with so as to permit the surface of the land to be utilized to the fullest extent, while preserving Government control over the minerals.

Regulations should be adopted looking to the most economical production of coal and other mineral fuels and the prolongation of the supply to the utmost. We favor also the substitution of water power for steam or other power produced by the consumption of fuel.

Great economy in the use of fuel has resulted in the past from the application of scientific inventions and the use of improvements in machinery, and further progress can be made in the same direction. We therefore recom-

mend that all possible encouragement and assistance be given in the development and perfecting of means whereby waste in the consumption of fuel can be reduced.

The loss of human life through preventable mining accidents in North America is excessive. Much needless suffering and bereavement results therefrom. Accompanying this loss there is great destruction of valuable mineral property and enhancement of the cost of production. The best method of eliminating these known and admitted evils lies in the enactment and strict enforcement of regulations which will provide the greatest possible security for mine workers and mines. We therefore favor the scientific investigation of the whole subject of mine accidents by the governments participating in this conference, the interchange of information and experience and the enactment and enforcement of the best regulations that can be devised.

Mineral fertilizers should not be monopolized by private interests, but should be so controlled by public authority as to prevent waste and to promote their production in such quantity and at such price as to make them readily available for use.

PROTECTION OF GAME

We recognize that game preservation and the protection of bird life are intimately associated with the conservation of natural resources. We therefore favor game protection under regulation, the creation of extensive game preserves and special protection for such birds as are useful to agriculture.

CONSERVATION COMMISSIONS

The action of the President of the United States in calling this first conference to consider the conservation of the natural resources of North America was in the highest degree opportune, and the proceedings which have followed, and the information mutually communicated by the representatives assembled, have, we believe, been conducive to the best interests of the countries participating. To derive the greatest possible benefit from the work which has already been done, and to provide proper and effective machinery for future work, there should be established in each country a permanent Conservation Commission.

When such Conservation Commissions have been established, a system of intercommunication should be inaugurated, whereby, at stated intervals, all discoveries, inventions, processes, inventories of natural resources, information of a new and specially important character, and seeds, seedlings, new or improved varieties, and other productions which are of value in conserving or improving any natural resource shall be transmitted by each Commission to all of the others, to the end that they may be adopted and utilized as widely as possible.

WORLD CONSERVATION CONFERENCE

The conference of delegates, representatives of the United States, Mexico, Canada and Newfoundland, having exchanged views and considered the information supplied from the respective countries, is convinced of the importance of the movement for the conservation of natural resources on the continent of North America, and believes that it is of such a nature and of such general importance that it should become worldwide in its scope, and therefore suggests to the President of the United States of America that all Nations should be invited to join together in conference on the subject of world resources and their inventory, conservation and wise utilization.

GIFFORD PINCHOT, ROBERT BACON, JAMES RUDOLPH GARFIELD, *Commissioners Representing the United States.*

SYDNEY FISHER, CLIFFORD SIFTON, HENRI S. BÉLAND, *Commissioners Representing the Dominion of Canada.*

RÓMULO ESCOBAR, MIGUEL A. DE QUEVEDO, CARLOS SELLERIER, *Commissioners Representing the Republic of Mexico.*

E. H. OUTERBRIDGE, *Commissioner Representing the Colony of Newfoundland.*

Attest: ROBERT E. YOUNG,
THOMAS R. SHIPP,
Secretaries of the Conference.

Washington, D. C., February 23, 1909.

EDITORIAL

Plant Trees

IN HIS address before the Annual Meeting, Secretary Wilson sounded a trumpet call to *"plant trees."* He referred to the rapidly waning timber supply, to the fact that "the time is coming when trees are going to be as scarce as diamonds," and urged that reforestation work be begun at once. The mere fact that Congress seems to be unwilling to take action was not, in his judgment, reason why no one else should. Congress is not the only power or effective agency in the United States. There are states, corporations, associations, societies and individuals. Each of these can do something; all of them together can do much. More than fifty years ago Iowa farmers began the planting of trees. It may be added that, all over the Central West, clumps, groves and wayside rows of trees planted by individuals may be found, the total aggregating a large area.

The Secretary wisely emphasized the fact that much of this planting must be done by wholesale. "We have probably 5,000,000 acres to plant. We ought to be reforesting a quarter of a million acres a year." This work is far too great to be done with spades in human hands. Tree seeds should be sown like grass seed, broadcast, on the last snows in the spring. An experiment made on an eighty-acre tract, one mile above sea level, some three years ago, succeeded magnificntly. Now let the good work go on!

It must not, of course, be inferred that the failure of Congress, thus far, to do its part affords to that body excuse for like failure in the future. The duty of Congress, in cases of which the Appalachian-White Mountain ranges are typical, is paramount. These ranges are inter-state, and control the streamflow of navigable rivers over which the power and, therefore, the responsibility of Congress is unquestioned. Still, the fact remains that, whether Congress works or shirks, others can and should do their own part.

That the United Kingdom is seriously considering the question of reforestation is shown by the report of the Royal Commission on Afforestation and Coast Erosion. This body maintains that, in less than thirty years, there will be no timber available unless the different countries of the world proceed, at once, with the work of replanting. Furthermore, though every country should now begin the work, the renewal will not, by any means, halfway keep pace with the consumption.

The soil and climate of Great Britain, the report states, are favorable to the production of high-class commercial timber, and the state could profitably undertake the experiment of planting large areas as an alternative to a timber famine.

Says a London dispatch of January 23 to the *Washington Post.*

> A sum of about $10,000,000 annually, the Commission believes, would be necessary to finance afforestation, but the money could be raised by loan. If money were expended at this rate for the eighty years which it would take to plant 9,000,000 acres, the value of the property might be expected to be $2,810,375,000 or $534,965,000 in excess of the sum involved in its creation.
>
> Besides, "afforestation creates a new industry; it does not compete with private enterprise. The conversion of comparatively unprofitable lands into forests enhances the productiveness of the adjacent area, and should promote the development of the small holdings movement. More than any other apparent remedy, afforestation will stem the tide of rural depopulation." In addition, it is believed that employment would thus be furnished for 100,000 men.

The report continues: "The afforestation of suitable lands in the United Kingdom, if undertaken on an adequate scale and in accordance with well-recognized scientific principles, would prove at present prices a sound and remunerative investment. In estimating the profits of sylviculture, account must, moreover, be taken of two facts—the increasing consumption of timber per head of population all over the world in spite of the introduction of alternative materials, and, further, the exploitation, waste and destruction by fire of the virgin forests, especially those yielding the more important building timbers.

"Already a noticeable shortage of timber supply has resulted, as is evidenced by steadily rising prices and depreciating qualities in all markets. It seems impossible to escape from the conclusion that this tendency will be continued and accentuated, and that a steady and very considerable rise in prices may be looked for throughout the present century.

"The amount of land suitable for afforestation, but not now under timber, in the United Kingdom may roughly be put at a maximum of 9,000,000 acres. A forest of 9,000,000 acres, in which are represented the various series of age classes, may be expected to yield 9,000,000 loads annually in perpetuity. The importation of foreign timber from temperate climates into the United Kingdom in the year 1907 exceeded 8,500,000 loads, or approximately the annual supply which could be expected from the afforestation of the above-mentioned area.

Fortunately wood, unlike metals and minerals, can be renewed. The foregoing report, and the growing sentiment in the United States in favor of reforestation, of which Secretary Wilson's speech is a splendid example, are encouraging signs of a turning in the tide of forest wastefulness, and of the gradual replacement of what the world has already lost.

The President Attacks the Water-power Monopoly

CONGRESS recently passed House Bill No. 17,707, authorizing William H. Standish to construct a dam across James River in Stone County, Missouri, and divert part of its waters through a tunnel for electric power. This bill the President vetoed on January 15, saying, "My reasons for not signing the bill are that it gives the grantee a valuable privilege which by its very nature is monopolistic and does not contain the conditions essential to public interest."

Another case in point the President found in that of the Desplaines River in Illinois, speaking of which he said:

"The great corporations are acting with foresight, singleness of purpose and vigor to control the water powers of the country. They pay no attention to state boundaries and are not interested in the constitutional law affecting navigable streams. It is significant that they are opposing the control of water power on the Desplaines River by the State of Illinois with equal vigor and like arguments to those with which they oppose the National Government pursuing the policy I advocate. Their attitude is the same with reference to their projects upon the mountain streams of the West, where the jurisdiction of the Federal Government as the owner of the public lands and National Forests is not open to question. * * * The people of the country are threatened by a monopoly far more powerful, because in far closer touch with their domestic and industrial life than anything known to our experience. A single generation will see the exhaustion of our natural resources of oil and gas, and such a rise in the price of coal, as will make the price of electrically transmitted water power a controlling factor in transportation, in manufacturing and in household lighting and heating. * * * No grant of this kind should be made except as it provides for a fee to secure title to the people and for termination of the grant or privilege at a definite time. I will sign no bill granting a privilege of this character which does not contain the substance of these conditions. I consider myself bound, as far as exercise of my executive power will allow, to do for the people, in prevention of monopoly of their resources, what I believe they would do for themselves, if they were in a position to act."

Here, again, the President takes high ground on a vital issue. We have all heard of monopoly of land, oil, coal, gas, street railways, telephones, etc., but water-power monopoly is, doubtless, for many, something new under the sun. Of the menace represented by it the President speaks in terms strong enough to arrest attention.

Note the situation. Mechanical power is essential to modern life. It has been produced from oil, gas and, especially, coal. These are fast disappearing. The coming great source of such power is

water used to generate electricity. The experts who serve the great corporations know this. The people at large do not. Now, obviously, is the time, the psychological moment, to find these water powers, buy them cheap or get them without buying, and hold them, using such as it may now be profitable to use, but taking good care that the unused ones are in safe hands. Such investments, wisely managed, will pay from the start; and, when the fuel famine becomes acute, will be so many diamond mines.

Why Governments Should Act

DOCTOR HALE again drove home, at the annual meeting, the fact that there are special and peculiar reasons why governments, State and National, in contradistinction to individuals and corporations, should invest in forest property and maintain it on forestry principles.

The first reason is that States, unlike individuals, do not usually die. Ancient nations, it is true, fell, and Poland was divided among her enemies; yet, in any practical view, such facts may be disregarded. The United States, as a nation, and the several states which compose it may, for all ordinary purposes, be conceived of as henceforth co-existent with the everlasting hills. Unlike individuals, therefore, who demand early returns—say eight years hence, at farthest—the State may properly and profitably make an investment whose return will be many years deferred.

The State need be in no hurry for returns, inasmuch as it has other resources; furthermore, it knows that when the period necessary to mature its investment has elapsed, be that period long or short, its need for revenues will be as real as to-day.

Not only will its need for revenues be as real; it will be as great and greater. For life assumes growth, and growth implies increased need, and power of consumption. Populations wax; public institutions multiply; increased wants, in countless ways, foreseeable and unforeseeable, constantly present themselves to organized society. As Governor Hadley, of Missouri, recently said, instead of that government being best which governs *least,* "It is admitted by all fair-minded men that that government is best which *governs most,* when that government is justly and fairly administered."

Governor Hadley also declared that "The most important question before the people in this country to-day is the question of taxation. It is the basis of organized society. It is through the revenue derived from taxation that our courts are maintained, our educational institutions are preserved and the care of our unfortunates is made possible."

The list of objects of expenditure named by Governor Hadley is modest. Further, judging the future by the past, the expenditures of organized society to-day are meager in comparison with those which will be made a generation hence. And, as the experience of European countries and Japan conclusively proves, a splendid source of public revenue may be found in the forests, publicly owned and administered on forestry principles. What policy, then, could be more sane and practical than to begin now to provide for the future?

This is the view in which bond issues in time of peace—if no other means be found—are abundantly justifiable as a present basis for forest conservation.

Doctor Hale also pointed out that the State can protect its forest property, while the individual cannot protect his. The State can pass laws forbidding carelessness in the use of fire, as by campers, hunters, smokers, brush-burners, railroad companies and the like, and it can enforce the laws by arrest and punishment. The individual can do none of these things. At the Biltmore estate where, because of the largeness of the property and the scientific and business talent employed in its management, private ownership is displayed at its best, it is freely conceded that the owner, in endeavoring to protect his forests against fire, labors under a

heavy handicap, from which government, state or National, is exempt.

If the indifference of the public, or its representatives, to public interests be urged, the reply must be that no government will run itself; that as the stream can rise no higher than its source, popular government cannot permanently represent a higher degree of intelligence and practical capacity than does the average of its citizenship; and that, therefore, a fundamental concern in the promotion of the movement for conservation, whether of forests alone, or of all natural resources, must be the informing and arousing of the people. As the National Conservation Commission says in its report: "For the prevention of waste the most effective means will be found in the increase and diffusion of knowledge, from which is sure to result an aroused public sentiment demanding prevention. The people have the matter in their own hands. They may prevent or limit the destruction of resources and restrain misuse through the enactment and enforcement of appropriate state and federal laws."

The ultimate remedy lies with the people, but the immediate duty rests upon those whose eyes are already opened to the situation. They must push the educational work that appropriate agencies may be devised, and adequate measures taken; and, this done, they must exercise that eternal vigilance which is not more truly the price of liberty than it is of good and efficient government.

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Funds for Conservation

THE need for action, immediate, vigorous, and on an enormous scale, if the existing unpardonable waste of our resources is to be checked and the residue properly conserved and developed is, to every one even fairly familiar with the facts, obvious and imperative. The disposition, in whatever quarter, "to shut our eyes to these facts, or attempt to laugh them out of court," "would be," as the President says, "unworthy of our history and our intelligence." Such conduct on the part of those in places of power and responsibility, we may add, would be comparable to "Nero's fiddling while Rome burned."

An ever present excuse for inaction in such matters is, however, found in alleged "scarcity of funds." Bricks, we are always assured, cannot be made without straw, and bills cannot be paid without cash. In the existing crisis, it is especially convenient to point to the great and growing treasury deficit as a triumphant proof that nothing can, by any possibility, be done by the National Government.

What is this policy of inaction costing the American people? Let us glance at a few, only, of the facts and figures presented by the National Conservation Commission in its report now in the hands of Congress:

In the year 1907 the waste in the extraction and treatment of mineral products was equivalent to more than $300,000,000.

During the same year the direct and indirect losses from fire approximated $450,000,000. Of this loss, four-fifths, or an average of $1,000,000 per day, could be prevented.

The loss to farm products due to injurious mammals is estimated at $130,000,000 annually; the loss through plant diseases reaches several hundred million dollars, and the loss through insects is reckoned at $659,000,000.

Since 1870 forest fires have destroyed a yearly average of fifty lives and $50,000,000 worth of timber. Not less than 50,000,000 acres of forest is burned over yearly.

The direct yearly damage by floods since 1900 has increased steadily from $45,000,000 to over $238,000,000.

The annual loss to farms alone from soil erosion is fully $500,000,000.

The economic gain from the mitigation of preventable disease in the United States, the Commission estimates, would exceed $1,500,000,000 a year.

Here we have an *annual economic loss* running well into the billions of dollars. As a small beginning in the

direction of promoting a movement which may lead, in time, to partial checking of some small percentage of the annual loss of which these billions represent only a modest estimate, the President urges "that an appropriation of at least $50,000 be made to cover the expenses of the National Conservation Commission for necessary rent, assistance and traveling expenses." He adds: "This is a very small sum. I know of no other way in which the appropriation of so small a sum would result in so large a benefit to the whole Nation."

In comparison with the yearly waste, and the interests, present and future, involved, the amount asked is, obviously, a sand grain by the seaside, a drop in a rainstorm, a satellite in a solar system; yet there seems ground to apprehend that even this crumb will not be allowed.

And why? Because, forsooth, of the "lack of money."

We hear, sometimes, of "saving at the spigot while wasting at the bunghole," and of permitting fields to lie fallow and grow up in weeds in order to "economize" on seed corn. In comparison with the case in hand, however, all such figures shrivel into hopeless inadequacy; and, for historic examples of legislative helplessness, the mind reverts to decaying Oriental governments, or to Old France, tottering to its fall.

The remedy suggested is a loan. In comparison with sitting idly and watching this inconceivable waste continue and multiply, a bond issue would be wisdom and economy themselves; for what were the interest on the bonds in comparison with the wealth which, like another Niagara, is pouring yearly into the all-consuming maelstrom of waste here depicted!

But have we no other resource than bonds? Assuming that our present sources of National income, including tariff duties, are yielding their maximum, does statesmanship here reach its limit? When National safety was menaced by civil strife resort was had to an income tax; and, fifteen years ago, in the face of a situation far less ominous than the one under consideration, Congress again, by legislation, provided for the taxing of incomes. True, the Supreme Court of the United States, by a vote of five to four, held that *that particular law* was unconstitutional; but it by no means held, as many seem to imagine, that income taxation, in and of itself, and however framed, is, save for war purposes, unconstitutional. The field still lies wide open to Congress to enter at will.

Again, from a multitude of sources, from the President down, comes the demand for the taxation of inheritances. Mr. Andrew Carnegie, whose personal estate, if left to-day, would contribute so bounteously under such a policy, urges the enactment of an inheritance tax law. In England, the "death duty" has, for many years, been a regular source of income. With the accumulation of great fortunes to which, in increasing degree, attention is to-day called, the propriety and effectiveness of an inheritance tax law must grow increasingly evident.

But without attempting, here, to discuss in detail the principles of taxation, attention is simply called to the following facts: First, that the need for action is paramount; second, that our country, the richest on the globe, is abundantly able, from any one of three sources—loans, income taxes and inheritance taxes—to provide the funds with which a hopeful beginning in conservation may be made; and third, that, so far, Congress has not seen fit to appropriate even the pittance of $50,000 which the President urges for the maintenance of the National Conservation Commission.

Forestry and Dry Farming

HOW to grow crops in the semi-arid belt lying east of the Rock Mountains has long been a question. A solution, it is claimed, has now been found in dry farming. The land is first deeply

ploughed. Then the sub-surface packer, so called, is run over it. This packer is a machine carrying a series of small wheels suspended close together on a spindle. It packs the earth tightly together in rows.

The farmer now waits for rain. Even in the dry region in question rain falls, and in quantities sufficient for the needs of crops if the water can but be conserved and utilized. The trouble has been that so much of it runs off or evaporates. The run-off, however, is largely prevented by the deep ploughing, which enables the earth to drink up the rainfall.

The rain comes and saturates the "sponge" of soil. But the fierce winds of that region blowing, at times, at the rate of seventy-five miles per hour, tend rapidly to drink up the precious moisture from the upper layer of soil, and cause the formation of capillary tubes through which, by capillary attraction, as through so many minute pumps, the moisture from lower layers is drawn to the surface and carried away in vapor. The farmer, however, now takes the next step. He industriously scratches the surface of the soil with harrows until he has broken up the capillary tubes and produced a thick blanket of dust, which protects the soil beneath much as a mulch of straw might do. Through this, he drills his wheat into the moist soil below, and all is well.

But another danger remains. The fierce winds may blow the dust blanket away. Here is where forestry comes in. At the Experiment Station at Fort Hays, Kansas, it has been found that trees, properly selected, planted and cared for, may be made to grow on the treeless plains. The catalpa, osage orange, Russian mulberry and honey locust thrive in the semi-arid belt. With these, wind-breaks may be formed to protect the fields from the winds. Incidentally, they will, in addition, furnish fence posts and fuel, and aid in holding the snow moisture of winter. Experiments made at the station have proved dry farming to be practicable, and another reason has been found for the practice of forestry in western Kansas and Nebraska.

Forestry and Unemployment

THE statement of the Royal Commission on Afforestation and Coast Erosion of Great Britain that the reforestation work proposed by them would afford employment for a hundred thousand men, calls attention to a condition now increasingly acute in Great Britain, not to mention other countries—that, namely, of unemployment. The *Literary Digest* for February 6th tells us that "The British Government is at present confronted with a difficulty which every month grows more aggravated," and quotes from *The Board of Trade Labor Gazette*: "The general decline in employment, which began during the second half of the year 1907, continued in 1908, and although there was some slight improvement during November and December, employment at the end of 1908 was, it is stated, worse than at the end of any year since 1892. The fluctuations in the percentages of unemployed in the period of 1898-1908 are shown below:

1898	2.8
1899	2.0
1900	2.5
1901	3.3
1902	4.0
1903	4.7
1904	6.0
1905	5.0
1906	3.6
1907	3.7
1908	7.8

"The mean of the monthly percentage for the metal-engineering, and shipbuilding group of trades was 12.6 in 1908."

The *Digest* publishes a striking chart of unemployment in Great Britain for 1907 and 1908. This chart shows that conditions in each month of 1908 were far worse than in the corresponding month of 1907. Such facts enable us

to understand not only the old age pension movement in Great Britain, but the studied endeavor to provide employment for the unemployed; reforestation on a large scale being one of the plans suggested.

That a connection exists in the United States between unemployment and the forest question was shown by Doctor Rothrock at the annual meeting, when he stated that "Hard times have a good deal to do with the problem of forest fires over the country this year;" that he knew "one place where there were hundreds of men lying idle, and all they had to do to earn 20 cents an hour was to apply the torch," and that he had "seen mobs voluntarily thrusting themselves upon the fire wardens * * * and while putting out the fire with one hand, they would pick up a fire-brand with the other, and throw it back over their heads. They were working by the hour, and did not want the fire suppressed."

This raises the question whether unemployment is not more than a mere individual question, of interest simply to the man out of work. Such a man, while deprived of opportunity to maintain himself and dependents, is obviously maintained, in one form or another, while he lives at all, by the community. Yet the community is deprived of the service he might render it in return while, in addition, he is tempted to the commission of crime to relieve his intolerable lot. When his crime takes the form indicated by Doctor Rothrock—not the mere stealing of food for a destitute family, or of a ride to a field of possible employment—but the wholesale destruction of valuable property, and of interests probably even more valuable dependent upon that property, and this, that he may earn a paltry wage, the question arises, Is not widespread unemployment a problem properly demanding the attention of governments, local, municipal, state or National?

To this question, the English people are coming to give a more and more strongly affirmative answer. "The public safety is the supreme law," and unemployment can reach the point, if it has not already reached it in Europe and America, where it directly concerns the public safety.

APPALACHIAN LEGISLATION KILLED

AFTER a long and determined effort on the part of the friends of Appalachian forest legislation in the House Committee on Agriculture, a bill popularly known as the Weeks bill, from its principal author, Hon. John W. Weeks of Massachusetts, was favorably reported as an amendment to the bill sent down by the Senate at the close of the last session. The report in favor of the Weeks bill was signed by eleven members of the Committee. Five members, including the chairman of the Committee, Mr. Scott of Kansas, signed a minority report in opposition to the bill, and there were two other individual minority reports. The bill came up in the House on Monday, March 1, under suspension of the rules, and passed, after a spirited debate of two hours, by a vote of 157 to 147. The majority was not large, but it was obtained against the combined opposition of both the Republican and Democratic organizations, and was a distinct victory for Mr. Weeks, and Mr. Currier of New Hampshire, Mr. Lever of South Carolina, Mr. Lamb of Virginia, Mr. Cocks of New York, Mr. Cole of Ohio, and of the others who supported them in securing its passage. The bill went into the Senate the same afternoon; but the Senate, through the opposition of Senator Teller of Colorado, Senator Heyburn of Idaho, and other senators from the Rocky Mountain states, refused to allow it to be sent into conference, insisting upon the right of the Senate to discuss it from the floor. This, in view of the pressure of business and the few hours that remained of the session, prevented the passage of the bill. It is a very great misfortune both for the White Mountains and Southern Appalachians that the earnest work of the last few years should have failed when so near achievement, and that it should be in the power of two or three men to nullify the plainly expressed will of the majority of the members in both Houses of Congress and of the great body of the people of the country.

THE ATTITUDE OF THE WEST TOWARD THE EASTERN FORESTS

IN URGING support for the Appalachian Forest Bill Hon. Curtis Guild, Jr., until recently governor of Massachusetts, sent the following letter to several of the governors in the Rocky Mountain states, and on the Pacific coast.

"It has been my pleasure as governor of Massachusetts, though this commonwealth is not affected by the National support of irrigation for waste lands in the West, not only to encourage favorable National action by voice and pen but to send delegates to National conventions called in support of the movement. Massachusetts is not to be benefited by the deeper waterways movement, also to be encouraged by National support, yet I have taken great pleasure in sending delegates to the National conventions in Chicago and Washington to give the encouragement of the commonwealth to this much-needed public improvement.

"Massachusetts is not asking for the expenditure of one dollar from the National treasury for any forest reserve within her own borders. We are maintaining and extending state, metropolitan and municipal forest reserves at our own expense. No one state, however, certainly not the little State of New Hampshire, can bear the comparatively large expense necessary for the forest reserve in the White Mountains which must be maintained if the water supplies of New England are not to be irretrievably endangered. This last year, thanks in no small measure to the cutting that has already taken place, Massachusetts has suffered terribly from drought. Our farmers have lost heavily by the shrinkage of crops. Our mills have been obliged to incur heavy expenses in the substitution of steam for water power. Our paper mills in particular have not even had sufficient water to cleanse the rags used as paper stock. Cattle in the fields have been without a sufficient supply. The shrinkage of water in the great rivers has left deposits of sewage and disease germs, spreading sickness among our people.

"When the trees are cut from the upper slopes of the White Mountains, the thin soil is washed away, leaving the bare granite rock. These forests can never be replaced. We not only need action but we need action now.

"If it is constitutional for the National Government to maintain forest reserves and to furnish water supplies as well as waterways for the West, we feel sure you will agree that it must be constitutional for the National Government to obtain forest reserves preserving water supplies for the East. I am writing, of course, of the peculiar needs of New England. The Southern Atlantic states we also feel should be given similar consideration. They are able to make the further plea that unless some step is taken by the National Government the hardwood supplies for the cabinet-making and furniture industries will at no late date disappear.

"I feel sure that New England, which has at least always tried to do her duty by the Union, will not appeal to you in vain in behalf of this measure of common justice."

It is a pleasure to record that in response to this letter, Governor George E. Chamberlain, of Oregon, introduced in the Oregon state legislature the following resolution which was adopted by both branches:

JOINT RESOLUTION NO. 24

"*Whereas,* the bill in the United States Congress to acquire forest lands on the Eastern Appalachian Mountains, in the States of New Hampshire and Maine at the North, and in Virginia, West Virginia, North Carolina, South Carolina, Georgia, Tennessee and Kentucky at the South, has three times passed the United States Senate, was recommended in a special message once by President Wm. McKinley and twice by Theodore Roosevelt, has the unqualified approval of the President-elect, Wm. H. Taft, and has now been recommended to the House of Representatives by a vote of ten to four in the Committee on Agriculture, and

"*Whereas,* the governor of Massachusetts, Curtis Guild, Jr., has asked the governor and people of Oregon to lend their support to the passage of this measure at this session of Congress before it adjourns on March 4th, therefore be it

"*Resolved,* by the Senate and House of Representatives of the State of Oregon, that the passage of this measure by the Federal Government is approved.

"*Be it further resolved,* That the people of this state and the legislature thereof favor the appropriation of moneys by the Congress of the United States for acquiring title to and reforesting deforested areas whenever and wherever this policy may be necessary in any of the states of the Union, and the governor is hereby requested to transmit copies of this resolution to members of the Oregon delegation in Congress."

It is a cause for greater regret that after the measure passed the House, and had already passed the Senate in nearly similar form, Senator Heyburn, of Idaho, and Senator Teller of Colorado objected to its going to conference and thus killed it for the present session.

CALAVERAS BIG TREES SAVED

BY SIGNING the bill for the creation of the Calaveras National Forest, California, President Roosevelt has saved the most famous grove of trees in the world. The people of California have been working to interest the Government in this wonderful grove of Big Trees for more than nine years. The Senate bill passed by the House of Representatives has just been signed. Every one interested in the great natural wonders rejoices that as a means of saving the Big Trees, the way has been paved for a practical exchange of the timber in the groves for stumpage on other forest land owned by the Government.

The land to be acquired under the bill includes about 960 acres in what is known as the North Calaveras Grove in Calaveras County, and 3,040 acres in the South Grove in Toulumne County. The North Grove contains ninety-three Big Trees and in the South Grove there are 1,380 of these giant sequoias. Any tree under eighteen feet in circumference, or six feet through, is not considered in the count of large trees. Besides the giant sequoias there are hundreds of sugar pines and yellow pines of astonishing proportions, ranging to the height of 275 feet and often attaining a diameter of eight to ten feet. There are also many white firs and incense cedars in the two tracts. A Government study of the land was made by a field party under the direction of Fred G. Plummer, United States Forest Service, in 1906.

The Calaveras Big Trees are known the world over. The North Grove contains ten trees each having a diameter of twenty-five feet or over, and more than seventy having a diameter of fifteen to twenty-five feet. Most of the trees have been named, some for famous generals of the United States and others for statesmen and various states of the Union. "The Father of the Forests," now down, is estimated by Hittel to have had a height of 450 feet and a diameter at the ground of more than forty feet when it was standing. "Massachusetts," contains 118,000 board feet of lumber; "Governor Stoneman" contains 108,000 board feet, and the "Mother of the Forest," burned in the terrible forest fire which licked its way into a part of the grove last summer, contains 105,000 board feet. Each of these trees named grows as much lumber as is grown ordinarily on fifteen or twenty acres of timberland. The bark runs from six inches to two feet in thickness.

NEWS AND NOTES

Floods on the Congo

A dispatch from Brussels, Belgium, under date of February 18, says:

Floods in the Lower Congo country have devastated posts, factories and villages. The inhabitants have been ruined and are dying in great numbers.

The Railroad Must Pay Fire Damages

The *Brooklyn Standard-Union* for January 13 said:

The Long Island Railroad Company heard to-day that it will have to pay $119,300 for damage caused by fires to property abutting the lines of the company. The suit against the railroad was won by Charles M. Stafford, who acted with the consent of the Forestry Commission, after a hard fight to convince the members that the company was violating the forest, fish and game laws of the State of New York.

The railroad officials contended that the law did not apply to Long Island, that it was only made for the forests in the Adirondacks and Catskills. The decision of the Court of Appeals says the law applies to every place and every railroad in the State.

The Joint Committee on Cooperation

The Joint Committee on Cooperation, authorized by the Joint Conservation Conference which met in Washington, D. C., on December 8, 9 and 10 last, will meet on March 5th.

This committee consists of eleven men, three members of the National Conservation Commission and six members of the State Conservation Commissions, with the addition of the chairman of the conference, Mr. Gifford Pinchot, and Mr. T. R. Shipp, Secretary. The six members are chairmen of the State Conservation Commissions.

This committee will consider suggestions forwarded to it from the various conservation organizations, National, state and private, and, from these, will formulate a plan of cooperation by which all the organizations named can cooperate harmoniously on specific, coordinated lines of effort. In this way it is hoped that a large and effective work may be organized.

State Control of Forest Fires

In the February issue of CONSERVATION, in connection with the remarks of Prof H. H. Chapman, appears the report on State Control of Forest Fires, submitted to the Annual Meeting of The American Forestry Association on January 13th last. This report was prepared by a commission appointed several months before by the Association and composed of men of wide experience who devoted a considerable amount of time and thought to the study of the question before them. Their report was adopted by the Association as its program. The Association further decided to publish a sufficient number of copies for distribution among all the state legislatures in the Union. In accordance therewith, twelve copies were sent to the President of the Senate, and to the Speaker of the House of Representatives of every state and territory, these copies being accompanied by a letter stating the purpose of the program. From about twenty states there have come to the office of the Association not only acknowledgment of the pamphlet, but a number of letters containing expressions of interest and approval. In one instance request was made for additional copies with which to supply every member of the assembly.

Secretary Wilson to Continue in Cabinet

The *Washington Times* of January 29 said:

The decision of Mr. Taft to retain Secretary James Wilson, of Iowa, as head of the Department of Agriculture, gives much satisfaction in Washington.

Much satisfaction also is expressed in Congressional circles. Not only had the members of the Iowa delegation written a strong letter to Mr. Taft, but a large number of members of the House and Senate, without being asked to do so, had written urging that Mr. Wilson be reappointed.

Secretary Wilson has seen the Department of Agriculture make great strides since he became the head of it. But he has been working in the cause of the advancement of Governmental efforts in behalf of agriculture much longer than he has been head of the department.

Back in the days when he was in Congress he urged the establishment of a Department of Agriculture. He was one of the first to insist that the Bureau of Agriculture ought to be converted into a department.

To Prevent Fraud on the Public Domain

The Sundry Civil Appropriation Bill, as reported from Committee to the House on February 19, contained a clause granting to the Secretary of the Interior, $1,000,000 for

the detection and prevention of fraud on the public domain. The appropriation last year was a half million, and the year before a quarter million. Secretary Garfield urged that it be increased to a million this year, in order that the great mass of land fraud cases now on hand can be prosecuted to their conclusion. This work is to be done by agents under the direction of the Secretary of the Interior.

Two and a half million dollars is appropriated for the construction of a building in Washington to house the General Land Office, the Geological Survey, the Indian Office, and the Reclamation Service.

For the continuance of work of rivers and harbors that has already been authorized by law, $19,574,514 is appropriated. This is the second largest item in the bill.

To Conserve Historic Data

The President has recently proposed to Congress the creation of a commission on National Historical Publications. This proposal is based on the recommendation made by the Committee on Department methods of which Comptroller Lawrence O. Murray and Mr. Gifford Pinchot are members. The committee shows that important historical materials in the possession of the Government are inadequately cared for and protected, and recommend the construction of a National archive house, and the storage therein, as promptly as possible, of the earlier records and papers of the administrative departments.

In preparing their report the committee on department methods appointed an assistant committee which included a large number of the most eminent historians of the United States. Charles Francis Adams, president of the Massachusetts Historical Society, was the head of this assistant committee. Prof. Charles M. Andrews, of Johns Hopkins; Prof. William A. Dunning, of Columbia; Worthington C. Ford, of the Library of Congress; Prof. Albert Bushnell Hart, of Harvard, and others equally prominent, were on this committee.

Rivers and Harbors Bill

The *Washington Times* of February 19 contained the following:

Chairman Burton, of the Rivers and Harbors Committee, to-day reported his bill, carrying $9,971,625 for repairs, maintenance, and preservation of public works in the rivers and harbors of the United States. The amount to be allotted to any one project, however, is limited to $50,000.

The bill also provided for the creation of a national waterways commission to consist of seven members of the House and five members of the Senate. Fifty thousand dollars is appropriated for the expenses of the commission. The items carried in the bill are as follows:

Maintenance and operation of Government plants, $8,185,750.

Engineers, $500,000.

National Waterways Commission, $50,000.

Surveys, $600,000.

Authorization for appropriations to be made hereafter, $635,875.

It is expected the bill will pass practically as presented.

The bill provides for a survey for the purpose of estimating the cost of a continuous intracoastal waterway with a channel twenty-five feet deep from Boston to Long Island Sound, to New York Bay, and thence across New Jersey to the Delaware River or Bay; thence to Chesapeake Bay, then from Norfolk, Virginia, to the North Carolina sounds, and Beaufort Inlet, North Carolina.

From Beaufort, North Carolina, another waterway twelve feet deep is to be surveyed, extending through Cape Fear River, North Carolina; Winyah Bay, North Carolina; St. John's River, Florida; to Key West, Florida; thence across the State of Florida, and along the Gulf of Mexico.

Waste of Michigan Lands

On January 25 the *Washington Times* published the following dispatch:

The waste of lands and forests and the accompanying money loss to the state of Michigan are appalling, according to the report of the commission of inquiry to-day, authorized by the last legislature, to examine the situation and recommend such legislation as might seem feasible.

For the 949,000 acres sold in the last six years, the state has received an average of $1.08 an acre. The commission found that in eleven counties 21,455 acres had been sold for $200,000 less than the actual value of the land and timber. At this rate, the State has lost over $9,000,000 in its sales of land during the last six years.

The commission recommends that the state withdraw at once all tax and homestead lands until the legislature can decide more fully what the proposed project shall be, and thereby put a stop to the waste.

For Healthy Fruit Trees

The House Committee on Agriculture has favorably reported a bill providing for Government inspection of nursery stock at ports of entry to be designated by the Secretary of Agriculture. The bill carries an appropriation of $100,000; it also authorizes the Secretary of Agriculture to establish a quarantine against the importation or transporta-

tion in interstate commerce of diseased nursery stock or stock infected with injurious insects.

The Secretary of Agriculture is authorized to extend the provisions of the bill to fruits, vegetable bulbs or other plants whenever he deems it necessary. The bill makes it unlawful for any transportation company to offer at any port of entry nursery stock unless accompanied by a certificate of inspection by an official expert of the country from which the importation is made.

Waterways Treaty between the United States and Great Britain

A waterways treaty has recently been signed between Secretary Root, representing the United States, and Ambassador Bryce, for Great Britain. The provisions of the treaty are thus summarized by the *Literary Digest* for February 20:

It provides for the settlement of all controversies which arise between the two countries by a joint high commission of six members, three from each country. It settles all waterways controversies, such as the question of power at Niagara Falls, the navigation of the St. John's River between Maine and New Brunswick, the use of water for reclamation purposes along the border and near the Milk and the St. Mary rivers, and decides questions of navigation on the Great Lakes. Its settlement of the Niagara Falls problem is regarded as probably the most important feature. This problem has been a cause of friction for a long time, and although both countries have repeatedly tried by legislation to decide the matter definitely, a settlement has never been reached. The establishment of the commission will most likely preclude the possibility of further disagreements between the two countries in their relations along the border, and the treaty itself is one that has long been hoped for by those who have taken an interest in relations with Canada. To some extent the treaty will supersede the work of the International Waterways Commission, made up of representatives of the United States and Canada, whose duties include the settlement of the location of that portion of the international boundary between the United States and Canada passing through the Great Lakes system.

Considerable indignation is expressed in Canada, the press claiming that that country is being robbed of her rights by a feat of American diplomacy; while the Canadian Senate protests against the making and legalizing, by the British Government, of a treaty of vital interest to Canada, without, at the same time, consulting the Canadian Parliament.

State and Local Receipts from National Forests

During the last fiscal year ending June 30, the United States Forest Service issued to settlers in the neighborhood of national forests in Western States over 30,000 "free use" permits, under which the settlers received free about 264,000 cords of firewood, posts, poles and sawlogs, worth $169,320, or about 64 cents per cord in the forest—a low valuation.

Besides this, the different states received for school and road purposes twenty-five per cent. of the income from the national forests, amounting last year to $447,064. The direct return to the States in lieu of taxes on the 147,000,000 acres, the estimated area of unpatented land in the National Forests, amounted then in the last year to $615,384 in cash and "free use" timber.

Yale Forest School

The senior class of the Yale Forest School, numbering thirty students, will leave New Haven, Connecticut, about March 1st for Doucette, Tyler County, Texas, where they will study the lumber operations of the Thompson Bros. Lumber Company, secure final practice in surveying, map making and the estimation of timber, and investigate the possibilities of forest management in the region. It has been the custom of the Forest School for several years to conduct the work of the spring term of the senior year on some large lumber operation. In 1906 the work was carried on at Waterville, New Hampshire, on the lands of the International Paper Company. The spring term of 1907 was spent in southern Missouri on the lands owned by the Missouri Lumber and Mining Company. The class of 1908 was in central Alabama on the holdings of the Kaul Lumber Company. The selection of Texas for the coming season's work is due to an invitation extended by Mr. J. Lewis Thompson, of Houston, Texas, manager of the extensive Thompson lumber interests in Texas and likewise an enthusiastic advocate of forestry. Mr. Thompson is a member of the Forest Conservation Committee of the Yellow Pine Manufacturers' Association, and also is greatly interested in the formulation of a proper forest policy for the State of Texas. Arrangements have been made for the construction of camp buildings near the center of one of the large timber tracts of the company, where the students will live during the greater part of their stay in the region. The trip will be made from New York to New Orleans by boat,

and from thence to Doucette by rail. It is probable that one or more cypress operations will be visited while the students are *en route* to Texas.

The class will remain on the holdings of the Thompson Bros. Lumber Company until the middle of June, when camp will be broken and a committee of students will return to New Haven to represent the class at the university commencement. The remainder of the class will scatter to various parts of the country for a short vacation. About July 1 the students will enter the employ of the United States Forest Service, State Forest Commissions and lumber companies or engage in private forest work.

The instruction in surveying, mapping and timber estimating will be in charge of H. H. Chapman, and the study of the logging and manufacturing methods in charge of R. C. Bryant, both members of the faculty of the Forest School. In addition to the regular instruction there will be a number of special lectures by prominent lumbermen. Among the latter are Mr. Thompson, who will spend some time in the camp with the students and will give a number of talks on subjects relating to the lumber business, and Mr. George K. Smith, secretary of the Yellow Pine Manufacturers' Association, who for the past two years has addressed the students on the subject of lumber associations, market conditions, etc.

Railroads Seeking Tie Supply

That the humble railroad tie is a most important factor in the material development of the country is a great truth that is little understood by people outside of railroad circles. The puffing engine that speeds at the rate of a mile or more a minute over the country is a slave to the two steel rails that insure a smooth and safe road, and these rails in turn depend on the old-fashioned wooden cross-tie which holds them in place.

Yankee invention has not yet found a substitute which has induced the railroads to give up wood, although experts say that the day will surely come when the country's forests will no longer be called upon to supply the demand for ties. Up to the present time it seems that no other material has been found which has the resiliency of wood and which at the same time causes less wear and tear on the rails, fastenings, and roadbed.

The country's railroads during the last two or three years used 110,000,000 to 150,000,000 of sawed and hewn ties a year. The ideal tie timber is white oak, which combines the qualities of durability, hardness, strength, and close grain. On account of its wide use, the supply has been greatly reduced and some of the railroads have been forced to pay almost prohibitive prices for ties, or to substitute other and cheaper woods to replace the white oak ties rapidly disappearing from their lines.

Over forty per cent. of the ties recently purchased by the railroads of the country are oak, according to latest statistics of United States Forest Service.

Stumpage values have been increasing so rapidly during the last few years that many railroads have found it necessary to modify their timber policy, and they yearly apply preservatives to a greater number of ties and to more kinds of wood. Substitute woods naturally vary with different sections of the country, but in most cases they lack the two essential qualities found in white oak, namely, resistance to mechanical wear and to decay. Experience proves that wear can be successfully retarded by the use of tie plates and other mechanical devices, and decay can be postponed by the application of proper preservatives. The new conditions have made it necessary for many railroad companies to meet the problem of preservation by establishing treating plants at central points of distribution along their lines.

Mahogany among Hardwoods

For refined expression in the manufacture and all other forms of interior decoration, mahogany is undoubtedly the peer of the hardwoods. A few years ago mahogany was regarded as a very precious wood, and was employed only in the interior of the finest houses and in the manufacture of the most expensive furniture. During the past few years, however, there has been a wonderful development in mahogany importation and use.

The total quantity of mahogany imported last year was nearly 42,000,000 board feet. Of this large amount North America supplied 65.6 per cent. and Europe eighteen per cent. Though Europe supplied only a little more than one-fourth as much mahogany as there was imported from North America its average value per thousand feet was more than twice as much, due to finer quality. The remainder of the imports came from Africa, South America, and Asia. Immediately following the war with Spain, lumbermen of the United States exploited the largest and most accessible of Cuban mahogany forests. An engineer employed by American authorities during the recent intervention in Cuba claims that nearly all of the available supply of mahogany of that island has been exhausted and that what now remains in any considerable quantities is far remote from transportation facilities.

The number of buyers of mahogany in this country's hardwood market is now exceeded only by those of oak, maple, poplar, basswood, ash, birch, chestnut and cypress. The principal reason for the popularity of mahogany is that the importers of the logs and the manufacturers of lumber have never ad-

vanced its prices beyond a modest profit, and it is relatively so low that it now makes little difference in price whether an office building or a home is finished in mahogany or quartersawn white oak. Another reason for its popularity is because it improves in tone with age.

Woodpeckers Destroy Poles

Birds are destroying the telephone and telegraph poles in the South and Southwest, particularly in Texas, Arizona, and California. In some places fifty per cent. of all the poles along the right of way have been riddled by these innocent offenders, which belong to the woodpecker family.

One of the Western Union officials, who has recently returned from an inspection through the West, reported having seen twenty-five telephone poles with two or three hundred holes drilled clear through them. Some of the holes were three or four inches in diameter.

An officer of the Illinois Central Railroad counted the white cedar telephone poles along the right of way near Covington, Tennessee, which had been affected by woodpeckers, and found that out of 268 poles, 110, or forty-one per cent., had been bored.

Many methods for preventing this damage have been suggested, but probably the most successful is preservation with creosote. A line of creosoted poles, opposite the one near Covington, was examined, and not a single hole was found. When it is considered that creosote will not only prevent the damage caused by the woodpecker, but also protect the pole indefinitely against both insects and decay, its great value as a preservative is apparent.

Tree Planting in Kansas

There are now 160,000 acres of planted trees in central Kansas, where at one time it was thought that trees could not be grown. As the area in which agricultural crops can be profitably grown is steadily extending, so the limit of forest planting and tree culture is widening always.

The native timber in Kansas is also on the increase; prairie fires no longer sweep unchecked across the plains, and the strips of forest along the rivers and in the ravines and gullies are becoming broader every year.

In some counties cottonwood was the only tree planted for many years. Then boxelder, honey locust, catalpa, osage orange, Russian mulberry, black walnut, and red cedar were tried, and all of them were found suitable over the greater part of the state.

Many persons desire a greater variety of trees, for ornament or for profit. A gentleman living in Albilene, Dickinson County, has planted a large number of trees and shrubs about his home and has proved that many species from the forests of the Eastern states and of the Old World are well adapted to the prairies of central Kansas. Some of the trees with which he has had success are persimmon, magnolia, basswood, juneberry, black cherry, buckeye, dogwood, sycamore, tulip-tree, pin oak, red oak, English oak, European alder, camperdown elm, redbud, Paulownia, Chinese cork tree, ginkgo, red-leaf maple, and cutleaf weeping birch. These are not so valuable for windbreaks, fence posts, and fuel as the trees ordinarily planted for those purposes, and since they are not so hardy, they require more care; but their ornamental value is very great, and as towns grow older, the demand increases for a variety of trees to replace the short-lived cottonwoods.

Goats Improving Forests

Three thousand angora goats herded out on the brush-covered foothills of California are going to do some hard work for Uncle Sam during the coming two years beginning this spring. The experiment will be unique both as a stock-raising proposition and as an engineering and tree-culture problem.

The little white animals whose long wool is of such great value are going to be put to no less a task than constructing mile after mile of fire line through the bushy chaparral growth in the National Forests, saving much labor by the United States Forest Service engineers and making way for forestation by merchantable trees. Not the least important feature of the experiment, which for the first two years will be confined to the Lassen Forest, is the fact that the task will be performed during the regular grazing by the goats which will not even realize they are doing a valuable work.

Plans for carrying on the work are outlined in a cooperative agreement drawn up by the Forest Service and the owner of a band of angora goats grazing on the Lassen National Forest of California. The scheme is to run fire lines parallel with the contour of the slopes by cutting trails about eighty rods apart. The trails are to serve as guides for the angoras. They will graze in each direction from the trails, killing, it is estimated, a strip of brush about 300 yards wide. The wide lanes cut out and grazed by the goats will serve as ideal fire lines in protecting the forest-covered lands lying beyond and around the chaparral areas and also make a place for reproduction of merchantable trees.

American and German Forests

American forests, according to the experts of the Department of Agriculture, are capable of yielding more wood to the acre, if well handled, than the noted forests of Germany, many of which net their owners from $2.50

to $6 or more per acre annually. Not only are our native forests richer in valuable timber trees, but our climate and soil conditions are more favorable. The trouble is not that our trees do not grow fast enough, but that our ignorance and carelessness have left our woodlands poorly stocked.

The German forester sees to it that his forest is uniform and dense. To grow a full crop of wood, as to grow a full crop of grass or corn, there must be a full stand. Next in importance is the rate of growth of the trees. The species most grown abroad are Norway spruce, Scotch pine, and silver fir for soft woods, and beech and oak for hardwoods. In German forests of the first quality, Norway spruce attains in sixty years an average diameter of 9.4 inches.

Wood Preservation in Louisiana

A cooperative agreement between the Forest Service and the North Louisiana Telephone Company for the investigation of economic methods for the preservation from decay of loblolly pine telephone poles has recently been carried out with gratifying results. The object of the Government was to demonstrate that a creosote treatment could be applied successfully and at a low cost to loblolly pine poles. Such success was obtained that a company has been incorporated under the name of the Louisiana Creosoting Company, which will operate commercially the plan designed by the Forest Service.

The treating plant, which has been in operation since the latter part of October last, is of the "non-pressure," or "open-tank" type. Extensive experiments carried on by the Forest Service in recent years, have shown that the "open-tank" system is admirably adapted to the treatment of certain classes of timber, and especially so as regards loblolly pine.

The plant used in the experiment with the North Louisiana Telephone Company is equipped with a horizontal treating cylinder fifty feet long and six feet in diameter. During some months, 3,000 poles, 2,500 crossarms, and 500 ties were treated, an amount sufficient to determine the most economical methods of treating these classes of material. The Forest Service then withdrew from the cooperation, and the plant is now being successfully operated by the owners.

Use of National Forest Resources

The actual use of the varied resources of the Government's 168,000,000 acres of National Forest land is on the increase, according to the report of the work for the fiscal year 1908. The report says that from an administrative standpoint the most striking fact of the year was the remarkable increase which took place in the volume of business transacted.

This growth in business done by the United States Forest Service last year over the previous year is partly brought out in the following statement showing percentages of increase: in the number of timber sales, 236 per cent.; in the amount of timber cut under sales, 102 per cent.; in the number of free timber permits, seventy-six per cent.; in the number of grazing permits, eleven per cent., and in the number of special-use permits, sixty-seven per cent. That the additions to existing National Forests and new creations caused this increase only to a small extent is shown by the fact that the area increased is only eleven per cent.

Irrigation Scheme in Spokane

Seven hundred and fifty dollars is to be expended by the Cook-Clarke Company of Spokane, in establishing an underground and direct pressure irrigation system to water 4,600 acres of land adjoining the north city limits. The land will be devoted to orchards in five and ten acre tracts, with roads around each forty acres. The company will donate two tracts of fifty acres each for park purposes.

Water for irrigating the land will be pumped from a spring, which has a flow sufficient for one section. The same flumes will carry water for domestic use in the beginning, but later separate systems are to be installed. When the spring will not supply enough water there are five other springs on the land which will be used. Later water will be taken from Peone Creek, which is to be dammed, and from Dragoon Creek and the Little Spokane, both of which flow through the River tract, and on which water rights have been secured. A reservoir almost a mile in length, 1,000 feet wide and thirty feet deep is to be built in the channel of Peone Creek.

Dams and Floods

Are the mill dams in the Smoky Hill River, Kansas, responsible for the floods of the last five years? The farmers who lost their crops in 1903, 1904 and 1908 claim that the mill-dams are more or less responsible for the damage. This contention the mill-owners deny. To ascertain the facts Capt. Edward H. Schulz, the Government engineer at Kansas City, was invited to look over the territory. He did so and explained the situation to the farmers, stating that the trouble was at least in large part due to bends in the river, and advocated the formation of a drainage district and the straightening of the bends. To what extent the floods were caused by the dams he was unable to state without an actual survey. The question seems likely to be carried before the courts.

Irrigation in Okanogan County

Eighteen thousand acres of land in Okanogan County, Washington, will be put under irrigation within the next three years by George T. Crane, of Spokane, and his associates, including R. W. Hunner and Earl B. Crane. The project involves the expenditure of $1,500,000, through the purchase of a half interest in the two tracts to be brought under the ditch, and the construction of a plant and a canal forty-four miles in length. Mr. Crane announces that the preliminary plans have been worked out, also that arrangements have been completed in the East for financing the project.

Twin Falls Irrigation Project

Construction work has been started on two tracts under the Twin Falls irrigation project, which will add 100,000 acres to the veritable empire under the canals of the system in southern Idaho. Contracts have been awarded by the Government for the survey of the Twin Falls Bruneau tract, the greatest of the projects, and construction on this enterprise will begin early next spring.

Within five years, it is predicted by expert irrigationists in Spokane, there will be 1,500,000 acres of land under the canals of the district, all under practically one system. This is a larger area than is under any one system in the valley of the Nile.

Since the Carey act was enacted by Congress more than 847,000 acres of desert land has been segregated by the State of Idaho for the companies operating under its provisions. The segregation of as many more acres of desert land has been applied for by the state and will be reclaimed within the next few years. The total area covered by the seventeen enterprises is approximately 1,700,000 acres.

Bleeding Southern Pines

"Bleeding" pine trees for their resin, to which chiefly longleaf (Pinus palustris) and Cuban pine (Pinus heterophylla) are subjected, has generally been regarded as injurious to the timber. It has been claimed that both durability and strength of timber are impaired by this process, and in the specifications of many architects and large consumers, such as railway companies, "bled" timber is excluded.

Special investigations, involving mechanical tests and the physical and chemical analyses of the wood of bled and unbled trees from the same locality, have been carried on by the United States Government through the Forest Service. Results prove conclusively (1) that bled timber is as strong as unbled if of the same weight; (2) that the weight and shrinkage of the heartwood is not affected by bleeding; (3) that the durability of the heartwood is not affected by bleeding, since the resin comes from sapwood only. Bled timber is as useful for all purposes as unbled.

A Farm Raising Timber

In every state of the Union there are many tracts of so-called agricultural land, which, owing to their hilly character, poor soil, or numerous boulders, are not suitable for farming. The owners of such tracts are often at a loss to know what to do with them. Without question, the best use to which land of this kind can be put is to plant it with trees.

An Ohio farmer is solving the problem of what to do with the worn-out farm. He owns an old homestead of sixty acres, which he is desirous of keeping in the family. He does not live on the place, however, and farming has been a losing proposition. He has, therefore, decided to plant the entire tract with trees. The owner is wise is planting several kinds of trees instead of confining himself to one species. His forest will be producing six or seven kinds of lumber, chestnuts, and Christmas trees, at the same time.

Asparagus Under Irrigation

William Lee, a professional gardener, who made a fortune in the Yakima Valley in central Washington, has planted the largest asparagus field in the Northwest at White Bluffs, Washington, south of Spokane. The tract of ten acres required 90,000 plants, representing an outlay of $450. The land is under irrigation. It is expected to gather a fair crop in two years. The yearly cuttings sell on the Columbia River markets at from 25 to 30 cents a pound. Should the prices go below 20 cents it is proposed to can the product.

Forest Protection and Management

Conservative management of timberlands is assured for less than one-fourth of this country's forested areas, the part contained in the National Forests and under the administration of the United States Forest Service. By cutting only the mature trees and protecting the new growth by keeping out fires, the National Forests will be made to yield indefinitely. It cannot be expected that this small part of the Nation's forests will supply the demand for future generations, and the one hope in sight is that users of wood and lumber manufacturers will insure the permanence of their business by applying the principles of forestry in the management of timberlands.

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CONTENTS FOR APRIL, 1909

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WORK ON A NATIONAL FOREST

No. 10. Dealing with Frontier Communities

By CHARLES HOWARD SHINN, Supervisor, Sierra National Forest

IT HAS been many months since I could find time for another of these glimpses of our problems up here among the rocks of Sierra. New and interesting phases of life present themselves almost every day, and of course, the larger policy questions are always with us.

When I look back along the busy months since the first article of this series appeared in print, I begin to understand with more definiteness how intimately all that I have written from this forest is related to actual events here, to our secret undercurrents, to the changing airs of our spiritual atmosphere, and indeed, to the very warp and woof of our perpetually fascinating struggle with the demons of doubt and chaos as we carry forward the bronze tree symbol of the Service.

The intelligent filing clerks, glancing, no matter how swiftly, over correspondence from any forest, must inevitably seize an impression as of the ebb and flow of tides, good or bad, sometimes in grazing matters, sometimes in timber, very often in regard to lands or special uses. Of course, the chiefs of divisions in their weekly conferences discuss, among all the routines, these occasional neaptides of tumult, which whirl and glisten like very maelstroms, funneling wild seas clear down to the primeval rocks of human nature; these young and fire-hearted chiefs can perhaps trace back all such tumults to the smallest of beginnings in local ignorance and misunderstandings.

At other times, how smooth and fair the placid waters of life move on in their appointed channels; the filing clerks have merely routine work, dull, safe, and pre-eminently proper, coming to their methodical hands from that serene forest. Then, of a surety, one may sit down and write little stories as of Robin Hood camp-fires, and indulge in a chapter of "New Worlds for Old" at lunch-time.

"Blessed is that nation," wrote a philosopher once, "that has no history;" and, as I remember, time was

when I accepted and rejoiced in the saying as one that was full of ripe wisdom. But one night my thoughts ran back along the pathways, half dream, half vision, and I saw such a land, wrapped in age-long peace and forever past its struggles. The very power to make history had perished, and, even in my sight, the people fell apart as a loosened fagot of dry branches gathered by an old peasant woman in a Thuringian forest—and that nation ceased to be. "Blessed is the Service," to make our new saying, "that goes on unresting, unhasting, adding strength to strength and wisdom to wisdom, age after age, and making many volumes of history all its own.

Really then, the very essence of all these primitive studies of mine—of these leaflets from the "Book of Beginnings"—is that they *must* move on and on with the actual currents of our lives and our work. They cannot always discourse prettily of ranger-lads, mountain horses, shake-makers, and forest fires. More and more, as the years pass, we are brought up against all those larger problems, social and economic, which are related to good government. Let us be truly glad that it is so, my gentle reader; that in every forest, in every community, in every honest effort to create new and better conditions, are the seeds of honest differences of opinion, and all the materials for a first-class conflagration.

Even forest officers, riding forth like Froissart's knights, a-carolling down the woodland ways, or sitting among their bluff companions in their sage-green doublets (new uniform, twenty-two ounces, etc!) underneath Lambertian Pines—even these mighty personages have had their bad quarters of hours, as they toiled to make safe and broad those all-essential trails and roads of thought and sympathy which link us to each other and to the whole outside world, until we, and our neighbors near and far, become one in regard to many vital things. We cannot use pickaxes, crowbars, and giant powder on these primal roads; we build them somehow, by every word and act; we maintain them at a great—and yet a most reasonable—expenditure of brain-cell and nerve-force. One must have a way open from heart to heart, here and there, all over a forest, or the most accurate records, the most methodical bookkeeping, the strictest of Use Book obediences will not save the forest-city in its hours of peril, when cloth-yard arrows are singing through the air like a swarm of yellow-jackets.

Nearly all of us are dealing with exceedingly attractive frontier communities, representing every conceivable type of American character on its most independent and out-spoken sides. And certain occurrences in recent months "along the fighting line" have set me the age-old human problem once more.

I think that one learns at last the utter wisdom of evading every sort of introspection—the whences, wherefores and whithers, the musty theological paradoxes, and the theses of the medieval school men. I think that a forest officer must neither let himself say, "Am I a success?" nor, "Am I a failure?" Both are wastes of energy, and not within his sphere of determination. But I do think that he should very often face the larger human problems: "Am I doing the very best that I can for each and all of the little independent communities scattered here and there through the forest?" "Is the best that I can do, high enough to fill the very high requirements of the changing and growing situation?" One's human trails strike miles of iron-wood brush; one's human roadways run up against basalt and obsidian; snow-slides and mountain floods sweep down one's rough-and-ready bridges; signal-fires from peak to peak sometimes warn one that there is still a spirit of dissent abroad. Then it is high time to size up the general problem once more.

Doing this, in all humility, with all patience and self-separation, one comes at last, I am led to believe, to an unshaken conception of the purely human side of an American forest offi-

Forest Rangers from Pine Mountain and Jaca Lake Forest Reserve, Who Acted as President Roosevelt's Special Escort at Santa Barbara, Cal.
Col. Willis M. Slosson, Superintendent of Forest Reserve, Dismounted

cer's work as constituting, on the whole, the alpha and the omega of the task to which we are set. Now and then I tell myself that the very highest value of a first-rate Forest Service in this day and generation is not so much timber, or grazing, or even conservation of water, great as all these are, now and forever. May it not be that we are in a fair way to shape and create that especial thing which America has hitherto in some degree lacked—the union, harmony and higher civilization of many and scattered mountain communities? I would not press this thought too far and thus wreck it in some word-desert, but I think it will bear consideration.

True, we are not policemen, nor teachers, nor even humanitarians. We are merely forest-workers, forest-makers, imperfectly equipped, brought up against new issues daily and hourly, and making all sorts of precedents for those more capable men of the future, those children spiritually sprung from our very loins, and carrying, for all time to come, the passwords of our earlier camps. Each of us all, in his own rude way, must learn so to deal with the frontier communities within or near to his forest, that they shall be helped and not hindered in the long run, by his labor as the local administrator of the Service. In the long run, too, these communities must come to know beyond peradventure that they *are* being so helped upward and onward in their progress toward a finer civilization. No one can truly accomplish this in a day, nor in a year, and in many places the work of a lifetime will be needed to lay true and square the cornerstones of our Temple of Forestry.

Least of all dare we to even think of ourselves as "reformers." Let Paul continue to plant and Apollos to water, and He that giveth the increase will at last bring our broadcast sowing of the seeds of human fellowship through all our frontier communities, from the Mexican borders to the isles of Alaska, into a golden and heavy-headed harvest.

Like Lord Cromer, each forest officer—whether an isolated ranger, thrown so often on his own resources, thumbing nightly his dimly-understood U. B., or a well-equipped supervisor, with his still larger responsibilities—is sent to a very Egypt, to a land where the brooding Sphinx looks far out over the yellow desert, serene, eternal, and asks of each wayfarer in those immense wastes the waiting question that was meant for him, and for none other, from the birth-hour of time. Lord Cromer heard, understood, and accepted the Burden of Egypt, and of her ancient peoples. Through days of good repute and of evil repute, through plots and counterplots, through slanders and abuse, and memorable upheavals he toiled on unanswering, unembittered, doing the Work of Egypt. Thus it came to pass, when he was old and worn out, that the foundations were truly laid. Thus is he remembered in world-history, not for the Assouan Dam, not for the cotton-fields and mills, not for the tawny, corporal-trained Egyptian soldiers in the Soudan, not even for his own marvelous financial genius; but chiefly because he was the slow, patient, persistent organizer of hundreds of struggling, ignorant, suspicious, and alien little village-communities scattered all over Egypt, into something like a working whole.

That was really great! That was to be one of the mighty line of modern proconsuls, English or American, who are shaping half-savage colonies into the beginnings of states and nations. One puts in the list Lord Dufferin and President-elect Taft; and I, for one, very gladly put Sir Dietrich Brandis there. I have learned a little of the forest-peoples of India and their village laws, usages and forest rights, and I can dimly guess at the vast complexities of the task which Brandis accomplished in dealing so well with those millions of hungry, suffering aliens. Yes! India's great forester was somehow so endowed by the high gods that he faltered no whit through all those wrestling years, until he disentangled and slowlier knit together, in equitable and

The Nile Reservoir Dam at Assouan, Egypt

durable manner, the whole fabric of forest-village life.

But the genius of our American institutions requires that administrators of public trusts, such as a forest, deal with the local problem according to other methods than the methods of Cromer and Brandis. All of the frontier communities form parts of the various counties and states, and are often American clear through. We belong to them, and they belong to us. Cromer and Brandis governed by obedience, in letter and spirit, to Equity; we, striving no less for Equity, must ever make that Equity plain to plain men. We appeal constantly to reason and good will. Sometimes the most supreme tact cannot avoid an issue without sacrificing a principle. In such cases a forest officer must stay with the principle, must sustain the issue at any cost of public criticism, sure that he will be justified in the end, even by many (if not by all) of those who have attacked him.

The underlying issues which are raised with more or less distinctness by many persons in frontier communities are exceedingly simple. They have to be understood, separated from irrelevant problems, and made very plain to one's own mind first, in order that they can be cheerfully met from time to time. The rangers are troubled by them, and often fail to think them out, so that excellent ranger material may be lost to the Service if a supervisor fails to discuss these things with entire freedom and justice.

The primary frontier issue with the forest is that, away down in the bottom of his heart, many a real, old-fashioned mountaineer does not sympathize at all with the setting apart of National Forests. He does not see any reason in trying to conserve the natural resources of his region; he considers, in fact, that there are none too many such resources for the present generation, and more particularly not anything more than he wishes to use himself. He says in effect, and when with his own kind he says very often and with emphasis, about this sort of thing:

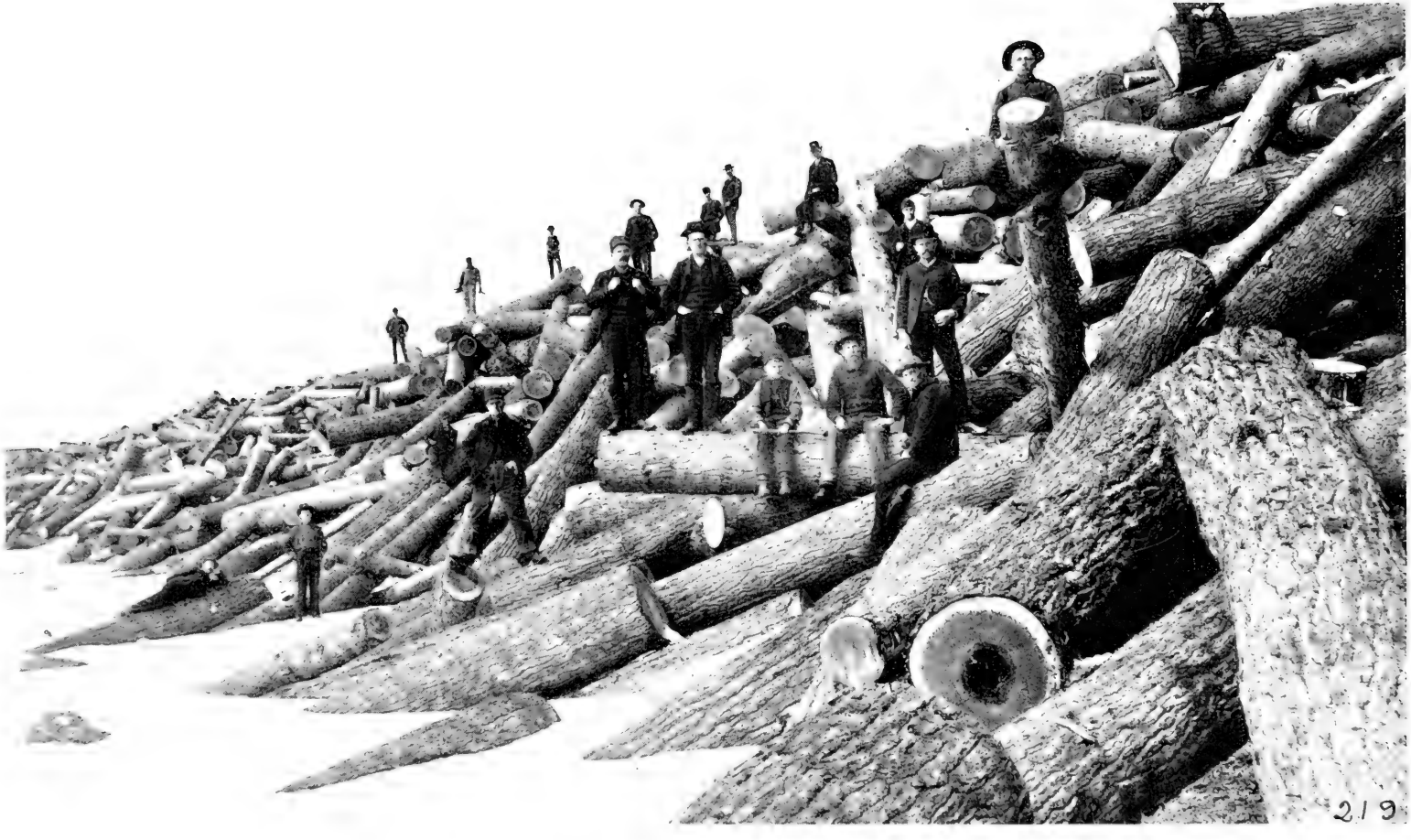
"It is downright wicked for Easterners, an' city folks, an' rich tourists, an' millionaire lumbermen, an' power-plants to get up this here forest scheme to take our rights away from us. This region belongs to us. Our fathers settled here in the rocks fifty years ago. There ain't nuthin' to spare for the outsiders. We want to 'take up' any timber land there is; we want to cut trees when and where we please; we want to burn brush in summer; we want to run our cattle any old way we like, without paying a grazing fee. We do not want any game laws; we do not want to go to any officer for permits, nor have regulations of any sort put up over us by men living somewhere else. We have to live here, and all we want is to be let alone."

I think that perhaps I have been more fortunate than many supervisors in being able to get at precisely the frame of mind of many mountain people about the forest idea. I heard much of this kind of thing long before I came into the Service, twelve and fifteen years ago, when President Cleveland first established reserves and parks. I used to go camping in the Sierras and talk with many mountain people about forestry and a forest system for America. The underlying question in nearly every mind was a very human one: "How would such a thing affect me personally?" And the almost universal conclusion was that whatever lessened the freedom of the mountain realm was wholly bad.

"Once," said one of them to me regretfully, long ago, "I could ride from Tejon Pass, north through the foothills of the Sierras, clear to Shasta, more than 700 miles, and never strike a fence."

"Before the forest was established," said another fine old mountaineer to me, not a year ago, "any of us fellows had all sorts of chances that we don't have now. A lot of things that we always held belonged to us as a right, are taken away."

He did not necessarily mean that it was less safe to shoot deer out of season, or track them in the deep snows. He did not necessarily imply that the



The Drive. A Jam Overtaken by a Lake Freeze

chances of putting a fraudulent homestead claim in splendid pine timber were gone forever. He meant a lot of little things, the taking the lumber from an abandoned cabin, the securing a little deserted orchard somewhere, the grazing of a small band of goats or sheep. Such men as these must be handled with the utmost skill and patience. Time and good will are the elements of the game.

There was once a mountaineer who owned a few head of cattle. He refused openly to take out a permit. He kept on friendly terms with the supervisor and all the rangers, and every one liked him, too. But he said that the regulation was nonsense and that he needed the $2 more than the Government did. It put the supervisor in a hole, for the mountaineer was vastly popular, and yet the offence was flagrant. Should he be arrested and taken into court for $2? Should his fee be paid by the supervisor, and a receipt sent him with a letter explaining that somebody had to do it, and that in all other respects he was too good a man to be hastily dealt with?

Just then the mountaineer's cattle broke down the supervisor's fence one day, and two of them, worth over fifty dollars, ate nitrate out of a sack of garden fertilizer under a shed, which killed them incontinently; and they were buried where they fell in the coming orchard by the meadow.

The mountaineer said "he couldn't blame nobody." "But," he added, "I expect ye might balance them steers agin that two dollars that ye thinks I owe ye fur a permit."

These things may seem trivial, but really they are not, because after awhile more serious issues come up. Neither ten nor a hundred mountaineers will ever break out into open war against a forest on these little items, nor on the general basis of inability to see the local value of a forest system. But after awhile, in one corner or another, a few men, from motives of self-interest, work deftly upon this raw material; it smokes a while, then it bursts into flame. A local politician wants an issue that leads men's thoughts from something more dangerous; a land-claimant has good reason to believe that his papers will be cancelled; a stock man desires to be allowed to run more cattle than the forest officer thinks best for the range, or fair to other neighbors.

In a thickly settled and prosperous region, time, experience and intelligent leadership have developed systematic methods of sifting baseless charges and foolish complaints from any genuine grievances which such a community has learned to present with force and dignity, through the proper channels. But the mountaineer, when stirred up, justly or unjustly, too often uses every available weapon, burns all his powder, and acts on the old principle that if one only throws enough mud at his opponent, some of it is sure to stick.

A supervisor of my acquaintance was once met by a highly excited friend, who said: "I nearly thrashed a couple of men on your account. There were a lot of teamsters down in the village. They were talking about you, and one of them said that you were in the habit of burning the cabins of poor, inoffensive Indians. Then another said that he heard that you had been arrested by a Government detective for stealing over $2,000,000 last year from the income of your forest. And both those men knew that you handled no Government money; that all the checks came from Washington. Both of them had teamed for the Government, and had been promptly paid. And both of them said you were a square man.

A little more questioning showed the supervisor that both these stories had been originated by a little group of land claimants, whose so-called "homesteads" were being "brought into court." It was merely a part of the price which one pays as he goes along, for the privilege of making things better and not worse. The supervisor (and his superiors) had philosophy enough to laugh about it, and the supervisor remarked that he fortunately

belonged to the natural order Pachydermata.

To be a forester in this day and age is to be a man who has a profound capacity for forgetting all unhelpful personal criticism. He must not pick it up, nor listen to talebearers and gossips. He must treat all men with equal fairness, and must carry no personal feelings into his daily business. Good literature is the refuge in all hours of storm, and most of all, the great lyrics and epics, the tales of heroes, and the vast dramas of human existence. There was once an astronomer up on Mount Hamilton, at the Lick Observatory, who used to tell me that five years of star-gazing lifted one "above all the flea-bites." Five years of forestry, of association with pines and mountains, ought to do as much as this for a man.

But let us not unduly exaggerate the frontier problems, for they lessen every year and our men are not afraid to meet them. Gentleness and justice long, very long, continued will ripen at last into permanent relations with each and every one of the frontier communities. The growing forest will give employment to more people, homes will increase, better schools and more churches will be established, telephones and railroads will bring in new ideas, and increase prosperity. Many an old superstition, many an ancient prejudice will soon melt like late rain-swept snows, and "leave not a wrack behind."

The next generation will be in complete touch with the forest idea, and even the old are learning, little by little, that forestry has come to stay, that timber cannot be cut without a permit, that grazing fees must be paid and that the forest officer is sustained, in case of need, by the whole power of a great government. No tactful man will ever try to "rub these things in;" but neither will be give up this impregnable position, as did one old-time ranger that I knew of. He was heard to say to a frontiersman, who objected to the trouble of asking for a permit for free firewood:

"If I wasn't a ranger I would feel just as you do. It's kind of a fool regulation anyhow."

Slowly and often painfully, then, the average frontiersman will learn the indisputable legal fact that what he has called "his" mountains belong in large part to all the people of America, "for the greatest good of the greatest number," and for whatever can be shown to be the "higher use." In what the frontiersman calls "his country," he only owns certain areas to which he has secured a title. He never had "rights" in the woods, the waters, the game, the grazing over wild areas of unentered land—the land of the people of the Nation. He only had a temporary privilege to use these outside lands, because they lay idle and unfenced. The Nation so long deemed itself so rich in surplus lands that no one thought of reducing these things to a business system, and of charging a rental for all use of Government land, so as to keep in clear sight the main fact of ownership. Men's thoughts are clearing fast on this point. In a National Forest the lands belong to the Government, and to those people who have titles there.

I find it slow work to get a frontiersman to understand or accept all this, and harder yet to have him realize that a "regulation" has any legal value whatever. Sometimes I say to a man:

"It's this way: All the people in California own the statehouse at Sacramento, because they furnished the money and ordered it built. But the laws of California create a Capitol Commission, appointed by the governor, and empower this commission to appoint a superintendent, who hires the workmen, and makes rules which are posted all over the building. If you go up there and deface the building, or spit on the floor, the first of the officials who sees you will stop it. If you make a row, he will "run you in." If the people had not given the authority to make such rules and regulations (and to enforce them) pretty soon California would have no Capitol. In just the same way the people established the forest, and gave the chief of the forest power to make rules and regulations which have the force of law. Government is mainly carried on in all civilized countries by appointive officers. Most

of the business of life is carried on in that way, too. Directors consult, and name a bank cashier, or a mill-boss, or a division superintendent. They cannot possibly leave it to the vote of the depositors, or the mill-hands, or the railroad laborers. There is no other way, so far as we can see at present, than to have the forests of America run from year to year under a business system, which puts men at the head, holds them responsible, and gives their rules and regulations an authoritative force."

I hear some reader saying just here: "This is too simple: no one objects to the system." But I assure you that I have known many persons who had to be talked to in just this way about "rules and regulations." Where conditions are primitive, thinking, too, remains primitive, and I have found a lot of comparisons very useful. The people want a battleship, but appointive officers must plan, build, and operate it under "rules and regulations." What happens to a man who walks into a Government navy yard, and tries to carry off some lumber? Very much what happens to a fellow who goes into a Government forest and tries to get what does not belong to him. And everybody knows that all this protection and this enforcement of "rules and regulations" is necessary.

I began these notes by saying that we warred continually with the spirits of doubt and chaos. But ever the empire of old Night diminishes; the light pours through. As in those tremendous cosmogonies of Dante and Milton, Hell, and all that is yet formless or sheer evil, lies below, shaken by great waves, winnowed by mighty winds, but nevertheless, already marked out for new worlds by the golden compasses of the Almighty. All that we need to see these things more clearly is to have more life, more vitality, more fighting power, a more absolute and invincible courage of our convictions. Then, though without diplomas, we shall teach the people, and though without batons, we shall lead them to victories of which they do not yet dream. Then we shall not be injured in mind, body or soul by any one's misinterpretations of us, or of our work. That work will move on as the stars of heaven move—a part of Universal Order.

Shooting the Rapids of the Grand Canyon of the Gunnison in a Canvas Boat

ETHICS OF THE FOREST

By ALEXANDRE ERIXON

"By day or by night, summer or winter, beneath the trees the heart feels nearer to that depth of life which the far sky means. The rest of spirit, found only in beauty, ideal and pure, comes there because the distance seems within touch of thought."—Jefferies.

NATURE, with its spirit of serenity and gentle teachings, is truly perceived by only a few in the busy rush of our prosaic time; and yet, if we will only stop to consider, we shall find that the phase here presented is not the one of least value.

"To most of us," says Lubbock, "Nature when sombre, or even gloomy, is soothing and consoling; when bright and beautiful, not only raises the spirit, but inspires and elevates the whole being."

No wonder that in ancient times the raiment of the fields and hillsides became an object of reverence, and that the forests were held in religious worship. With a roof of leaves, a carpet of moss and flowers, the stillness, and the softened light of the shady arcades, what a realm we have for the fairies of old mythology! But though our age can see only as visions of the past, there are yet monarchs of the forest that become enveloped with their own chapters of historic events, which give them an added charm even to the less poetic observer. In our own country these landmarks may yet be few, but if not neglected they will go down into the annals of posterity like "The Soma Cypress of Lombardy, which is 120 feet high and twenty-three in circumference, and is calculated to go back forty years before the birth of Christ. Francis the First is said to have driven his sword into it in despair after the battle of Padua, and Napoleon altered his road over the Simplon so as to spare it." And though their history may not have so many pages as that of this, even the trees under which we played as children will come back with reverent memories if we see them shading the same plot of grass, after many years.

But there are also pleasures and benefits which are ours to enjoy today; though often they are so common as to pass unheeded. The comfort of shade in the warmth of summer, beneath a canopy of leaves is one of the free gifts of the forest. Again, there is the shelter which it yields in a storm. And not least, the fresh fragrance of its purified air, where with each breath we gain a lengthened lease of life, and the mind is revived as well as the body. Lastly, in this class, we may also add that of wealth, following as a gift of the forest, of which Sir John Lubbock gives us an example when speaking of "The region of the Landes, which fifty years ago was one of the poorest and most miserable in France, but has now been made one of the most prosperous, owing to the planting of pines. The increased value is estimated at no less than 1,000,000,000 francs. Where there were fifty years ago only a few thousand poor and unhealthy shepherds whose flocks pastured on the scanty herbage, there are now sawmills, charcoal kilns and turpentine works, interspersed with thriving villages and fertile agricultural lands."

"Speak to the earth and it shall teach thee," says Job. And truly, to those who study Nature, it will also have its lesson. Of this Charles C. Abbott brings forth a very pretty illustration when speaking of a tree. "Go to it in

A Hardwood Forest, Showing Good Specimens of the Tulip Tree
or Yellow Poplar (Liriodendron Tulipifera)

Scene along Indian River, Alaska, Showing Spruce Timber

early spring," says he, "and watch the swelling leaf-buds. This is the tree's busiest time, and yet how quietly it does its work! No one ever heard of a nervous or fretful tree. * * * I know a beech that yearly bears a half-million of leaves, yet their growth never made sufficient stir to deflect a thistle-down from its course." To this he further adds, that, "He is a poor student who can spend a day with a tree and go home none the wiser."

All this may be perceived by a general observer if the mind is in tune with Nature; but still its greatest ethical value can be seen only when we open the portals of literature and art. The indebtedness of the latter to Nature is self-evident, if we look into galleries and homes for the beautifying pictorial productions of the day; but of its relation to literature less is commonly known. However, it is a recognized fact that environments lend their modification to human character and work. Of this Ruskin speaks, with due force of expression, in the third volume of Modern Painters:

"This gift of taking pleasure in landscape I assuredly possess in a greater degree than most men; it having been the ruling passion of my life, and the reason for the choice of its field of labor."

All familiar with the works of Ruskin will affirm that his "field of labor" was one of the most noble of modern times. And we will here only add another quotation from his writings about the moral of landscapes. "It was," says he, referring to the inspiration of beautiful sceneries, "according to its strength, inconsistent with every evil feeling, with spite, anger, covetousness, discontent, and every other hateful passion; but would associate itself deeply with every just and noble sorrow, joy, or affection."

In the same chapter he speaks of the works produced by some of the eminent authors in whom love of nature formed one of the strong traits of character, giving the following words as a summary of the effects which this love produced: "And if we now take final and full view of the matter, we shall find that the love of nature, wherever it has existed, has been a faithful and sacred element of human feeling; * * * it becomes the channel of certain sacred truths, which by no other means can be conveyed." On the other hand, as a matter of contrast, he brings forth some examples of the results attained where this love was lacking; proving there the existence of a pleasure which the writers themselves felt in mere "filth and pain." "They delight in dwelling upon vice, misfortune, or folly, as a subject of amusement."

Without seeking further data to verify this line of thought, let us here pass to the inferences deduced: that the effects which environments lend to one's work may be greater than at first believed; and secondly: that purity of environments will lead to purity of thought; for it is evident that there will be no love of nature if there is around us no nature to love. And as a summary of this analysis we will find that the decline of this love does not only bring devastated fields, but also a degeneracy of moral sentiment; not only the loss of material wealth, but also the germs of national degeneration.

"Beautiful things have an ideal to show us," says Harris. "When we get acquainted with them and, as it were, get their confidence, they tell us their secret." And in the beauty of Nature, the vegetable kingdom, where the trees of the forest rank as the summary of all creative perfection, this secret will be found to be in a happier and nobler trend of thought. With this their ancient sacredness becomes more rational. And we find, in our own time, not only the apparent advisability of sparing the old landmarks, but the necessity of increasing as far as possible these areas which bring their salutary influence to both body and mind. In addition to this rises the still graver need of not only encouraging the growth of a nature to love, but also the love of nature; the study of that which in itself is a source of peace and pleasure.

We must arrive at a true conception of beauty, and learn that in a final analysis the value of these verdant areas will there even transcend their economic worth; leading, as it does, not only to the highest development of the most notable talents with which human minds have been endowed, but also to a moral transcendency of the people among which the influence of these talents is brought to bear. And in this way, and this way only, can we leave to the future a country which is not composed of barren hillsides and barren hearts.

"All those who love Nature she loves in return, and will richly reward, not perhaps with good things, as they are commonly called, but with the best things of this world; not with money and titles, horses and carriages, but with bright and happy thoughts, contentment and peace of mind."

Natural Reproduction of White Pine, Showing Density of Growth

Logs on the Ice, Just before the Spring Freshet

IN THE GIANT FOREST OF THE SIERRAS

By ALEXANDER BLAIR THAW

YE FIRST of living things!
Ye that were goodly trees
When the great King of Kings,
Building his garden wall,
Brought down to Babylon,
Upon her streams, the tall
Cedars of Lebanon.

Ye mighty trees!
Ye which are first, of all
Kings of the wildwood!

Over the earth and seas
Here we are come at last,
Weary with wanderings,
Down at your feet to fall;
Here, by your mountain springs,
Silent and all alone,
Through the long ages past,
High on your granite throne
Ye stood in your glory.

Mighty ye grew in girth,
Brother by brother,
Bending your mighty knees
Down to the lap of earth,
While the great mother
Still to your listening ears
Whispered her story,
Tales of our wandering years,
Tales of our childhood.

Here on the mother's lap,
When earth was young,
Your slender rootlets clung,
Like tender fingers pressed
Close to her maiden breast.
Then first the living sap
Leaped from her bosom.

Now you are mighty trees—
Full forty centuries
Past, since that morn,
When on these stony hills
Bloomed your first blossom.

Led by your mountain rills,
We greet you, great brothers, first born
Of our mother, the earth!
Here, in the heart of the hills,
Where you dwell
And forever have dwelt,
The great mother first felt
Through her virgin repose
The quickening spell
Of your birth.

And under the snows
Of these hills of her breasts,
Where they rise—
Where they lift their pure crests
To the skies—
Deep under the ground,
Where your strong roots are wound,
Her delicate veins
With your growth have grown;
And they swell
With the coming of life to these hills
Where you dwell,
With the sweep of the life-giving rains,
Which her passion distils
From the pure, sunlit heavens above her.

Ye guardians who treasure
The gracious gift of rain,
And still pour forth again,
Age after age, and year on year,
In bounteous measure,
Your everlasting fountains!
O, ye great trees,
Who lift your lofty forms,
And gather earth's increase,
And reign in endless peace
Through all the centuries
Amidst the passions of her storm!
Up to these mountains—
Where evermore you stand,
Great sentinels
O'er all this virgin land,
Guarding your sacred wells,
We come to drink of these.

THE WORLD'S MOST VALUABLE IRRIGATED DISTRICTS

By G. E. BROWNE

AT THE present time, when the tendency for people to congregate in the cities is so great, and when these congested conditions result in such a loss to health and happiness and morals to so many, it seems a pity that the wonderful resources of the irrigated sections of our Great West can not be brought more closely to the attention of the public generally. There is room now for hundreds of thousands of our people in the irrigated districts already developed, and other great projects nearing completion. With the development of irrigation during the past few years, and at the cost of millions of dollars, agricultural, horticultural and intensified farming have advanced most wonderfully.

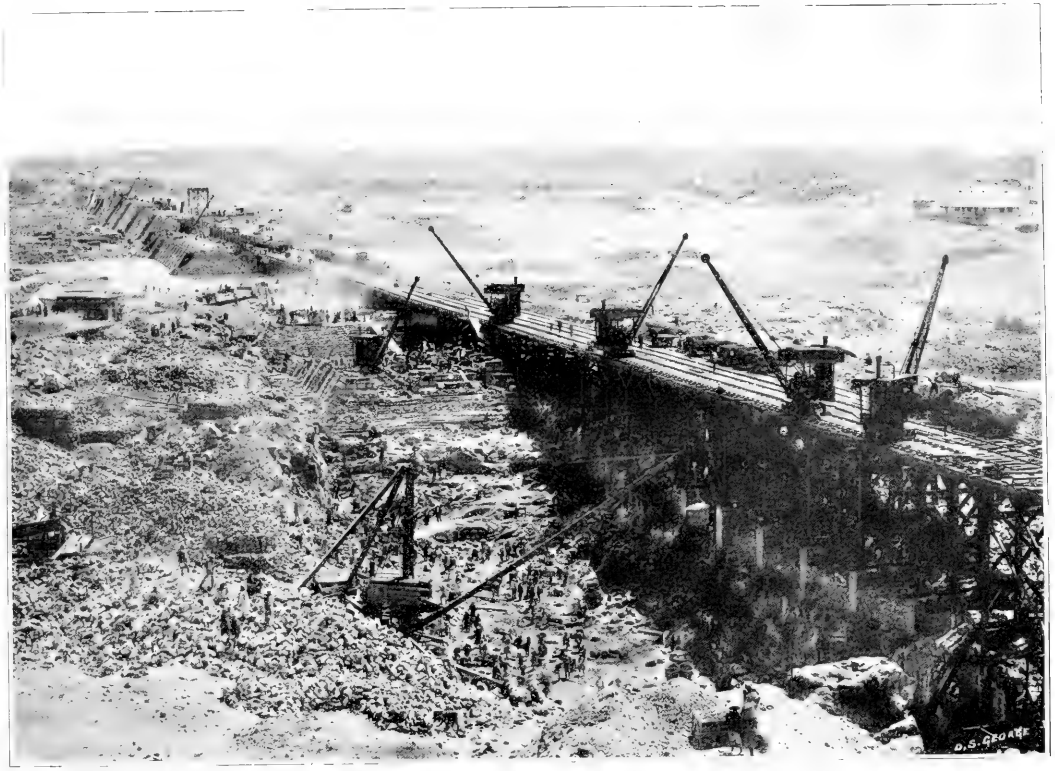
This is an age of specializing, and, thanks to our Federal Government, which through the Reclamation Service, the Forest Service, and the Bureau of Soils and Plant Industry, has brought these subjects down to a science, thousands of acres of arid and worthless lands are now occupied by the most prosperous and contented people on the continent. No other public appropriations our Government has made have resulted in so much good to so many.

In this age, when the young man asks, "What business am I to follows?" what better advice can be given him than to follow scientific agriculture and horticulture? He can make no mistake by taking up a tract of irrigated land, which has been proved to be adapted to fruit culture. It is an ideal life—not isolated, as on the prairies, farms and ranches, and our educated people are developing and making their homes in these new districts, and the social features of this life are more congenial than in the large cities. Many of the leading educators and business men of the country are buying and developing irrigated lands in the better fruit sections. There are excellent school facilities and it is a healthy life, and a life of independence.

Fruit raising on irrigated land appeals to nearly every one. It is not drudging in the hot sun and dry and dusty soil for small and not sure yields of crops, but concentrated work confined to a small area. No one should be misled, however, and think a living can be obtained with little or no work. It requires the best attention and at the right time; but he who gives honest and intelligent attention to his work will be amply repaid in results. Most irrigation companies prefer young men, even though they have had no experience in country life and fruit culture. They generally learn the modern methods more correctly and in less time than the older farmers from the East, who are liable to be set in their methods. It is the intelligent and industrious class of people who have made the best districts so famous.

At the present time there are many irrigating companies putting land on the market, both in large and small tracts, some demanding high prices for the land and others much lower. The Government is also expending millions of dollars in new undertakings.

Irrigated lands are divided into two classes, one, which we may designate as fruit land, which, in the raw state, always brings a high price, and the other forage and crop land, which



The Assouan Dam in Course of Construction. Filling in the Excavations with Masonry

sells much lower. In this article I am dealing with the former. However, I want to say here, that the latter class is valuable land, and with proper care will yield large returns, but it has not the attractive features nor as great prospects as the former. It can never reach the high prices which the fruit lands begin to bring immediately after they are planted to trees.

I have shown no partiality in selecting the best fruit districts, but have taken Wenatchee, Hood River, Yakima and Spokane Valley as examples, for in these districts there are better organizations and better results have been attained. There are other localities which are smaller and probably fully as good, but the above mentioned districts are undoubtedly the best known throughout the country on account of their age, and because their fruit has gained a world-wide reputation. Fruit growers in these places are using the most advanced and improved methods, and land values are the highest in the West.

These four great districts have set the example, which the younger territories are bound to follow to achieve success. It has not been easy to gain the reputation that Wenatchee, Hood River, Yakima and Spokane Valley have in the markets of the world.

There are many different kinds of fruits raised in these places, but the apple is the leader. The culture of this fruit has reached the highest possible development, and that grown in these sections commands the top-notch prices in the world's market.

These districts were all started in a small way, and it is now almost impossible to buy raw land except in the Spokane Valley, where a few tracts are being put on the market.

Success or failure extends from the time the land is broken and trees planted, up to the bearing state, and everything depends on proper care at the proper time, especially in pruning, spraying, irrigating and cultivating.

Thanks again to the Government interest and advice on these subjects, the growth of the fruit industry has been wonderfully developed, and the increased value of the land has gone beyond the wildest expectations, and is still advancing.

People look with amazement at the irrigated land values, and are just as much amazed at the prices obtained for fruit grown on these lands. The present prices and values are certain to keep on climbing as long as the fruit growers in these districts adhere to the high standards set in growing, packing and marketing their products.

The most essential requirement in making this arid land valuable is the water. The more complete and better regulated the water system, the more valuable it is to the land and the owner. Above all things the water supply must be adequate at all times.

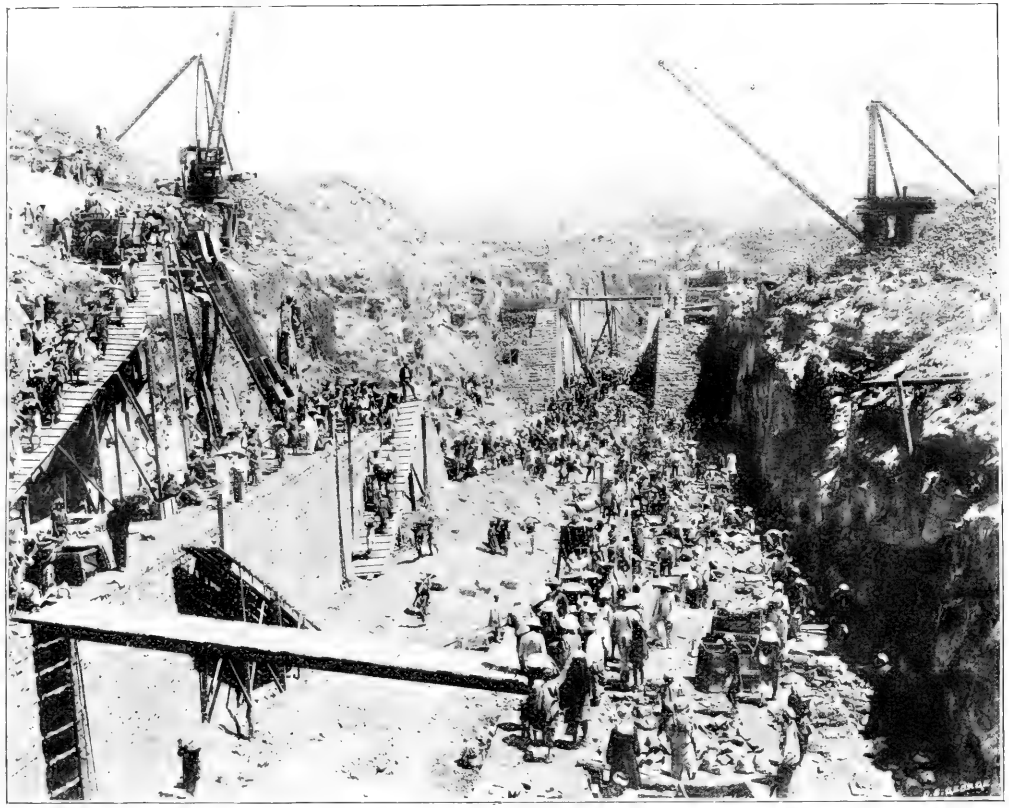
The right kind of trees, true to name and from the best nursery stock, adapted to the soil, climate and general conditions, is the next essential to success.

Transportation is undoubtedly as important an any one thing, excepting water and nursery stock. Cars must be had at the time needed, and the more railroad competition at hand the more valuable the land is.

Soils are also very essential. In the four districts above mentioned, there are entirely different soils, but each one is especially adapted to growing different varieties of apples, peaches, pears, cherries, plums, prunes, apricots and grapes, and consequently the above localities have never been forced to compete strongly among themselves.

Wenatchee grows Spitzenberg apples very successfully and an exceptionally fine quality of peaches, apricots and cherries. Hood River leads with the Yellow Newton and Spitzenberg apples. Yakima is proved to be better adapted to Winesap apples and certain varieties of peaches and pears. Spokane Valley grows to excellent advantage the Jonathan, Rome Beauty and Wagener apples.

The systematic picking, packing and marketing of the fruit leads to increased values for the products of the orchards, and this has caused the organization of



The Nile Reservoir Dam at Assouan. Building the Ship-canal. This View Gives an Excellent Idea of the Vast Amount of Hand Labor

Grazing Sheep. Black Mesa Forest Reserve. Showing Scattering of the Animals, in Spite of Which Over-grazing Has Taken Place

Destruction of Agricultural Lands along the Kansas River, Resulting from the Spring Floods of 1903

fruit growers' associations, which are not only a great benefit to people raising fruits, but also to the buyers, as there is no cutting of prices and no poor fruit shipped. Pruning, spraying and caring for the trees, and picking and packing the crops all tend to increased values. The fruit industry nearly equals the lumber industry in capital, and will likely lead in a few years.

When one thinks of a five-year-old orchard (which means it is just coming in to bearing) selling for $300 per acre, it seems absurdly high, but by proper attention and cultivation, the land can easily be made to pay ten per cent. net, or better, annually on this valuation. Many sales have been made this past season in these districts, of bearing orchards at from $1,500 to $3,000 per acre.

Taking the figures of each district separately and collectively, with an average yield per acre in the average year, we find that a five-year-old orchard, which is just beginning to bear nicely at that age, will pay for itself in four years, if the same were bought for $3,000 per acre. It is nearly impossible to buy an orchard after the trees are over three years old, and this is very plausible, for any owner is generally situated so he can keep his holding until it comes into full bearing, when he is made independent with even a ten-acre tract.

Each year sees the price of land planted with trees increase in value, and a conservative price for two- and three-year-old orchards is $700 and $1,000, respectively.

Of all the numerous varieties of fruit grown in these four irrigated valleys or districts, there is probably a greater cash return derived from growing peaches, cherries, berries, cantaloupes, tomatoes and other small fruits, but it requires far greater attention and care than does the raising of apples. The first named fruits must necessarily be picked, packed and shipped just before they ripen, and any delay is disastrous to the grower. Not so, however, with apples. These may be picked through a period of several weeks and packed and marketed at any time during the winter, and this fruit I desire to treat of in particular.

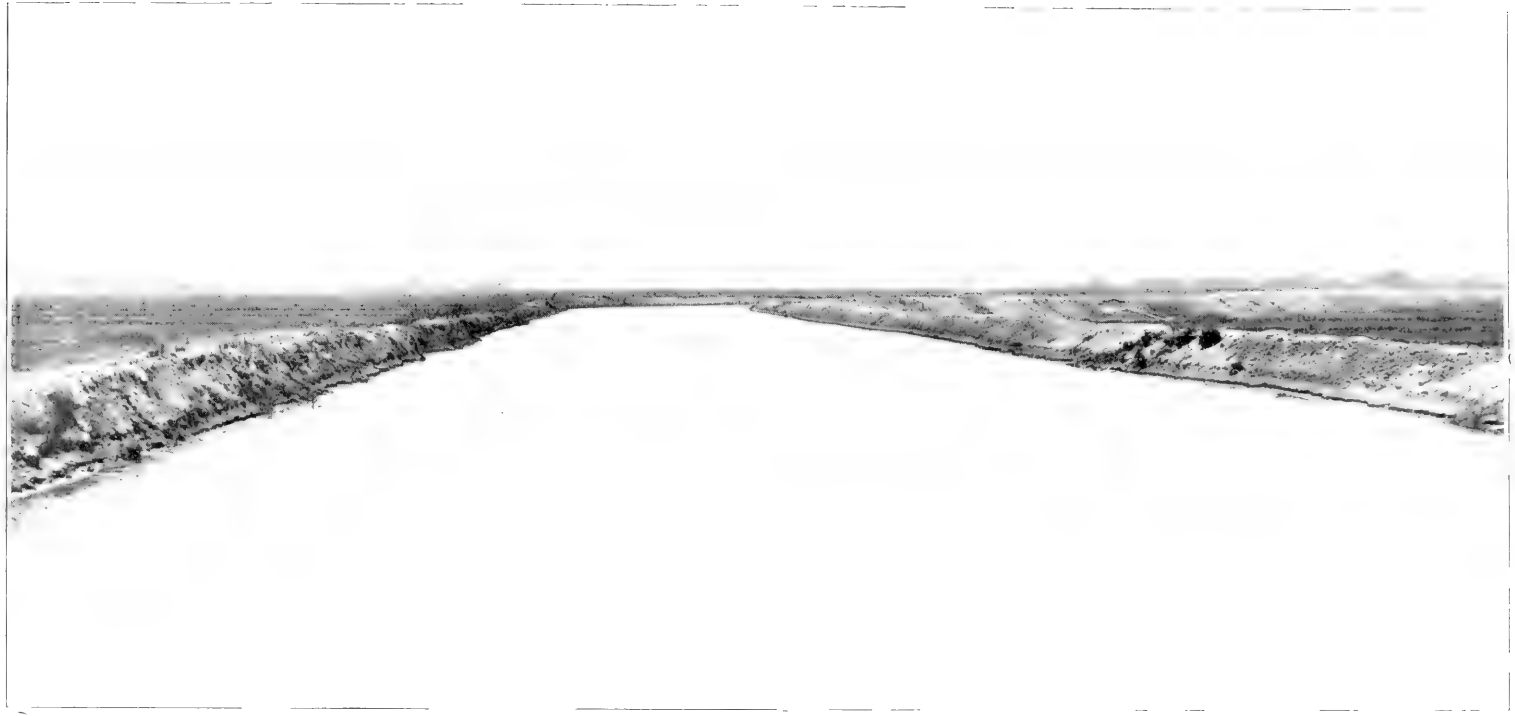
I have been asked many times "what are the best varieties of apples to raise." My answer is that it depends entirely on the climate, soil and location.

The Spitzenberg, Jonathan, Winesap, Rome Beauty and Wagener have the highest market value and are always in demand in the large apple centers. There are many other varieties, which grow and bear equally well, and often bring a high price, but the above named varieties command on the average the highest figures. The Winter Banana, which is a new apple, so to speak, has brought a remarkable price the past two seasons. It is a very delicate fruit, however, and hard to ship. It probably has the best coloring and the most delicate tints of any apple grown, but the flavor is poor. It would not be advisable to plant a large orchard to this variety, as it is simply a fad at the present time. The finest trade demands a melting fruit—a texture that assimilates when eating.

It is a difficult matter to decide on the different varieties for planting, but the best advice I know of is to plant a strictly commercial orchard, with, of course, the possible exception of a few varieties for family use.

It is proper to add that people are becoming so interested in the fruit industry that the department of agriculture in several of the western states, as well as at Washington, are flooded with inquiries relative to location and to the fruit industry in general. I can state very positively that there is no question before the American people to-day that is attracting so much attention as irrigation, and especially as applied to fruit culture, and I can venture to say that within two years all the best fruit districts that are now irrigated will be set out to orchards, and this coming year will see a great rush of the best class of citizens to these valleys to obtain small tracts of this valuable land.

The fruit markets of the world are



An Irrigation Canal in the Rice-growing Region, near Jennings, La. (Photo reproduced through courtesy of Mr. S. L. Cary)

demanding western fruit. No section of the country can compete with the West for the highest grades. Eastern nurseries have even moved to this section of the country. Buyers from all sections of the land, and many from London and European points, visit these valleys to make their annual purchases, and it is figured that two-fifths of the apple crop of this year is being shipped abroad.

How great this increase will be in the future can only be estimated from past shipments, and the continually increasing demand for our fruit in the European markets. Many dealers in this country, who ordered from one to twenty cars of apples this season, have recently placed orders for additional cars and find that they have to go without or pay increased prices. There is no fruit in the world that excels the western apple, and the great class of American apple users demand the best, regardless of price. From the closest observation, even in view of the fact that there are many orchards coming into bearing, the demand has increased faster than the supply, and market values are naturally bound to increase. It can be stated positively that American markets can more than take care of the additional fruit raised each year, and the foreign demand, on the other hand, has been increasing more rapidly in the past three years than the home demand.

There has seldom been any business that offered such great and sure returns to the investor, and irrigation has been proven to be of great value and no experiment.

It is not generally known that the laws of the State of Washington prohibit the sale or giving away of wormy apples. The object of this is to keep the orchards free from disease and increase the yield and price.

Agricultural schools and colleges have made careful tests and studies of the soils within their respective states, and a new comer is protected in every possible way, if he takes time to investigate. The danger from pests is now very slight, as they are taken in hand at the start and never allowed to spread or obtain a foothold. I do not want to give the impression here that there are no obstacles to overcome, but people who plant orchards, and are observing, and listen to advice from people who have made this subject a careful study, are bound to bring their orchards into a bearing state in excellent condition.

One thing very noticeable is, that people with little experience in irrigation and fruit culture often try to work out some plan of their own, which they think may be an improvement over methods used, but which proves in the end a detriment as long as they are trying to compete with men of experience and a thorough understanding of fruit culture. New comers should gain their experience from those who have been successful. Every fruit grower is interested in a beginner raising the best fruit and keeping his tract in excellent condition, as it prevents the spread of disease, and makes the land more valuable. There is as much danger of over irrigation as of too little. I know of one company that employs a "water man," who assists and teaches a new comer in the method of irrigation. It is most peculiar also that quite a large percentage of these same people seek this advice, but act on their own judgment, and very often injure the growth of their orchards.

I am sorry to say that there are a few poorly irrigated districts, due to the fact of location. Some are in frost belts, and others have not the soil or water which is essential. However, there are not many of this class, but a prospective purchaser should look into all conditions very thoroughly.

I have often heard the statement made that the crops between the trees will pay for the land in two years. There are a few examples of this being done, but only under the most favorable conditions. A ten-acre tract planted with vegetables or small produce between the trees, and well taken care of, can surely pay the interest on the investment and give the owner a good

Water Flowing Through the Upper Tier of Sluices, Down-stream Side

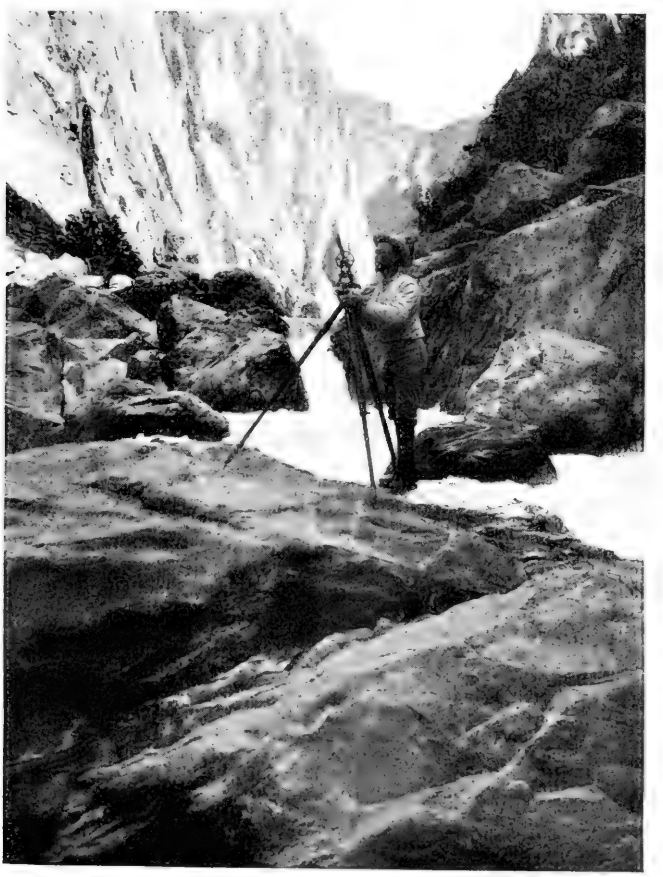
(Photo reproduced through courtesy of Bureau of Soils, U. S. Dept. of Agriculture)

Field of Irrigated String-beans, Sanford, Fla.

living the year round. It is unreasonable to expect more. Often times in the desire to reap large returns in crops between the trees, the trees themselves are neglected. I would not advise croping after the third year, unless it were for the purpose of a small family garden. Bearing fruit trees require all the nourishment the soil contains.

Other valleys may equal, or even surpass the districts above mentioned, but I am convinced that Wenatchee, Hood River, Yakima and Spokane Valley will always be in the front ranks, and when we think of the best apples grown, these places will naturally be called to mind, and they will certainly make a decided claim for the honor of being the districts where the best and highest priced apples are raised.

Our National Government has aided very materially in reclaiming the arid lands of the West, and if our legislators at Washington could see the direct results of the appropriations that have been made in the past few years to the United States Geological Survey, and the Bureau of Soils of the Agricultural Department, they would certainly be very liberal in their appropriations to these departments the coming year and thereafter.



Surveying in the Grand Canyon

FOREST PRESERVATION AND ELECTRIC DEVELOPMENT OF WATER POWER

By ALLEN HOLLIS

AN EMINENT North Country authority has declared that water was fit for but two uses—floating logs and turning mill wheels. Without assenting to this implied exclusion of the aesthetic notions of drinking and washing, we will now interest ourselves in the turning of mill wheels.

Our industrial development and economic welfare depend on heat, power, and light. Without these tangible expressions of energy, modern civilization were impossible. For centuries before the age of steam, power for mechanical uses was obtained from water; but heat and light have required fuel until the present era. The steam engine, operated from cheap coal, for a time lessened interest in water power; but increased cost of steam power, due to high cost of fuel and advanced wages, compels attention again to water power; and this finds a new field through electrical distribution.

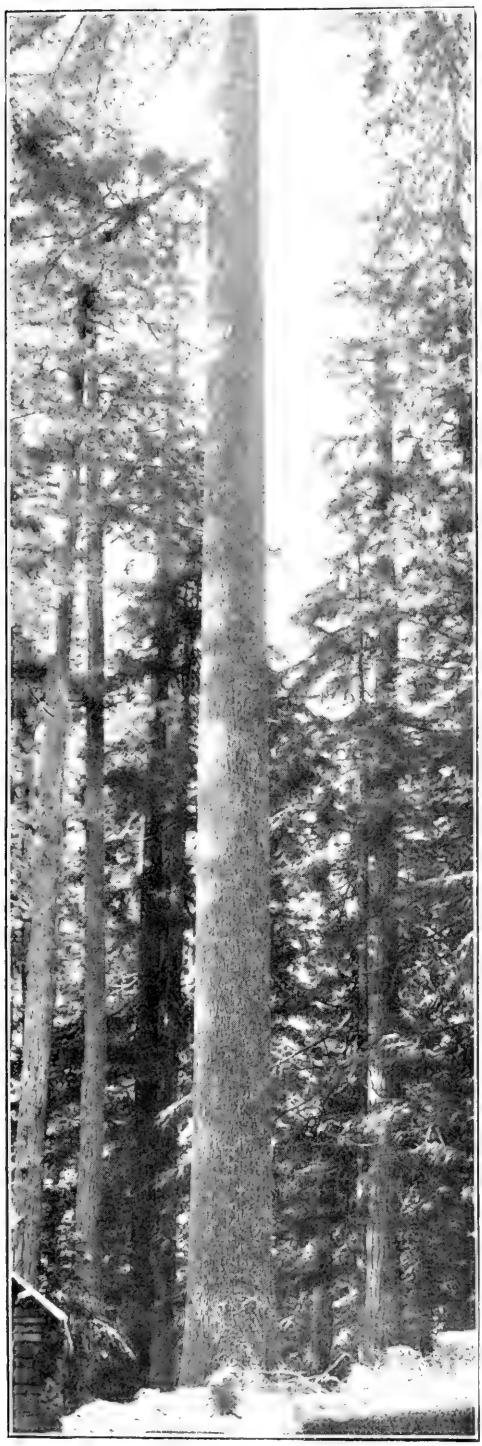
Assuming that fuel will ultimately become exhausted (an hypothesis which bids fair to become an early reality), the only recognied substitute is water power. Sun power is still in the clouds—in more senses than one. Mechanical power from water is most conveniently applied through electricity; while heat and light can be obtained from water power solely through this agency. Our ultimate economic salvation seems inevitably to depend on water-generated electric energy.

Mr. Pinchot, the modern Moses who leads us back to the wilderness, sketches this picture of conditions now imminent:

"Let us suppose a man in a Western town, in a region without coal, rising on a cold morning, a few years hence, when invention and enterprise have brought to pass the things which we can already foresee as coming in the application of electricity. He turns on the electric light made from water power; his breakfast is cooked on an electric stove heated by the power of the streams; his morning newspaper is printed on a press moved by electricity from the streams; he goes to his office in a trolley car moved by electricity from the same source. The desk upon which he writes his letters, the merchandise which he sells, the crops which he raises, will have been brought to him or will be taken from him in a freight car moved by electricity. His wife will run her sewing machine or her churn, and factories will turn their shafts and wheels by the same power."

Water power is the product of two factors, available head and supply of water. Roughly speaking, one cubic foot of water per second, falling ten feet, will produce one horse power; and in a year, ten hours a day, will do the work of five tons of coal or more, worth in this latitude twenty-five dollars. Operating twenty-four hours a day the same water power will equal twelve tons of coal, worth sixty dollars. Including labor and other costs, steam power, used ten hours a day, now costs over forty dollars per horse power under best conditions, and far more under usual conditions. As the price of fuel advances, the value of our unit of water power will correspondingly increase.

Electric energy can best be furnished from some general supply. The business is complicated and specialized, while the product can be used by the most inexperienced and careless. Apparatus for using electricity is well nigh fool proof.



View Showing the Clear Length of a Noble Fir

The demands on a central station, however, are most exacting. Service must be furnished every day and every hour. Factories must have a uniform supply. The demand of every customer must be met on the instant *without notice*. While a factory developing its own water power will adjust its business to bridge over low-water periods, the manufacturer who buys power forgets that such adjustments can be made.

These considerations bring us to a maxim in the electric supply business—the minimum capacity of the central station must equal the maximum demand of the service. No more regular business can be handled by a water power plant than can be supplied in times of lowest water. Unless auxiliary power is provided, the water wheel capacity is limited to this minimum flow; and the excess water above the minimum flow, amounting perhaps to eighty to ninety per cent. of the entire flow, is wasted.

The discrepancy between maximum and minimum stream flow is extraordinary. The Pemigewasset at Plymouth, representing a stream whose watershed is largely wooded, in a period of ten years showed a maximum flow of over 30,000 cubic feet per second (July, 1897); and a minimum of 120 cubic feet per second (September, 1899). There is no artificial storage on this stream. The minimum has fallen to 350 cubic feet per second every year for twenty years.

It is obvious then that any means by which the minimum flow can be preserved or increased is of vast importance to the water-driven electric plant

If the minimum flow is sufficient to furnish adequate power, the rates to consumers can be fixed at the lowest point. Whenever an auxiliary becomes necessary, even for use only a few days in the year, charges must be advanced to carry this additional investment. Interest and fixed charges are at least ten per cent. on the investment, an annual charge of $10 to $15 per horsepower.

The Sawkill Falls, near Milford, Pa. One of the Many Beautiful Views in the Vicinity of the Yale Summer School of Forestry

These conditions have been met in our state by two methods, artificial storage in ponds and auxiliary steam stations. Probably every lake in New Hampshire is controlled by a dam, which retains the excess water for use in dry times. Little more can be done in this direction, because of damage to shore property by flowage; but the possibilities of artificial reservoirs are large, and are yet little employed in this state.

It has been found economical in manufacturing plants to develop water powers to an extent which demands the use of steam auxiliaries during nine months in the year; but as the price of coal advances the operation of steam relays will become more and more costly. The inevitable exhaustion of fuel supplies will compel attention to storage reservoirs, natural and artificial. The wisest plan is to conserve our fuel by the immediate use of available water powers to the utmost, employing them in connection with artificial power in such proportions as will give us the largest supply of useful water power. Any such plan necessarily involves distribution by electricity.

While the matter of minimum flow is of most consequence, the correlative conditions of increased freshets and erosion of soil are troublesome. The former involves heavier expense in building dams and protective walls, while the latter requires the removal of sediment from mill ponds and from supply and discharg channels. A water plant in Concord has had its flumes one-half filled with silt in two years.

What has forest preservation to do with all this?

There are probably few interested persons who have not seen the summer flow of some small stream destroyed by removing the forest growth from its source. Trees, especially evergreens, provide a spongy soil for retaining moisture and dense shade for retarding evaporation of water and melting of snow and ice. We know that forest preservation tends to equalize the stream flow.

It is fortunate that forestry methods which will produce the best financial returns from timberlands are most effective in maintaining the water supply.

These suggestions apply with special significance to our own state and particularly to the White Mountain region, in which rise the Connecticut, the Merrimack, the Androscoggin and the Saco. Upon these streams and their tributaries are water powers capable of developing thousands of horse power now running to waste. Many of these are small, but to these the protection of the woodlands is of more relative importance than to the larger. Small powers can be used by those of comparatively slender resources, who would be financially unable to develop artificial storage basins in distant places; while the larger streams in most cases, particularly the Merrimack, are already provided with such facilities. The larger unused powers are principally located at a distance from centers of populations needing a supply of electricity; but $1,000 will build a mile of transmission line, which may be run hundreds of miles without prohibitive loss of energy.

The fact that these idle powers have remained unused, or if ever developed have been abandoned, indicates in most cases that they are not adapted or needed for manufacturing in that particular locality. This suggests at once the idea of transmitting the power to places where it may be needed—a miracle which can be performed only through the aid of electricity.

Instead of building cities in remote locations where the idle water powers are located, we will carry the power to our existing cities and towns which are now paying heavy tribute to the "barons" who own the coal fields and railroads.

So we find in this most practical subject an additional reason for urging forward a work the ultimate success of which depends upon securing the cooperation of every interest affected by forest destruction. I may safely promise some assistance to this end from the electric companies of New England.

THE CONSERVATION OF WORLD RESOURCES

To Be Discussed at The Hague by Representatives of the Leading Nations Next September—The Significance of Such a Conference, the Need for It, and Some of the Subjects with which It Will Probably Deal.

By TREADWELL CLEVELAND, Jr.

THE North American Conference on the Conservation of Natural Resources, which held its sessions in Washington, February 18 to 22, was remarkable principally for two results—the powerful stimulus which it gave to the conservation movement in the North American continent, and the significant and unexpected expansion of the movement to worldwide proportions. The delegates to the conference from Canada and Mexico entered heartily into the spirit of international cooperation, which was the direct object of the conference. They pledged the aid of their respective countries, concurring in the belief that all of the countries should profit by the results obtained by any one of them, and that certain problems could be most satisfactorily solved by united action. On the second day of the conference, the delegates of all three countries unanimously endorsed by resolution the proposal advanced by the President and defined in a statement by the Secretary of State, that there be held at The Hague, next September, a conference on the world resources and their conservation, to which the forty-five nations which participated in the last Peace Conference would be invited to send representatives. The proposal was incorporated in the Declaration of Principles signed by the Commissioners.

Those who heard the President's address of welcome realized that Mr. Roosevelt had struck a new note. His few words, carefully weighed and deliberately spoken, were pregnant with a political philosophy to which the nations are but now awakening, the philosophy that, broadly speaking, the nations must rise or fall together, and that therefore the highest aim of diplomacy is to secure not the conquest of rival powers, but the uplifting and development of neighbors bound together by common aims.

"The ablest man," said the President, "will do best where his neighbors also do well. It is just so with nations. * * * In international relations the great feature of the growth of the last century has been the gradual recognition of the fact that instead of its being normally the interest of one nation to see another depressed, it is normally the interest of each nation to see the others elevated. * * * This conference represents one of the many steps that have been taken in recent years looking toward a harmonious cooperation between the nations of the earth for the common advancement of all. * * * I believe that the movement that you this day initiate is one of the utmost importance to this hemisphere and may become of the utmost importance to the world at large."

The President then pointed out some of the advantages which the North American countries would gain in com-

mon by the study of the problems of conservation, suggested lines of investigation that could best be pursued in union, and cited international streams as an example of natural resources whose injury or wise use concerned the neighboring countries equally.

In the general session of the conference, which immediately ensued in the Diplomatic Room of the Department of State, the delegates again emphasized the fact that each of the three countries must inevitably profit by the work of the others in dealing with conservation problems. The wide scope of these problems was once more indicated, particularly by Mr. Sydney Fisher, Canadian Minister of Agriculture, who said that Canada hoped to see the conservation movement extended "not only to all North America but to all the civilized nations of the earth."

When, therefore, later in the same day, the proposal to call a general conference at The Hague was broached to the delegates, it found them fully prepared to endorse it. At the same time, the primary object of the North American Conference was kept clearly in view. It was the sense of the conference that the peculiarly close interrelationship of conservation problems in North America required that the integrity of the conference be preserved. Discussion brought out a remarkable unanimity as to general policies, and it was felt that practical results of great value to each of the three countries would be secured by a plan of permanent cooperation. The delegates accordingly set themselves to review the condition of the resources of our northern continent and to compare methods and results in their utilization, with a view to drawing up a general declaration of principles which should embody a policy of conservation to be followed by the three countries represented. This declaration, the direct, tangible fruit of the conference, was published in the March issue of this magazine, following the report of the proceedings.

The State Department, by means of an aide-memoire addressed early in the present year to the foreign governments which are to be invited to send representatives to The Hague Conference, has already received favorable replies. There is thus assured a full attendance from the leading nations, who for the first time in history will meet to take stock of the material wealth of the whole earth and to discuss the means of so using that wealth as to safeguard the material future of the race. The plan is colossal. It is charged with tremendous possibilities, moral and economic, of which only partial glimpses can be caught in advance. That it will go far to knit new bonds of interdependence and mutual understanding between the nations, and so aid in the maintenance of peace, is beyond reasonable doubt. It cannot fail to cement the nations closer than ever before through a fuller realization of their dependence upon a common basis of prosperity, the common heritage of the human race in the natural resources of the earth. The Hague Conference will throw into new relief a long obscured truth—that the debt to Nature makes the whole world kin.

What will be the matters taken up in this spirit at The Hague, and what practical results may be expected to follow the conference?

PROBLEMS FOR THE HAGUE CONFERENCE

1. *An Inventory of Resources.*

As the Secretary of State has already indicated in his statement concerning the North American Conference (p. 163), The Hague Conference "might well consider a general plan for an inventory of the natural resources of the world, and devising a uniform scheme for the expression of the results of such inventory, to the end that there may be a general understanding and appreciation of the world's supply of the material elements which underlie the development of civilization and the welfare of the peoples of the earth."

The great need of such a world inventory of resources is well illustrated

in the case of the forests. It is known, for example, that all Europe, as a unit, is an importer and not an exporter of timber, and that she is consequently making steady inroads upon the world's forest surplus; but it is not known what the world surplus of forest it. In other words, the nations face a future timber shortage, but do not know how soon it will come, and are therefore in the dark as to the action which is called for now to husband the present supply and provide for its renewal. The problem is fundamentally one of how much. Yet there are a number of countries of which the timber supplies and forest areas are practically unknown. In Conada, for example, the most widely differing estimates have been made of the forest resources; of the real character and extent of the Central and South American forests only fragmentary information exists; we do not accurately know at what rate the cut-over forests in the wood-exporting countries are restocking, while the various censuses which have been taken of our own remaining virgin forests do not agree. These facts only partially indicate our ignorance of the world situation in regard to forests products.

But not only are we ignorant as to the extent and value of existing forests and of their ability to bear the drains that are made upon them. We are handicapped in our calculations regarding the forests of foreign countries by the want of standardized statistical methods and interchangeable denominations. Thus, not only do we know very little of what we need to know of this great resource, but we are needlessly hampered in making use of what is known.

What is true of the forests is largely true of the other resources.

2. Recommendations.

Once more to quote the Secretary of State: "It would be appropriate also for the conference to consider the general phases of the correlated problems of checking and, when possible, repairing the injuries caused by the waste and destruction of natural resources and utilities, and make recommendations in the interest of their conservation, development, and replenishment."

A number of the older countries are rich in experience by which newer countries may well profit. Of all nations, Japan alone entered the modern industrial age with her forests improved, and not depleted, by centuries of use. The same nation has taken an advanced stand on the subject of land classification. In 1898 she appropriated some $13,000,000 for the classification of the land in the government forests alone. China, the "horrible example" among the nations in misuse of forest resources, has her lesson of warning to offer, to which she herself has now grown sensitive. Western Europe has many examples to show of both wise and wasteful development of resources. British India possesses an effective modern forest organization which holds many suggestions for our own country. Great Britain is at the moment considering the largest single afforestation project ever attempted, and her conditions of soil and climate are such that the experience of her European neighbors is a fair standard by which to predict the results which she may hope to secure.

With the lands, waters, and minerals the story is the same. Australia and New Zealand may have important lessons for us in their experience with their systems of land tenure. Most of Europe can teach us much in the intensive culture of soils. Switzerland, which has just amended her constitution so as to give the Federation supervision of the development of water power, occupies in respect to water resources a position in many ways not unlike our own. Few countries are so wasteful of the minerals in mining as is the United States, while in the safeguards which surround human life and health in the mines, in the factories, and in every day life, such nations as Germany can point to results which we have not begun to approach.

Such are but a few of the benefits which would accrue to the United States from a mastery of the lessons which the whole earth has to teach in the use of natural resources and the protection of life. And we should not be the sole gainers. We should be in a position to offer many useful suggestions and to furnish certain clear warnings from our own experience. Moreover, owing to the great extent and varied character of our resources the consumers of the whole world are interested in our commercial development, which is limited by the use that is made of our raw materials and our sources of power, while, conversely, our purchasing power in foreign markets will rise and fall with the national prosperity.

These and similar considerations apply also as between any one of the foreign nations and the rest. No single nation can afford to remain in ignorance of the experience of the others in the production of wealth from the riches of the land, and none, even if bent solely upon its own advantage, can reasonably or safely withhold from the rest the useful knowledge that it has.

There is every reason, therefore, why the combined wisdom of the nations in the economics of resources should be brought together, at The Hague, funded, formulated, and distributed for the good of all. The resulting recommendations may well lead to vast economies and perhaps even vaster developments in the future use of world resources. The treasures of the earth are a common store whose needless depletion works injury to all, and whose fullest use must augment the power and efficiency of the whole race.

3. *Economy of Effort and Outlay.*

In so large a field as the conservation of natural resources there is great risk of duplication of work. This risk could be removed by the action of The Hague Conference, to whose attention would be brought both the results already secured and the work under way in the several countries.

4. *Localization of Study.*

It is more than probable that certain classes of conservation problems can be studied best in one or two countries, even when their solution affects many or all countries. A better localization of study, which is closely allied to the prevention or duplication of effort, might well be a subject of discussion. In connection with subjects 3 and 4 there is indicated the possibility of cooperative agreements for the investigation, for common benefit, of problems in which several nations are equally interested.

5. *Compilation and Publication of Results.*

The results of investigations would be valuable in proportion as they would be accessible and uniformly expressed. One of the greatest services which The Hague Conference could perform would be to provide for a more satisfactory compilation and comparison of results and for their publication in easily available form, preferably in one language—French, for example, which is so admirably adapted for scientific exposition and is read by investigators in all countries.

6. *A Permanent International Bureau.*

All of the subjects above discussed, except the first and second, point to the need of a permanent international conservation bureau, without which it seems doubtful whether the legitimate objects of the conference could be fully secured. The International Bureau of Forest Experiment Stations is an example of such a bureau. This bureau has more than justified its existence, yet the problems with which it deals are far more closely related and more limited in scope than those embraced in the entire field of conservation. The considerations which led to its formation should weigh yet more decidedly in favor of a similar bureau charged with the collection and distribution of material dealing with the extent, condition, and use of the natural resources of the earth as a whole.

A WORD FROM MRS. WILLIAMS

MRS. LYDIA ADAMS-WILLIAMS, the writer and lecturer on conservation, and the first woman to take up this work, says:

"From time immemorial when any great work is to be accomplished—any achievement which vitally concerns the life and welfare of humanity, any uplift of the children of men in the home or in the broader field, the world—to woman's integrity, resourcefulness, genius, and capacity for endurance has the final triumph been due.

"To Isabella of Spain, to her intuitive grasp of a great idea, to her foresight and her divine sympathy the world is indebted for the discovery of a great continent, for the civilization we enjoy to-day and for the great wealth of resources, the development of which has made us the most powerful nation on the face of the earth.

"As it was the *intuitive foresight* of a *woman* which brought the light of civilization to a great continent, so, in large measure, will it fall to woman, in her power to educate public sentiment, to save from complete exhaustion the natural resources upon which depend the welfare of the home, the children and the children's children.

"Unless immediate, concerted and determined action be taken by the women, the forests will be gone and the water power with them; the mothers and housewives of the next generation who will have to depend upon electricity generated by water power for heating and lighting their homes, for cooking food and for other domestic purposes, as well as for transportation, will face a scarcity of natural resources and a monopoly of what remains which will threaten the comfort, the life, the very existence, even, of those they love and care for.

"Let all women throughout the country who have at heart the interest of the child and the economic welfare of the home and the homes that will be made by their children, immediately, before it is too late, use their utmost efforts to save the forests and to conserve the natural resources.

"Far-reaching results may be accomplished speedily by women educating the men of their families to work for conservation and to support those who favor it. Then by inculcating in their children the precepts of economy in relation to natural resources, and by impressing them with the unselfish aim and the patriotic duty of elevating the Nation to the highest plane of civilization, the motherhood of the country, in a single generation, may change the entire sentiment of the Nation, and convert this people from the most wasteful and extravagant in the world to the most prudent and conservative."

In our news columns may be found an interesting correspondence between Mrs. Williams and Mrs. Fairbanks, regarding the work of the Woman's National Rivers and Harbors Congress.

THE "DISMAL SCIENCE" DECADENT

By THOMAS ELMER WILL

IN HIS address at the annual meeting, Rev. Edward Everett Hale spoke of having, as a boy, studied Jean-Baptiste Say's Political Economy, "which was a science comparatively new then. It was called the 'dismal science,' and with very good reason, for the political economy of those days was founded on the Devil's philosophy, which is 'the Devil take the hindmost and everybody cut throats for himself.'"

One of the infallible dogmas of the "dismal science" was the doctrine of *laisser faire*. It rested on the assumption that the existing economic status, including private property in practically all land and tools, and the uncontrolled conduct of industry by private individuals for private profit, was divinely decreed, fixed and eternal; that the operations of such an economic system were regulated by "natural laws" as irrepealable as the laws which govern the motions of the planets, and that the outcome was a system of "economic harmonies" beautiful to contemplate and, like the Ark of the Covenant, sacredly to be guarded against the profane touch of man or government.

Archbishop Whately (quoted in Francis Bowen's Principles of Political Economy, 1863, pages 20-22) illustrates the automatic workings of this system in the feeding of a city like London. After explaining the perfection of the mechanism, he exclaims: "It is really wonderful to consider with what ease and regularity this important end is accomplished, day after day, and year after year, through the sagacity and vigilance of private interests operating on the numerous class of wholesale, and more especially retail, dealers. Each of these watches attentively the demands of his neighborhood, or of the market he frequents, for such commodities as he deals in. The apprehension, on the one hand, of not realizing all the profit he might, and on the other, of having his goods left on his hands,—these antagonist muscles regulate the extent of his dealings and the prices at which he buys and sells. An abundant supply causes him to lower his prices, and thus enables the public to enjoy that abundance; while *he* is guided only by the apprehension of being undersold. On the other hand, an actual or apprehended scarcity causes him to demand a higher price or to keep back his goods in expectation of a rise. Thus he cooperates, unknowingly, in conducting a system which no human wisdom directed to that end could have conducted so well,—the system by which this enormous population is fed from day to day.

"I say, 'no *human* wisdom'; for *wisdom* there surely is, in this adaptation of the means to the result actually produced. In this instance, there are the same marks of benevolent design which we are accustomed to admire in the anatomical structure of the human body. * * * The heavens do indeed 'declare the glory of God,' and the human body is fearfully and wonderfully made; but man, considered not merely as an organized being, but as a rational agent and as a member of society, is perhaps the most wonderfully contrived product of Divine wisdom that we have any knowledge of."

On this, Professor Bowen comments:

"It is on a large induction from such cases as this, that political economists rest their most comprehensive and most noted maxim—the *laisser-faire*, or 'let-alone' principle—the doctrine of non-interference by the government with the economical interests of society.

True, these interests are in the hands of individuals, who look only to their own immediate profit, and not to the public advantage, or to the distant future. They are not only selfish; they are often ignorant, short-sighted and unconscious of much of the work that they do. But society is a complex and delicate machine, the real Author and Governor of which is Divine. Men are often His agents, who do His work, and know it not. He turneth their selfishness to good; and ends which could not be accomplished by the greatest sagacity, the most enlightened and disinterested public spirit, and the most strenuous exertions of human legislators and governors, are effected directly and incessantly, even through the ignorance, the wilfulness and the avarice of men. Man cannot interfere with His work without marring it. * * * *Laisser-faire;* 'these things regulate themselves,' in common phrase; which means, of course, that God regulates them by His general laws, which always, in the long run, work to good. In these modern days, the ruler or governor who is most to be dreaded is, not the tyrant, but the busybody. Let the course of trade and the condition of society alone, is the best advice which can be given to the legislator, the projector and the reformer. Busy yourselves, if you must be busy, with *individual cases* of wrong, hardship, or suffering; but do not meddle with the general laws of the universe."

In the same vein, Say (Political Economy, page 88) says:

"The grand mischiefs of authoritative interference proceed not from occasional exceptions to established maxims, but from false ideas of the nature of things, and the false maxims built upon them. It is then that mischief is done by wholesale, and evil pursued upon system."

This, of course, is the doctrine on which Mr. Herbert Spencer earnestly insisted from the days of his Social Statics, in 1850, until his death. In the book named, for example, (page 334) we find him saying: "Political economy has shown us in this matter—what, indeed, it is its chief mission to show—that our wisest plan is to let things take their own course;" and, in his The Study of Sociology (page 21) he says: "The one thing needful is to maintain the conditions under which the natural actions have fair play."

Some of the saner writers, it is true, as John Stuart Mill, in Chap. XI. of his Political Economy, where he discusses "the grounds and limits of the *laisser-faire,* or non-interference principle," recognize the possibility of extending that principle much too far. Mill satisfied himself with maintaining that "laisser-faire is the general rule, but is liable to large exceptions." (Page 573.)

The striking politico-scientific and economic fact to-day is the number of exceptions which every advanced nation is finding. It is true, Mr. Spencer listed many of these, pilloried them as horrible examples, and pointed to them as evidences of "The coming slavery," "The sins of legislators," "The new Toryism" and "The great political superstition;" but society marches straight on and, long before his death, the great English philosopher was recognized as, sociologically, a "voice crying in the wilderness."

Speaking of Say's "Devil's philosophy," Doctor Hale says, "We have now gotten well beyond that." A striking example of the distance which we have actually gotten beyond it is found in the article by Mr. John Martin in *"The World's Work"* for September last, entitled "Our Government's Widespread Socialistic Activities." The editors explain that "Mr. Martin uses the word socialism in its broad sense to denote a wide range of activities beyond those that pertain to the individual." He begins with the statement that, "Democracy in this country has acted socialistically and communistically to a degree which few Americans realize." He then discusses "socialism for the farmer," "in reclamation work," "in the swamps," "in the forest," "in our colonies," "in the canal zone," "in the consular service," "in public utilities," and "in National legislation," and approaches his close with the following paragraph:

"So far are theory and action divorced, that we can picture a city alderman lauding private enterprise as the source of American greatness, and denouncing collective enterprise as impossible. And yet, he walks down a city street, which the city sweepers are cleaning and the city repairers improving, to the city subway by which he reaches his office in the City Hall. There he washes his hands in city water and runs the waste into a city sewer. He turns on the city electric light, and reads the mail which National departments have brought him from the ends of the earth. He glows with pride as he reads how gallantly his National army has subdued some Indians, and how cleverly his National navy has rounded Cape Horn. From his city newspaper, the *City Record,* he discovers that a meeting held the night before has decided to interfere socialistically with the outrageous capitalist management of the street cars. Before long, perhaps, his children come in from the city school, where they have had a school meal at cost price, to tell him that they are going to play that afternoon in the city playgrounds, and that his wife wishes him to call her up on the co-operative telephone to set an hour for their walk in the city park before taking the city ferry to the city swimming baths. They all want him to take them later to hear the city band, though the lads would prefer to put in an hour or two at the city gymnasium, and the girls at the city library," etc.

That Mr. Martin's closing pungent paragraphs are adapted from a similar statement made by Mr. Sidney Webb, some fifteen years ago, regarding British conditions, does not rob them of their interest and appositeness. The fact is that, while the civilized world is by no means ready to repudiate, *in toto,* the principle of private ownership of productive agencies, and reasonable freedom of individual initiative, it has long since made up its mind that the sacred principle of *laisser-faire* is more honored in the breach than in the observance; and that the constant study of the legislator must be to see that the strong, in pursuing their personal ends, do not trample the weak into the mire, and that private concerns and interests do not menace the public interests.

In his special message transmitting the report of the National Conservation Commission, President Roosevelt voices fundamental truths too easily lost sight of in the struggle for money. He says: "The function of our government is to ensure to all its citizens, now and hereafter, their rights to life, liberty, and the pursuit of happiness. * * * We should do all in our power to develop and protect individual liberty, individual initiative, but subject always to the need of preserving and promoting the general good. When necessary, the private right must yield, under due process of law and with proper compensation, to the welfare of the commonwealth * * * no man and no set of men should be allowed to play the game of competition with loaded dice. The unchecked existence of monopoly is incompatible with equality of opportunity. The reason for the exercise of government control over great monopolies is to equalize opportunity." The President names many of the policies mentioned by Mr. Martin: those relating to public lands, forests, reclamation, pure food, Panama Canal, holding the remaining supply of unappropriated coal, conserving resources, bettering of country life, improving waterways, protecting children from excessive toil and ensuring them educational opportunities, and the like; and declares that all these acts "fit in as parts of a consistent whole;" that they "are integral parts of the same attempt, the attempt to enthrone justice and righteousness, to secure freedom of opportunity to all of our citizens, now and hereafter, and to set the ultimate interest of all of us above the temporary interest of any individual, class or group."

These principles are unquestionably sound, and the science of economics or politics, however ancient or "classic," which cannot be made to square with them, must give place to one which will.

CHESTNUT TIMBER GOING TO WASTE

By ROBERT T. MORRIS

IN THE vicinity of New York a very large amount of valuable chestnut timber is now going to waste, and it seems to me that it would be worth the while of some lumbering concern to take charge of the situation. The chestnut blight, which has rapidly made its way from the South, reached this locality in serious form about three years ago. Practically the entire chestnut stand of Long Island is going under, and the magnitude of the loss does not seem to be comprehended. North of New York City, in Westchester County, and Connecticut, the blight was noticed as a menace two years ago. At that time eight or ten trees on my country place presented blight signs, and this last autumn many hundred trees were affected on my grounds. The chestnut forest in the vicinity of New York must be very valuable for somebody, although the area is so heavily timbered that there is little shortage of hardwoods. Consequently it is almost imposible to dispose of timber to local dealers excepting solid tracts, to be cut clean of all timber. Lumbermen accustomed to large operations do not realize that the deserted farms of New England have reverted to forest, and that there are wild deer within seventeen miles of New York City limits on two sides. Millions of feet of fine chestnut timber, valuable for planking, piles, telegraph poles, and cord wood, will be lost within the next two years. Right now the blighted trees are still good for cutting purposes. I tried to dispose of about 1,000 chestnut trees, but could not find a purchaser. All of my neighbors are in the same predicament. "No market," is the regular reply to all of my letters asking dealers if they want hardwood of any sort. Forty or fifty cords of hardwood were rotting on the ground last autumn because I could not find any one who wanted cord wood that had been split and stacked while clearing part of the property three years ago. I gave away twenty cords recently, but could not find any one who would haul the wood "on halves," leaving one cord at my woodpile for every cord that he would take for himself.

It is a pity now to see the magnificent chestnut forest going to ruin with blight, because there is so little market near New York for chestnut timber and lumber. There are plenty of fine, straight trees thirty or forty feet to the first limb, and measuring from two to three feet or more in diameter. These are to be lost so quickly that they will be gone before lumbermen realize that profits might be made by operating over a territory reaching in a circle of say fifty miles about this city, and shipping the products to regions where there is really a shortage of timber.

ARTICLES OF INCORPORATION AND BY-LAWS OF THE AMERICAN FORESTRY ASSOCIATION

ARTICLES OF INCORPORATION

WHEREAS, at a meeting of the American Forestry Association (a voluntary association organized in the city of Cincinnati and state of Ohio in 1882), duly called and held on the 20th day of December, A. D. 1892, it was

Resolved, That the resident members of the Executive Committee of this Association in the city of Washington, District of Columbia, be, and hereby are, constituted a committee with full power to take all action which they may consider necessary to become a body corporate under and by virtue of the acts of Congress relating to the District of Columbia in such case made and provided:

Now, therefore, by virtue of and in pursuance with the foregoing resolution and the action of said Committee, duly had in that behalf:

Know all men by these presents, That we, the undersigned, each of whom is over twenty-one years of age and a citizen of the United States, and a majority of whom are citizens of the District of Columbia, being desirous of associating ourselves and those associated with us as aforesaid, for the purpose of converting the American Forestry Association into a body corporate in accordance with the acts of Congress relating to the District of Columbia, in such cases made and provided, do hereby certify as follows:

First. The name or title by which this corporation shall be known in law shall be "The American Forestry Association."

Second. That the term for which it is organized is twenty (20) years.

Third. That the objects of the organization are the discussion of subjects relating to tree-planting, the conservation, management, and renewal of forests, and the climatic and other influences that affect their welfare; the collection of forest statistics, and the advancement of educational, legislative, or other measures tending to the promotion of these objects. It shall especially endeavor to centralize the work done and diffuse the knowledge gained.

Fourth. That the number of Directors of this organization for the first year shall be seven.

IN TESTIMONY WHEREOF, we have severally set our hands and seals this 25th day of January, 1897.

(Seal) EDWARD A. BOWERS,
(Seal) GARDINER G. HUBBARD,
(Seal) JOS. C. HORNBLOWER,
(Seal) BERNARD E. FERNOW
(Seal) NATHL. WILSON,
(Seal) GEO. P. WHITTLESEY,
(Seal) SAM. MADDOX.

District of Columbia, ss:

I, Frank D. Blackistone, a Notary Public in and for the District of Columbia, do hereby certify that on this 25th day of January, A. D. 1897, before me personally appeared Edward A. Bowers, Gardiner G. Hubbard, Joseph C. Hornblower, Bernard E. Fernow, Nathaniel Wilson, Geo. P. Whittlesey, and Samuel Maddox, to me personally well known and known to me to be the persons whose names are signed to the foregoing and annexed certificate of incorporation, and did severally acknowledge the same to be their act and deed, and that they and each of them executed the same for the purposes therein set forth.

IN TESTIMONY WHEREOF I have hereunto set my hand and affixed my official seal this 25th day of January, A. D. 1897.

(Seal) FRANK D. BLACKISTONE,
Notary Public for the District of Columbia.

BY-LAWS

(Revised January 14, 1909)

ARTICLE I

Name

The name of this Association shall be "The American Forestry Association."

ARTICLE II

Object

The object of the Association is to promote the preservation, by wise use, and the

extension of the forests of the United States; its means are agitation and education; it seeks to encourage the application of forestry by private owners to forest holdings large or small; and it favors, especially, the establishment and multiplication of National and state forests, to be administered in the highest interests of all.

Article III

Members and Dues

Section 1. Any person may become a member of this Association, as hereinafter provided.

Sec. 2. Members shall be divided into five classes: Patrons, Life Members, Sustaining Members, Annual Members, and Honorary Members.

Sec. 3. Any person contributing at one time the sum of one thousand dollars ($1,000) to the permanent fund of the Association shall be a Patron. Any person may become a Life Member by the payment of one hundred dollars ($100) at one time. Patrons and Life Members shall not be liable for annual dues. Sustaining Members shall be those who pay annual dues of twenty-five dollars ($25). Any forestry association or other organization approved by the Board of Directors may become a Sustaining Member. Annual Members are those who pay annual dues of two dollars ($2). Honorary Members shall be the officers of state, territorial, provincial, or other forestry associations, or the delegates from such associations, or the delegates of any government.

Sec. 4. Applications for membership shall be referred to and voted upon by the Board of Directors at any regular or called meeting therefor.

Sec. 5. All members except Honorary Members shall be members of this corporation and shall be entitled to vote and hold office in said corporation.

Sec. 6. Dues are payable when any member is elected, and for each succeeding calendar year on or prior to January 1st of said year.

Sec. 7. When any member is elected after October 1st of any year the dues then paid include those for the following calendar year.

Sec. 8. The Board of Directors shall have the power to remit the annual dues of any member.

Article IV

Officers

Section 1. The officers of this Association shall be a Board of Directors, a President, ten or more Vice-presidents at large, not exceeding twenty-one; a Vice-president from each affiliated organization, as hereinafter provided; a Treasurer, a Secretary, an Assistant Secretary, and two Auditors, neither of whom shall be otherwise officers of the Association.

Sec. 2. The Board of Directors, President, Vice-presidents at large, and Treasurer shall be elected by ballot at the Annual Meetings of this Association and shall serve one year, or until their successors are elected. Provided the full number of Vice-presidents are not so elected at the Annual Meetings, the vacancies so occurring in making up the full number authorized by these By-Laws may be filled as provided in Article V of these By-Laws. The Auditors shall also be elected by ballot at the Annual Meetings of the Association, as follows:

Two shall be elected at the Annual Meeting in January, 1909, one for a term of one year, and one for a term of two years; and after said meeting in 1909, one Auditor shall be elected for a term of two years in place of the one whose term is about to expire, said Auditors to hold their positions until others are elected to serve in their places. The duty of said Auditors to be to audit the books and accounts of the Association at least annually and at such other times as may be required by the Directors.

The Secretary and Assistant Secretary shall be elected by the Board of Directors at the first meeting following the Annual Meeting of the Association, to serve at the option of the Board.

Sec. 3. Any forestry or other organization which may become a Sustaining Member shall be entitled to delegate as advisors of this Association three of its members, one of whom shall be elected by the Board of Directors a Vice-president of the Association. The advisers so elected from the various organizations shall constitute the Advisory Board of this Association.

Article V

The Board of Directors

The Board of Directors shall consist of fifteen (15) members, of whom eight (8) shall constitute a quorum. It shall elect its own Chairman, and have the power to fill any vacancies in the offices of the Association, whether occurring from non-election at time provided in these By-Laws, or for any other cause, the one so elected to serve until the next Annual Meeting of the Association. The Board of Directors shall have the control and management of the affairs, funds, and property of the Association. It shall take, receive, hold and convey such real and personal estate as may become the property of the Association for the purposes of the Association set forth in the certificate of incorporation in Article II above. The Board shall meet at 4 p. m. on the day preceding that of the Annual Meeting of the Association; and the new Board, as soon as convenient thereafter. Also at such other times as may be determined by vote or as it may be called together by its chairman, or three members of the Board.

The Board of Directors shall designate seven of its members to act as an Executive Committee of the Association, to which Committee the Board shall from time to time entrust such duties as it will deem best in the interests of the Association.

ARTICLE VI

The President

The President shall preside at all meetings of the Association.

ARTICLE VII

Vice-presidents

In the absence of the President, a Vice-president shall preside at the meetings of the Association; and in the absence of all of them, a President *pro tem.* shall be elected by the meeting.

ARTICLE VIII

The Secretary

The Secretary shall keep a record of the proceedings of the Association and of the Board of Directors; shall have the custody of the corporate seal of the Association and of all documents, books, and collections ordered to be preserved; shall conduct the correspondence of the Association, and keep a list of members with their addresses, notify members of the time and place of all meetings, and shall perform such other duties as may be assigned him by the Board of Directors.

ARTICLE IX

The Treasurer

The Treasurer shall have the custody of all moneys received. He shall deposit and invest the same in such manner and to such extent as the Board of Directors shall direct, and shall not expend any money except under the direction or approval of the Board of Directors. The financial year of the Association shall close on December 31st of each year.

ARTICLE X

Meetings

Section 1. The Annual Meeting for the election of officers and the transaction of such business as requires to come before the entire Association shall be held on the second Wednesday in January, at such hour and place as the Board of Directors may determine, unless some other day in January be selected by the Board of Directors, in which case at least three weeks' notice must be given.

Sec. 2. A quorum shall consist of thirty (30) members of the Association (Patrons, Life Members or Annual Members), as specified in Section 5 of Article III.

Sec. 3. Special meetings may be called by the Board of Directors. The Secretary shall give to all members at least seven days' notice of all meetings.

ARTICLE XI

Amendments

These By-Laws may be amended by a three-fourths vote of the members present and entitled to vote at the Annual Meeting of the Association.

THE FIRST TREE

By HAZEL ALMA BANKS PIERCE

THE first tree stood forth. And it was day. The great trunk pillared heaven; its heavy, perfumed branches dragged low from the clouds in wreaths of sounding leaves; leaves of shadows and shimmering color, crystal, parchment, or thin-veined copper, glinting fire of emeralds.

And all the trees that were to live stood back in silent mist.

Like darting lights the gay winged birds flew glad about the tree, but gave no song, and their whirring wings brought all the stillness closer.

The day slumbered softly in the sun, save where some insect wound its way with cobweb wings over the tall noon grasses.

In the dusk-blown twilight the drowsy day still dreamed, while a breeze sang sweetly about the tree; a frail wind trailing over tangling buds of water-lilies and evening violets cold in cupped dew.

And night came with a moon of roses. Aimless fireflies and quaint glow-worms spun zig zag paths of color for the dim moth, the tardy beetle and a multitude of shadowy wings.

And the tree stood alone in a fragrant world.
And God said, "It is good."

EDITORIAL

Defeat of Appalachian Legislation—A National Loss

IN CONSERVATION for March appeared a news item announcing the defeat of Appalachian legislation by the Sixtieth Congress. To readers of this publication such announcements will, by this time, have lost the charm of novelty. Nevertheless, they must be recorded.

In this connection it should be said that the misfortune accompanying the defeat of this legislation falls not simply upon the region in which the mountains in question are located. It falls as well upon the country at large. The question of forests, water-powers, soil-preservation, stream-utilization, and resource-conservation in general is no more a question for a New Hampshire or a North Carolina alone than it is alone for this farmer, that mill-owner, or the other steamboat company. In the century-old discussion of protective tariff the Nation has become familiarized with the phrases, "our industries," "our labor," "our exports," "our imports," "our National prosperity," and the like. We have ceased to look upon the Nation as a mere aggregation of states, individuals, or interests. We have learned to take, at least a part of the time, the National view. We have come, in increasing measure, to recognize the Nation as a unit, an entity, economic and social, no one portion of which can suffer without detriment to all sections. The doctrine which Paul, 2,000 years ago, applied to the Church applies absolutely to the Nation: one member cannot suffer without all other members suffering with it.

One of the few blessings accompanying the unspeakable calamity of war lies in the fact that war compels a people to recognize this principle. A great conflict between nations becomes a test of strength and endurance. Resources of every kind, animate and inanimate, are called into requisition for defense and offense. At such times it becomes evident to the veriest clown that the vital question regarding a public resource is not the geographical one of its location in this, that, or the other section of the country, but the practical one of its actual availability for a public need. If, in the midst of a great struggle in which the Nation's life and freedom were trembling in the balance, an individual or corporation were found destroying stores or resources needful for the public defense, a universal cry would be raised for the prompt application of adequate protective measures. People would talk of the need of protecting "our woods," "our water-powers," "our coal and iron," and what-not; and whoever dared then to oppose such a policy would be regarded as little better than a public enemy.

Happily, we are not engaged in war; nevertheless, in what fundamental respect does a nation's situation as regards its resources differ in time of peace from its situation in time of war? While nations compete in industry, as when they compete in war, victory, in the long run, will lie with the strongest. And strength lies in resources, material and human. What industrial standing has a nation whose natural wealth is wasted and whose population is depleted? We have recently been reminded of Asia Minor, once capable of producing a Crœsus, the typical multi-millionaire of antiquity. Yet Asia Minor, with her resources long since looted and dissipated, now lies prostrate and helpless. Who, to-day, thinks of her as a competitor for world markets. Who thinks of industrial or commercial competition coming from Mesopotamia? Yet this valley was the seat of ancient empires. But here

again, as in Asia Minor, the natural resources have largely been destroyed.

Again, blessed as is peace, and ever to be desired and sought, what guarantee have we that the United States is permanently immune from war? Not long since, our armada encircled the globe, and hints have been dropped from high quarters that there was method in this apparent madness. At least one public man of ability, character, and standing, with a vehemence and zeal comparable with that of Demosthenes when he urged the Athenians to guard themselves against the designs of Philip of Macedon, traverses the country warning the American people against a condition which, after profound and detailed study, is manifestly, in his judgment, a menace to the United States. He, at least, is convinced, as was Demosthenes, that a foreign power has for years been plotting hostilities against this country. Furthermore, he assures his audiences that high authorities, unable to say so publicly, agree with him perfectly.

As to whether or not such a danger exists, this publication has no adequate knowledge and, therefore, no opinion to express. It is, however, prepared to propound a question:

Suppose a foreign power, or a combination of such powers, should attack the United States. Would it then be a matter of indifference to the Government at Washington, either legislative or executive, that our forests had been cut and burned away, and our resources in general ravished and despoiled in the manner already familiar to our readers? Would any one then raise the question whether supplies needful for the National safety were located in New England or the South, whether they were connected with the navigability of rivers, whether the attempt to save them might involve the stretching of constitutional powers or the spending of more money than was at first estimated? Instead, every rational reader knows that all such subterfuges and petty excuses would be swept aside like chaff; and, with them, if necessary, the statesmen hiding behind them. In tones which none would dare ignore, the Nation would demand the opportunity to avail itself of its full strength; and that demand would be heeded.

And if it be necessary, in the face of actual war, to conserve the Nation's sources of strength, why should it not, while time and opportunity still remain, likewise be necessary in the face of possible war? And if it be necessary for purposes of war, why should it not be necessary for purposes of peace?

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Do They Represent the West?

IT IS noteworthy that the Appalachian bill was struck down in the Senate by the action of certain Rocky Mountain senators, notably Messrs. Teller and Heyburn. The questions naturally arise: Do these men represent the sentiment of the West? Shall we say that the Eastern forests bill was killed by the West? If so, what do we mean by the West? The territory west of the Mississippi, or of the Missouri, or of the Rocky Mountains, or that included in the Rocky Mountain states, or in certain of those states only?

Friends of Appalachian legislation vividly remember the aid extended by the East to the enactment of the Reclamation law, and are inclined to wonder whether the West, as such, is disposed to repay good with evil. The writer inclines strongly to the belief that the senators in question represent in no sense the whole West, no considerable section of the West, nor perhaps even the sentiment of the majority of the people in their own states. He notes the fact that one of the two senators named was, at the very moment he was slaughtering the Appalachian bill, ending his own career in the Senate. The other senator named had, it is true, just been re-elected; nevertheless, Forester Pinchot, it is credibly reported, not long since delivered an address on forestry in that very senator's town, and was applauded to the echo.

For the sake of the West, and of mutual good feeling between the sec-

tions, it is hoped that evidence will multiply still further justifying the opinion that the West, as such, does not sustain the reactionary attitude of the senators who have thus again blocked the passage of Appalachian legislation.

The Forest Service in Congress

READERS of CONSERVATION will be gratified to learn that the appropriation to the Forest Service for next year is greater, by $750,000, than that of last year. A still greater increase would have meant a National economy; nevertheless, the fact that no ground was lost and that substantial gains were made affords cause for congratulation.

As was to be expected, the annual onslaught upon the Service by a few representatives and senators from mountain states occurred in due course. The remarks of Representative Mondell, of Wyoming, which received little consideration in Washington, and were presumably designed chiefly for home consumption, were typical, and notable chiefly for the variety and picturesqueness of their inaccuracies. His charge that the Service is wantonly extravagant is easily met by the facts; while his assertion that "the effort of the Forest Bureau is to grind every dollar it can out of the people of the West" is a characteristic product of "economic determinism." As Mr. Weeks pointed out, and as Mr. Shinn elaborates in his article in the current issue of CONSERVATION, some people living on or near the public domain have so long been accustomed to treating it as their private property, or as common, not to the whole people, but only to those living in the vicinity, that the assertion of National right in a National asset inevitably created friction.

That the ammunition of the critics is running low may be inferred from Senator Heyburn's charge that the Forest Service people have descended to the robbing of squirrels' nests to obtain pine-nuts. The senator mentions this as "an instance of the petty, trivial, mean way in which they are doing in this Service." "The poor squirrels," we are told, "gather the nuts, with the wing on the nut, take them into their nests in the fall at their leisure, take out the pine nuts and use the wing for nests." This practise Senator Heyburn denounces as "cruel," and intimates that if a boy should do such a thing, he would deserve to be "thrashed."

It is conceded that the Forester does avail himself of the labor of squirrels in the gathering of pine-nuts; it seems, furthermore, that this "private property" is "taken for public use without just compensation;" it would appear, therefore, that the senator, being a lawyer, might bring action against the Service for violation of Article 5 of the Amendments to the Constitution of the United States and such legislation as has been based upon it.

When George Stephenson, the improver of the locomotive, was asked what would happen if a cow got in front of his engine, he declared that "it would be hard on the coo." In like manner, it must be conceded that the above-mentioned practise of the Forest Service is a little hard on the squirrels: nevertheless, should these interesting denizens of the forest appear, whether through Senator Heyburn as counsel, or otherwise, as complainants, it should not be overlooked that "there are others." For some ages past mankind has resorted to practises analagous to, if not identical with those criticised. Senator Dolliver suggested that honeybees were subjected to similar treatment. In like manner, it should be noted, man has for some time resorted to cows and goats for milk, and to sheep for wool; he has not hesitated to avail himself of the labor of the ox and horse, and he has even been known to consume the flesh of the lower animals, including squirrels, to appease his hunger. In mentioning the above, full credit is given to the magnificent work which such bodies as the Society for the Prevention of Cruelty to Animals are doing; nevertheless, when it

is remembered that men in Senator Heyburn's section have, in cases, been suspected of helping themselves, by questionable means, to public lands, including the metals and mineral under the surface of the lands, the forests growing upon them, and even the squirrels themselves which gambol in the branches of those forests, it would seem that, for a charge preferred upon the floor of the Senate of the United States, the one under consideration is somewhat lacking in dignity and weight.

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Public Advantage from Reclamation

IN A news item in this issue appears a statement regarding the progress of the work of draining the Florida Everglades. Lands hitherto valueless are being redeemed. We are informed that a vigorous demand has already sprung up for these lands, and the state could easily dispose of every acre of them. It is recognized, however, that, with the progress of the drainage, the value of the lands will steadily enhance until, by the completion of the work, they will attain such figures as are obtained for the rich coal lands of the western states. This region, it is expected, will be converted from a habitation of Seminoles and crocodiles into a home area for thousands of prosperous and contented farmers.

Next follows a still more interesting statement. We are told that, instead of converting all these lands into private ownership, the Drainage Board has wisely *reserved each alternate section,* from which the state will, in time, reap a substantial reward in the great enhancement of value which is certain to follow the success of the reclamation project.

As is well known, numerous western states, in converting public into privately owned lands, reserved one section in each township for public-school use. Some of the younger states went further and reserved two sections in each township. One of these school sections lies in the heart of the city of Chicago; it is still public property, and the land is now enormously valuable. Had the school sections been generally retained by public authority and properly administered they would, in numerous instances, have proved gold mines for the promotion of public education, instead of, as was frequently the case, for the multiplication of "swollen fortunes."

A valued correspondent calls attention to the principle of the Revolving Fund, in accordance with which public moneys, appropriated for improvement purposes, do not inure wholly or primarily to private advantage, but are recouped from the proceeds of the improvements, and made available for repeated uses. For example, the fund used by the Reclamation Service, beginning with a little more than $3,000,000, and amounting now to above $51,000,000, is a permanent fund. The Government uses it to reclaim an arid or semi-arid region, receives back from the users of the irrigated lands the equivalent of the funds actually used in reclamation work, and is thus in position to irrigate still other lands; so to continue, personally, *ad infinitum,* until there shall remain no other desert worlds to conquer.

The same principle has been introduced into one, at least, of the bills before Congress for the drainage of swamps. Its workings in the case of the Reclamation Service are admirable. In the case of a great National drainage service there is excellent reason to believe the principle would work equally well.

Why, now, is not this principle susceptible of much wider application? It is conceded that certain great public improvements, if effected at all, must be initiated, carried through and paid for by the public. On what ground or principle can we justify a policy which then transfers the sole or chief benefit of such improvements to private individuals and corporations? If individuals are to enjoy the proceeds, why should they not bear the burdens? If, on the other hand, the public must do the work and pay the bill, should it not

at least share substantially in the fruits? The revolving fund, on the one hand, and the publicly reserved, alternate sections in the Everglades on the other, are well worthy of careful consideration.

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The North American Conservation Conference

IN CONSERVATION for March appeared the report of the North American Conservation Conference at Washington, participated in by Canada, Newfoundland, Mexico, and the United States. The proceedings of this, the first body of its kind in history, were harmonious, and marked by wonderful unanimity. This fact affords added ground for faith in the encouraging declaration of Senator Smoot that the success of the conservation movement is now assured; that the people who formerly called the leaders dreamers have seen a new light, and are now firm believers in the absolute necessity of saving the woods and waters.

True, the Congress of the United States does not appear, as yet, to be fully in sympathy with the movement. This is indicated by its failure, a year ago, to create a conservation commission, by the declarations of Senator Newlands at the recent conference that the legislative branch of the Government had not done so much for conservation as it should have done, and that there seemed to be a feeling in Congress that commissions are, in some way, trying to usurp the functions of Congress; by the failure of Congress in its last session to provide funds for the National Conservation Commission, and by its disallowance of the performance of such work by existing Government employees on Government time. Nevertheless, ways will be found for prosecuting the work. The Congressional inhibition does not apply to the governors of the states; and to these, it is understood, the commission will have to look, for the present at least.

For those who believe that the chief function of government is to promote the public good, and make the world more habitable, and life, for the average citizen, better worth living, there is much ground for congratulation in the broad character of the principles enunciated by the conference which met at Washington on February 18-20 last. As has so often occurred in historical crises, human rights were again asserted, and were traced back to their source, behind governments, laws, and constitutions, to Nature itself. The commissioners declare: "We agree that these resources should be developed, used, and conserved for the future, in the interests of mankind, whose rights and duties to guard and control the natural sources of life and welfare are inherent, perpetual, and indefeasible."

Strong ground is taken against monopoly. The commissioners assert: "We agree that those resources which are necessaries of life should be regarded as public utilities; that their ownership entails specific duties to the public, and that as far as possible effective measures should be adopted to guard against monopoly." "We regard the monopoly of waters, and especially the monopoly of water-power, as peculiarly threatening. No rights to the use of water-powers in streams should hereafter be granted in perpetuity," etc. "In the interest of the homemaker, we favor regulation of grazing on public land, the disposal of public lands to actual settlers in areas each sufficient to support a family, and the subdivision of excessive holdings of agricultural or grazing land, thereby preventing monopoly." Speaking of mineral fuels, the commissioners recommend that "Such fuels should hereafter be disposed of by lease under such restrictions or regulations as will prevent waste and monopolistic or speculative holdings, and supply the public at reasonable prices." Of mineral fertilizers, they say: "Mineral fertilizers should not be monopolized by private interests, but should be so controlled by public authority as to prevent waste and to promote their production in such quantity and at such price as to make them readily available for use."

The governmental right to protect the public against extortionate charges

is asserted. In the paragraph on waterways we read: "The public authority should retain the right to readjust at stated periods the compensation to the public and to regulate the rates charged, to the end that undue profit or extortion may be prevented." The same idea appears in the paragraph on minerals above quoted, where provisions are recommended whereby the public may be supplied at "reasonable prices."

Public participation in enterprises of public interest is advocated. In discussing waters the commissioners say: "We therefore favor the participation of the public to secure the complete and economical development and use of all water available for irrigation and of all lands susceptible of profitable drainage, in order to ensure the widest possible benefit."

In sections of the mountain states, the question of Government regulation of grazing on public lands is a burning issue. The commissioners, however, as noted, unequivocally declare for it, "in the interest of the homemaker."

Public control of resources needful for the public good is repeatedly advocated; implicitly in the paragraph on forests which reads: "We agree that the ownership of forest lands, either at the headwaters of streams or upon areas better suited for forest growth than for other purposes, entails duties to the public, and that such lands should be protected with equal effectiveness, whether under public or private ownership."

The recommendation is made explicitly in the following instances: "We further express our belief that all waterways so developed should be retained under exclusive public ownership and control;" "In the matter of irrigation public authority should control the headwaters;" "We * * * favor Government control of such lands (non-irrigable public lands too dry for cultivation) in order to restore their value, promote settlement, and increase the public resources;" "Mineral fertilizers should not be monopolized by private interests, but should be so controlled by public authority as to prevent waste and to promote their production in such quantity and at such prices as to make them readily available for use."

In discussing waters, the commissioners express themselves as follows: "We therefore favor the development of inland navigation under general plans adapted to secure the uniform progress of the work and the fullest use of the streams for all purposes. We further express our belief that all waterways so developed should be retained under exclusive public ownership and control." Nor are they willing that private property rights shall stand in the way of such a policy, for under the same head they advise that "Where the construction of works to utilize water has been authorized by public authority and such utilization is necessary for the public welfare, provision should be made for the expropriation of any privately-owned land and water rights required for such construction."

Such declarations from such a source and such a vantage ground cannot fail to be heard. Furthermore, so transparent is their equity and so pressing is the need for the steps indicated, that, being heard, such proposals must, sooner or later, be heeded.

Conservation of the Resources of the Planet

MARK the sweep of the conservation movement! First, we have had forestry on a small, and then on a gradually enlarging scale. Next came the movement to conserve the resources of the United States. In less than a year this developed into an effort to conserve the resources of North America; and now, growing directly out of this latter movement, comes the dramatic proposal to convene a conference to promote the conservation of the resources of the World.

This World-Conference, it is proposed, shall meet next September at The Hague, the headquarters of international gatherings.

The initiation of this movement came from President Roosevelt. Secretary

Root stated to the North American Conference that the President foresaw the possibility that that conference would be the precursor of a World-Conference, and that, by an aide-memoire in January last, the principal governments were informally sounded as to whether they would look with favor upon an invitation to send delegates to such a conference. Responses were uniformly favorable. Following upon this came the proposal from the North American Conference that such a gathering be held. In view of the progress already made, it is conceded that the conference will be held at the time and place named. In his valuable article in this issue, continuing the one from his pen in the last, Mr. Treadwell Cleveland, Jr., of the Forest Service, discusses this conference, and formulates the problems which may be expected to confront it.

As the Secretary of State points out, the object of the conference might well be to plan an "inventory of the natural resources of the world, and to devise a uniform scheme for the expression of the results of such inventory, to the end that there may be a general understanding and appreciation of the world's supply of material elements which underlie the development of civilization and the welfare of the earth."

In view of facts now common knowledge regarding the destruction of natural resources in the Old World and the New, the propriety and desirability of such a conference should be clear. As was stated in the preliminary aide-memoire, "The people of the whole world are interested in the natural resources of the whole world, benefited by their conservation, and injured by their destruction." It is upon these resources that the human race, for whatever progress and prosperity it may in future enjoy, must, so far as can be anticipated, rely to the end of time. And so powerful has become the enginery of modern industrial civilization, and so gigantic and rapid the consumption and waste of the earth's stock of raw materials, that, unless measures are promptly taken to safeguard the residue, race well-being, to the remotest future time, may, in a brief, historic period, be seriously handicapped.

The present age demands facts. If William the Conqueror was justified in bringing together the materials which make up the famous Domesday Book, and if the United States Census policy of continually broadening the scope of our decennial inquiry is wise, why should it not be wise to enable the world to know the size of its bank account, as represented by its natural resources? There seems to be but one way to ascertain the facts—namely, by concerted action, such as an international conference implies. Again, there is but one way to make the results of such an inquiry available—namely, by "devising a uniform scheme for the expression" of these results, and then their publication.

Such material, it is true, may be utilized by special interests, as speculators; yet, while such interests exist, this result cannot well be avoided. The data will also be widely used by economists, and especially, it is fair to assume, by representatives of governments in the formulation and administration of national policies.

Even larger results may be expected to follow. Through the invention and improvement of agencies of transportation, communication, and the diffusion of knowledge, the world is fast becoming one great neighborhood. The broad doctrine enunciated by the President, so contrary to the old-time, national particularism and exclusiveness in accordance with which each nation was prone to think of its own gain as directly proportional to the losses of its neighbors—the doctrine that the nations must rise or fall together, that each is part and parcel of one common whole, that the social organism extends beyond national lines and includes the race—such a doctrine must receive renewed emphasis at every delegated meeting of the nations of the world such as it may be hoped will follow from the one of next September. As a means of promoting international peace,

such a movement should compare favorably in importance with the Peace Conferences already held at The Hague. And with peace, inter-communication, the fuller acquaintance following from comparison of views at short range and the realization that the aims of all nations, as of all individuals, are substantially identical, there must necessarily follow a closer knitting of the bonds of international fraternity and a hastening of the realization of the poet's dream of

"The parliament of man,
The federation of the world."

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Private "Rights" in Public Lands

THE familiar controversy in the public land states over the gradual attempts of the National Government to resume its rights in the public lands suggests another of the parallels with which history abounds. The most striking, perhaps, is that between our own case and that of Rome. Like the United States, Rome held at times vast areas of public lands. Like ourselves, again, she was exceedingly careless in the administration of these properties, and allowed them to drift, in vast areas, into the hands of private citizens. Where, with us, these public beneficiaries are frequently great cattlemen, sheepmen, lumbermen, and the like; with the Romans, they were the great nobles and capitalists. As with us, grazing among the Romans, by 200 B. C., had become a vast and highly profitable industry. Much of the rural population had been destroyed by Hannibal. Much of what remained was evicted, as in the sheep-grazing days of the English Tudors, that farming districts might be converted into pasture lands where cattle were tended by slaves. Rome's administration was, apparently, an improvement upon ours in one respect; she at least pretended to charge these occupants a tithe of the produce as a rental. In the collection of this, however, she was extremely lax, and occupants nominally tenants-at-will treated the lands as their private property, even to the extent of selling them.

As population increased, evictions multiplied, and the numbers of landless proletarians became congested in the capital, the necessity became obvious for making the public lands available for such, and thus transforming men, otherwise beggars and disturbers of the social order, into self-supporting, self-respecting heads of families.

From time to time, therefore, attempts were made on the part of the state to resume, in part, its rights in the public lands. Such attempts, however, were resisted by the aristocratic occupants of those lands, even to the point of bloodshed.

The struggle over the public lands began early. About twenty-four years after the expulsion of Tarquinius Superbus, the consul, Spurius Cassius, attempted, by means of a so-called "agrarian law," to make a portion of the public lands available to citizens, and to compel the occupants of other public lands to pay their rents to the government. The attempt, however, was frustrated by the aristocracy, and Cassius, on his retirement from office, was accused of attempting to make himself king. He was condemned, scourged, and beheaded, and his house destroyed. In 367 B. C., the tribune, Licinius Stolo, secured the enactment of an agrarian law entitling each citizen to occupy not more than 500 jugera (250 acres) of state lands, and to pasture stock upon the public pasture lands.

By 133, when Tiberius Gracchus was elected tribune, this law had fallen into desuetude. The state, meanwhile, had acquired vast tracts of land; but these had passed not to the needy poor, in accordance with the Licinian law, but to the aristocracy of birth and wealth. Tiberius proposed that every father of a family might occupy 500 jugera of state lands for himself, and that each of his sons might have 250 jugera, the total for one family not to exceed 1,000 jugera; while all holdings in excess of these figures should be resumed by the state, with payment to occupants for improvements made by them. Tiberius

forced this measure through, but paid for so doing with his life. His brother Caius, later elected tribune, attempted to enforce the above "Sempronian" law, but, for so doing, was compelled to pay the same penalty as his brother.

In the light of such history, with other that might be cited, including the enclosure of the commons in England in the sixteenth century, we may understand that the private appropriation, or occupancy without leave, of public lands in the United States is no new phenomenon. However, we may feel encouraged that opponents of the Government's attempts to reassert its right in these lands, instead of executing its officials for treason, or beating them to death with fragments of broken benches, after the good old Roman fashion, merely consume time and breath in criticising them for robbing squirrels' nests.

The Fight Just Begun

WHEN John Paul Jones, in battle with the Serapis, was asked whether he had "struck his colors," his reply was, "I have just begun to fight." This laconic declaration represents the viewpoint of the friends of Appalachian legislation. There are victories, such as was that of Pyrrhus, which presage defeat; and defeats, such as those encountered by George Washington in the American Revolution, which are merely milestones on the pathway to ultimate, permanent victory. A good cause may be obstructed and its triumph delayed by hostile tactics, but its final victory is sure. The proverb that "No question is ever settled until it is settled right" is to-day accepted as true by an ever-increasing multitude. For many years American abolitionists led an apparently forlorn hope. A former president of the United States, day by day and year by year, presented, in the House of Representatives, petitions innumerable favoring limitation or abolition of human slavery, only to have them uniformly laid, first on and, later, under the table. Yet slavery was even then dying, and its disappearance is to-day approved by the descendants of those who were once its champions.

The persistency with which Appalachian legislation is opposed by a few, first in one house and then in the other, will but give zest to the fight, and will add strength to the arms of those who are convinced of its righteousness and resolved on its triumph. So absolute is the commitment of The American Forestry Association to this cause, and so fully convinced is this organization of the wisdom and necessity of this legislation, that its own course is predetermined beyond question. Like Nelson, in Trafalgar Bay, it recognizes that its membership and friends "expect every man" connected with its affairs "to do his duty."

It is not too soon to begin preparations for the next campaign. Now, in the interval which must elapse before the measure can again be presented in Congress, let the lines of battle be reformed, let the munitions of war be replenished and the organization strengthened and perfected for the renewal of the struggle. The resources of the United States must be conserved; National action to this end, including Congressional legislation, is essential; obstruction and dilatory tactics must be met; the people must be aroused still further and their demands focused more perfectly upon Congress, and the battle must be led by those already informed and aroused and pledged to this cause. No leader in thought and opinion for a moment counsels abandonment of the fight; instead, as in the Sinaitic wilderness of old, the cry again rings forth, "Speak to the people, that they go forward!"

NEWS AND NOTES

Wisconsin Gets Forest Laboratory

The Government's new forest products' laboratory will be located at the University of Wisconsin, at Madison. In naming Wisconsin, Gifford Pinchot, Chief of the United States Forest Service, said: "I have had few decisions to make which were so difficult or which have had such prolonged and careful consideration as the decision as to which of the offers for cooperation in establishing and maintaining a forest products laboratory I should recommend for acceptance by the Secretary of Agriculture."

The establishment of the laboratory means the concentration of all lines of the experimental investigations of the Government looking to closer and better utilization of timber and the checking of wood-waste. Forest Service laboratories for timber-test work at Yale and Purdue universities and the Government's wood-pulp and wood-chemistry laboratory in Washington will be consolidated and transferred to Madison as soon as practicable. A force of fifteen to twenty timber-test engineers, experts in wood preservation, wood-pulp manufacture, and wood distillation, will have charge of the work carried on. The laboratory will have an equipment valued at not less than $15,000. The university will furnish the building, light, heat and power, and in return advanced students will have the use of the laboratory for special work in related lines.

Roads for National Forests

The Office of Public Roads of the Department of Agriculture is to cooperate with the Forest Service in drawing up plans for comprehensive systems of roads and trails on National Forests.

For the last two years Congress has provided funds for permanent improvements on National Forests, and a large part of the money thus made available has been and is being used for road and trail building. The amount is too small, however, in comparison with the total area of the forests, to make possible more than a very small beginning.

During the present summer an engineer of the Office of Roads will go over the ground on several of the Forests, and draw up plans which will be submitted to the Forester, and will serve to guide subsequent work. Where the roads planned for cannot be built, trails will, so far as possible, be made to follow the courses laid out, with the expectation that later they will be converted into roads.

The roads, trails, telephone lines, and fire lines already constructed on National Forests are proving of great value both in the work of fire protection and in serving the convenience of the public.

English Forest and Land Policy

After neglecting her forests for hundreds of years, Great Britain, as indicated in CONSERVATION for March, has come to the front with the most farsighted proposal for forest-work and land-improvement ever advanced by any nation in a single plan.

The recommendations just made to the British government by the Royal Commission on Afforestation and Coast Erosion will make England self-supporting in the production of timber if successfully carried out.

Great Britain has long been dependent upon outside sources for her wood supplies. But the constantly-increasing demand for wood, together with the overdrain already made upon these sources, indicates a world-shortage of wood unless those countries which now have to import are able to establish and maintain their forest independence and grow the needed wood at home. Most of the countries of Europe have taken care to keep up the home-wood output by looking after their forests before they were destroyed or hopelessly depleted, and managing them for a sustained annual yield about equal to the demand. The British Isles, however, are practically stripped of productive forests. If Great Britain is to grow her own wood, she will have to begin at the beginning, set out the seedlings on treeless ground, and wait for them to reach marketable size. The commission recommends that this work of starting future national forests from the seed be undertaken "as a sound and remunerative investment."

There is no question, the report says, that substantially the anticipated results can be obtained. Experts testified before the commission that "the production of timber in Great Britain will be more rapid than in Saxony," which was selected for comparison on account of the close resemblance between the economic and physical conditions in the two countries. Yet, in Saxony, the net annual profits per acre from the national forests has increased 412 per cent. in ninety years, mainly, it was testified, because of "the more systematic and careful management." The lack of forests in Great Britain is the result, not of natural conditions, but of bad national economy. This is further proved by the fact that there are a number

The proposal of the commission is especially interesting to Americans in view of the fact that the measures that are now being proposed in the United States are so much simpler and less expensive. In this country the forests are already on the ground. All that is necessary is to bring them to a state of full productiveness. The present annual production of forests in the United States is scarcely more than twelve cubic feet per acre of all kinds of wood. The centuries of experience in Saxony, Switzerland, and France show that the same kind of land will grow three to eight times as much wood under wise forest management. Protection and proper cutting, begun now and steadily followed as a policy, will keep America, except in the prairie region, from reaching a point where, as in Great Britain, it will be necessary to start the forests of the future from the seed, and wait for them to grow. A tithe of the great outlay which the British commission contemplates would easily guarantee this country's forest independence for all time. And the wood needed each year could be got out of the forests right along.

A German on International Conservation

Mr. Hermann F. Essig, of Stuttgart, Germany, who came to the United States to see the inauguration of President Taft, showed deep interest in international conservation. Speaking to a reporter for the *Washington Herald,* he said that, although conservation has been reduced to a science in Germany, and that there was not much which that country could learn in the line of conservation at an international conference, Germany would be only too glad to be represented, and give all the other participating powers the benefit of her researches and experience along these lines.

There is no country on earth where forestry has been made such a thorough study and science as Germany. There are quite a number of forestry schools throughout the German empire, where everything pertaining to the subject is taught from A to Z. The German government realized years ago that a nation without trees was inevitably doomed, and has set to work to preserve its forests. There is no such thing as waste of trees or timber or forests in Germany.

"If you own a forest, as proprietor of it, you are not allowed to fell trees or cut timber without first having received the permission to do so from the government forester. He will point out to you what you may cut, how much of it, and where. He will also point out to you that you will have to replant tree for tree, and he will keep an eye on you that you will not fail. This rule applies as well to public forests. You are not even permitted to gather brush or undergrowth in the woods without a permit from the government.

"America owes a debt of gratitude to President Roosevelt, who, by creating the Conservation Commission, has halted the wanton destruction of forests and other natural resources. He will go down in history as a great president and a great public benefactor. His acts are not correspondingly appreciated yet, but they will be before many years have passed. There is one thing Americans may rest assured of, and that is he will receive the greatest ovation ever accorded to any living being in Germany, outside the Kaiser himself. We think the world of Roosevelt in Germany."

Kansas Catalpas Pay

A valuable experiment in artificial forestry has just been concluded in Greenwood County, Kansas. The result has demonstrated that many thousands of acres in Kansas not utilized for pasture and not adapted for fruit trees can be profitably planted with quick-growing hardwood timber. Locust has been tried in many parts of the state, but, with the exception of Clark and Mead counties, it suffers so severely from the ravages of the borer that it is practically useless when cut. A variety of catalpa, *Catalpa speciosa,* however, appears to be immune from this pest. This is the tree that has been tried in Greenwood County.

In 1887 and 1888 George M. Munger bought a quarter-section of upland eight miles north of Eureka, Kans., for $1,000, and planted 130 acres in catalpa at a further cost of $1,500, including the price of trees, breaking out, plowing, and cultivation for two seasons. It was a poor class of soil with a large proportion of alkali spots, but after ten years' growth he began to cut and in four years netted $4,000 above the cost of cutting and handling. In 1903 he sold the farm to E. P. Riggle for $16,000, thus making a net profit of $17,500 on the whole transaction. The present owner has now cut and shipped the balance of the first growth. After deducting the purchase price and cost of cutting and handling, he has netted $10,000 in these five years. Next year he will be able to begin cutting the second growth.

VALUABLE FOR FENCE-POSTS

Besides the advantage of a sure and easy growth, the wood of the *Catalpa speciosa* is of a better quality for fence-posts than walnut and locust.

The trees are planted as yearlings, four feet apart, making 2,300 to the acre. They are left alone for twelve months and then cut clean off at the ground level. After this there is nothing to be done but wait eight years, when they will be ready to cut for market. The close planting makes a straight growth and under the shade of the broad leaves the unnecessary shoots die off.

WHAT THE FARM PRODUCED

The following list shows the proportion of posts and telegraph poles cut by G. M. Munger and E. P. Riggle on the Catalpa Knob plantation. The posts are graded in thickness, varying from two and one-half to five inches:

First-grade posts	8,017
Second-grade posts	102,700
Third-grade posts	133,770
Fourth-grade posts	142,480
Fifth-grade posts	48,750
Telegraph poles	19,045
Total	454,762

The average price received for each post was just under 7½ cents; the cost of cutting, 1 cent, and of hauling ½ cent, thus netting about 6 cents a post, or about $27,285 on the whole crop.

There are two other successful catalpa plantations in Kansas—the Yaggy plantation at Hutchinson and the Hunnewell at Farmington.

Draining the Everglades

The work of draining the Everglades of Florida is progressing in a satisfactory manner. Hon. A. C. Croom, of Florida, recently devoted some two weeks to inspecting the dredges and draining operations in the Everglades, and, on his return, gave an encouraging report of progress. The end of the year, he claims, will disclose the reclamation of a considerable portion of this vast area of hitherto valueless land. Money is to become available from the Bolles' sale, and this fund will be utilized as fast as possible in furtherance of the great project

A vigorous demand has already sprung up for these lands, and the state could now easily dispose of every acre of them. It is recognized, however, that with the progress of drainage, the value of the lands will steadily enhance, until, by the completion of the work, they will command such prices as are obtained for the rich prairie lands of the western states.

This project, if successful, will open up for settlement a section almost as great as the states of Massachusetts, Rhode Island, and Connecticut combined, and richer in fertility than the valley of the Nile. Instead of being a habitation of Seminoles and crocodiles, it is expected to become, within a few years, the home of thousands of prosperous and contented farmers. Instead of converting all these lands into private ownership, the Drainage Board have wisely reserved each alternate section in the recent sale and, by so doing, will reap for the state a substantial reward in the great enhancement of value which is certain to follow the success of the project.

Opening of the Payette-Boise Project

Five thousand people, including representatives of the Reclamation Service, Governor Brady, and members of the Idaho Legislature, witnessed, on February 22, the formal opening of the Payette-Boise Project, one of the largest reclamation works undertaken by the Federal Government. When the headgates of the canal were raised, the waters of the Boise Valley were diverted to more than 200,000 acres of land.

The scene of the ceremony was at the big dam, eight miles above Boise, which provides the source of water for the south side section of the project. From this point water is diverted into canal systems covering Ada and Canyon counties. One canal carries water to the Deer Flat Reservoir, which is the largest artificial body of water in the world. This reservoir will be filled before the irrigation season begins, and waters will be stored for use during the dry season.

Progress on the Uncompahgre Project

An advance of 600 feet was made on the Gunnison Tunnel, Uncompahgre Irrigation Project, Colorado, during February, leaving only 2,340 feet between headings on March 1. At the river portal fifty feet of tunnel were timbered and forty-five feet lined with concrete. In the west heading 345 feet of lining were placed. At the present rate of progress the opening should be made in July, but so much difficult material has been encountered in excavating this tunnel that it is not safe to make any predictions. The flow of water throughout the month of February amounted to 8.5 second-feet at the west portal and 1,282,000 gallons per day at east portal. There was an unusual number of storms during the month, which greatly increased the difficulty of handling sand and gravel in concreting in renewing and repairing structures, but the work of cleaning the canal system was nearly completed. The heavy snowfall in the mountains gives promise of a better water supply than the valley has enjoyed for many years.

Lands Restored to Public Domain

About 130,000 acres of land which were withdrawn from any form of disposition whatever under the public land laws, in connection with the Salt River Irrigation Project, Arizona, have been restored to the

public domain and will be subject to settlement on and after June 3, 1909, but will not be subject to entry, filing, or selection until July 3, 1909. No person will be permitted to gain or exercise any right whatever under any settlement or occupation begun after February 26, 1909, and prior to June 3, 1909, all such settlement or occupation being forbidden. These lands lie in townships 1, 2, and 3 N., R. 1 and 2 W., Gila and Salt River Meridian.

In addition to the area thus restored, about 184,000 acres which were withdrawn under the same project from any form of disposition except homestead entry, have been restored subject to settlement and entry on the same dates. Settlement and occupation on this tract between January 28, 1909, and June 3, 1909, are forbidden. These lands lie in townships 4 to 7 N., R. 1 to 3 E., Gila and Salt River Meridian.

Regulations Applying to Government Irrigated Lands

The Secretary of the Interior has just issued the following regulations, which are of importance to settlers on the Reclamation Service projects:

"1. *Reclamation of lands entered subject to the provisions of the Reclamation Act.*—To establish compliance with the clause of the Reclamation Act that requires reclamation of at least one-half of the irrigable area of an entry made subject to the provisions of the act, entrymen will be required to make proof showing that the land has been cleared of sagebrush or other incumbrance and leveled, that sufficient laterals have been constructed to provide for the irrigation of the required area, that the land has been put in proper condition and has been watered and cultivated, and that at least one satisfactory crop has been raised thereon.

"2. *Reclamation of lands in private ownership.*—The express purpose of the Reclamation Act is to secure the reclamation of arid or semi-arid lands and to render them productive, and Section 8 declares that the right to the use of water acquired under this act shall be appurtenant to the land irrigated, and that beneficial use shall be the basis, the measure and the limit of the right. There can be no beneficial use of water for irrigation until it is actually applied to reclamation of the land. The final and only conclusive test of reclamation is production. This does not necessarily mean the maturing of a crop, but does mean the securing of actual growth of a crop. The requirement as to reclamation imposed upon lands under homestead entries shall therefore be imposed likewise upon lands in private ownership, namely, that the landowner shall reclaim at least one-half of the total irrigable area of his land for agricultural purposes, and no right to the use of water for such lands shall permanently attach until such reclamation has been shown.

"3. *Delinquency.*—Under Section 5 of the Reclamation Act, 'A failure to make any two payments when due shall render the entry subject to cancellation with the forfeiture of all rights under this act, as well as of any moneys already paid thereon.' This provision evidently states the rule to govern all who receive water under any project, and accordingly a failure on the part of any water-right applicant to make any two payments when due shall render his water-right application subject to cancellation with the forfeiture of all rights under the Reclamation Act, as well as of any moneys already paid to or for the use of the United States upon any water right sought to be acquired under said act. In the case of one who has made homestead entry subject to the terms of the Reclamation Act the entry shall be subject to cancellation in case of such delinquency in payment, whether or not water-right application has been made by him.

"4. *Operation of sub-laterals.*—The control of operation of all sub-laterals constructed or acquired in connection with projects under the Reclamation Act is retained by the Secretary of the Interior to such extent as may be considered necessary or reasonable to assure to the water users served therefrom the full use of the water to which they are entitled."

Mrs. Fairbanks for Conservation

The following interesting correspondence passed between Mrs. Lydia Adams-Williams, First Vice-president of the Woman's National Rivers and Harbors Congress, and Mrs. Cornelia C. Fairbanks, wife of Charles Warren Fairbanks, late Vice-president of the United States:

"Atlantic Building,
"Washington, D. C., Feb. 28, 1909.

"Mrs. Charles Warren Fairbanks, Washington, D. C.

"My dear Mrs. Fairbanks: Mrs. Hoyle Tomkies, President of the Woman's National Rivers and Harbors Congress, has suggested that I call upon you to ask you to accept the office of Second Vice-president of the Woman's National Rivers and Harbors Congress.

"The Congress was organized at Shreveport, La., June 29, 1908, at the instance of Hon. Joseph E. Ransdell, President of the National Rivers and Harbors Congress, with seven members; at the time of the first biennial meeting, held in Washington last December, the Congress had grown to a strength of 1,500. Its strength is, perhaps, double that at the present time.

"The objects of the Congress are the preservation of the forests, the development of the waterways and harbors, and the conservation of the natural resources of the Nation.

"In the face of the almost insurmountable obstacles placed in the way of conserv-

ing the forests and other natural resources, it is obvious that but little progress will be made until the women of the country collectively take up the work.

"It is not necessary to enlarge upon the good that may be accomplished by women earnestly banded together for the welfare of the children of this and of future generations.

"The Woman's National Rivers and Harbors Congress has the endorsement of Mr. Gifford Pinchot, Chairman National Conservation Commission and Chief Forester of the United States, who says: 'You are to be congratulated upon your organization of the Woman's National Rivers and Harbors Congress. * * * You have my best wishes for success in the important work you have undertaken.'

"Knowing the vast value of your assistance and the powerful influence for good which may be accomplished by your joining us, I herewith respectfully ask you to accept the office of Second Vice-president of the Woman's National Rivers and Harbors Congress.

"Yours very truly,

(Signed) "MRS. LYDIA ADAMS-WILLIAMS,

"*First Vice-president of the Woman's National Rivers and Harbors Congress, Corresponding Secretary of the Woman's National Press Association, and Chairman of the Waterways Committee of the District of Columbia Federation of Women's Clubs.*"

"1701 K St. N. W.,

"Washington, D. C., Feb. 28, 1909.

"Mrs. Lydia Adams-Williams, Atlantic Building, Washington, D. C.

"My dear Mrs. Adams-Williams: You and the Woman's National Rivers and Harbors Congress are very good to desire my cooperation, and if I can aid in helping the grand work of conservation of our forests by becoming Second Vice-president of the Congress, I am pleased to accept.

"I think that the object of your organization is one highly to be commended, and for the success of which I have every good wish.

"I thank you for your kind expression toward me, and I think your unselfish devotion to the cause is one worthy of all praise.

"Thanking you for your kindness, I am,

"Very cordially yours,

(Signed) "CORNELIA C. FAIRBANKS

"(*Mrs. Charles Warren Fairbanks*)."

What a Timber Patch Can Do

"Mr. Editor: I would like to hear something on the subject of planting and raising forest trees—the best kinds, the best ground for them, and the best way of planting. Here in Nemaha County we have plenty of timber, but it is being destroyed so fast that I fear we shall regret it when it is too late. For thirty years I have owned 160 acres, with some twenty acres of native timber on it. I have had all the poles and posts I needed for the farm all these years, and still have three times the timber there was on the land forty years ago, when I came here. That is better than nine-tenths of the farms have done. T. K. MASHITER.

"Sabetha, Kans."

The writer has done well. By corresponding with The Forester, Washington, D. C., he can doubtless obtain the information he desires on the planting and raising of forest trees. The Forest Service carries a splendid line of documents intended especially to aid in every way in conserving and renewing the forests of the United States.

Forest Conservation in Hawaii

That substantial interest in forestry exists in Hawaii is made clear by the accompanying editorial from a Honolulu paper:

"Hawaii has suffered so much from depredations on its forests, by animals, fire, and insects, that an active movement to save the watershed trees and increase their number or to create popular interest in saving them is most welcome. While in Washington recently, Mrs. A. F. Knudsen, with the personal approbation of the President, took up the matter for Hawaii at the Woman's National Rivers and Harbors Congress; and she has come back to interest the public, particularly the women, in this work. It is surely a fortunate circumstance. Abundant and healthy forests, besides giving these islands half their beauty, are of untold economic importance to their inhabitants. A land denuded of its trees either becomes a desert, or a place which is only practicable for agriculture a part of the year. Spain became impoverished for several reasons, chief among them deforestation; and so, for that matter, did large areas of China. Writers since the time of Strabo have pointed out the peril of forest denudation, many of them contending that large wooded areas actually increase the rainfall. However that may be, they assuredly conserve it, holding water in their deep mosses and mold, under thick shade, which, if exposed to the direct rays of the sun, would soon dry up. Torrential rains, even, are taken into these natural reservoirs and held for gradual distribution during dryer months, keeping the streams and springs alive, whereas, if they had fallen on denuded ground, they would have torn wide furrows in their rush to the sea, carrying vast quantities of arable soil with them. Under conditions like these, what would Hawaii be worth? Already tens of thousands of acres of watershed land have lost their trees, the process beginning when the old chiefs sold the sandalwood. Then came the goats and wild cattle which ate and are still eating the herbage over the shallow rootage of forest growths, thus drying out the moisture by which the trees subsist and making conditions right for fires. Adding to this the damage done by borers, insects

which were formerly kept in check by native woodpeckers, birds now almost extinct, we have a state of things which leads toward the ruin of agriculture as well as landscape beauty.

"It is time to act in self-defense. It is time to make war on the goats as California did on the coyotes, by offering bounties for their scalps or fresh skins. It is time to compel the cattlemen to fence their lands along the forest border and to slaughter or capture the wild cattle which have wandered from their herds into the deep woods. More foresters and fire-wardens are needed and more tree-planting on the public domain. There is nothing of the fad in this; and the process is as much needed here as in the other parts of the United States, where large sums of public money are being expended on forest-preservation."

War on the Prairie Dog

In cooperation with the stockmen, the United States Forest Service has begun an active campaign against prairie dogs on the infested ranges within the National Forests of Arizona and New Mexico. Successful attempts at poisoning prairie dogs were made last spring and summer by the Forest Service in other parts of the country, and this year the work will be carried on much more extensively.

The poison used to put an end to these little pests of the western ranges is prepared by coating wheat with a preparation of strychnine, cyanide of potassium, anise oil, and molasses. The stockmen supply horses and men, and the poisoned wheat is given out by the Government officers for distribution upon ranges within the National Forest areas. Each rider carries the wheat in a tin pail supported by a gunny-sack slung across his shoulder. One hand is free for the reins and with the other the rider uses a teaspoon to measure out the poison in "baits" and drop it near the entrance of the holes. The action of the poison is almost instantaneous. Most of the prairie dogs in a town are dead within an hour or two after the bait is dropped.

Early last month 9,300 pounds of wheat were prepared in Albuquerque and shipped to the various National Forests in Arizona and New Mexico to be distributed. This quantity of wheat will make approximately 6,020,000 baits, which will clear up an area of from 65,000 to 80,000 acres, at a cost, exclusive of the labor of distributing it on the ranges, of about 1 to 1½ cents an acre. The poison is used to best advantage in the early spring, when the dogs first come out of their winter quarters, and before the green grass is plentiful enough to appease their appetites.

As all Westerners know, prairie dogs are among the worst enemies with which the stockmen have to contend. Where they establish themselves the destruction of the range is only a question of time. On ranchlands they have proved most destructive to a variety of crops, among which are wheat and alfalfa, grain, potatoes, and sugar beets, and on grazing lands they are said to consume and destroy so much grass that the grazing capacity of the range is reduced fifty to seventy-five per cent.

It is expected that the campaign against the dogs in the Arizona and New Mexico Forests will be most successful, as it has met with universal favor among the stockmen, who are giving every assistance to the Forest Service men. Range improvement in National Forests is one of the chief objects of regulating the grazing, and for this reason the Forest Service is leaving no stone unturned to prevent range deterioration.

Stockmen and others who wish to try the poisoning on their own account can obtain the formula for its preparation and direction for its use from the district forester at Albuquerque, N. Mex., or from the Forest Service, Washington.

Timber Supply of United States

"We are now cutting timber from the forests of the United States at the rate of 500 feet board measure a year for every man, woman, and child. In Europe they use only sixty board-feet."

Few statements could be made better than this to convince the average man that our country leads the world in the demand for timber. It is made by Treadwell Cleveland, Jr., in a circular which treats of the conservation of the forests, soil, water, and all the other great natural resources, which has just been published by the United States Forest Service. In speaking further of the consumption of timber in this country, Mr. Cleveland says:

"At this rate, in less than thirty years all our remaining virgin timber will be cut. Meantime, the forests which have been cut over are generally in a bad way for want of care; they will produce only inferior second-growth. We are clearly over the verge of a timber famine.

"This is not due to necessity, for the forests are one of the renewable resources. Rightly used, they go on producing crop after crop indefinitely. The countries of Europe know this, and Japan knows it; and their forests are becoming with time not less, but more productive. We probably still possess sufficient forest land to grow wood enough at home to supply our own needs. If we are not blind, or wilfully wasteful, we may yet preserve our forest independence and, with it, the fourth of our great industries.

"Present wastes in lumber-production are enormous. Take the case of yellow pine, which now heads the list in the volume of

annual cut. In 1907 it is estimated that only one-half of all the yellow pine cut during the season was used, and that the other half, amounting to 8,000,000 cords, was wasted. Such waste is typical. Mr. R. A. Long, in his address on 'Forest Conservation' at the conference of governors last spring, pointed out that twenty per cent. of the yellow pine was simply left in the woods—a waste which represents the timber growing on 300,000 acres.

"The rest of the waste takes place at the mill. Of course, it would never do to speak of the material rejected at the mill as waste unless this material could be turned to use by some better and more thorough form of utilization. But in many cases we know, and in many other cases we have excellent reason to believe, that most, if not all, of this material could be used with profit. It is simply a question of intelligent investigation and, more than all, of having the will to economize.

"But there are other ways to conserve the forests besides cutting in half the present waste of forest products. The forests can be made to produce three or four times as rapidly as they do at present. This is true of both the virgin forests and the cut-over lands. Virgin forests are often fully stocked with first-class timber, but this stock has been laid in very slowly, on account of the wasteful competition which is carried on constantly between the rival trees. Then, too, in the virgin forests there are very many trees which have reached maturity and stopped growing, and these occupy space which, if held by younger trees, would be laying in a new stock constantly. As regards the cut-over land, severe cutting, followed by fire, has checked growth so seriously that in most cases reproduction is both poor and slow, while in many other cases there is no true forest reproduction at all at present, and there is but little hope for the future."

Effect of Deforestation

"What has been the effect of the tremendous consumption of timber upon our forests?" This question is often asked by people in various sections of the country, and often the information of the average man on the subject is not definite enough to enable him to make a clear and satisfactory answer. R. S. Kellogg, assistant forester, engaged upon statistics in the United States Forest Service, in giving a concise answer to the important question, says:

"Now our annual requirements exceed 40,000,000,000 feet of timber, 100,000,000 cross-ties, 4,000,000 cords of pulp-wood, besides great quantities of other forms of forest products, such as firewood, posts, poles, mine timbers, etc. The per capita consumption of lumber in the United States was 215 board-feet in 1850; now it is 470 board-feet.

"One forest region after another has been attacked. With the exception of Maine, the New England states are cutting mostly second or third-growth timber. The box factories there take white-pine saplings down to six inches in diameter. The so-called 'inexhaustible' white-pine forests of Michigan are gone, and millions of acres of cut-over and burned-over land have gone upon the delinquent-tax list. Michigan supplied twenty-three per cent. of the lumber-production of the United States in 1880, and less than five per cent. of it in 1907.

"The value of the lumber-production in Michigan since 1849 has been fifty per cent. greater than the output of gold in California, and it has all taken place without a thought for the future. The cream of our hardwoods is gone, and it is becoming more and more difficult to get in sufficient quantity the high grades of oak, yellow poplar, ash, and hickory that our great manufacturing industries require. The South's once great supply of yellow pine is rapidly giving way before ax and saw, fire and tornado. Half a generation more will, in most places, see little but remnants left of the Southern forests, and in that time the Pacific coast supplies will be heavily drawn upon.

"Ours is primarily a wood-using civilization. Despite the introduction of substitutes for wood in the form of stone, cement, concrete, and steel, our consumption of timber has constantly increased from the earliest days up to the present time. The prices of forest products have risen more rapidly than those of other commodities. According to the reports of the Bureau of Labor, the quoted prices of the leading kinds of lumber on the New York market have risen twice as much in the last ten years as the average increase in all commodities. This indicates that the supply of timber is not keeping pace with the demand."

Improved Methods of Turpentining Bring Favorable Results

Through the improvement in the systems of turpentining the South has taken a long step forward in the movement for the protection and development of one of the country's most important natural resources, the rich yellow-pine forests, which make the United States the leading nation in the production of rosin, turpentine, and the other products known as naval stores.

Improved methods of turpentining were first established to an appreciable extent during the producing season of 1904, when the cup-and-gutter system was installed by a number of the most enterprising manufacturers of naval stores in Georgia and Florida. Since that time there has been a steady and satisfactory increase in the percentage of turpentine and rosin produced by those conservative methods. The work in conserving these vast turpentine orchards of the South has perhaps come in time to stay the early destruction of yellow-pine forests threatened by years of careless management.

Experiments conducted by the United States Forest Service at Ocilla, Ga., and Green Cove Springs, Fla., as well as definite and reliable data received from operators throughout the naval-stores belt, have effectively determined the great advantages of the new methods over the old. Not only has it been shown forcibly that the conservative methods are of great protection to the forests, but sufficient data has been collected to show that the increase in yield of both turpentine and rosin by the new and improved systems furnishes a strong argument in favor of their use.

Reports from the states where naval stores are produced show that where there is a greater percentage of turpentine produced by improved methods there is also a greater yield. The following table gives the average yield of turpentine per crop of 10,500 boxes or cups, reported and compiled by states, together with the percentage of turpentine produced in each state by either the cup-and-gutter or cup-and-apron systems:

State	Yield per crop, casks	Percentage*
Alabama	35.6	.08
Florida	29.8	.16
Georgia	26.5	.09
Louisiana	44.7	.44
Mississippi	34.5	.11
Texas	43.5	.49

*Produced by improved methods.

To demonstrate more fully that the use of improved methods is largely responsible for the remarkable increase shown, the reports from two of the large establishments in Texas, one using the cup-and-apron system and the other cutting boxes into the tree, are compared. The establishment using the cup-and-apron system reported a yield of 1,372 barrels of turpentine for twenty crops, as against a yield of 1,500 barrels of turpentine for thirty-five crops where the old methods were employed, 68.2 casks per crop for the cup-and-apron system as against 42.8 for boxes.

Both companies were operating for the first year, and timber and weather conditions were practically the same. The two establishments reporting these figures employ a high standard of business methods and the figures given are reliable. Forty-two barrels is considered a fair average yield for the first year the trees are bled and where boxes are used.

China Begins Education in Forestry

China, often called the most backward of nations in the care of natural resources, is to be the scene of a vigorous campaign in the interests of the forests, according to plans for a series of meetings which will be held under the auspices of Boone College, Wuchang, China, at Hankhow, Wuchang, and Hanyang. Later there will be meetings in all the large cities and important ports both on the coast and in the interior. Mr. Howard Richards, Jr., the representative in this country of the Chinese college, has been collecting material for these courses, and has just started for China. Several of the photographs showing the effect of deforestation in China, which accompanied the President's last annual message to Congress, form a part of a set of stereopticon views which will be used in illustrating these lectures.

China has probably taken less care of her forests than any other nation of the earth, and this movement to awaken in its people a realization of the importance of the forest comes at an opportune time. Many parts of China are practically desert wastes as a direct result of the destruction of its trees. On account of the erosion which has followed the removal of trees from the slopes, farmers are compelled to terrace their hillsides, in order to hold enough soil in place for farming, and to build little walls across the valleys to catch the silt which the annual floods deposit. Two centuries ago, many regions of China which are now barren were paying revenue to their owners. Now the wood supply is so scarce that little poles are used for building houses, and roots and saplings are burned as fuel.

Over 300 Chinese students from eleven provinces are being educated in Boone College for the uplift of their country, and it is expected by those in charge of the proposed course of lectures that a movement started there will in time spread throughout the empire.

Children Plant Trees

The prairie town without trees is cheerless and unattractive. Few things add more to the attractiveness of a town than rows of thrifty shade trees planted along its streets.

Village and town improvement societies and civic associations have done much to promote tree-planting, especially in the prairie regions of the middle West. Where trees adapted to local conditions have been planted, and where the citizens have cared for them and taken an interest in them, the results have been remarkable.

A public-spirited man residing in a city in Missouri has been doing commendable work along this line, in connection with the Civic Improvement League of his city. In the year 1901 he planted a large quantity of seeds of various trees in nursery rows. He carefully tended the young seedlings, and, a few years later, dug them up, labeled them, and turned them over to the school children free, upon condition that they should be planted and cared for.

Since the trees started life with the beginning of the present century, they were called "century trees," and this gave them additional interest.

Each child was given printed directions, which were headed as follows:

"Ornament your homes. Plant century trees, seedlings of 1901. They are living monuments; watch them develop. They began with the century, and the century, as it advances, marks the record of their age year by year."

Those who received trees were directed to dig holes two feet in diameter and one and one-half feet deep. They were told to keep the roots of the trees moist and covered until planted, to see that all torn ends of roots were cut off smoothly, and to cut back the side branches about a quarter or third of their length, or, if the tree was a straight shoot, without branches, to cut back the tip a few inches. This pruning was to balance the loss of roots in digging up the trees.

In planting the tree, they were told to spread the roots out into natural position, and to set the tree about an inch deeper in the ground than it stood in the nursery; to use good, rich soil, but to allow no fertilizer or mulch to come into direct contact with the roots; to work the soil carefully about the roots, and to water the tree plentifully every few days after it was set out, and during the dry weather of summer.

Five or six thousand trees were given away in this manner. Two or three trees were given to each child who asked for them, and almost every child did so. There were many species, and naturally some died, but few children lost all that they planted. Each child who received trees was required to fill out a slip giving his name and address, and the place where the tree was planted. The trees in public places will be labeled when they have grown somewhat larger.

The town is now dotted with these little "century trees," which have become the pride of those who planted them.

Utilizing Natural Gas

Speaking of the ineffective attempts of the states of Oklahoma and Indiana to prevent the export of natural gas, Mr. Godfrey L. Cabot, of Boston, writing to the *Boston Transcript*, says:

"There is no commodity whose export and freedom of transportation is relatively so important as natural gas, because there is no form of wealth, from its physical nature, so subject to waste. By far the greater portion of natural gas which has been produced up to this time has been absolutely wasted, and it is not likely that five per cent. of the natural gas at present produced in Oklahoma is put to any useful purpose. The greatest waste results from the fact that most of the petroleum oil produced in this country, and in particular the petroleum oil found in Oklahoma, Pennsylvania, West Virginia, Indiana, Ohio, Kentucky, Tennessee, Illinois, Louisiana, and New York, is associated with a large amount of gas, which is usually allowed to escape into the open air. Even the large operators such as the Standard Oil Company, or rather the various producing branches of the Standard Oil Company, have made little attempt to utilize the gas off the oil, except locally in connection with the production of the oil itself, and considering the fact that the amount of gas sold in the year 1907 was estimated by the United States Geological Survey at nearly fifty-three millions of dollars, there is no question that many hundreds of millions of dollars' worth of natural gas have been absolutely wasted in this country since the systematic exploitation of oil began in the year 1859, and it is very regrettable that the Standard Oil Company, and other large operators, who have shown great economy and wisdom in the handling of oil, have in most cases ignored the immense waste of gas.

"I am, myself, buying this gas off the oil in very large quantity, at a cent and a half a thousand, and gas having more than half again as much energy per cubic foot as the best illuminating gas, and I seek through your columns to give the widest possible publicity to the fact that here is an immense field for legitimate enterprise, to gather together this gas off the oil; pump it through gas lines to market, and thus utilize a natural resource which cannot be replaced by any method known to man, and which is, at present, subject to greater proportional waste than any other valuable asset that I can think of."

Increased Need for Private Forestry

"In its application to the management of private holdings forestry has lagged far behind its record of progress on the National Forests," says the Secretary of Agriculture in his annual report. "With a fast-diminishing timber supply and steadily-rising lumber prices, the vast bulk of our cutting is done destructively. This is a matter which seriously concerns the public welfare.

"Ten years ago the Department of Agriculture offered, in pursuance of investigations in forestry, and in order to disseminate a knowledge of improved ways of handling forest lands, to cooperate with private owners through expert advice and assistance in planning and putting into practise forest management for their holdings. The investigations thus made possible were of the first importance. But for them the Government would have been altogether unprepared to undertake six years later the scientific management of the National Forests. They were, in fact, the foundation and virtually the beginning of practical forestry in the United States.

"This offer has never been withdrawn. The work which its fulfilment involved was the chief cause of the rapid growth of the Forest Service between 1898 and 1905. Since 1905, however, the necessity of providing first of all for the needs of the National Forests has compelled curtailment of expenditures for general investigations, since neither men nor money have been available to carry them on. There has been a steady increase in the number of informal applications, but many of these were not encouraged to fill out the necessary blanks, since neither men nor money were available to make the examination.

"There is urgent need to enlarge this work. The time is ripe for a widespread taking up of forestry by private owners of timberland, large and small, if the Forest Service can be in a position to guide and assist a general movement through fulfilment of its offer. None of the National Forests is east of the Mississippi River, and nine-tenths of the expenditures of the Service are on behalf of the National Forests. It is a national duty to protect and put to best use this great resource which is directly under the charge of the Government; but it is no less a national duty to promote in the East the spread of methods through which this part of the country also can preserve its forests."

Condition of Forest Resources

The forests of the United States now cover about 550,000,000 acres, or about one-fourth of the land of the whole country. The original forests covered not less than 850,000,000 acres, or nearly one-half.

The forests owned by the Government cover one-fourth of the total forest area and contain one-fifth of all timber standing. Forests privately owned cover three-fourths of the area, and contain four-fifths of the standing timber. Besides having three times the area and four times the forests, the timberland privately owned is generally more valuable.

Forestry, or conservative lumbering, is practised on seventy per cent. of the forests publicly owned and on less than one per cent. of the forests privately owned. This covers the country's forest resources as they stand to-day. Senator Smoot, chairman of the section of forests of the National Conservation Commission, in outlining the future, has said:

"By reasonable thrift, we can produce a constant timber supply beyond our present need, and with it conserve the usefulness of our streams for irrigation, water supply, navigation, and power.

"Under right management, our forests will yield over four times as much as now. We can reduce waste in the woods and in the mill at least one-third, with present as well as future profit. We can perpetuate the naval-stores industry. Preservative treatment will reduce by one-fifth the quantity of timber used in the water or in the ground. We can practically stop forest fires at a total yearly cost of one-fifth the value of the standing timber burned each year, not counting young growth.

"We shall suffer for timber to meet our needs until our forests have had time to grow again. But if we act vigorously and at once, we shall escape permanent timber scarcity."

INDEX TO CONSERVATION FOR 1908

The Index to CONSERVATION and FORESTRY AND IRRIGATION for 1908 will shortly be ready, and will be furnished without charge to all members and subscribers on application.

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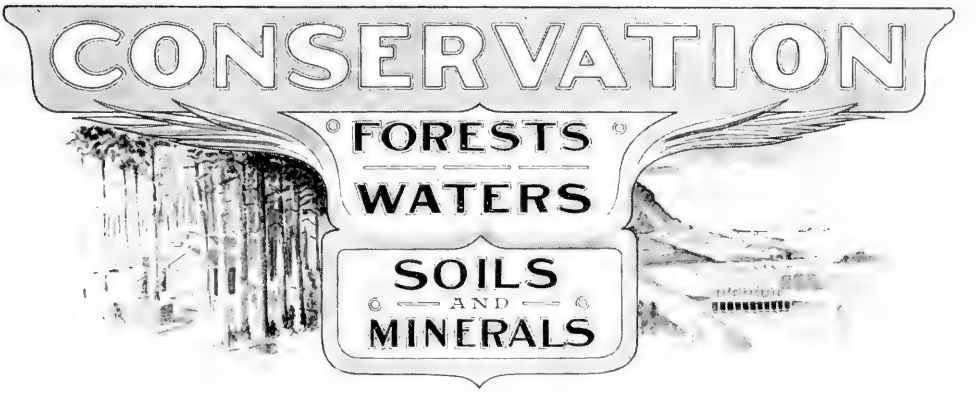

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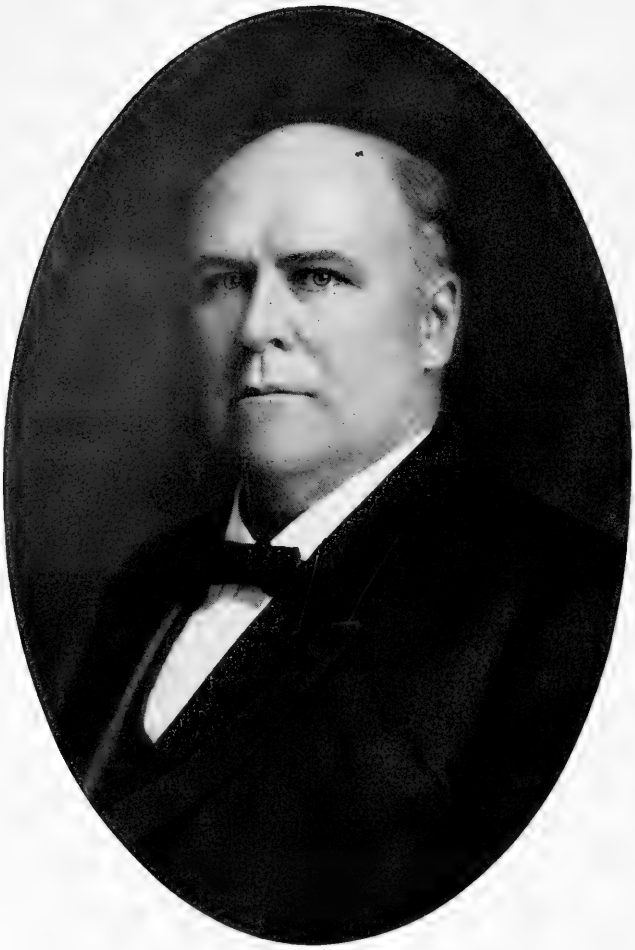
THE FIGHT FOR THE APPALACHIAN FORESTS

By EDWIN A. START

THE Sixtieth Congress having passed into history without enacting into law any legislation for the maintenance of the great Appalachian forests, north and south, the present seems to be a good time for a retrospect and outlook in connection with this vital and pressing conservation question. It is now ten years since the project took concrete legislative form. Since January, 1900, when groups of foreseeing men, north and south, first brought before the Fifty-sixth Congress the plan of establishing a National Forest reserve in the southern Appalachian Mountains, every Congress, and nearly every session, has had this subject before it; and in these years the whole country has been aroused to the need of action. Year by year, cumulative evidence has been piled up of the terrible waste of the Nation's resources that has been going on with progressive destructiveness in the forested mountain countries of the East. There has been progress in each Congress, but still a laggard legislature has biennially fallen by the wayside without the attainment of the object.

The first bill was introduced on the 10th of January, 1901, by Senator Pritchard, of North Carolina. It provided for an appropriation of $5,000,000 to establish a National Forest reserve in the southern Appalachians. Its principal backers were the Appalachian National Park Association, organized in Asheville, N. C., in 1899, and the Appalachian Mountain Club, a well-known semi-scientific society in New England; and it had the approval of the Forestry Bureau of the United States Department of Agriculture and of President McKinley. The bill was favorably reported in the Senate but went no farther. Four bills, two in each house, were introduced in the first session of the Fifty-seventh Congress, in 1901 and 1902, together with a report from the Secretary of Agriculture and a strong message by President Roosevelt con-



Hon. R. B. Glenn, Former Governor of North Carolina

taining a summary of the arguments for the proposed action. One of the Senate bills, introduced by Senator Burton, was passed in the originating body on the 24th of June and halted there. The matter went over to the second session, and in the meantime a liberally illustrated volume, known as *Senate Document* 84, was issued. This contained the messages of Presidents McKinley and Roosevelt, the reports of the Secretary of Agriculture, various memorials to Congress, references to several magazine articles, favorable resolutions of state legislatures and their acts ceding jurisdiction and permitting the United States to acquire land within their boundaries. In the second session the Senate bill with one amendment was favorably reported to the House, but got no farther.

Promptly at the opening of the Fifty-eighth Congress Representative Brownlow, of Tennessee, again introduced in the House a bill for the purchase of southern Appalachian forest reserves, and on the same day (November 11, 1903), Senator Hoar presented to the Senate resolutions of the general court of Massachusetts in favor of the enactment of national legislation to protect the forests of the White Mountains of

New Hampshire. This broadened the issue. It was charged at the time by ardent advocates of the southern project that the White Mountain movement was a sentimental one and had no economic basis. This was an error of misinformation for which the northern men were partly responsible. They had not reached the economic stage in their consideration of the subject. These first appeals were a cry for help from those who saw the summer land of promise of tens of thousands of people being laid waste and who wanted something done about it. Like the southerners who were earliest in that effort they had in mind a national park, rather than an economic reserve. As a matter of fact the conditions were the same as in the South, except for certain differences of local topography. Both regions are mountain forest districts, containing very small areas of agricultural land. Both are interstate watersheds of the same Appalachian Mountain system. The water flow of the southern rivers is less regulated by lake storage; but in one respect the White Mountains were in the worse case. The timber tracts in the northern country were controlled by a few large operators who, impelled by industrial conditions, were cutting heavily and making big sweeps up the higher slopes, where the soil is only retained in place by the protective forest growth. The New Hampshire hills have never been protected by inaccessibility, and the wholesale cutting of the last few years is the climax of a long-sustained attack.

A bill for the southern reserve was again introduced in the Senate by Senator Burton, and the first White Mountain bill was offered by Senator Gallinger. Both were reported favorably by the committee on forest reservations. The report on the latter by Senator Burnham, of New Hampshire, was the first official notice of the White Mountain project. Mr. Currier, of New Hampshire, had introduced a White Mountain bill in the House. This was as far as either project traveled officially in that Congress.

As the movement went on its importance became more manifest. Strong support was constantly being gathered to it but it was evidently necessary to conduct a broad campaign to overcome popular ignorance of the questions involved and congressional indifference. The North and South must be brought together, made to understand each other's needs and to realize that they stood on common ground, that the issue was an essentially national one. The American Forest Congress of 1905 promoted this larger knowledge and better understanding. That congress, the most important and representative forestry convention ever held in America, unreservedly endorsed 'the establishment of National Forest reserves in the southern Appalachian Mountains and the White Mountains of New Hampshire," and urged the passage of the pending bills for these purposes.

In December, 1905, bills for the two reserves were introduced in the House by Mr. Currier and Mr. Brownlow, and in the Senate by Senators Gallinger and Overman. At its annual meeting in January, 1906, the American Forestry Association appointed a committee to prepare a bill uniting the two projects, and to offer it as a substitute for these four measures. This union bill was accepted by all interests. On January 20, 1906, it was laid before the Senate committee on forest reservations and the protection of game, of which Senator Brandegee, of Connecticut, was chairman, and was reported by that committee, in lieu of the Gallinger and Overman bills. This bill called for an initial appropriation of $3,000,000, though its advocates frankly stated that this was but a beginning, and that the completion of the two projects would involve an ultimate expenditure of not less than fifteen millions. They also declared that every year of delay would increase the cost, on account of condi-

Hon. John McLane, Former Governor of New Hempshire

tions which made the immediate present a favorable time to act.

Since the acceptance of the union bill there has been no North and no South in the advocacy of this legislation. It has been supported with honest, nonpartisan and non-sectional cooperation, and has secured as notable and disinterested popular support as ever backed a bill before Congress. Letters and petitions showing the popular interest that had been awakened poured in upon Congress in an ever-increasing tide. Resolutions were passed by bodies representing various interests. One remarkable petition from New England was signed by the governor of every New England state and by men not merely of prominence but of eminence in the world of business and affairs from each state, the whole representing the united public sentiment of the section. A similar petition from the South followed. The ablest newspapers and magazines of the whole country took up the cause. The President and the Senate were known to be favorable, but in the House the measure, from the first and in any form, met the determined opposition of the Speaker and the little coterie of House managers who, under the rules, assume a censorship of legislation. That the opposition was sincere there can be little doubt, for outside of Congress no opposition has appeared. No interests are arrayed

against the project, openly at least, but inside the House these few men who hold tremendous political power, seeing only the expenditure and the lack of any partisan gain to be secured, and not comprehending the essential economy of the proposed action and its necessity for the country's future welfare, have held up legislation by every known parliamentary means.

On the 25th and 26th of April, 1906, the union bill had a hearing before the House committee on agriculture. Thirteen states were represented, and Governors Glenn, of North Carolina, and McLane, of New Hampshire, headed the delegations. Among the petitions presented was one from New England milling interests aggregating over $130,000,000 capital. So effectively was the case presented that a hostile committee was converted, and reported the bill favorably to the House.

In January, 1907, the foreign commerce convention assembled in Washington, representing the largest business interests of the whole country, passed a strong resolution endorsing the bill and appointed a committee to present it to the Speaker personally. A deputation of governors of several northern and southern states visited the Speaker on the following day, but to both he expressed the same unalterable opposition, refusing even to say that he would allow the people's representatives an opportunity to vote upon the measure. The only accomplishment in the Fifty-ninth Congress was the passage of an appropriation of $25,000 for a survey of the two regions by the Department of Agriculture. This came down from the Senate as a rider to the agricultural appropriation bill and was passed on roll call, 138 to 115. Both party organizations, as shown by the words and votes of the leaders, were evidently against it. The survey, or more properly investigation, was conducted during the summer under the direction of William L. Hall, of the Forest Service, and a valuable report was made to the Sixtieth Congress by the Secretary of Agriculture.

New bills were introduced in both Senate and House of the Sixtieth Congress, calling for an initial appropriation of $5,000,000. It was plain that there was a great and growing support behind these bills. Apathy toward them in Congress was gone. Friends and opponents alike recognized their importance. This caused a very evident stiffening of the opposition. In appointing his committees Speaker Cannon reconstructed the committee on agriculture, supplanting Mr. Henry, of Connecticut, the ranking member, with Mr. Scott, of Kansas. The Speaker's confidence in Mr. Scott has been justified during the two sessions of the Congress. Other changes were made unfriendly to Appalachian forest legislation, and the popular indignation was voiced so forcibly that the Speaker filled one vacancy on the committee by appointing John W. Weeks, of Massachusetts, one of the strongest friends of the Appalachian forests in the House. It will be seen that this appointment was productive of important results.

The new committee gave a hearing on the bill January 30, 1908. The representatives of the governments, people, and organized bodies of twenty states were present to the number of over 250. Governor Smith, of Georgia, conducted the case for the petitioners, and the strength of the presentation was unquestioned. It soon became evident, however, that the adverse majority on the committee was not to be easily shaken.

In February the bill was thrown into the committee on judiciary on the question of constitutionality, and it became necessary to argue that point before this politico-judicial tribunal, which held the question under advisement as long as the patience of the people would allow. Finally, on the 22d of April, the committee gravely decided that "the Federal Government has no

Hon. Hoke Smith, Governor of Georgia

power to acquire lands within a state, solely for forest reserves; but under its constitutional power over navigation, the Federal Government may appropriate for the purchase of lands and forest reserves in a state, provided it is made clearly to appear that such lands and forest reserves have a direct and substantial connection with the conservation and improvement of the navigability of a river, actually navigable in whole or in part; and any appropriation made therefor is limited to that purpose." The committee decided that the pending bills, not being limited to the aforesaid purposes, were unconstitutional.

This opinion, whatever may be said of its legal value or of its statesmanship, made it necessary to work along the lines of protection of navigable streams to secure immediate practical results. Fortunately this could be done, as nearly all the needed lands were on the watersheds of such streams, and this protection had always been an important object in view. The Senate bill was modified in its form to meet the judiciary committee's opinion, was passed by the Senate in the closing days

Hon. John W. Weeks, Representative from Massachusetts

of the session, and when it was received in the House was referred to the committee on agriculture. In the House, three new bills were framed in the committee on agriculture by Weeks, of Massachusetts, Lever, of South Carolina, and Pollard, of Nebraska. None of these was acceptable to the committee, which finally reported to the House a bill prepared by a subcommittee under the leadership of Chairman Scott. This bill granted permission to any group of states to form an agreement for protecting their forests and streams, and provided for a congressional commission to investigate the relation of the forested watersheds of the Appalachian rivers and the navigability of such rivers and report to the President with recommendations before January 1, 1909. This bill, generally known as the Scott bill, passed the House by a vote of 202 to forty and was referred in the Senate to the committee on commerce, where it was pigeon-holed. For several reasons, which may all be summed up in the phrase "inapplicability to existing conditions," it was in no way acceptable to the friends of practical Appalachian forest legislation.

Here the question rested at the opening of the second session of the Sixtieth Congress. The shortness of this session, the many political complications, the unwillingness of Congress to enact any general legislation carrying an appropriation, were conditions unfavorable to success, but the Appalachian forest project had gained a momentum which was sure to bring it to the front.

Notwithstanding the heavy handicap, of political conditions, the supporters of the Senate bill again appeared before the House committee on agriculture on December 9, 1908. Governor Guild, of Massachusetts, headed the delegation and he was supported by Governor Ansel, of South Carolina, ex-Governor Pardee, of California, Governor Chamberlain, of Oregon, and President Van Hise, of the University of Wisconsin. These names of representative men from widely separated states show how broad and unselfish is the support of this project. Once again public men and experts from many states testified to the need of the proposed action by the national government, and numerous resolutions from boards of trade, merchants' associations, and chambers of commerce were added to the mass that had already gone on record. Following this hearing Mr. Weeks, of Massachusetts, and Mr. Lever, of South Carolina, with the assistance of Mr. Currier, of New Hampshire, undertook to prepare a substitute for the Senate bill that would be acceptable to a majority of the committee and would pass the House. The result of this was the so-called Weeks bill, which was accepted by the committee January 28, by a vote of eleven to seven, and was reported to the House.

This bill incorporated from the Scott bill the clauses permitting states to combine for forestry purposes, and appropriated $100,000 for the use of the Secretary of Agriculture in assisting any state or group of states in protecting from fire the forested watersheds of navigable streams, it being provided that each state so assisted should have in its own law a system of fire protection. The bill further appropriated from the income not otherwise appropriated of present and future National Forests the sum of $1,000,000 for the fiscal year ending June 30, 1909, and not exceeding $2,000,000 each year for nine years following, "for use in the examination, survey and acquirement of lands located on the headwaters of navigable streams or those which are being or which may be developed for navigable purposes." This money was to be expended by a board consisting of the Secretaries of War, the Interior, and Agriculture, one Senator and one Representative, on recommendation of the Secretary of Agriculture, after examination and report by the Geological Survey to ascertain the fitness of said lands for the desired purpose. Other provisions of the bill make it conform to the general administrative practise of the National Forest system. The report accompanying this bill was signed by KITTREDGE HASKINS of Vermont, WILLIAM W. COCKS of New York, RALPH D. COLE of Ohio, ERNEST M. POLLARD of Nebraska, CLARENCE C. GILHAMS of Indiana, JAMES C. MCLAUGHLIN of Michigan, JOHN W. WEEKS of Massachusetts, JOHN LAMB of Virginia, ASBURY F. LEVER of South Carolina, AUGUSTUS O. STANLEY of Kentucky, and J. THOMAS HEFLIN of Alabama. A minority report, which held that the connection of forests on the watersheds with the navigability of streams was not established and that the proposed legislation opened the way to enormous and unjustifiable expenditure, was signed by the chairman of the committee, CHARLES F. SCOTT of Kansas, and by WILLIAM LORIMER of Illinois, GEORGE W. COOK of Colorado, JACK BEALL of Texas, and W. W. RUCKER of Missouri. Individual minority reports were made by W. C. HAWLEY of Oregon and GILBERT N. HAUGEN of Iowa.

Hon. Asbury F. Lever, Representative from South Carolina

These reports removed the fighting from the skirmish line in the committee to the House itself, and there a battle royal was to be expected, with the whole powerful machinery of both party organizations opposed to action. It became known, however, as the session wore on, that the Speaker had finally given his assurance that the bill should receive consideration during the session, and it then became a question of whether the appropriation bills and other privileged legislation would be out of the way in time for full consideration. A special rule was reported about a week before the close of the session under which business could be brought up under suspension by a majority instead of a two-thirds vote. This enabled the Weeks bill to be brought in on the first of March and it passed the House by a vote of 157 to 147, ten answering "present," and seventy-two not voting. There was a spirited two hours' debate in which there were many speakers on both sides and PAYNE of New York and TAWNEY of Minnesota took the floor

Hon. Frank D. Currier, Representative from New Hampshire

against the measure and made clear the bitter and uncompromising opposition of the House managers. On the roll call the Speaker asked that his name be called and was recorded in the negative. The bill was ably managed by Mr. WEEKS and Mr. CURRIER on one side of the House and by Mr. LAMB and Mr. LEVER on the other. The bill went immediately to the Senate, where Senator TELLER and Senator HEYBURN objected to its being sent to conference without consideration on the floor of the the Senate. Finally, on the evening of March 3, when Senator BRANDEGEE called it up on a motion that the Senate concur with the House amendments, the Rocky Mountain Senators announced that if any attempt was made to pass the bill they should require full time for debate, and that they would alone occupy all the time that remained of the session, to the exclusion of other business. Against this opposition no move of force or strategy could be of any avail and the friends of the bill were obliged to accept its reference to the committee on forest reservations and the protection of game, which, of course, meant its death, so far as that Congress was concerned.

The net result of the vigorous campaign for the passage of the bill in the last Congress was therefore an accurate testing of the temper of the two houses toward the proposed legislation, and a definite line-up of the House on a roll call. It was also shown that more determined opposition may hereafter be anticipated in the Senate. The strongest arguments of our opponents have been made. Their efforts to check this movement by argument, by votes, or by parliamentary tactics, have been exerted to the utmost and it has gone forward in spite of them. Two bills, not identical, have passed both the Senate and the House. This in itself is progress. It is to be hoped that in another Congress it may be possible to agree upon a measure, which may pass both houses early enough in the session so that it will not be prevented from becoming a law by lack of time.

The issue is now clearly before Congress and the country. It rests on the vital principle of conservation of natural resources, and will not down. The people have unmistakably asked for legislation on this subject. They will demand it of the Sixty-first Congress.

—

Proclamation Concerning Cuting of Timber and Clearing of Lotts in Philadelphia and Suburbs, 1686. Wm. Penn, P. Gr. By William Penn, Proprietary and Governor

Since justice in all things ought to be observed It ought not for yt reason in ye least thing to bee neglected and for yt end I took great care whilst I was in ye Province among ye rest to prevent People cuting Wood and especially Timber off from other mens Lotts, and foreseeing ye scarcity yt would quickly follow, I did appoint a Woodsman who was instructed to graunt such Trees as belonged not to any private Purson, and in such number as ye case deserved and for his pains to receive 6d per tree. And in as much as I am credibly informed yt some of ye People of Philadelphia have been very irregular and injurious herein. I doe hereby desier and strictly order my loving friends and Comrs: William Markham, Thomas Ellis and John Goodson dilligently to inspect this matter and to cause such as shall from time to time be found offenders to be effectually and Impartially Presented according to Law in ye case provided. And because one of ye evil consequences of destroying ye Timber soe irregularly has been the growth of Underwood, which does not only hinder ye Town stock of ye benefit they might else have, and render ye Town more a Wilderness, but if not cleared and prevented may become a common Nuisance, by being a Covert for Vermin and too often for loos and evil persons, I have thought fitt to require my said Commrs and they are hereby ordered to present this to ye Inhabitants of ye Town whose accomadation has been for ye most part ye cause of this inconvenience, and they allsoe are hereby required to take some effectuall cours to clear the ground of such under-woods with all convenient speed.

Given at Worminghurst Place in old Engld ye 26th of ye 11th Mo 1686.

(Pennsylvania Archives, Vol. I, p. 97, Philadelphia, 1852.)

WATER CIRCULATION AND ITS CONTROL

By BAILEY WILLIS, E.M.C.E., United States Geological Survey

Circulation of Waters

THE moisture which falls upon North America in the form of rain and snow comes chiefly from the Pacific Ocean. A smaller proportion rising from the Gulf of Mexico and the West Indian seas falls upon the eastern United States. A part of this precipitation returns to the air; another part flows to the streams; a third enters the ground. It all sooner or later returns to the oceans. In this great general circulation there are many short cuts and many stop-overs. Rain which falls upon the sea has taken a short cut. Snow which gathers in banks and glaciers, water which lingers in lakes, swamps, and especially in the soil and deeper recesses of rocks underground, has stopped over for a longer or shorter time. On the whole, the great body of moisture moves constantly, circulates in various forms through the air, on the earth, and through all parts of the superficial crust of the earth, and in its constant flow is the most vital element affecting the life of plants and animals. The very air itself is not more necessary than the presence of an adequate and fairly regular supply of moisture. These vast movements of moisture transcend our control, but their effects do not. Has not man through intelligent skill converted the desert into a garden? And has he not through obstinate ignorance turned the garden into a desert? The path of our race from Asia across Europe has led through many such gardens; it is marked also by such deserts.

Says Irving in the charming introduction to The Alhambra:

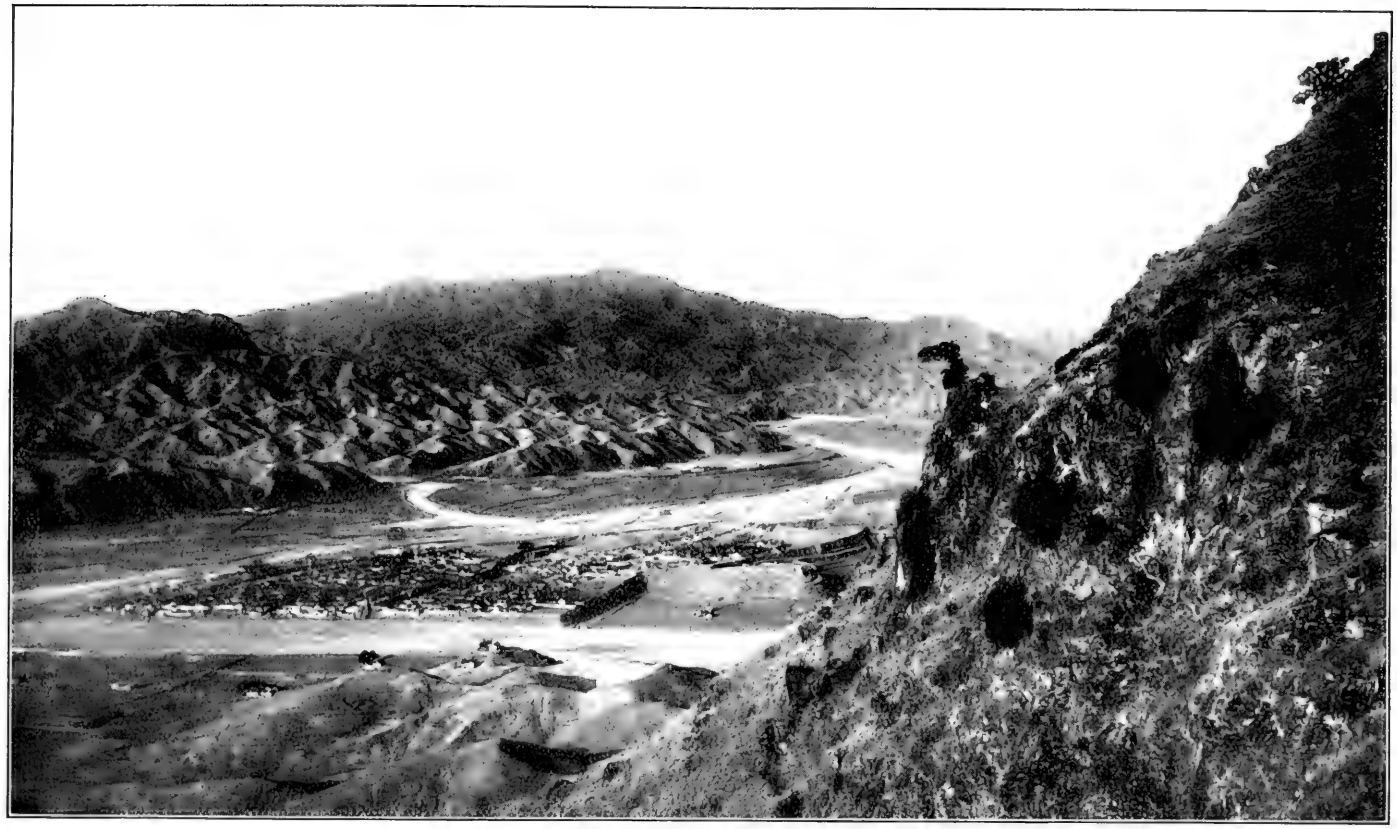
> Though there are exceptions in some of the maritime provinces, yet for the greater part Spain is a stern, melancholy country, with rugged mountains and long sweeping plains destitute of trees and indescribably silent and lonesome, partaking of the savage and solitary character of Africa. What adds to this silence and loneliness is the absence of singing birds, a natural consequence of the want of groves and hedges. The vulture and the eagle are seen wheeling about the mountain cliffs and soaring over the plains, and groups of shy bustards stalk about the heaths; but the myriads of smaller birds which animate the whole face of other countries are met with in but few provinces in Spain, and in those chiefly among the orchards and gardens which surround the habitations of man.

No better description could be written, not only of Spain but of Asia Minor, where the marbles of Grecian civilization mark the sites of lost cities; or of Dalmatia, where barren plateaus have replaced the forests from which Rome built her navies; or of many other parts of southern Europe and northern Africa, where man has helped to rob nature of her charm and transformed her gentleness into stern severity.

We Americans have left these desert mountains behind in Eurasia; but we occupy the last land that lies toward the setting sun. Our children and our children's children for countless generations are to enjoy the gardens or bewail the deserts we create.

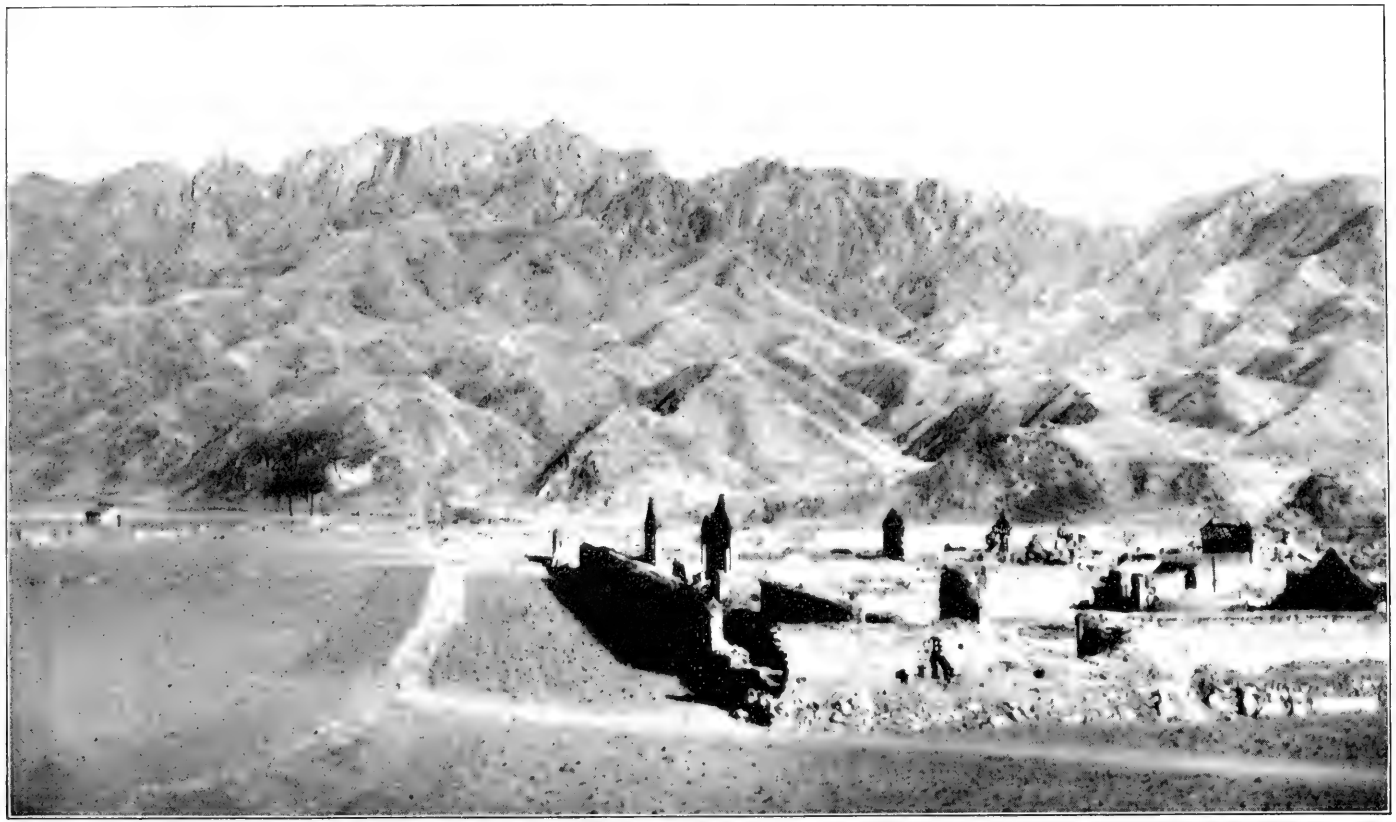
In the general circulation there is just one point where agencies under human control can directly affect the course of the movement. It is where rain strikes the ground or the vegetation covering the ground. From this point three routes are open to the moisture. It may evaporate, it may run off, or it may sink in. That which evaporates is lost to man's immediate use;

[1]To appear in the Report of the National Conservation Commission.



CHIEF CITY IN A DISTRICT FORMERLY RICH IN TIMBER

Locality: Fou-ping District, Chili Province, China. View Across the Valley of the Ta-Sha-ho (Big Sandy River), Including the City of Fou-ping and the Neighboring Mountains of Gneiss, a Region Closely Resembling in Situation and Physical Conditions the Piedmont District of the Appalachians from Virginia to Georgia. Bailey Willis, January, 1904



ORIGINALLY WOODED, SETTLED, CLEARED, AND RUINED SINCE 1725

Locality: District of Fou-ping, Chili Province, China, near the Headwaters of the Ta-Sha-ho (Big Sandy River). This Region Being on the Borders of Mongolia Remained but Sparsely Settled and Timbered until the Reign of a Powerful Emperor, 1705-1728, When Immigration Was Promoted and Cutting of the Timber Began. Bailey Willis, January, 1904

that which runs off may be useful, but is frequently so violent as to be harmful; that which sinks in flows slowly to the springs and streams and becomes available when most needed.

Now man can send more water back at once to the air and down to the streams, or he can lead a larger proportion into the soil to enrich his crops, to feed springs, and to bear his boats during low river stages, for he can strip the ribbed rocks of soil, as witness Spain, France, Italy, Greece and China, or he can clothe the surface with forest or verdure or thirsty fallow.

It is the object of this paper to consider the methods and efficiency of man's control, through engineering, agriculture and forests. But before entering upon that subject we may take a general view of moisture in circulation along the several parts of the route that are commonly known as precipitation, ground water, evaporation, and surface flow.

PRECIPITATION

Air and moisture may be mixed, as in clouds and mists, and some amount of moisture is dissolved in the air, no matter how dry it may seem. These two states of moisture in the air, whether mixed or dissolved, depend chiefly on the temperature. Changes of the barometer change the temperature, and thus pressure has an effect on the condition. And for any particular temperature and pressure the air will hold a certain amount of dissolved moisture and no more.[1]

Any effect which changes the temperature of the air makes it either more or less thirsty. A familiar instance is the cloud banner which seems nailed to a mountain top, especially to a snow peak, in spite of a strong wind. In that case a warm air current containing dissolved moisture is cooled by rising along the slope or by contact with the snow, and a part of the moisture becoming condensed is seen as a cloud. Blown farther, the water particles are redissolved in warm air currents and the cloud ends; but as the conditions and changes are continuous the banner is not blown away.

A similar phenomenon may be observed over such regions as our great plains, where the column of rising air becoming dilated and cooled forms a rain cloud at great height, yet the falling rain is dissolved in the hot air below before it can reach the ground. No one who has seen the shower vanish into thin air will question the effectiveness of radiation from treeless plains under a summer sun to prevent precipitation.

Who does not know a drying wind—such an one as blows cold from the Canadian snows and warming up drinks up moisture from every pore of the surface? Or if you have crossed the Cascade Mountains of Oregon or Washington you know how the wet air of the western ranges contrasts with the furnace dryness of the eastern plains. The mountains are wet because they are high, and they are heavily forested because they are wet. But there is also a reciprocal action of the forest on the wetness, for the radiation from the dark green expanse is comparatively uniform and promotes frequent and steady rains. Were the mountains bare they would, like the bared sierras of Spain, receive occasional but violent downpours and send down excessive and disastrous floods, even more disastrous than now.

On the other hand, the plains are dry because they are low and situated beyond the heights in the path of moisture-bearing currents, and they are without forests because they are dry. But here also there might be, yes, may be, a reciprocal action of vegetation on the dryness. For in so far as we clothe the surface with green crops we lower the temperature of the rising air and favor precipitation on the verdure-covered plain.

[1]Dissolved here means invisibly dispersed in the air. The physical or chemical nature of solution is not in point.

MOUNTAINS RESEMBLING THE APPALACHIANS, ONCE WOODED, NOW BARED; ARTIFICIAL TERRACES WHEREVER PRACTICABLE

Locality: District of Wu-t'ai-shan, northern Shan-si Province, China. These mountains were occupied by the earliest Buddhist monks, who came to China about 65 A. D., and during succeeding centuries established many monasteries, and under their protection the sacred mountains continued to be clothed with pine forests. But Chinese immigration having been promoted about 1725 as a protection against Mongolian attacks, the timber was cut and the mountains have been laid waste in less than two centuries. Bailey Willis, January, 1904

TREES REMAIN ONLY WHERE PROTECTED IN TEMPLE GROUNDS

Locality: District of Wu-t'ai-shan, Northern Shan-si Province, China. Bailey Willis, January, 1904

Thus moisture, in pursuing the great globe-encircling routes of the winds, may be influenced by local conditions to stop or to hasten on. There is a cycle of reactions which begins with rain, is continued by ground water and vegetation, and leads back to rain. The showers sink in, the seed germinates, the plant grows in the moist soil, and the cool, moist air above the green surface provokes a shower; or the downpour dashes off, the bare surface radiates the heat of the brilliant sun, and the shower that might fall passes over.

These reactions are not the great ones, but they are effective enough in many regions to make a garden or a desert, as the experience of our race, viewed in the light of modern knowledge, proves.

GROUND WATER

If anywhere in humid regions a well be sunk deep enough water will commonly be found. The water fills the soil or the spaces in the rocks. It flows into any opening and is governed by gravity, so that it runs down grade under ground. It is "ground water" and its surface is the "ground-water table."

In humid regions the ground-water table corresponds with the surface level of swamps and streams in their immediate vicinity, but it rises above them in uplands, following in a measure the altitude of the surface, though it does not reach an equal height. From the higher parts the ground water flows down to the lower; that is, from the uplands underground to the streams. If it be replenished by frequent rains it feeds the streams steadily. If not, the supply diminishes at first rapidly and then very slowly. It is the principal source of moderate and low-water flow in rivers of the eastern United States.

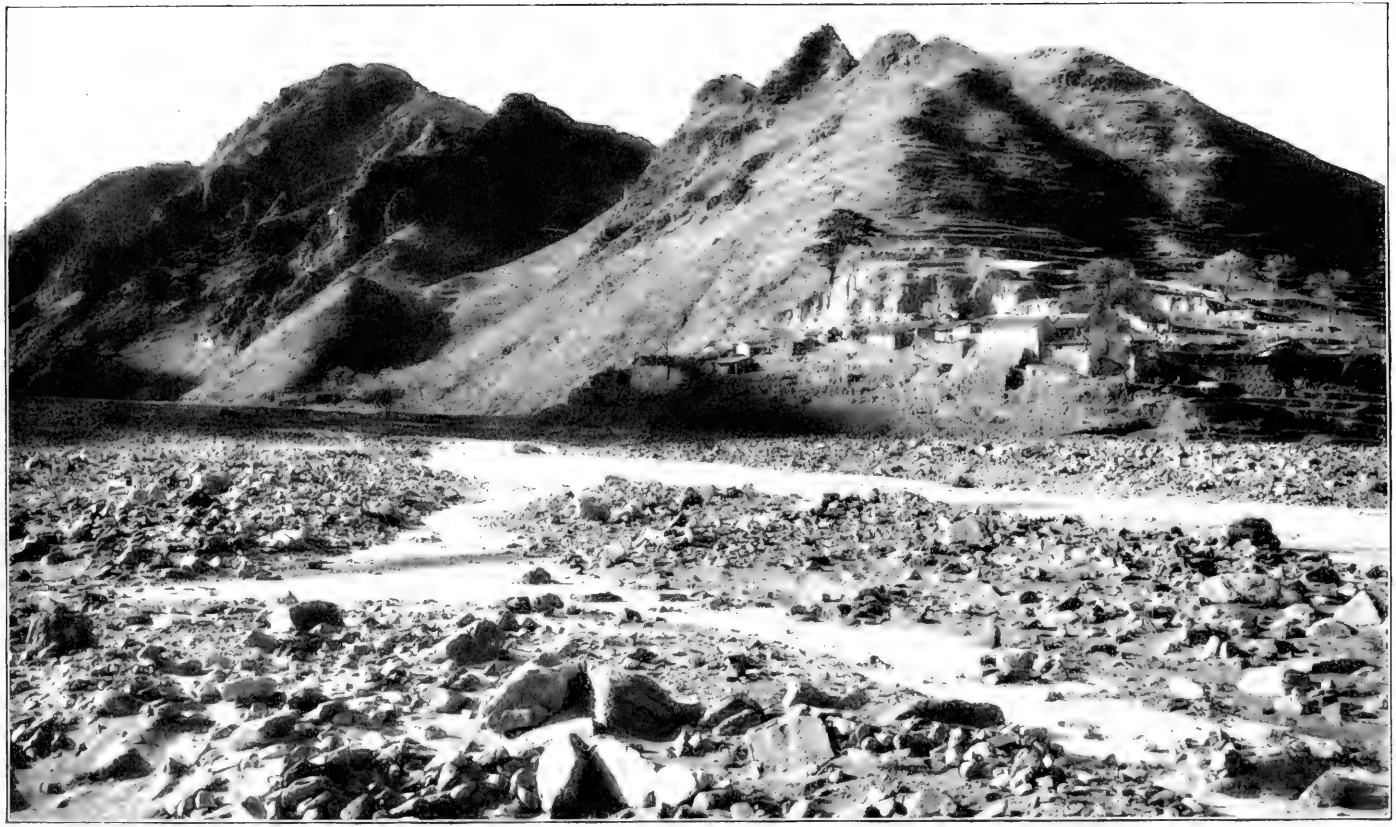
In arid regions the ground-water table usually lies at considerable depth or is wanting. Underground water may even be restricted to deep water-bearing strata, which it enters along the outcrop and in which it is under artesian head.

In all regions, except excessively dry deserts, the soil above the ground-water table contains some moisture, which envelopes the grain with a thin film only, if the soil be very dry, but which otherwise occupies the minute spaces between the grains. This moisture does not fall or rise in obedience to gravitation, it being under control of forces due to surface tension, which exist in tubes of very small bore (capillary tubes) and similar minute spaces. These forces of surface tension, overpowering the effect of gravitation, draw the moisture upward or sideways or downward in the direction of least moisture and thus tend to establish a balance throughout the mass so far as the capillary films are continuous. If there be evaporation from the surface the moisture is drawn upward, and this is the principal effect due to capillary attraction.

In humid regions the ground water and the soil moisture are in contact. From the surface of the ground to the water table the soil is more or less moist, and if evaporation takes place the upward movement may extend down to the water table, and some part of the ground water may be drawn into the capillary circulation.

In arid regions the ground water and soil moisture are commonly not connected, but are separated by a greater or less space in which the capillary films that envelope the soil grains are not in contact and there is consequently no capillary circulation. This is true under much of the great plains. Streams are fed only by immediate flood run-off or by underground waters from remote mountains.

Both ground water and soil moisture are derived from precipitation; the soil moisture in any acre being part of the rain or snow that falls on that acre; and ground water also being often accumulated from the surface which it underlies, but frequently coming from higher grounds near by or sometimes far away. This fact places in the farmers' hands the power to regulate the



BOTTOM LANDS BURIED IN WASTE FROM THE DEFORESTED MOUNTAINS

Locality: District of Wu-t'ai-shan, Northern Shan-si Province, China. Bailey Willis, January, 1904

SAVING WHAT IS LEFT OF THE SOIL WHEN THE FORESTS ARE GONE. APTIFICIAL TERRACING

Locality: District of Wu-t'ai-shan, Northern Shan-si Province, China. Bailey Willis, January, 1904

most vital thing in making a crop, by seeing to it that rain goes into the soil and not over it or away with it.

EVAPORATION

When dry air passes over a moist surface it absorbs moisture from the latter. This is the simple process of evaporation, which is, however, subject to intricate relations of temperature, pressure, and humidity. Considering it as a way in which water that we want in the ground escapes into the air, we are interested to limit evaporation. This is possible by keeping the surface cool and the air above it moist, as under trees; and in sufficiently arid regions it is accomplished by covering the surface with a dry mulch, which cuts off the upward rise of moisture. The action of the woods in keeping the air and ground cool and moist is not open to question; even on the semiarid plains a wind break notably reduces evaporation from the fields in its lee; but it is held by some writers that the trees draw in through their roots and transpire through their leaves more moisture than would evaporate were the soil beneath them bare. This is true with regard to the soil reached by their roots, particularly on plains. On hill slopes it is also true, but trees so increase the amount of water stored in sloping ground, over that which can be stored in the same slope if bare, that they more than make up for what they transpire.

In regard to the manner of evaporation from soils under arid and humid conditions we may best quote as follows from Buckingham:[1]

> When a moist soil dries by contact with the air above it the loss of water takes place by evaporation close to the surface, the amount lost by direct evaporation from points several inches below the surface being in general negligible. As the surface soil dries out a moisture gradient is established, and the dry surface soil draws up water from the moister region below by capillary action. If this capillary flow of water be prevented or lessened, as by the use of a mulch, the escape of water is decreased, because the evaporation has, on the whole, to take place from farther below the surface, so that it encounters greater resistance and is slower.
>
> The flow of water in a soil which is not very wet has to take place through the thin films in which a part of the water is distributed over the soil grains. If the soil becomes very dry it is to be expected that these films will become thinner or break, the resistance to capillary flow increasing very much in either case. Hence it is to be expected that in very dry soils capillary flow will be slow.
>
> Suppose a soil could be made so dry that no capillary flow at all would take place in it even when it was in contact with a moist soil. Such a layer of soil would act toward the moist soil below it as a protecting mulch. A soil can probably not be made so dry as to lose its power of capillary conduction of water entirely, but we may get an approximation to this limiting case.
>
> Suppose that after a rain the soil surface be exposed to very arid conditions with a high surface temperature and a hot, dry wind. The surface of the soil will lose water much faster than it can be brought up from below by capillary action, and if the arid conditions be kept up a layer of dry soil will be formed on the surface, which may be so dry as to act in the manner suggested, i. e., as a protecting mulch. We shall thus have an initial period of very rapid evaporation, followed by a period of slow evaporation, taking place largely from below the surface.
>
> If the same soil had been subject to less arid conditions the initial loss would have been less. The capillary flow from below would have been sufficient to prevent the surface soil from becoming dry enough to act as a mulch; hence, though the initial rate of loss would be smaller, that rate would not fall off so rapidly. It might even happen that in the long run the soil under the arid conditions would actually lose less water than the same soil under humid conditions.

From these statements and the careful experiments on which they are based it appears that in humid regions exaporation from a bare surface is not readily controlled, whereas in arid regions the precious moisture may be retained by a mulch of sufficiently dry soil.

SURFACE FLOW

Surface flow is the water in swamps, lakes and streams. It is all derived

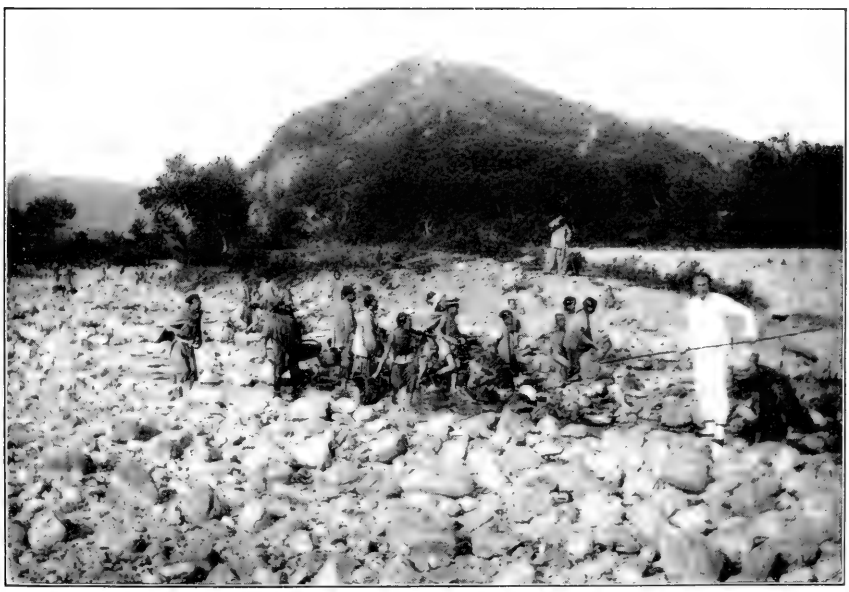
[1] Buckingham, Edgar: Studies in the Movement of Soil Moisture. U. S. Department of Agriculture, Bureau of Soils, Bull. No. 38, pp. 18-19, 1907.

FARMING IN THE PATH OF THE FLOOD

Locality: District of Wu-t'ai-shan, Northern Shan-si Province, China. A Valley at the Base of the Mountains which During the Spring Rains Is Covered by Flood Waters. The Stone Walls Catch Some of the Sediments and Crops are Grown on the Soil Thus Saved. Bailey Willis, January, 1904

CARAVAN PASSING THROUGH A VALLEY WHERE FORMERLY PROSPEROUS PEASANTS USED TO LIVE, WHEN THE MOUNTAINS WERE STILL FORESTED

Locality: Near the Wu-t'ai-shan, Shan-si, China. The Floods Have Carried Destruction All Over the Land, and Its Aspect Is Like a Stony Desert. April 14, 1907



A PEBBLY RIVER BED IN SOUTH MANCHURIA

Locality: Near Fong huang sheng, South Manchuria. The formerly big stream has dried up, on account of the climate having become more arid, since the destruction of the forests on the mountain sides. Only some scrub wood is left which will disappear within the next forty or fifty years. June 27, 1906

from precipitation, but is gathered from the surface in part only; another part appearing from seepages and springs after a trip underground. The former we will call "flood run-off," the latter "seepage run-off."

Flood run-off is that part of rain or snow fall which remains on or very near the surface, flows directly to swamps, lakes or streams, and immediately or in a short time runs away. Following showers, flood run-off raises streams; following prolonged rains or melting snow it occasions high water, which quickly recedes when the rain or melting ceases; and following excessive rains or melting, flood run-off produces great floods.

Flood run-off is thus the most transient, irregular, wasteful and dangerous part of precipitation.

It damaged the people in the United States in eight months, January 1 to August 31, 1908, $237,000,000. In the year 1907 it occasioned the loss of $118,238,000. In the ten years prior to December, 1906, it cost not less than $1,500,000,000 in goods, buildings, bridges, roads, railroads, and real estate, washed away.

These losses are net losses; they do not include deterioration of values not actually destroyed, nor do they cover the incalculable, irreparable loss of fertile soil from our mountains, grazing lands, and fields. This loss amounts to approximately 1,000,000,000 tons of soil per annum. Nor does the financial loss include the sum of human suffering or the loss to the Nation through lowered efficiency and morale of the citizens who suffer from floods.

Seepage run-off stands in direct contrast to flood run-off. It is slow and gradual where the other is quick and spasmodic; it is regular where the other is irregular; it continues when the other fails. The uses of surface waters (crop growing, city water supply, sanitation, water power, and navigation) depend on reliability and regularity. Hence it is obvious that the works of man should be designed to increase that part of rainfall and snowfall which, sinking into the ground, contributes to seepage run-off and to regulate the flow of that considerable part which cannot enter the ground.

Rain falling on a well-tilled field or grass or forest largely sinks in. Falling on bare, baked, incrusted ground, it dashes off. Whichever in any place occurs, some farmer or herdsman or lumberman is responsible, for there is now no considerable part of the United States that man does not make or mar. But at the best there will always remain a notable proportion of precipitation that will form flood run-off, and this we must commit to the care of the engineer as part of the surface flow which it is his duty to control.

(To be continued)

PRACTICABILITY OF STATE FORESTS IN THE SOUTHERN APPALACHIAN STATES

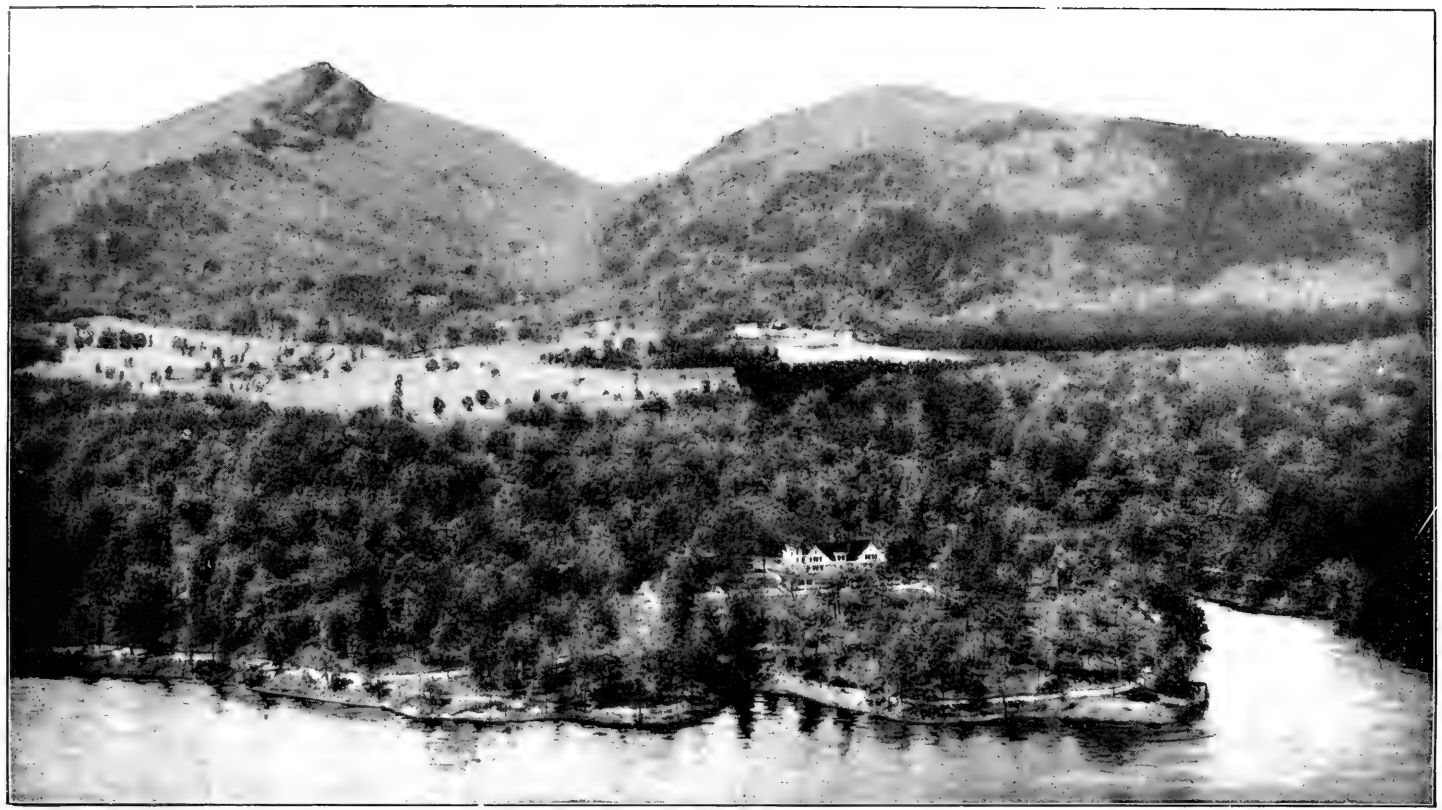
By W. W. ASHE, State Forester of North Carolina

THE political theory of the southern states has been that of *laissez faire,* of non-interference with the industrial activities of their citizens. While this theory of government yet obtains, there has rapidly developed a belief that the forest situation at the present time in respect to the supply of timber, as well as the influence exerted by the forest upon stream-flow, justifies the exercise of a certain amount of public assistance and even, under some conditions, governmental supervision for the benefit of the people of the entire community. When the citizen by his limitations and his lack of means is unable to develop or to protect a resource, the use of which involves the general public welfare, the state is justified in assisting him. This principle was recognized by nearly every southern state in the aid they rendered in the financing and in building of many of their railroads, the construction of which would undoubtedly have been delayed many decades but for this assistance.

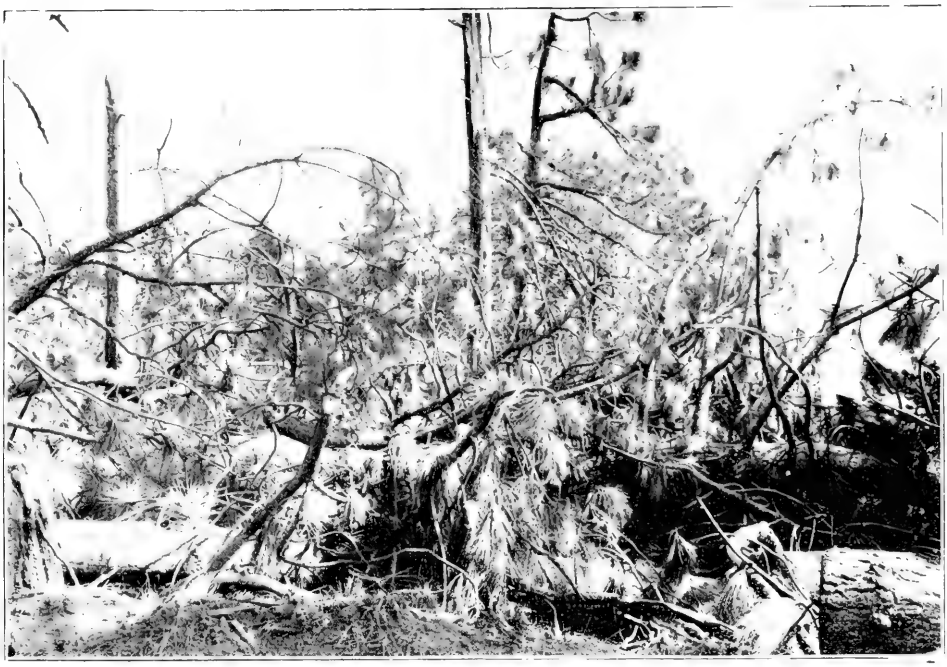
In several of the northeastern states this view of the necessity of the control by the state of certain classes of forest lands has resulted in state ownership. New York owns more than a million acres, while Pennsylvania has already acquired nearly as much. The financial condition of the southern states is not such as to warrant, at the present time, the acquisition of extensive holdings. That these states, however, would seek to acquire land, if they were able to do so, the private ownership of which might seriously jeopardize the rights of others, is amply attested by the fervor with which they have advocated the establishment of Federal forests in the Appalachian region. Undoubtedly, they will eventually follow the examples of New York and Pennsylvania and secure control of forest lands which protect important water-sheds; but it is doubtful if they would be financially in a situation to do this until the timber has been exploited and the ownership of the land by private parties found unprofitable to the owner and detrimental to the best interests of the state.

In North Carolina, where the conditions are fairly typical of those existing in several other states which are situated partly within the southern Appalachians, there are, out of a total forest area of more than 11,000,000 acres, between 3,500,000 and 4,500,000 acres of absolute forest land. By absolute forest land is meant land which is better suited for forest purposes than for farming uses. Two-thirds of this area is located within the Appalachians, and is situated above an altitude of 2,000 feet; while one-third, or more than 1,300,000 acres, lies within the Piedmont and coastal plain regions. Between one-eighth and one-seventh of the total area of North Carolina is absolute forest land, while more than one-third of the total area of the state is yet nominally forest land. Virginia, Kentucky, Tennessee, and Alabama have about the same proportion of obsolute forest land as North Carolina, while a smaller proportion exists in South Carolina and Georgia; that is, if the same basis is used for deciding what is absolute forest land in the different states.

Several of these states yet own small areas of forested public lands which

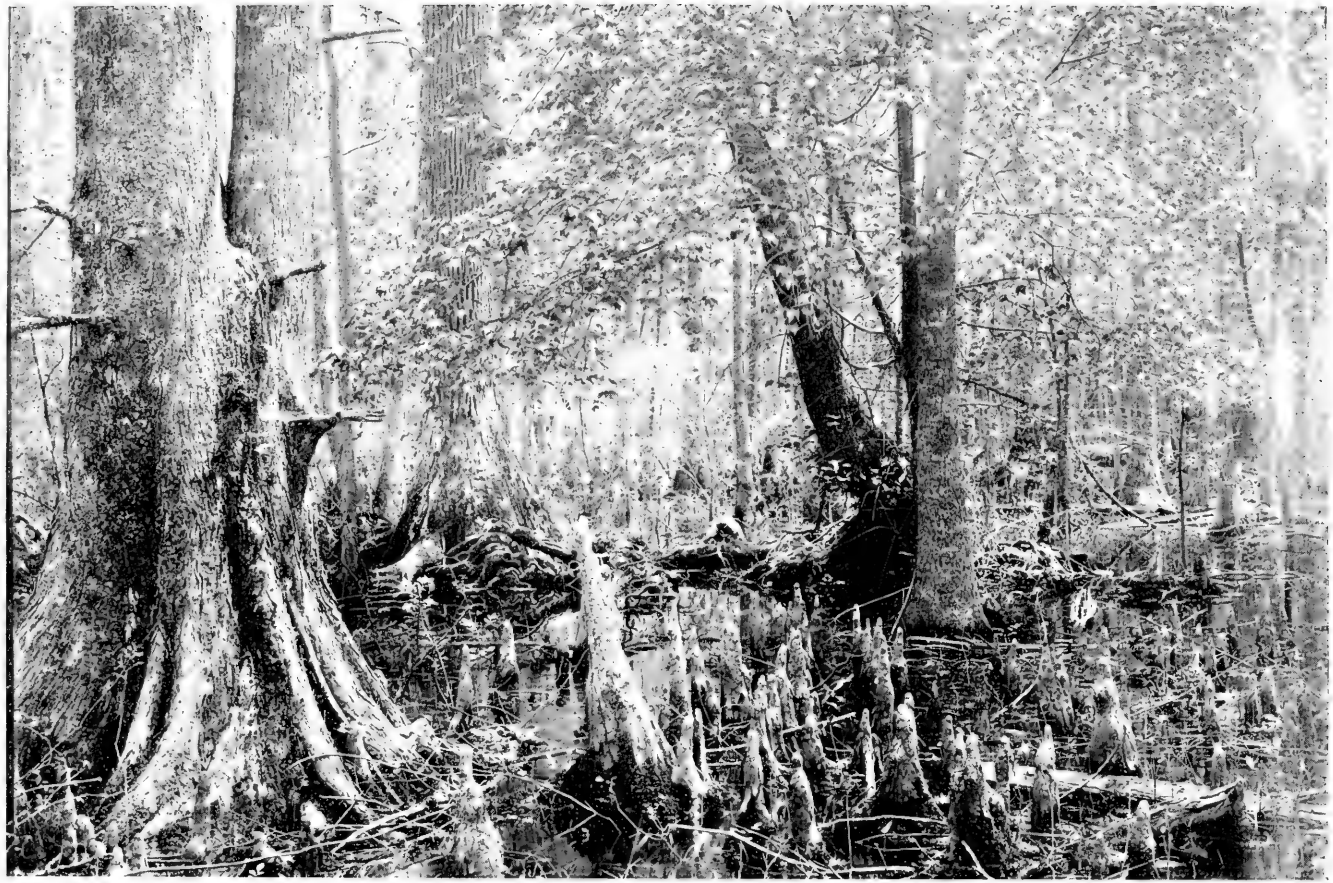


View in the Sapphire Country, North Carolina, within the Area of the Proposed Southern Appalachian National Forest



A Fire-trap Left by Lumbering

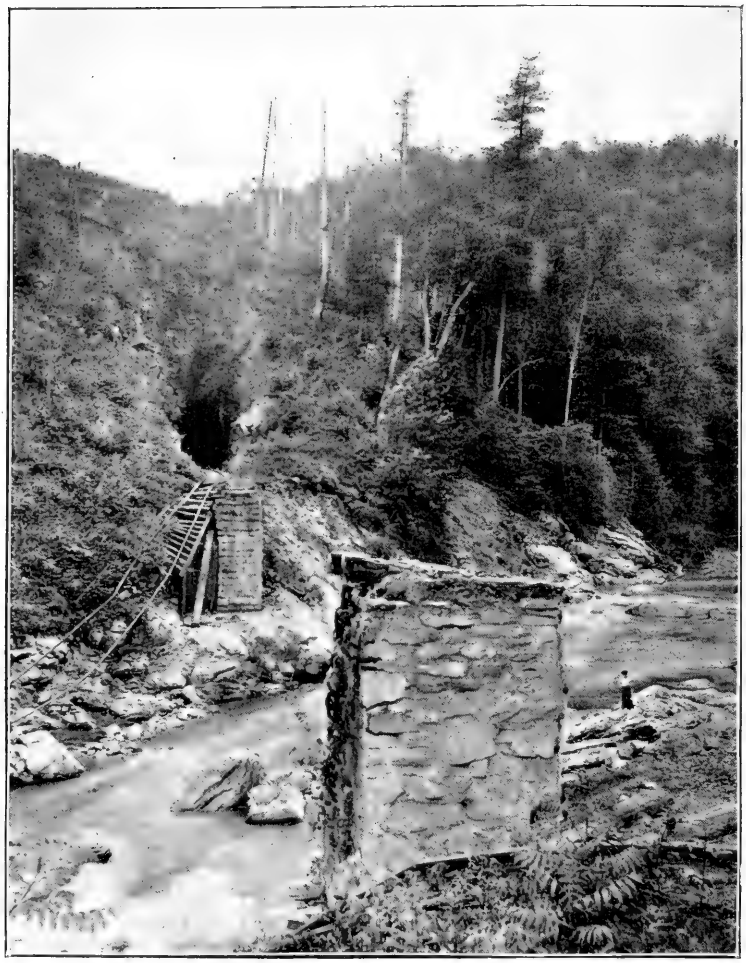
Waste from Logging



The Problem of Reclamation by Drainage. Southern Margin of the Dismal Swamp, Showing Character Swamp Landscape and Forest

Fire Running from the Open into Green Timber

North Sugar Loaf Mountain, New Hampshire. Once Heavily Timbered, but Now Practically Barren as a Result of Clean Cutting and Fire



Flood Damages to Railway on Nolichucky River, East Tennessee, May, 1901

were either set aside by the states for some particular purpose, as for the benefit of the educational system of the state, or which have never been sold or patented by the state. These holdings are, however, usually not well suited for the purpose of permanent forests. In North Carolina they consist in part of swamp lands, situated near the coast, and in part of areas of very rough or poor land, situated, for the most part, in the mountains. While many of the swamps are large enough to form units of forest management, the soils are generally of good quality, and require only thorough drainage to establish them as agricultural lands of high value. Moreover, the character of the timber, which is largely black gum, offers, on account of its slow growth, an uninviting field for temporary forest management. The mountain lands which yet belong to the state consist of small and isolated areas, and, as they now exist, could not be profitably managed as commercial forests. In North Carolina the state would not be justified in making any extensive outlay for the development of either of these classes of holdings. These lands should receive, however, preferential protection from fire.

It is evident that the state owns only an insignificant proportion of the abso-

lute forest lands of the commonwealth, and that the protection and development of its small quota can have no appreciable influence upon the timber supply or the welfare of the people of the state. The state's interest in the forest lands which are owned by its citizens is paramount. The forest lands and the interests directly dependent upon forest products constitute one-sixth of the entire taxable assets of North Carolina. They constitute a very large and important proportion of the wealth of each of the Appalachian states.

At the present time the state's policy could scarcely be directed along more profitable lines than seeking to develop the holdings of its citizens. Owners are deterred from developing their own holdings largely on account of the low prices of forest products, making the returns from forest lands seem extremely small compared with those from agricultural lands, while other deterrent elements are the fire danger and time; that is, the long period which must elapse before the youngest trees will be mature and salable.

The price of forest products is yet fixed by the remaining supply of old timber which has grown without cost; and cut-over and second-growth forest lands will, as a whole, not be profitable investments until the prices of forest products are fixed by the cost of growing or producing them. It is this condition which makes it necessary to give the owner of second-growth forest land some assistance until the profits from low-grade and cut-over lands become greater.

Assistance should be along these lines:

1. Technical advice in regard to methods of management. Very little is yet known from experience respecting the best methods of management, and the individual owner is seldom able to pay an engineer to develop a system of management. Even if able and willing to do so, the owner will seldom know where to secure the help he needs.

2. Assistance in protection from fire. The enormous damage caused by fires, especially to second-growth forests, is not realized, even by owners, far less by the general public. Several years of constant agitation will be required to bring people to realize the extent of this loss and to regard young timber as property.

3. Adjustment of taxes so that immature timber will not be taxed while mature timber will be taxed only once.

For these reasons the state of North Carolina is anxious to acquire more valuable and extensive interests than it could possibly secure through acquiring holdings in fee, by expending its entire available funds in developing its forest resources as a whole. The following policy is one which seems to be suited to the present conditions in North Carolina, and which has been generally approved by owners of forest lands.

A system of fire-protection which will be sufficiently flexible to require establishment only in those townships where conditions require it should be adopted. While fire-protection must eventually become a matter of purely private concern, it is impossible for private interests to assume it so long as low-grade timber cannot profitably be handled, and so long as the public is indifferent to the loss occasioned by forest fires.

A second measure provides for advice to owners of timber lands in regard to methods of management, fire-protection, logging, etc. This feature is already well established, and applications have been received for working plans for 50,000 acres. The scope of this work is entirely advisory, and no obligation is assumed by the owner who receives such assistance.

There is a large area of waste and gullied hillside land, totalling more than 200,000 acres, in the middle and western portions of North Carolina. This land is objectionable in its present condition because entirely without earning power. Moreover, it has a very injurious effect upon streams; adding, by the great rapidity of the run-off of storm water from it, to the height of

floods, and contributing to the streams an enormous burden of silt and sand which is deposited by the floods over the farming land in the alluvial valleys; this sand likewise fills the reservoirs, and chokes the channels of the navigable rivers.

It is proposed to interest landowners in replanting this land as a profitable investment. Small seed beds have been established, which will soon be very much enlarged; from these it is expected to supply seedlings for planting to the owners of such land. It is proposed that the state should acquire some reasonable rights in such plantations respecting either the length of time before they can be cut or the method of cutting.

Eventually it is hoped to acquire small areas of old forest in different portions of the state for use as demonstration forests. These need not necessarily be purchased, but the right of exclusive use for a definite term of years can be secured. These would be used in much the same manner as the demonstration farms of the South are used at present. They should be selected for accessibility rather than for their value as commercial enterprises. Their object would be to develop methods of management and show the results of such methods.

Another measure provides for the establishment of registered forests. This permits forest land of a certain grade to be listed in the county in which situated, and in the office of the Secretary of State as forest land. It must be non-agricultural land which, in the opinion of the Forest Office, will not be suited for farming purposes for at least thirty years. In consideration of certain privileges in regard to management, which are given by the state, paying taxes on the timber only as it is cut and granting police power to rangers the owners agree to maintain registered forest lands in forest for a fixed period, managing the forest on lines approved by the State's Forest Office. The interest which this measure has created indicates that it would be of much service in permitting owners to regard holdings as permanent investments.

In this way the state of North Carolina hopes to be able to secure far greater benefits than would be possible if the limited means which are now at its command were used in acquiring holdings in fee or in paying for labor in planting. And the people of the commonwealth must eventually derive greater benefits from such a policy which is directed entirely toward making all the timberlands in the state productive, and securing protective planting on the watersheds of all the streams of the state, than would be possible if the state, at the present time, were to expend its entire resource in the purchase of holdings which could never be of great importance either as sources of timber supply or as protective forests on account of their comparatively limited extent. The salient features in this policy would also seem to be well suited to the conditions of the other Southern Appalachian states.

WHAT FOREST CONSERVATION MEANS

By R. S. KELLOGG, Assistant Forester, Forest Service

AT ITS meeting in Cleveland two years ago the National Association of Box Manufacturers took the initiative among all the great wood-using industries in recognizing the importance of having a timber census of the United States. It was clearly seen that before the Nation and the states could take the steps which are necessary to an economical utilization and the maintenance of our timber supply, we must know what kinds and how much timber we have and under what conditions it is growing. A great deal of excellent work was done by the association in putting the necessity for a timber census before the public, and in calling attention to the condition of our forest resources so far as shown by the facts then at hand. While the association did not succeed in its attempt to have Congress authorize a timber census, the work which it did was of great educational value. Needless to say the need for a timber census still exists, and only upon the complete knowledge of our forest resources, secured by such a census, can adequate and detailed plans for the perpetuation of our forest resources be based. In the meantime, we are exceedingly fortunate in having the compilation made by the National Conservation Commission. The report of the Commission brings out clearly the main facts as to what forests we have, how fast they are being used up, how fast they are growing, and what must be done to conserve them. The report of the Commission is a broad platform of facts and principles upon which we must proceed to make further plans for forest conservation.

The Conservation Commission estimates that the original forests of the United States covered not less than 850,000,000 acres, or forty-five per cent. of the total land area of the United States, and that they contained not less than 5,200,000,000,000 feet of merchantable saw timber according to present standards of utilization. Clearing for agriculture, cutting, and fire have reduced this acreage to about 550,000,000, with a stand of perhaps 2,500,000,000,000 feet of saw timber. Of this 550,000,000, acres of forest land which we now have, some 200,000,000 acres are covered with mature timber on which annual growth is balanced by loss through death and decay. Two hundred and fifty million acres are partially cut or burned over, but restocking naturally with sufficient young growth to produce a fair crop of timber, while it is estimated that 100,000,000 acres have been so severely cut and burned over that the natural growth upon them is of little value. The annual cut of forest products is in round numbers about as follows: One hundred million cords of firewood; 40,000,000,000 feet of lumber; 1,000,000,000 posts, poles, and rails; 118,000,000 hewn ties; one and one-half billion staves; 133,000,000 sets of heading; 500,000,000 barrel hoops; 3,000,000 cords of pulpwood; 165,000,000 cubic feet of round mine timbers, and one and one-fourth million cords of wood used for distillation. This is equivalent to a total of 23,000,000,000 cubic feet of wood, or 260 cubic feet per capita. Under present conditions of mismanagement and neglect the annual growth of our forests is probably less

than 7,000,000,000 cubic feet. In other words, we are producing less than one-third as much wood annually as we are using. We are like a get-rich-quick concern which pays dividends out of its capital stock. If this continues, some day all of us will be doing our share in holding the sack.

Forests are essential for the protection of watersheds, for their ameliorating influences upon local climate, for recreation grounds for the people, as a habitation for birds and game, and, above all, for a timber supply. Despite the introduction of many substitutes, we cannot conceive of the practicability of doing without wood. Granting this, it follows that as a Nation and as individual citizens we must do our utmost to put our forests upon a permanent producing basis. We must cut no more from them than they produce each year, and we must make their yearly growth equal to our needs. Forest conservation means two things: First, the fullest possible utilization of the present supply of timber, which will make it last longer, and, second, the handling of forest lands in such a way that succeeding crops of timber will be secured.

At present only about one-fifth of our standing timber is in public forests. This term is used to cover the National Forests, state forests, the timber on Indian and military reservations, National parks, etc. These forests are being managed according to the principles of scientific forestry so far as funds available for their administration permit. In the main they are being conserved. While the extent of the public forests will undoubtedly be increased in the future, it is not likely that for a very long time to come they will contain even as much as half our timber supply. Four-fifths of our forests are now owned by individuals, companies or corporations. The manner in which these forests are handled is, therefore, of the utmost importance in forest conservation. So far but little attempt has been made to conserve them. The timberland owner and the lumber manufacturer are primarily business men. They are working for a profit, and an immediate one, if possible; at any rate, a profit within comparatively few years. They will not conserve their forests unless they are convinced that forest conservation will yield a profit. We cannot blame them for this. It is a perfectly natural and necessary attitude from the standpoint of the individual. The National Conservation Commission recognizes that three main considerations arise in making plans for the conservation of privately owned forests. The first two of these are matters for state legislation. The third is an economic one. They are:

1. We must stop forest fires. Millions of acres of forest land are burned over every year. In many cases the damage to standing timber is great, but in almost every case, the damage to the soil and to the young-growth timber is far greater. The cutting of successive crops of timber from our forest lands depends absolutely upon the keeping out of forest fires. Forest fires can be prevented, but to prevent them requires constant vigilance during the danger season. Proper state laws, with ample funds for their enforcement, and cooperation with timberland owners, will do it. Some splendid examples of this occurred during the past season, in which forest fires were unusually widespread and destructive. Four forest protective associations in northern Idaho, for instance, organized in accordance with the laws of that state, protected a million and a quarter acres of forest land, and kept the damage down to a comparatively small amount. They did so at a cost to themselves of 4 cents per acre. The Washington Forest Fire Association also did excellent work. When in comparison with this it is stated that, during the last fiscal year, the Forest Service had an equivalent of only 1½ cents per acre to spend upon the National Forests for all kinds of work and administration, including fire fighting, it is seen that the lumbermen cannot be

charged with a lack of interest in fire prevention in the Northwest at the present time whatever may have been their attitude in the past. The lumbermen in the Lake States are now working for legislation which will assist in reducing the damage in that region. The fires there last fall are a lesson which will not be forgotten. An enlightened public sentiment, coupled with adequate legislation, will solve the forest-fire problem.

2. It is essential that the methods of taxing forest lands be made more equitable. The recommendation of the National Conservation Commission is that for purposes of taxation only a small annual tax be levied upon forest land considered apart from the timber, and that no tax at all be paid upon the timber until it is cut. Farm land has a value based upon its ability to produce annual crops. It is right that it should be taxed upon that value. Were timberland taxed upon its value, based upon the amount of timber which it produces each year, it would be fair, but when, as is usually the case, timberland is taxed each year upon the value of the timber standing on it, which may have required 100 or more years to grow, it is obviously unjust. Timberland brings in no revenue until the timber is cut. By levying a tax then, it comes at a time when the owner is best able to pay it, and there is no danger that he will be forced by unfair taxation to cut his timber when conditions otherwise do not justify it. Since there is no possibility of getting a return from cut-over lands for many years, the method of taxing forest land recommended by the Conservation Commission is particularly applicable to them. With practical exemption from taxation, the owner can afford to hold his cut-over land for another crop of timber when otherwise he could not do so. Forest taxation is entirely a matter for state legislation. The National Conservation Commission and the Forest Service can recommend methods that seem to them best, but the enactment of them must be made by the legislatures of the various states.

3. Forest products must bring a price which makes forest conservation profitable if privately owned forests are to be conserved. Cheap lumber retards forest conservation. We are now paying what we consider, by comparison with the past, very high prices for many grades of lumber, but there is no prospect that lumber will ever be much, if any, cheaper. Some grades and kinds must certainly advance. The farmer plants and grows the wheat and corn which he sells. When the price goes below the cost of production, he stops raising them. No lumber manufacturer has grown the timber which he is cutting, nor has he in general paid a price for it at which it could be profitably grown. It is obvious that eventually the average price of the entire cut of any kind of lumber must be a price at which it can be reproduced. Higher prices for forest products mean a much closer utilization of timber; the lumber manufacturer will cut much more lumber from the same ground and the consumer will use it much more economically and carefully. The lumber manufacturer will reduce the waste in the woods and at the mill just as fast as the price which he can get for his product will justify him in doing so. He does not leave his top logs and poorer trees in the woods so much because he prefers to as he does because he cannot sell the lumber which they will make.

The National Conservation Commission advocates nothing which experience elsewhere has not demonstrated to be practicable. We know that we must continue in the future as we have in the past to rely upon our own forests for the great bulk of the wood we use. We know that Germany faced this same great problem early in the nineteenth century, and that she solved it in a way that is a model for the rest of the world. We take 260 cubic feet of wood per capita annually from our forests; Germany uses but thirty-seven.

Our forests are now producing not more than twelve cubic feet of wood per acre per year; Germany's forests are producing forty-eight cubic feet annually. In other words, she has reduced waste and consumption and increased production. We have as rapid growing species and as good forest soil as Germany has. Shall we fail in meeting our problem? I do not think so. As admirably stated by the President, the conservation of natural resources means "the application of common sense to common problems for the common good."

(Read at annual meeting of National Association of Box Manufacturers, Chattanooga, Tenn., February 23, 1909.)

AIMLESS TREE SLAUGHTER

By M. E. BAKER

THERE was a man who lived in New England, whose name was Legion. Nine-tenths of the time he tilled his land and mended stone fences, like a moral and intelligent being; and the tenth part of the time a madness came upon him—an hereditary madness. He remembered subconsciously how his ancestors wrested the soil from the forests, and did battle with the foes that lurked in their depths, and he seized his ax and went forth to take vengeance upon the forest, for the hostile front it showed his elders. But the forest was gone, and the only soil he could find to wrest was beside the town roads, on either hand. This, then, he fell upon with right good will. There were oaks, and these he cut down, wastefully two feet from the ground and scattered their branches about. There were walnuts and birches and beeches, and he felled them all, and hewed them into bits. There was red cedar, with its priceless worth, and its heart of fragrance and this he hacked and haggled and utterly destroyed. Then he looked upon what he had done, and called it very good, and the madness left him. He never returned to finish clearing up the roadside. He never covered the bared rocks, or leveled the ragged banks. The ground bristled with stubble of trees, and their boughs rotted where they fell.

The only times when the man revisited the roadside were when he cast old stovepipes and broken china, in a heap, a few hundred yards from his dwelling.

What shall be done for the madness of this man? He is not to be greatly frighted with droughts or floods, and he has no regard in his heart for the landscape. He does not desire shade trees. Would legislation avail for his cure, or psycho-therapy, or beating with many stripes? If this last were done speedily, there are still birches left by the roadsides wherewith to do it. But if he is not restrained before long, New England will be, here and there among its towns, in like condition with Japan, which has no need to make laws to protect its birds, because the birds are all slaughtered.

A LITTLE ABOUT ENGLAND'S TREES

By ANNE WARNER

Paper Four

WE LEFT Germany a month ago and have been railroading, motoring, pony-carting, and walking about some few bits of England. It's a beautiful country with a rare gift for looking warm on cold days and getting comfort out of fires to which the notion of giving forth heat has never occurred in their wildest dreams. We are always very happy here, even though I cannot see what form of scourge could have brought on the first emigration across the Channel I know what brings me, but the same cause could never have operated B. C. (And I doubt if I come again in December.)

The prettiest things in England at all times of the year are the trees and the hedgerows. The trees are bare now and their curious old trunks and branches and uncut sprouts are all as picturesque as Rockham's fantastic drawings. If one stops short at the surface of the subject nothing could be more ideal than the tree-life of England.

We passed along Addison's Walk at Oxford and through "Broad Walk" behind Christ Church College. Three years ago the walk was magnificent but they have had to take out so many of the fine old trees that the picture is going all to pieces. It's the same tale in Hyde Park. This is the hard side of protection for sentiment alone. Like every other phase of human action that doesn't ring *absolutely* true, it defeats its own end. The master of landscape gardening must arrange his pictures so that as the centuries turn the pages each page will be a picture in itself.

We were in Chepstowe Castle and saw huge trees growing out of ruins wrought by Cromwell. In some places the trees absolutely bound the stone into place while in others they sprung thick masonry apart. In the first of Chepstowe's four courts stands the largest walnut tree in England, its long branches supported by props.

At Monmouth we had a pony for eight hours for $2.50 and drove to Raglan Castle, the last castle but one to "hold out for the king." The drive coming and going was almost the prettiest I ever took, and I saw a bit of "planted wood"—the only bit I've ever seen in England. I must confess that what impressed me most was getting a pony and trap for eight hours for $2.50, but when I had to pay a dollar for a whip that I didn't lose and which didn't have a lash even if I had lost it—I felt less under obligations to the stable.

We motored to Dorchester, where the Prince of Wales objects to having the Roman amphitheater excavated because he rents the present surface for a sheep pasture, and I learned nothing new about trees; but coming home I had it vividly borne in upon me that on the stoniest road imaginable you can't find a stone big enough to keep a motor from rolling backward—not after dark.

At Zeals' in Wiltshire, I saw the oak under which Judge Wyndham sat to judge, and to the branches of which he had those he judged hung forthwith.

From the foregoing it will easily be seen that I am well fitted to sum up England's position as far as her woods are concerned, and for the benefit of those no wiser than myself, I will try to be fair.

England is practically the property of a class who are not forced to concern

themselves as to food and lodging. They own the land. They own the trees. Nothing more ideal than their homes and the estates surrounding them can be imagined. There are others in the land—a vast majority—who own nothing.

I am not a socialist and I love wide views and beauty as well as any one can, I believe. But I choose the country with the straight line of dark pines or big white birches crowning every hill or protecting every little brook. I choose the land where the land is bringing its quota in every way that science can help the sun, the earth, and the water to do so. They say that want and misery and lack of work are as rampant in Berlin as in London and I do not doubt that it is so. But Berlin and London are not Germany and England, and I do know that when one travels and watches, there is a far greater proportion of comfort and kindliness in the former land than in the latter, and that the difference has its root in very much the same place that the trees have theirs—deep down. I think that I said something like this before. The world is such a wonderfully made puzzle that the same statement may fit in many corners of it. But the fact remains that dear and good as beauty is, utility is also dear and good. It's almost as bad to preserve trees till they tumble over with dry-rot as it is to cut them all at once. I didn't say that it was as bad—I said that it was almost as bad. All of which proves that dearly as I love my English friends, I am thinking much these days of the thousands who are freezing while the blizzard rages over the great stretches of good English earth kept for hunters and for sheep, and for nothing else.

View of the Mountain Forests at Biltmore after Lumbering

A TREE LOVER

By MRS. R. A. ELLIS

THE painter's brush has paid its highest tribute to the beauty of the forest, whether in the delicate fairness of spring leafage, the opulent verdure of summer, the peerless tones of autumn, or the subtler charm of winter's bareness. The pen of poet, or of prose-master, has a hundred thousand times been devoted to the same theme of enduring magic. The beauty, the grandeur of the deep forest, the ineffable grace of a single perfect tree! Who has not once and again fallen under the spell of each?

Yet only one time in the long train of years and the history of states do we find it recorded that this profound love and admiration for the splendid beauty of a tree has impelled a man to throw around it legal protection reaching far beyond his own brief span and covering, he hopes, the many-centuried existence of the lordliest of oaks.

There is a little college town in north Georgia, Athens by name, the seat of its university, where, several generations back, lived a man with the heart of a poet, a seer. Would you have expected it in the most eminent jurist of his day? Among the sources of deepest joy in this man's life, was a beautiful tree, growing upon his domain, splendid in size, matchless in symmetry, the earliest always in vernal leafing, the most regal in autumnal glories.

The lawyer loved the oak with a love rooted in his childhood, bourgeoning with his youthful joys, waxing more potent, more enduring, as manhood's prime came on, and the golden aftertime was foreshadowed.

The tree-lover scarcely believed that there would ever come a despoiler so ruthless, an age so barren of the reverence due nature, as to hurt, or mar, or wilfully bring destruction upon this perfect handiwork of Him who made trees and loves His creation.

Yet hundreds of chances were to be provided against. Carelessness and ignorance, oftener than not, do the work of vandalism. Changes of every kind must be expected and provided for. Municipal alterations, yes, and errors, might be counted on, in this rapidly developing college town on the hill tops.

So it chanced that in his declining years Judge Jackson formulated a truly unique plan for the protection of this admirable bit of nature's handicraft. He would make the tree a property-owner, he said, and a landed proprietor, indeed, owning eight feet of ground in every direction from its great trunk.

A novel transaction, you will agree; yet its legal soundness has stood the test of a century. Still upon the record books in Athens you may read, written strong and clear, this record of the deed, which nothing has arisen forceful enough to render invalid:

"I, W. H. Jackson, of the County of Clarke, of the one part, and the oak tree [here defining exact location] of the County of Clarke, of the other part: Witnesseth, That the said W. H. Jackson, of and in consideration of the great affection which he bears said tree, and his great desire to see it protected, has conveyed, and by these presents doth convey unto the said oak tree entire possession of itself and of all lands within eight feet of it on all sides."

So it stood, so it stands. To this

day the tree, with its added century of girth, is as flawless as the record. Naught of man's doing or of higher ordaining has come to defeat the fine purpose of the tree-lover. In the very heart of the pretty, classic town, this majestic oak is pointed out as one of its treasures.

FORESTRY MAIDENS

By SARAH E. KUHN, Washington

THERE were bright maids of high degree,
Who worked and toiled for forestry;
Who sat up nights to plan their work,
That no small duties might they shirk.
To laugh and talk all through the day,
As some maids while the time away,
Was not the object of their life;
For ne'er were heard there sounds of strife,
Nor voices loud, nor laughter shrill,
But low, sweet tones expressed their will.

These maidens dressed with greatest care,
They wore no costly store-made hair;
No straggling locks or frowsy "rats,"
Escaped beneath their Paris hats;
But brown hair, black hair, golden crown,
Sedately blent with office gown.
Deportment better ne'er was known,
Than by these maidens daily shown;
To chief and subchief, high and low,
A modest deference did they show.

If forced to meet a manly form,
Within their hearts this raised no storm;
For maids like these gave heart and soul,
To save the forests intact, whole;
This single purpose filled the mind,
To full exclusion of mankind.
They gave no thought to sordid gain,
But worked with ready hand and brain,
Content to know their high esteem
Was the one never-failing theme.

For Uncle Sam these maidens toiled,
Remaining simple, sweet, unspoiled;
They turned their thoughts to realms above,
And never sighed for earthly love;
A sure reward before them lies,
A brighter home beyond the skies.

EDITORIAL

The Lesson Taught by China

IN THIS issue we are able, fortunately, to present, in connection with the opening section of his very strong article, a number of photographs taken by Mr. Bailey Willis, of the Geological Survey, showing effects of deforestation in China. All of these photographs were used by the President in his message to the Sixtieth Congress at its second session, and the story told by them would seem to be complete in itself. The effect, however, produced upon the extremely dense population of China naturally arouses inquiry. Mr. Willis passed through one or more famine-stricken districts; and his account, in conversation with the writer, though couched in the carefully chosen words and uttered with the restraint of a man of science, was harrowing. Still further light is thrown upon the situation by the following letter, sent Mr. Willis on February 12, 1908, by a friend, from the China Inland Mission. In it the writer says: "On reaching Shanghai, news of the great floods and famine occurring in the near Province of Kiang Su was just reaching the outer world. Public funds were opened at once, and money poured in from England, America, Canada, Australia, New Zealand, the ports of China and other lands. * * * I proceeded at once to the affected district for distribution work. In one city on the Grand Canal, half a million refugees were congregated with no food and only a mat or two to cover their bodies. In other cities 100,000 and 60,000, 30,000 and 20,000 assembled. Most of their land was under water, the summer crop spoiled, and houses washed down." Here the writer describes the relief measures instituted by himself and says: "In this way we supported about 100,000 mouths until the spring crop came in; about five months in all.

"The city was under water, but by digging a new canal and miles of drains we rescued it. I had 8,000 men on canal work and 3,500 carrying earth into the city, and gangs of police, soldiers, carpenters, bricklayers, stone-masons, barrowmen, boatmen, millmen, etc. Miles of road, canals and drains were dug; bridges (twelve) built, 2,000 trees planted, streets paved. In fact, it was a new city when we finished. * * * The official estimate is that 20,000 people of the district died of starvation. The dead and dying lay everywhere. We could not case all. The sight and stench was often trying. The famished dogs just fed upon the dead bodies. Missionaries to the number of forty visited, worked, and distributed in large districts all around. Three or four became sick and two lost their lives in the work." Returning to his starting point, the writer found, as he says, that "riot, rebellion, and bloodshed occurred here and in the cities around, during our absence."

About a year ago we were informed of the death by drowning of 2,000 persons at Hankow, China, when a sudden freshet swept down on the city and flowed over the great dikes which protect it. The inhabitants were asleep in their homes and had but little chance of escape. Hankow is a city of 800,000 inhabitants, situated at the junction of the Han with the Yang-tse-Kiang, about 450 miles west of Shanghai.

These are a few leaves from the experience of one of the oldest nations in the world. We are one of the newest. There is a proverb, rather too severe, perhaps, to quote, regarding the dearness of experience, but the necessity that a certain class of people shall learn

thereby. The important question for the American people is whether we belong to that class. Lying before the writer is a speech made, about thirteen months ago, on an important occasion before an important body of men. The author of the speech was one of the two or three men in the United States who seem, at times, to possess more political power than the whole American people outside of themselves. He discussed the conservation of natural resources, including the forests. His speech is punctuated with "Laughter," "Applause," "Applause and laughter," etc. These expressions were called out by the orator's quips and jibes at "political lumbermen," "demagogic lumbermen" and "men who are friends of the people," and at those who, in the next twenty years, would exhaust the forests of the Republic—maybe!" The whole speech is interesting as an anachronism. To those familiar with conservation problems, it suggests, let us say, the reincarnation and rehabilitation of the mummy of Rameses II. After ridiculing the idea of the possible destruction of our natural resources, he exclaims, amidst the laughter of his auditors, "I am not losing any sleep!"

As regards the distinguished orator of that occasion, there appears to be little ground for loss of sleep. Our country's resources, together with his own private ones, will undoubtedly last out the span of life still remaining to him. Nevertheless, to American citizens who realize something of the place of America in human history, and who maintain some measure of hope and ambition for its future, it will be worth while to look, through Mr. Willis' photographs, at a nation which has actually run the course we are so rapidly running, and to contemplate the result.

How It Is Done

A SHORT time since a correspondent sent to CONSERVATION a clipping describing the final "clean-up" of the old Wright & Davis contract near Hibbing, Minn. The writer well says: "This news item gives such a vivid picture of the utter destruction and desolation of the ordinary logging methods that it seems to me it ought to be given a place in the columns of your journal, CONSERVATION, as this recital of actual conditions would, it seems to me, carry greater weight with your readers than many columns of preaching on the same subject."

The dispatch recites that

> To-day one of the greatest lumbering contracts in the history of Minnesota became history. The event marks the final passing of one of the state's most famous timber tracts, known as the old Wright & Davis contract, drawn up more than seventeen years ago between Wright & Davis, of Michigan, and the Pine Tree Lumber Company of Minnesota. This contract covered the right to cut the timber on something like 250 square miles of the finest pine land in the state, lying at the western end of St. Louis County and reaching into Itasca County.
>
> The Weyerhaeusers began logging this land in 1891. Hibbing was then not even a name, and the western end of the Mesabi range was unknown. There was not a white settler within miles. What is now the Great Northern right of way was built by the first logging camps as a logging road and was afterward sold to the Hill road. The whole country now, except for stumps, bare as a rock, was covered with great white and Norway pine.
>
> From the vast forest preserve the Weyerhaeusers have cut nearly a billion feet of lumber, paying out millions of dollars in carrying on their operations.
>
> Not a merchantable log remains standing in the neighborhood. The last of the historic forest, about two train loads, lies cut and stacked along the tracks north of Nashwauk, a little village to the west of here. When these few remnants are shipped out, one of the greatest lumbering tracts in the world will have ceased to exist.
>
> The mineral rights were sold to the Great Northern Railroad and it is from them that most of the mines of the Western Mesabi have been developed. The Hull-Rust, the biggest iron mine in the world, is on a part of this land. It has probably yielded more wealth than any similar piece of land in America.

This is but a sample of the kind of work that has been in progress in the United States since the beginning of the lumbering era. From the standpoint of the business man who has gone

into lumbering, rather than into mining, railroading, merchandising, stock-speculating, or what-not, there seems absolutely nothing about the situation to occasion comment. "Business is business." Men enter business to make money. One way in which money has been made and in which some will probably still be made is by buying up at a low figure a tract of timberland, clearing it, selling the timber, mineral rights, or anything else "thereunto appertaining" and then, when the lemon has been well squeezed, discarding it and seeking new worlds to conquer. This is what, in Europe, Asia, Africa and the isles of the sea, as well as in America, men "on the make" have been doing in increasing measure since the beginning of our modern industrial era, say 200 years ago. It is also quite in harmony with the methods frequently employed, in a measure at least under the forms of law, by Roman provincial governors, who were assigned choice territory nominally to "administer" but, from their own standpoint if not from that of the public, to exploit and plunder. Had such a governor failed to improve his opportunities to make a fortune out of his office, and left something worth while for his successor in the territory assigned him, to say nothing of the population presumably dependent for their livings upon the resources of that territory, he would, thereafter have been regarded by his contemporaries with cynical smiles, as a man incapable of appreciating a "good thing."

The policy pursued by Warren Hastings in India was similar in principle. He saw his chance, improved it, and expected the approval of those who observed how well he had taken care, not only of the interests of the company he served, but of himself.

But sentiment sometimes changes. Verres, it will be recalled, realized this truth when, after listening to the first of the powerful orations by Cicero on his methods in Sicily, he found it advisable to flee with his booty. Hastings, likewise, on returning to England discovered that public opinion in that country had undergone a "sea change, into something new and strange." Methods which were once winked at or applauded now raised grave questions. Under the eloquence of Burke, Fox, Sheridan and Grey the Hastings administration assumed an aspect widely different from that in which it had hitherto been viewed.

Indications are not wanting that a similar change in public opinion regarding the conduct of private business is in progress in the United States and throughout the civilized world. It is probable that the Roosevelt administration will stand in history as the landmark indicating the beginning of this change in the United States. We readily remember the time when a "private business" was supposed to be a private concern pure and simple. The idea of operating it with a regard for the public well-being, or for the interests of posterity, was thought chimerical, sentimental and unworthy of consideration by practical people. "Money" was the one thing that "talked," and each was supposed to get money, honestly, if he could, but nevertheless, to get it. If, in so doing, he manufactured plugged armor plate, sold goods infected with disease germs, "sweated" women and children in factories, or ravished the resources of a continent, it was the affair of no one save those immediately concerned. Even the individuals injured had little ground for complaint, because, if workers, they were "free" to work or desist, and if buyers, to buy the goods or leave them alone; while, as for the public, its interests were not to be seriously thought of.

Are we not conscious, however, of the acceptance to-day by increasing numbers of a different viewpoint? Do we not now speak of "human resources" which must be conserved? Do we not admit that the rights of the public are, after all, paramount to the rights of the mere money-maker; and do we not agree that future generations have rights which the present is bound to respect? If such be true, is it not probable that the day will come—is, in

fact, almost at hand—when such deeds as the Hibbing "clean-up," or any other form of ruthless exploitation for the benefit of the profitmonger at the expense of the community, present or to come, will be impossible? May the day hasten!

"Developing" Our Resources

MUCH potency is there in words. They are things to conjure with. In the mouth of the expert in linguistic ledgerdemain, the verbal prestidigitator, they become magic wands, or the philosopher's stone, forsooth, whereby with a torch, Presto, change! Black becomes white, evil is transformed into good and vice into virtue.

These reflections are suggested by the glibness with which certain statesmen speak of "developing" our resources. Conservation they are wary of. The earth exists for human use. In its raw, crude state, it is unavailable for such use. To render it available it must be "developed." Conservation, however, in the view of these solons, impedes development—therefore, away with it!

Now development, of course, has its place. A virgin prairie sod may be developed into a fertile field by ploughing, harrowing, etc. A swamp may be developed by the withdrawal of its surplus waters, a desert by the application of adequate water to its surface, and a jungle by clearing. Wild beasts may be developed into useful domestic animals, and wild plants, even the thorny cactus, into agencies for supplying the wants of man. Streams, by dredging, canalization, etc., may be developed into agencies of human service; and so on through the category.

But over against "development" are certain other processes with which the race should now be fairly familiar. When war made slaves in Rome plenty and cheap, it was thought good business to put a slave through at a brisk pace, exhaust his energies, discard him and buy another at the nearest slave-market. The policy of Legree, at a later day, of "wearing out and buying more" will be recalled. In his Constitutional History of the United States Von Hols tell us that southern overseers were interested chiefly in a single crop; they, in the pursuit of their personal gain, therefore, rapidly exhausted the soil, thus necessitating the "land hunger" which forced the South into Mexican wars, attempted annexations of Cuba, Kansas-Nebraska struggles, and the like, until an issue once local became national. In Rome, for example under Justinian, in Old France and elsewhere, the function of tax collecting was left to "farmers," so-called, whose business was to furnish the state a specified lump sum of cash, and whose privilege it was to appropriate whatever else might "stick to their fingers" in the process—with results well remembered.

The similarity between these forms of activity and those whereby, in our own country in recent years, money-grabbers have heaped to themselves millions can be discerned. Like the modern "land-skinner," the old-time slave-slayer or tax-farmer may have laid to himself the sweet unction that he was a "developer of the country." The impartial observer need no more be deceived by the one case than by the other. Development calls out powers hitherto latent in the thing developed, it increases the capacity of that thing for usefulness, it enlarges its life and multiplies its possibilities for good. The other thing, which word-jugglers would make respectable, operates in exactly the opposite way. For power it substitutes impotence and for beauty ugliness; it turns Edens into deserts, and diminishes the sum total of the world's wealth.

To call such work "development" is to do violence to the language; it is to wrest words from their true significance and use, and prostitute them to confusion of thought and the dis-service of man. The evil thing which, by a wordy sleight-of-hand, the statesmen in question would justify, is no more development than the burning of Rome or Chicago, the shooting down of 10,000

men on a battle-field, or the earthquakes of San Francisco or Sicily were developments.

Individuals, it is true, may grow rich by the processes in question, but individuals have likewise grown rich by such calamities as those named. It is high time that statesmen occupied themselves with other considerations than those pertaining to the enrichment of a few individuals. The statesman, as his name implies, is supposed to be the *state's* man—the representative of the community, and of the public's interests. As such, it ill becomes him to sacrifice those interests that a few masters, not of the art of development but of that of *exploitation,* may heap to themselves ill-gotten fortunes which mean the impoverishment of the human race till the end of time.

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The Community Must Care for Itself

AND still we hear the lumberman condemned! Usually from people new to the forestry idea, and beginning for the first time to realize the tremendous havoc wrought by wood-users and destroyers, comes the protest against "private greed," "lack of public spirit" and the "vandalism" of the lumberman.

We need to remember that the lumberman is very much like other people. He is in business, as are others. Business is conducted for profit. Those who conform to business requirements win; those who fail to do so, lose. Competition, insofar as it still survives, takes care of that.

In his speech at the Annual Meeting of The American Forestry Association, Mr. Elliott of Pennsylvania emphasized this point. "The lumberman," he declared, "is no fool." He utilizes what he can sell. "If you buy from him all the wood there is that grows on the trees, the stump and even up to the twigs * * * he will clear it all out * * * and if you want to buy the hole the stump stood in, he would sell you that * * * He is willing to sell you everything he can. You can go into some parts of the country where there is a demand for all of the wood, and you will find that they will strip the forests clean; the lumberman goes in and gets all that he can get out of the saw logs; the tie man follows him; the paper pulp man follows him; and the acid factory man follows him, and there is nothing left bigger than my arm." Elsewhere, where there is no market for pulpwood, railroad ties or acid factory wood, the lumberman is forced to leave what he cannot sell.

But the novice asks, How are public interests then to be cared for? If the lumberman's private interests lead him to desolate the forests and to leave the ground covered with tops and high stumps, or to strip slopes and occasion floods, what shall the public do?

Very good. Such questions inevitably force themselves to the front. We are not likely to consider them too much.

The answer is, The public must not look to the individual for its protection; instead, it must look to itself. Its power is far superior to that of any individual. Its capacity for self-protection exceeds that of any man or collection of men. If it will not care for its own affairs, it deserves to suffer, and will suffer. We have long been taught that the individual should not expect the community to carry him; much less should the community expect the individual to carry it. The individual has his own affairs to attend to; if the affairs of the community are not to be ignored, as they too long have been ignored, if they are not to be trodden into the mire, as in countless instances has been their fate, the community must assert itself; it must study its own case, consider the grounds of its own well-being and then, without hysteria, without undue haste, without rancor, but calmly, coolly, resolutely and energetically proceed to mind its own business and protect its own interests. In this way, and in this way only will its prob-

lems be solved and the rights of the present generation and of future generations be conserved.

Biltmore Forest Fire

ON APRIL 8 and 9 disastrous fires occurred in the forests on the Vanderbilt estate near Asheville, N. C. The fire destroyed immensely valuable groves of young poplars on a 10,000-acre reforested tract of the Biltmore estate and then swept over 20,000 acres of virgin forest on the Pisgah Reserve, causing enormous damage.

It is reported that people living near the preserve fought the fire desperately, both from a kindly desire to aid Mr. Vanderbilt and with the hope of saving their own property, which was endangered by showers of sparks. As often, however, as the fire was extinguished in one place, other fires sprang up at different points. The latter, it is believed, were set by incendiaries who, it is supposed, had become offended by some of the forest employees, or because they had been prevented from hunting and fishing on the Vanderbilt preserve.

Incendiary forest fires are not unknown. The fires at Biltmore, if actually due to incendiaries, seem to have been attributed to spite. In CONSERVATION for March (page 175) instances were given of other forest fires kindled by incendiaries. These fires, however, were attributed to economic motives. People fired the woods in order to obtain work and wages in extinguishing the fires. On a visit to Biltmore, a year ago last fall, the writer was told that such fires were not unknown in that region. Broadly viewed, of course, such methods are expensive. They suggest Charles Lamb's story of the origin of roast pig, according to which a man would burn a house in order to roast a pig. Later, however, less expensive methods of preparing this species of food were devised. Likewise, it would seem that civilized society could find more economical methods of employing workers than that of leaving them to destroy immensely valuable property that they may be paid a pittance for saving a remnant of it. However, it is encouraging to observe that rewards are being offered at Biltmore for evidence leading to the conviction of the incendiaries, and that public opinion seems to be ready to deal vigorously with them if found.

Private Interests Protecting against Fire

MR. KELLOGG'S statement in his paper, "What Forest Conservation Means," regarding protection work by private agencies is interesting. While appealing for state action, backed by ample funds, he pleads also for cooperation with timberland owners, and instances what some such owners have done. "Four forest protective associations in northern Idaho, for instance, organized in accordance with the laws of that state, protected a million and a quarter acres of forest land and kept the damage down to a comparatively small amount."

Evidently private individuals and agencies can do things in this field. Furthermore, in the instance quoted, they have not hesitated to spend money. The cost to these associations of this protection was four cents per acre. How much this is relatively may be inferred from the accompanying statement that the Forest Service had but one and one-half cents per acre to spend upon the National Forests for all kinds of work and administration, including fire fighting.

Such action by private individuals and agencies should be recognized and encouraged. At the same time, we must not err by supposing that it will cover the whole case. The public cannot shirk its responsibility and shoulder the burden of protection against fire off upon individuals. It must do its own work, or expect to see that work remain unperformed.

Far-away Forestry

IN OUR news columns will be found a paragraph on forestry in Hawaii. Other matter at hand indicates the deep interest of the women of that country in forestry and conservation.

Far to the southwest of Hawaii, in the latitude of South Africa, is New Zealand, a country which, in some respects, is to-day the most remarkable in the world.

A century and a half ago its inhabitants were living in the Stone Age. Among them to-day are some who vividly remember the taste of human flesh and who, like the Israelites in the desert, yearning for the fleshpots, leeks, and garlic of Egypt, still hanker after "long-pig," as this particular species of meat is jocosely called by them.

New Zealand was discovered by Tasman in 1642, explored by Captain Cook in 1769, first visited by English missionaries in 1814, annexed to the British Empire in 1840, partially pacified in 1848, and, finally, in 1870; it was given its first constitution in 1852; it held its first parliamentary session in 1854; opened its first railway in 1863, and, about that time, entered upon its wonderful career of innovation, progress, and prosperity.

In 1890, through a combination of farmers and workingmen, occurred the political overturn whereby the control of the government passed from the conservatives to the progressives. Since that time has come the movement for the nationalization of land, including state resumption of large estates, the progressive taxation of land values, incomes and inheritances, the checking of panics through government control and guarantee of bank issues, the nationalization of credit, with government loans to farmers, merchants, and workingmen, the advanced governmental stand on the labor question, including the creation of a minister of labor with a seat in the cabinet, the establishment of government life and accident insurance and old-age pensions, government ownership of patents, made available to the public at reasonable rates, government operation of coal mines, national ownership of railroads and telegraphs, municipal ownership of water, gas, electric, and street car plants, equal suffrage, direct nominations, hearing and questioning of candidates, voting by mail, and, in general, the inauguration of a political system which makes the boss and machine impossible, and government by the people not "an iridescent dream," but a fact.

In view of the advanced ground taken by New Zealand on such questions as are above indicated, we are prepared for the statement that that country maintains a progressive state forest policy. Says Prof. Frank Parsons in his book, "The Story of New Zealand" (p. 143):

"The splendid forests of New Zealand had for years been subject to a rapid process of destruction by forest fires and commercial vandalism. It became evident that the supply of timber would not last many decades if something were not done to check the wastes and losses. Moreover, the rainfall and river sources of wide districts were being seriously affected; and in many places on the mountain slopes where the soil was thin the removal of the trees left it at the mercy of the storms, which washed it away, leaving the rocks entirely bare, undoing in a few months the whole results of nature's soil-building carried on through ages of the past.

"To stop these evils a forest act was passed in 1885 to provide for the reservation of state forests and the control and management of them by the government."

The preamble of the act recites that it is "expedient to make provision for setting apart areas of forest land in New Zealand as state forests, and to subject the same to skilled management and proper control in order thereby to prevent undue waste of timber, and to provide timber for future industrial purposes, and to provide for the proper conservation of climatic conditions by the preservation of forest growth in elevated situations."

Professor Parsons continues:

"The law authorized the Commissioner of State Forests to establish schools of forestry and agriculture, grant licenses to cut timber, and take measures to preserve and improve the forests of the colony.

"The government in recent years has shown an ever-increasing interest in the preservation of the forests and the planting of trees. In the financial statement presented to parliament, July, 1902, the acting Premier said:

"'In pursuance of the decision of the government that the remaining areas of forest in the colony should be conserved and dealt with in a systematic manner, the government have under consideration the whole question of how best to deal with this important matter. Special attention is being given to the reservation of all forest upon the mountains and higher table-lands to insure the maintenance of rivers and streams, the gradual distribution of rainfall, the protection of the surface of the country from degradation, and the prevention of the destruction of lands in the valleys or their deterioration by the deposit of detritus, whilst maintaining the climatic equilibrium, protecting the native flora and fauna, and doing all that is possible to preserve the beautiful scenery for which the colony is famed. On a smaller scale, scenic effect is being attended to by the reservation of forest lands in gorges and on river banks and the higher portions of the colony, so as to preserve all places of natural beauty which serve to make New Zealand attractive, especially from a tourist point of view. * * * The government also have in contemplation a large expansion of tree-planting operations; and it is fortunate that we possess a large area of land in the central district of the North Island which, though not well adapted for agricultural and pastoral purposes, is believed, as the result of trial plantations, to be well suited to the growth of vast forests of specially selected and valuable trees.'"

A letter in *American Industries*, published three years later than the book above quoted (May 1, 1907), says, among other things: "New Zealand is having a period of great prosperity on account of the high prices it is receiving for its principal articles of export. Agriculture and mining are the pursuits which are turning in the money." We may well believe that the conservation of the forests, and the interests connected with them, bear their full share in producing and maintaining this prosperity; and it should require no prophetic vision to foresee the advantage which might accrue to the United States or, in fact, to any other nation which, in the midst of the present forest holocaust, would conserve its stock, and deliberately and systematically set about producing an additional stock for its own future use, and for sale to other peoples when, as Secretary Wilson predicts, trees shall have become "as scarce as diamonds."

Forest Taxation Again

LIKE Banquo's ghost, the question of forest taxation will not down. We know that things can be taxed out of existence; that many things, as windows in Old France, date trees in Egypt, and dogs and saloons with us, have thus been eliminated. We know that forests are being taxed out of existence in this country every day. And we know that the irrational system of taxation which produces this effect must give place to a rational system. May the day of transition hasten!

The National Conservation Commission has taken up the question of forest taxation. It insists that more equitable methods of taxing forest lands should be introduced. To facilitate the adoption of such methods it distinguishes sharply between the land and the crop growing upon the land. Each of these it would tax; each it would tax upon its value. The land it would tax annually; the crop but once. The value of the land it would determine by the value of its annual timber product. The value of the timber would, of course, be determined by its market price.

The time recommended for taxing the timber is the time of harvesting it. This is the one and only time when it brings actual revenue to its owner; this is the time when the tax can easily be paid. By collecting the tax at this time only the owner is not driven, as

often now, to harvest his crop prematurely. He waits until it has ripened, cuts it, markets it and out of the proceeds pays his timber tax.

What proceeding could be more rational than this? Why persecute the owner with annual taxes into destroying a property which, in the interests of the community, may need to be preserved? Why, though the forest be one which may be cut without damage to the public interests, should the owner be forced by annual taxation to hurry it upon the market before it has matured?

This method of taxing cut-over lands seems peculiarly appropriate. The annual value upon which such lands would be taxed would be slight. The owner would pay no tax at all until the harvest time, many years deferred. The tax burden would thus be light. In consequence he could well afford to hold the cut-over lands for reforestation.

What objection can be found to this system of taxation? Should there be any, CONSERVATION will be glad to see it and give it publicity.

A Tree as a Landowner

SPECIAL attention is called to the brief story in this issue entitled "A Tree Lover." Here, indeed, we find a unique, though evidently not new, method of protecting a tree from the menace of man. Great are the "rights of property!" In their name what has not, hitherto, been accomplished? Here is instanced a case in which the rights of landed proprietorship are bestowed upon a tree. By formal title the tree is made the legal owner "of itself and of all lands within eight feet of it on all sides." And for a hundred years this deed has stood, and so has the tree. In all the dignity of a property owner, with "its feet on the ground," and in it as well, it lifts its head toward heaven and braves not only the elements, but, more dangerous still, man and his municipality.

Why have we not here a suggestion? Are there not other trees, great and noble, which might and should be protected in this way? Think of the giant redwoods, the Big Trees of California—trees which have survived almost the entire period of recorded human history yet, in many instances, are now subject to the greed, the need, or the caprice of man! Think of "Charter Oaks," of "Independence Elms" and other historic trees, living or dead! Why may not the method adopted by Judge Jackson be exactly the method whereby such monuments may be preserved to live out their allotted time, though that be yet centuries long, and render their service to mankind?

President Taft for Conservation

MR. GIFFORD PINCHOT, Chief of the United States Forest Service, has recently issued the following statement regarding the administration's attitude toward National Forests and the work of the Forest Service:

> Any statement that President Taft is not in sympathy with forestry and the conservation movement is without foundation. On the contrary, I am authorized by the President to say that he is in entire sympathy with the forest policy and the conservation policy as already developed and stands behind them.
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> This statement is wholly unecessary to those acquainted with the real situation. It is made only in answer to the large numbers of questions asked me during my recent trip through the West and since my return. These questions had to do with rumors to the general effect that the administration is out of sympathy with the forest policy and the conservation policy. In order to set these rumors at rest by an authoritative statement of what I already knew to be the fact, I thought it best to lay them before President Taft. Accordingly, it is with his authority that I make the above statement.
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> I am also authorized by the President to deny categorically the story that great areas are to be thrown out of the National Forests by presidential proclamation. The only possible basis for such a rumor that I have been able to discover lies in certain plans adopted by the Forest Service months ago. These plans were in accord with lines of policy long recognized and established. They were approved by Secretary Wilson and they provided for a careful examination and mapping of the boundaries of the National Forests

and of the character of the land, and the timber and other growth, along these boundaries.

Repeated charges, well known to be baseless by those actually acquainted with the situation on the ground, have been made, that the National Forests contain vast areas of agricultural land. Whatever agricultural lands may be found along the boundaries will be restored to entry, for one of the strongest desires of the Forest Service now and in the past is that any agricultural lands which may have been included in National Forests should be open to use for agricultural purposes. Indeed, this is already provided for in the Act of June 11, 1906. The Forest Service undertook the mapping of the National Forest boundaries on its own initiative in the regular line of its work and in pursuance of general plans laid years ago.

I have been greatly interested, but not at all surprised by the persistent circulation of these rumors. President Taft's statement to me, coupled with his authority to make it public, should set them at rest once and for all. The present administration is in the fullest sympathy with forestry and conservation. Friends of these movements should recognize their obligation to the President for his prompt and direct support.

That friends of conservation should be deeply interested in the attitude of the President toward the question they have so much at heart was to be expected. The strong stand taken by President Roosevelt, his earnest and frequent utterances and, better still, his aggressive policy, have brought a large and increasing body to the point where they expect, and are disposed to insist, not only that no backward steps shall be taken, but that a vigorous forward policy shall in every way be promoted.

President Roosevelt's policy was thoroughgoing, and it continued to the end of his administration. Notwithstanding the congressional attempt, about a year ago, to check the extension of National Forests—met, as will be remembered, by a very material enlargement of those forests by the President before he signed the bill limiting the executive power—one of the last official acts of President Roosevelt was the signing of proclamations creating additions to National Forests in Nevada, South Dakota, California, New Mexico and Arizona, aggregating 26,761,626 acres, thus bringing the total National Forest area up to 194,500,053 acres.

On this matter, as on some others, President Taft has been much less outspoken than his distinguished predecessor, and the question arose in many minds as to what might be expected. The abolition of the National Conservation Commission was a severe shock to the friends of conservation, though this act is attributed, not to the President, but to Congress. Still, a strong, earnest word from the White House was awaited with deep interest. Such a statement, in part, was found in the President's letter of March 24, reported in our news columns, to Mr. John Hays Hammond, of the Joint Engineering Societies. In this the President says: "I have already pledged the administration to as full support as possible to the policy (of the conservation of the natural resources of the country), and I am glad to renew my expression of sympathy with the movement." The statement issued by Forester Pinchot adds, in point of fullness, to the above; and when, as is expected, the President makes, in his coming message to Congress, a full and formal declaration, it is believed that all fear of indifference on this subject on the part of the present administration will be set at rest.

NEWS AND NOTES

Engineers Meet

The spring meeting of The American Society of Mechanical Engineers will be held at the New Willard Hotel in Washington, D. C., on May 5-7, 1909.

A Forest Congress in Chicago

At a recent meeting, the board of directors of The American Forestry Association by resolution agreed to hold a forestry congress in Chicago next November. A committee on arrangements and promotion was created consisting of Messrs. C. A. Marsh, of Chicago, chairman; William L. Hall, Washington, D. C., and George V. Markham, of St. Louis. This committee was authorized to increase its number to nine and to appoint such auxiliary committees as may, in its judgment, be deemed desirable.

For the Appalachian Bill Next Session

Woodland and Roadside points out that it has been demonstrated that "a bill primarily designed to nationalize the Appalachian Mountain forests can be passed in the House of Representatives as well as in the Senate. There is reason to believe that this will be true of the Sixty-first as of the Sixtieth Congress. At last there is a strong, well-organized body of active friends of the measure in both houses—men pledged to do their utmost to secure the enactment of a workable law that will meet the needs and demands of the people of the eastern United States; and House and Senate are on record. This has been made possible by the great public awakening that, beginning in New England and the South, has won friends and supporters throughout the United States. If success is to come ultimately this public sentiment must be strengthened and kept at work. There is no longer, as there was until a year or two ago, apathy among our friends in Congress. We must hold up their hands if their efforts are to succeed. The opposition will be strong in the present House, as the vote of March 1 showed it to be in that which has just expired. In the Senate there is a group of Rocky Mountain Senators, hostile to the forest policy of the Government, inimical to eastern interests, who will do anything in their power to defeat any measure of this kind. This winter they had the advantage of time—or the lack of it. Otherwise the Weeks bill would have become a law. If a measure can be agreed upon by the Senate and House committees and brought forward early enough in the first regular session of the present Congress there is a strong probability that it can be passed. We must make that probability an actuality."

What Children Can Do for a Cause

Mrs. John Dozier Pou, an active worker for civic improvement in the Georgia Federation of Women's Clubs, is a thorough believer in having the cooperation of the children.

"If you desire enthusiasm," insists Mrs. Pou, "go to the children; if you wish a changed condition of affairs, get the children's cooperation, and if we are planning for a higher standard of city housekeeping let us educate the children in future citizenship."

"If an appreciation of forests and forest preservation is ever to become general, public sentiment must be aroused, and the most comprehensive way of accomplishing the result is to educate the children of the public schools and, through them, their parents."—*Louise Klein Miller, Curator of School Gardens, Cleveland.*

What the American Civic Association Does

"Few persons realize the vast amount of commendable work that the American Civic Association has accomplished. Its successful campaign against the commercial spoliation of Niagara Falls brought its activity into wider acquaintance, but it has achieved much in a minor way which has gone without loud hurrah or advertisement.

"Such an organization should command the good will, if not the practical assistance, of all who have pride in the town where they live."—*The Pittsburg Post.*

Work on the Coast

Mr. Frank H. Lamb writes:

"We have been quite actively at work here on the coast during the past two months trying to get some allowances from the legislatures. The Oregon legislature has adjourned without securing anything we desire. We

have hopes, however, of getting $46,400 from the Washington legislature, besides getting an amendment from the land laws which will allow the state to handle its timberlands on a forestry basis. In Idaho we are able to secure certain amendments to the forest fire laws which strengthen the work there, and in Montana, I am advised, it is possible we will be able to secure provisions for fire patrol and also the adoption of forestry principles to the handling of state timberlands."

Maine Commission Reports Log Rules

The Maine state legislature in 1907 appointed a commission of three, with the forest commissioner, an ex officio fourth member, to investigate the methods of scaling logs and lumber and to report to the next legislature. On this commission William J. Lanigan, of Waterville, Fred A. Gilbert and Hosea B. Buck, of Bangor, and Edgar E. Ring, forest commissioner, of Orono, were appointed by Governor Cobb.

It is a commission of practical business men from wood-using industries. After holding hearings in the different lumbering districts of Maine, the following conclusions were reported in substance:

"The method of measuring manufactured lumber seems satisfactory and no change is recomended.

"The lack of uniformity in methods of scaling logs leads to great confusion and general dissatisfaction on the different rivers in Maine.

"The log rules in use, especially the New Hampshire and the Maine or Holland rules, give fair results only for short logs, but are unsatisfactory for longer logs.

"The board foot is not the proper unit for log measure since it is relevant only in case of lumber manufacture, but entirely irrelevant in pulp, staves, veneer, and other industries.

"The cubic foot should be the unit of measure, and each manufacturer should calculate the product he could manufacture in board feet, pounds of pulp, number of staves and square feet of veneer, and fix the price accordingly.

"The contract logger figuring in cubic feet would then be paid according to the weight he handles, whether the logs are large or small. In contracting by the thousand board feet, as is now done, he handles a larger weight of small logs per thousand than of large logs.

"The commission recommends the substitution of a cubic foot caliper rule as the legal rule for Maine, arguing that besides applying to all industries involved it would aid economical logging and full utilization of material."

It is very evident that if log measurement is to be standardized for the entire country the cubic foot caliper rule applied at the middle of the log will be applicable for all states, all industries, all species, whatever their taper, and for long logs as well as short logs. While the volume is not entirely exact by the middle diameter method for very long logs, the error is very small in favor of the buyer. But it gives by far the better result in comparison with end diameter measurement, even when the latter method makes allowance for "rise" or taper.

If the Maine legislature adopts the rule recommended, the lumbermen and foresters say the state will be setting a standard rule that may be followed with profit by all the other states.

Developments in Colorado

Says the *Financial Age*, of New York:

"The Empire Water and Power Company, which has in contemplation a large power development project near Colorado Springs, Colo., has secured an additional 320 acres of land, adjacent to reservoir sites on the north slopes of Pike's Peak, making its total holdings 1,200 acres.

"Fifty thousand acres of semi-arid land in Kiowa and Prowers Counties, Colorado, will be reclaimed by irrigation as a result of a contract recently let by the Chivington Canal Company. The cost will be $200,000. Colorado Springs men are largely interested in the company."

Alabama's Resources

"Announcement is made in Montgomery, Ala., that for the first time in the history of Alabama, a prospectus of the state's resources, agricultural, mineral, commercial and otherwise, has been compiled. A book, containing over 600 pages, has been drafted by the state department of agriculture, in which every phase of Alabama life and industry is described. The book is now in the hands of the printers, and will be issued during the coming fortnight to the public.

"'The Handbook of Alabama' it is called. Every county has its history, its development, and its possessions set forth at length, and every one of the state's numerous sources of wealth and development are described.

"The department of agriculture has been occupied in the compilation of the book for more than a year, the officials and those aiding the attaches of the department working on the volume at odd hours. As it is, it represents a comprehensive description of the state, and the advantages which the state affords.

"It is not an advertising bulletin, but a book to instruct Alabamians and others in

the marvelous possessions and wealth which lie within its boundaries. It contains bits of history, even politics; in all, it is a book which covers Alabama, and its rise and development since its admission into the Union, with stress laid upon its present prosperous condition, and its promise for the future."—*The Tradesman,* Chattanooga.

President Van Hise for Conservation

In an address on April 7 before the Wisconsin Commandery of the Loyal Legion, President Chas. R. Van Hise, of the University of Wisconsin, said:

"From the point of view of our descendants, this question is more important than any political or social one upon which we are now engaged. It is also now pressing, for our unnecessary losses are already irremediable and the situation is growing steadily worse.

"For many years the voice of the scientist has been raised for conservation; but his voice has been a voice in the wilderness. I believe that the work which ex-President Roosevelt has done for the conservation of natural resources will mark him among the future generations as one of the greatest statesmen of any time."

President Van Hise traced the history of the conservation movement from its inception in ex-President Roosevelt's first White House conference, May 13, 1908, pointing out that since then thirty-seven state conservation commissions have been appointed and forty-seven, representing the large national organizations, have been formed.

"Our most fundamental duty," he declared, "is to transmit the heritage of our natural resources to our descendants as nearly intact as posible. The future of the Nation is safe only when small and large holders alike shall administer their trusts primarily for the benefit of the people now living and for succeeding generations, rather than for themselves."

Counties Committee Meeting

(Special for CONSERVATION)

California is the first state to take up in systematic manner the subject of conservation of its natural resources, and on May 8, at the eleventh semi-annual meeting of the counties committee of the California Promotion Committee, to be held at Del Monte, the theme of the meeting will be "Conservation in California." Papers will be read by such men as F. H. Newell, Director of the United States Reclamation Service; W J McGee, secretary of the National Conservation Commission; members of the National Commission and heads of great departments such as Forestry and Mining of California.

This meeting will not be content, however, to simply hear and discuss papers. It will act, as that is one of the features of the semi-annual meetings of the committee. The findings of the gathering will be put in concrete form, applicable to legislative action, and the committee will take active interest in furthering such matters as will best serve the state's interest. These meetings are attended by representatives of about 200 commercial organizations of all parts of the state, every county having representatives, and the sentiment expressed is the crystalized sentiment of the entire state.

California's rivers, forests, lands and mines have never been under a systematic conservation idea, but following the meeting at Del Monte it is expected that a complete outline of work will be formulated which will enable the state officials to work to the great benefit of California's natural resources. Much interest centers in the meeting owing to the fact that it is directly in line with the ideas formulated at the meeting called by President Roosevelt, and attended by the governors of nearly all the states.

Missouri's Forests

Says the St. Louis, Mo., *Globe-Democrat:*

"Nature has bestowed upon the 70,000 square miles of Missouri rich and varied gifts, and they will not diminish if they are handled on the right economic system. On the other hand, they will certainly be destroyed if not protected by forethought and wise methods. When forests are slashed off wastefully, something more than timber is wiped out. Floods are increased and the climate itself is affected. A farmer whose soil washes away loses his working basis. Every desert place in the paths of civilization tells its story of a wanton waste of the forests. The mischief may be quickly done. Only ten years ago the wooded area in Missouri was estimated at 41,000 square miles, or sixty per cent. Now the forest area is stated to be 27,000 square miles, or thirty-nine per cent. The lumber production in Missouri during the last decade has averaged at least 600,000,000 feet a year. At this rate comparatively little would be left in another ten years. Thereafter the state's lumber output would cease to be reckoned in a large way. Yet, properly conserved, it would last forever.

Massachusetts Women for Conservation

Woman's share in the solution of the great problems of conservation and forestry was outlined vividly to a representative gather-

ing of women this afternoon at the Twentieth Century Club. The meeting was called by the forestry department of the Massachusetts State Federation of Women's Clubs and was presided over by Mrs. Mary L. Tucker, who is chairman of that department.

The first speaker called upon was Mrs. Emmons Crocker, vice-president of the Woman's National Rivers and Harbors Congress, and she spoke especially on the "Conservation of Waterways." Mrs. Crocker has just returned from Louisiana, which is the home of the waterways movement, and is deeply interested in the development of this movement in Massachusetts. She said that the question of waterways, the conservation of water, is inseparable from the question of forestry. One is dependent upon the other and they are completely interwoven, but in Massachusetts it is all "forestry," while in the South it is all "water." They go together and must be so recognized, and the problem will not be solved properly before it becomes a national movement.

The next speaker was Prof. Frank W. Rane, the state forester. He discussed forestry management and reforestation in Massachusetts, and outlined the campaign of education which has been followed in recent years to develop public interest in the subject. He showed that each town is now equipped with a forest warden through whom the people may be reached and much work accomplished. There is a very much improved system for fighting forest fires, a subject on which the forestry department will issue a special bulletin shortly.

Edwin A. Start, secretary of the Massachusetts Forestry Association, discussed "Shade Tree Problems," considering the shade tree as a municipal asset and its recognition and valuation under the law in Massachusetts. He spoke of the duties of the tree warden and the importance of the office, of the danger to shade trees from lumbering, gas, wires, horses, poor soil, insect pests and disease, all of which the tree warden must combat, and he urged the duty of the citizen to aid in electing a competent man to the office in his town, and then to assist him in enforcing the law. Here, the speaker suggested, was an important work for the women's clubs. Mr. Start closed with some remarks in regard to the larger tasks of forestry and the relation of the Massachusetts Forestry Association to the great work of conservation.

The National Irrigation Congress

"Apostles of irrigation, deep waterways, drainage, good roads and conservation of resources and recruits from various parts of this continent, England, Germany, France, Hawaii, the Philippine Islands, the Latin republics and China and Japan, representatives of foreign nations and colonial governments, officials of the Federal reclamation, forestry and agricultural departments, governors and members of state and territorial legislatures, railroad and bank presidents, and members of agricultural, horticultural, commercial and fraternal organizations will gather in Spokane, August 9 to 14, where the National Irrigation Congress will have its seventeenth session.

"'To save the forests, store the floods, reclaim the deserts and make homes on the land,' are the four primary objects outlined in the official call, issued by George E. Barstow, of Barstow, Tex., president; B. A. Fowler, of Phoenix, Ariz., secretary of the national organization, and R. Insinger, chairman, and Arthur Hooker, secretary of the local board of control.

"The regular program will consist of addresses by officials of the reclamation, forestry and agricultural departments of the United States, statesmen and scientists, railroad and financial men, promoters of the Carey act reclamation projects and officials of private irrigation enterprises. The Federal Department of Agriculture has taken charge of a twenty-acre tract of land in the Spokane Valley, where there will be demonstrations of the latest approved methods of supplying the soil with moisture by artificial means by irrigation experts.

"The open-air features of the congress will be the parade of the irrigation army of 10,000 and the industrial parade, in which Indians from four of the reservations in the Northwest will participate. In the latter it is designed to show the progress of the Western country in the last quarter century. One day has been set aside for the governors of states and territories, and there will be a series of banquets, receptions, theater parties and excursions to near-by lake and river resorts.

"Spokane is selected for the gathering because it is in a section that affords opportunity to observe the working of irrigation projects. Four thousand accredited delegates are expected, many of them from agricultural societies, engineering societies and bodies interested in the conservation of natural resources.—*Danbury News.*

Irrigation Congress Wanted in the South

Delegates from the southern states to the meeting of the National Irrigation Congress in Spokane the second week in August probably will make a concerted effort to have the eighteenth session of the organization take place somewhere in the South.

Mr. James Cosgrove, of Charleston, S. C., in a letter to Arthur Hooker, secretary of the local board of control of the seventeenth

congress, suggests that the sessions of the irrigation congress following the Spokane meeting be held somewhere in the South, and mentions Charleston as probably the right place. He adds:

"I trust we will be able to have President Taft attend the sessions, as I recognize it will be of inestimable benefit to all who attend to have him deliver an address."

Mr. Hooker expresses the opinion that if the proposition is formally presented to the congress by the southern members, the delegates will give it every consideration.

Cabinet Members Invited

Formal invitations to be present at the seventeenth session of the National Irrigation Congress in Spokane the second week in August have been forwarded by R. Insinger, chairman of the local board of control, to these members of President's Taft's cabinet:

P. C. Knox, secretary of state; Franklin MacVeagh, secretary of the treasury; Jacob M. Dickinson, secretary of war; George W. Wickersham, attorney-general; Frank H. Hitchcock, postmaster-general; George von L. Meyer, secretary of the navy; Richard A. Ballinger, secretary of the interior; James Wilson, secretary of agriculture, and Charles Nagle, secretary of commerce and labor.

"We are hopeful that President Taft will honor this congress, which Col. Theodore Roosevelt has declared 'is undubtedly one of the most important unofficial bodies in the country,'" said Mr. Insinger, "and we expect to have the President with us one or two days.

"Advices to hand from various parts of the country indicate that the attendance of delegates and visitors will be the largest in the history of the organization, and I may tell you that nothing is being left undone by the executive committee of the board of control to make it the most interesting.

"The program gives promise of being continent-wide in scope, and action tending to solve some of the problems of irrigation, forestry, drainage, deep waterways and good roads is certain to follow, thus benefitting the whole country."

The Forest Service to Be Represented

W. B. Greeley, district forester, stationed at Missoula, Mont., writes to J. P. McGoldrick, chairman of the forestry committee of the National Irrigation Congress, that Gifford Pinchot, chief of the Forest Service, who will be representative of the Federal Government at the sessions in Spokane, August 9 to 14, endorses the plan of a special meeting with the lumbermen one day that week to discuss the policies and regulations of the Forest Service in the administration of Government timber affairs, adding:

"Mr. Pinchot will, of course, be present at this special meeting. I will arrange also for three members of the Forest Service to give ten or fifteen minute talks on the following subjects:

"'The policy of the Forest Service as regards selling timber and fixing stumpage prices.'

"'Marking, slash piling and logging regulations in sales of National Forest timber.'

"'Cooperation between the Government and private timberland owners in protection from fire.'

"I believe that it would be an excellent plan to let the lumbermen in the district tributary to Spokane know in advance that these subjects will be discussed at a special session in connection with the congress, so that they can arrange to be present. I am also of the opinion it would be a good idea for your committee to invite some of the lumbermen to speak briefly on each of the topics suggested. General discussions could follow the addresses.

"I have asked Mr. Pinchot to suggest two speakers for the main congress. One to speak on the relation of forests to flow and water supply and the other on the experience of some of the older European countries on the problem of forest conservation and water supply and its application to conditions in the United States."

Encouragement from Montana's Governor

Governor Norris, of Montana, has given assurance that a representative delegation will be appointed from that state. He adds:

"You may say to the board of control and to the people of Spokane that it is my intention to attend the sessions. I am greatly interested in the work of the National Irrigation Congress, and will assist in every way I can to make it a success. I have not yet taken up the matter of appointing delegates to represent the state, but I shall do so on my return from the East and endeavor to see the state is well represented."

The plans of the board of control for a parade of the industrial and irrigation army, in which it is expected to have at least 10,000 uniformed marchers in line, appeal to the people of Montana, as it will give them opportunity to bring their districts before the delegates and visitors, as well as the press representatives expected from fifty or more metropolitan papers and news-gathering associations.

BRASS BANDS IN DEMAND

Mr. Arthur Hooker, secretary of the local board of control, said:

"The offer of the board of control to refund the railroad fares to any community

or district sending a band of twenty or more pieces was also received with favor in numerous places, and this, I believe, will result in a large number of bands accompanying the delegations from various parts of the country. I was informed at Missoula that its delegation will travel in a special train, and it is probable that similar arrangements will be made in other parts of Montana."

Missoula and the Bitter Root Valley will send a delegation of 150 and a brass band to participate in the parades.

Utah Again in Line

"Utah will be fully represented at the National Irrigation Congress in Spokane, August 9 to 14, notwithstanding the fact that the Grand Army of the Republic will have its national encampment in Salt Lake City at the same time."

United States Senator George Sutherland of Utah, chairman of the committee on industrial expositions, conveys this information in a letter written at Washington, D. C., to R. Insinger, chairman of the local board of control, adding:

"The various irrigation companies and industrial associations are very much interested in the coming congress and, notwithstanding the counter-attraction at Salt Lake City, you may expect the usual strong and enthusiastic delegation which Utah always sends to the National Irrigation Congress."

Meeting of Mechanical Engineers

The American Society of Mechanical Engineers will hold its spring meeting in Washington, D. C., May 4-7. Professional sessions will be held at which papers on the conveying of materials, gas power engineering, steam turbines, the specific volume of saturated steam, oil well pumping and various other subjects will be discussed.

At the reception, which will be held in the New Willard Hotel, an address of welcome will be made by the Hon. B. F. Macfarland, president of the Board of District Commissioners, with a response by Mr. Jesse M. Smith, president of the society.

Among the numerous other interesting features of the meeting will be an illustrated address by Mr. F. H. Newell, Director of the United States Reclamation Service, on Home-making in the Arid Regions.

Deep Waterways Meeting at Toronto

The last meeting of the joint deep waterways commission of the United States and Canada, at Toronto, this week, resulted in progress on the proposition to raise the levels of the Great Lakes, or of the water that stays in them. The plan is to dam the short rivers that connect the lakes, but how much of such work shall be done has not been determined by the commission. In connection with that large undertaking there are many applications for power locations under consideration by the commissioners of both countries. Enterprising men are seeking locations in several places between the lakes and on the St. Lawrence River in Canada. The Canadian commissioners are favorable to allowing all the use possible of the water that is allowed to pass through the streams from one lake to another and from the most easterly one to the St. Lawrence River. The raising of the water level of the great lakes is a matter of much importance to the sections of country in which they lie. It means better facilities for shipping, and eventually must have a good deal to do with the cutting of canals out from the lakes for shipping through the states of this country and the provinces of the dominion. There is plenty of water there, and no engineer has ever made an estimate of the tremendous possibilities of that water when used to its utmost for power and canal purposes.

Iowa's Waterways Commission

The state legislature of Iowa has authorized the appointment of a commission to investigate the waterways of that state. The commission is expected to concern itself with the conservation interests of Iowa.

A New Southern Waterway

Advocates of waterway improvement and shippers throughout the country are manifesting an interest in the projected improvement of the Sabine-Neches Canal and the Sabine and Neches Rivers so as to enable ocean-going and other vessels to ply direct to Orange and Beaumont, which offers substantial evidence of the pluck and progressiveness of the people. For several years the possibilities of making Orange and Beaumont important inland ports have been considered by some of the foremost and far-sighted citizens. As a result of an effort in this direction an appropriation was secured to dig a canal along the west side of Sabine Lake and connecting the mouths of the Sabine and Neches River with the Gulf. This canal is now 100 feet wide and about ten feet deep, permitting only light-draft vessels to pass through, but it has proved sufficient to suggest great possibilities for the opening of another artery of commerce and the development of the many and varied resources of

this section. Fresh-water ports are always attractive to ship owners and there is every reason to believe that with the deepening of the canal and the further improvements of the rivers, these ports will do a vast shipping business.

Failing to obtain Congressional aid, a bill was passed by the state legislature of Texas conveying the constitutional right to levy special taxes and issue bonds for such improvements. Simultaneously a bill was presented in the National Congress and the necessary Government permit to make such improvement has been granted. The proposition will soon be submitted to a vote of the people of Jefferson County and it is expected that the issuance of bonds will be promptly authorized. It is estimated that $400,000 will be sufficient to deepen the canal to twenty-five feet and to improve the rivers materially.

The fruition of these plans will be a decided contribution to the commerce of the country and great good is expected to come to this section.

To Stop Water Waste

The gigantic project of conserving the billions of gallons of water that run to waste in the twelve watersheds of New York and transforming it into industrial energy, with a resultant revenue to the state, is the subject to be presented to the legislature, before adjournment, by engineers of the state water supply commission, who have spent two years figuring out a practical plan.

Carried into effect at a cost which cannot fall below $30,000,000, the scheme means the wiping out of villages and the erection on their sites of huge dams and reservoirs; the ripping up of railroad tracks; the submersion of country roads and the forming of them into navigable waterways; the construction of a system of reservoirs on the upper Hudson that will practically do away with great freshets; the enlargement of Schroon Lake in the Adirondacks, so as to establish a continuous line of deep-water navigation for thirty miles; the transformation of three hamlets into water fronts, with piers at their doors; the plying of vessels between villages over what are rocky turnpikes—why it would all sound like a chapter clipped from the prospectus of Mulberry Sellers were it not buttressed by hard, practical engineering facts.

It is not likely, even after the two years' survey and exhaustive investigation of the tremendous possibilities presented, that a full working plan can be prepared in less than another year; but when it is finished it will be put forward as an engineering feat combining beautification of the natural with the utilization of what are spent forces never attempted on such a scale anywhere in the world. It is designed according to the plans of the engineers, not only to turn the comparatively valueless parts of forest and meadow into spots of sylvan beauty, but to increase the wealth of the state by adding to its industries and creating new avenues of employment. There are in New York 1,824 plants run by water power; their total horsepower is 830,000. The actual horsepower in use is 618,942, due either to inadequate supply or ignorance of owners of the power value of water as compared with fuel. If the system of reservoirs and dams as projected becomes an actuality, the energy will be increased to 2,000,000 horsepower and without any further encroachment on Niagara.—*New York World.*

Farms under Water

While the "land water" must be kept from flowing back to the sea unused, and Professor Shaler in "Man and the Earth" suggests that by and by practically all of it will be held back for water power and irrigation service until it has evaporated, yet he thinks that none of it will be kept in shallows, in bogs, and in marshes. It will be held by forested tracts, in artificial reservoirs, and in lakes of restricted area but increased depth. The tillable lands of Holland are ten times greater than they were before artificial winning of them from the sea began. This is well known; but most readers are surprised to learn that one-third of Great Britain was bogs and marshes in King Alfred's time, and that all around the North and Baltic seas the work has been only less extensive than in Holland. In America we have done practically nothing of the sort. Two hundred thousand squares miles of the earth's surface will yet be won for production by such means as the Dutch have employed by systems of drainage.

The Government Retains Title to Coal Lands

According to a statement given out at the Department of Justice, the United States Government has regained title to 1,120 acres of coal lands lying in Mt. Ranier National Park, worth about $100,000, by a decision of the district court of Montana.

The land has been recovered from the Northern Pacific Railway Company, the Rocky Ford Coal Company, and the Northwestern Improvement Company.

Timber Consumption in United States

The systems of forest management and wood utilization in the United States and Germany offer many interesting compari-

sons. The United States takes 260 cubic feet per capita annually from the forests; Germany uses but thirty-seven. In other words, this country is already using seven times as much timber per capita as is Germany. American forests are now producing not more than twelve cubic feet per acre; German forests are producing forty-eight cubic feet per acre annually according to the United States Forest Service. Germany has reduced waste and consumption and increased production.—*Wall Street Journal.*

Tree Planting to Transform the Prairie

In connection with tree planting in the prairie regions of the middle West, the *Springfield* (Ill.) *Register* contained this interesting article:

"The prairie town without trees is cheerless and unattractive. Few things add more to the attractiveness of a town than rows of thrifty shade trees planted along the streets. Where trees adapted to local conditions have been planted and where the citizens have cared for them and taken an interest in them, the results have been remarkable.

"A public-spirited man in Missouri has been doing commendable work along this line in connection with the Civic Improvement League of his city. In 1901 he planted seeds of various trees. He carefully tended the seedlings and, a few years later, dug them up, labeled them, and turned them over to the school children upon condition that they should be planted and cared for. To each child printed directions were given, headed thus:

"'Ornament your homes—plant trees. They are living monuments; watch them develop. These began with the new century, and the century, as it advances, marks the record of their age year by year.'

"Five or six thousand trees were given away in this manner. Two or three trees were given to each child who asked for them, and almost every child did so. There were many species and naturally some of the trees died, but few of the children lost all that they had planted. Each child who received trees was required to fill out a slip giving his name and address, and the place where the trees were planted. The Missouri town is now dotted with these 'century trees' which have become the pride of those who planted them."

Progress in Conservation

"Practical results already are reported by the joint committee on conservation, which has taken over the duties of the old National Conservation Commission, which was put out of business by the Tawney amendment cutting it off from funds. This committee, which has been organized by the governors of the country and is maintained by private subscription, has well equipped headquarters in the Wyatt Building, and is doing valuable work. President Taft has promised to recommend that Congress make an appropriation for carrying on the work; and it looks as if, by the time the money gets around, the committee will have a good deal to show for itself.

"Secretary Thomas R. Shipp has just sent a letter to the chairmen of state conservation commissions explaining the status of the organization. Conservation work in the branches of the executive departments of the Government along their respective lines, he explains, is in no way hampered by the amendment to the sundry civil act. The joint committee will keep in close touch with this work, and will make it its business to see that information, technical and otherwise, available either from Federal or other agencies, which would be of peculiar local value in conservation work, will be sent without delay. The committee also volunteers advice or assistance needed by state or local committees in making investigations or in preparing plans for the practical application of the principles of conservation to definite problems. The committee also will keep the various local commissions informed of what each is doing, thus serving as a conservation clearing house.

OREGON STARTING WELL

"The joint committee is now busily working upon an outline of a definite plan under which the work will be conducted. One of its first suggestions will be that each of the states pick out its most pressing problem and get busy with that, along either legislative or executive lines. The advantage of uniform progress is emphasized by the unanimity with which the various states appear to be deciding for themselves the most imporant fields for state cooperation. So far they all appear to have hit upon water resources, both with respect to conservation and the urgent need of legislation regulating water-right privileges across state lines. Oregon has made remarkable headway in this direction. Her unofficial committee of fifteen has been followed by the authorization by the legislature of a permanent commission of seven, for which an appropriation of $5,000 has been voted. Acting under these influences, and with a report drawn up by the commission as a basis, Oregon has codified her laws relating to water rights. The beneficial use of the water is made the basis of the right, which is granted for only forty years. State control is reserved, of course,

and the whole situation has been brought under a workable legal system.

"Say the Oregon commissioners significantly in their report: 'We have no hesitation in saying that if President Taft will stand for conservation as unflinchingly as President Roosevelt stood for it, and will push it as persistently, the question will be in a fair way to be solved within the next four years.'

"Iowa has made a start with legislation establishing a Drainage, Waterways and Conservation Commission, and appropriated $2,500 for it. Rhode Islands reports that she expects to do about the same. Several other state commissions are working on reports and inventories of their own. Wisconsin, for instance, is taking official stock of her land, water-powers, forests, phosphates and soil resources. Gov. J. O. Davidson writes: 'Our undeveloped water-powers are the most valuable of our natural resources, and are rapidly increasing in value. Capital is fast seeking their control. In a few years they will be utilized and it will be more difficult then to secure their control than now.' The governor believes that the power of granting water franchises should be placed in the hands of some state authority, and that the powers of corporations receiving these franchises should be very carefully defined. The conditions on which franchises should be granted should be determined, he says, and a small privilege or franchise tax be imposed upon each horsepower, payable annually. This is the plan followed also in Oregon.

"In Louisiana, the state commission has brought to the attention of the district attorney the great waste of natural gas in one section, and an inquiry has been instituted to see if there is not some way by which it can be stopped by law. Some wells are said to have been burning for months, the purpose being to get rid of the gas so that promoters may be able to reach the oil.

"Indiana has had her bitter experience with natural gas waste. She now has a model natural gas law, but unfortunately she has lost her natural gas. The city of Anderson, once known as the 'Pittsburg of White River,' has called upon its citizens to contribute a so-called factory fund, and is offering all kinds of inducements to keep manufacturing at home. Muncie, Marion and other places, where the natural gas supply has failed, are having the same woeful experience. The model Indiana gas law may yet have its uses, however, for it is the purpose of the joint committee on conservation to send copies of it wherever legislation for the protection of natural gas supplies is needed."—*Boston Transcript* (April 12).

Engineers for Conservation

On the evening of March 24 the four great national engineering societies held a joint meeting in New York City. The object of the meeting was to consider questions in connection with the conservation of natural resources. The attendance numbered some 700.

The meeting opened with the reading of the following dispatch from President Taft: "John Hays Hammond:

"Please say to Joint Engineering Societies that I am greatly gratified to know of their cooperation in the movement for the conservation of the natural resources of the country. The members of these societies with their technical knowledge are not only better advised as to the necessity for such conservation, but are more competent to suggest the methods by which such conservation can be carried out. I have already pledged the administration to as full support as possible to the policy, and I am glad to renew my expression of sympathy with the movement, and to state my high estimate of the value of the aid which can be rendered by the United Enginering Societies.

(Signed) "Wm. H. Taft.

"The White House, Washington, March 24."

Conservation in Rhode Island

The State Conservation Committee of Rhode Island has recently presented its report to the governor. The commission maintains that there is no state in the Union which more than Rhode Island needs to conserve its resources. It advises new and better fire laws similar to those in other states, and the rehabilitation of the many abandoned farms within the state's borders.

"The state has been indifferent to its natural resources," says the report. "It has allowed them to be wasted to a serious extent, and therefore there is great need of taking account of stock, and finding out what we have in the state, so we can conserve it."

Among the recommendations of the committee are the following: Laws for the protection of forests from fires; preparation of charts showing for what lands are best suited; what areas are needed for water conservation; public ownership of the banks of certain streams; trees to be placed along highways; laws regarding waterways; and the widest possible dissemination of intelligence regarding results obtained by the Rhode Island agricultural station in their application to the farmers of the state. This committee consists of Henry A. Barker, chairman of the Metropolitan Park Commission, J. Herbert Shedd, and Jesse B. Mowry, state forester.

World Conservation

In a column article in the *Chicago Tribune* for April 12, Mr. John Callan O'Laughlin says:

"Important as have been the international conferences for the promotion of arbitration in international disputes and the amelioration of the hardships of war, they will not approximate in the results for the benefit of humanity at large that which is to be held at The Hague in May of next year.

"All of the great nations have formally accepted the invitation of the President to attend a conference for the conservation of natural resources.

"People of every country are interested in the supply of food and of the material for manufacture in every other country, not only because these are interchangeable through the processes of trade but because a knowledge of the total supply is necessary to intelligent treatment of each nation's share of the supply. It will be the purpose of the conference to arrange for the cooperation of the entire world, each for its own good and all for the good of all, toward the safeguarding and betterment of their means of support.

"Gifford Pinchot, Chief Forester of the Government, has returned to Washington after an extensive tour through the West, where he had an opportunity to explain President Taft's views and to ascertain the public sentiment in connection with the general conservation movement.

"Mr. Pinchot is satisfied that the people are behind the administration in its purpose to prevent the waste and monopolization of natural resources. Machinery to this end has been partially disabled through the action of Congress in directing in the sundry civil act that no commissions shall be maintained without express authority of law."

Mr. O'Laughlin next explained that the President was compelled to dissolve the Federal Conservation Commission, but that the situation has been temporarily bridged by the organization of a joint committee on conservation. He adds that President Taft is expected to recommend in his annual message an appropriation for a Government agency similar to the old Conservation Commission.

Stopping Waste

The *Omaha Bee* says, editorially:

"Until within comparatively recent times the people of the United States have been living and acting under the hallucination that the natural resources of this country were boundless and have drawn upon them with a prodigality born of that idea. Fortunately the awakening has come before impoverishment and we are realizing that the fertility of the soil must be preserved and that slipshod and wasteful methods of farming cannot be depended upon indefinitely to support our population.

"The opinion once common that our timber resources were sufficient in perpetuity has given place to a certainty that the forests must be protected and restored else in the near future the country would be without lumber, to say nothing of the damage from denudation of the forest areas. Probably in no one direction has the national habit of waste been so predominant as in the use of timber. In the earlier days of the lumbering industry only the best was taken and the remainder burned simply to get it out of the way. Railroads, once among the worst offenders, are taking the lead in reforestation and are also employing scientists to treat artificially varieties of timber previously considered valueless in order to make them serviceable and also to increase the life of ties and other timbers which they use. A recent discovery promises a process which it is maintained will render valuable the hitherto worthless gumwood of the South and make the short-leaved pine of that section equal to the more valuable species.

"The former waste of the coal mines is being utilized, the packing houses and petroleum refiners have brought to their aid the scientist and there is now little waste product in these industries. All lines of manufacturing are aiming at elimination of waste and sooner or later the idea will permeate the American home, which is without doubt the most wasteful of all. This great country of ours can soon become many times richer simply by stopping needless waste."

Government Buys Steam Dredge

The Secretary of the Interior has authorized the Reclamation Service to execute a contract with the Bucyrus Company of Milwaukee, Wis., for the purchase of a steam dredge for use in enlarging the main canal of the Sunnyside irrigation project, Washington. The machine will be a three and one-half cubic foot steam-driven elevator dredge with buckets of the continuous type, and the contract amounts to $28,010.

Progress at Belle Fourche

The settlers on the Belle Fourche irrigation project, South Dakota, are busy preparing their land for irrigation. The hay lands are already receiving water as the ground is exceedingly dry. It is expected that the new land office at Belle Fourche will be open for

business in a short time. This will greatly simplify land office business for the settlers and eliminate the delays resulting from forwarding their papers to the office at Rapid City.

At present there are only ten farm units on the project open for entry. The large ranches are being subdivided and the recent sales show that land values are steadily increasing. A great many inquiries from prospective settlers are being received and it is probable that about August 1 additional farm unit plats will be filed and 10,000 acres of Government land will be opened to settlement. Quite a colony of Wisconsin people are congregating on this project, bringing their stock and household goods.

The farmers are receiving good prices for feed, oats bringing $2 per 100 pounds and hay from $8 to $16 per ton. The contractors on the works state that although they can procure feed shipped in from other states at a lower rate it does not compare with the grade of the Belle Fourche produce and they find it cheaper in the end to purchase on the ground.

The Klamath Project

The reclamation of the North Poe Valley Canal, Klamath irrigation project, Oregon, has been completed. The Keno Canal has been operated continuously for several weeks. The upper four miles of the South Branch Canal are completed, the laterals excavated and the small structures finished so that the system is practically ready for operation.

During March the water was removed from the surface of the marshes on the demonstration farm and in the drainage trenches around the tract to a depth of from three to four feet below the surface. Careful levels have been taken over the marsh at intervals of 200 feet, in order to study the amount of settling, and wells are being put in to determine the gradient of the water table in the soil. Careful observations are being made in connection with precipitation and evaporation.

The people of the district have decided to construct a highway from Klamath Falls to Lakeview, Oreg., a distance of 110 miles, which shall serve as an outlet for supplies into the Lake country. A county dairy association has also been formed with the intention of fostering this industry and building it up from proper foundations. One creamery has already been established and another will soon be opened.

The S. P. Railroad has closed the Klamath Strait to navigation by building the railroad trestle across it, connecting the two ends of the embankment. It is expected that the railroad will reach Klamath Falls by June 1.

Scrub Pine for Pulp Material

The long-neglected and despised scrub or Jersey pine, growing on the abandoned farms and cut-over lands of the East, seems destined at last to have reached its rightful place as a material of value, according to the results obtained through recent pulp and paper-making tests at the United States Forest Service laboratories in Washington.

While there is a considerable amount of this wood standing as timber, it has heretofore been used only in a very desultory fashion, and then mostly as fuel. About 500,000 acres, or twenty per cent., of the wooded area of Maryland, and about 130,000 acres, or ten per cent., of that of Virginia, is covered with fairly dense stands, while the broad range of the tree extends along the Atlantic seaboard from southern New York to South Carolina, and back over the Appalachians to central Indiana, where its largest specimens are found.

While a number of mills have used scrub pine for the manufacture of soda pulp and ground wood, no plants have ever operated the sulphite process. Scrub pine might have been used to good advantage long ago, but for the fact that it did not seem to the practical paper-maker even worthy of trial. By only slight changes of the regular cooking treatment which is ordinarily accorded pulp wood in the sulphite process, however, it has now yielded a pulp product which has been favorably commented upon by numerous members of the paper trade as a substitute for spruce sulphite in the manufacture of news paper.

When a forest of scrub pine is matured, a fully-stocked stand will yield thirty to forty cords per acre, when economically harvested according to the practical forestry methods. At the present time there is practically no general use for the timber, outside of fuel, although a coarse lumber is made of it and it is sometimes used for fencing. An evidence of the low esteem in which this pine is held is the price which the Maryland wood brings when delivered—$5.75 per cord. The wood itself is of a light yellow color, with a white sap-wood. It is light in weight, is brittle, and coarse-grained. While it is fairly durable in contact with the weather, its weak structural properties offset any advantage this might give.

Practical paper-makers who have seen this product are almost unanimous in claiming it to be a strong, long-fibered, and hard-wearing pulp, which seems especially desirable for making bag, news, and wrapping papers. Several even went so far as to say that it would make fine bank or ledger papers when properly handled, and that this wood gave one of the best fibers which has been prepared from pine wood.

Wood Preservation Means Forest Conservation

An increase from three and one-half million gallons of the oil of coal tar, or creosote, as it is popularly known, imported into the city of New York in 1904, to an amount estimated to be almost 25,000,000 gallons last year, is one of the indications pointing to the progress of the Nation-wide movement for the conservation of forest resources.

It is creosote which the Government and scores of corporations and private wood users have found to be one of the most satisfactory preservatives of railroad ties, mine props, telephone and telegraph poles, fence posts, and for timbers used for other commercial purposes. Lengthening the life of timber in use means the lessening of the drain on the country's forests, and what is more important to the average business man, it means the saving of thousands of dollars annually spent for the labor of the frequent renewals made necessary when untreated timber is used.

Ten years ago the strongest advocates of the creosoting method of preserving wood could scarcely have hoped for the present advanced state of this industry. Creosoting is becoming the acknowledged standard means of increasing the life of timbers.

Formerly the production of creosote, from both coal tar and wood tar, far exceeded any demand for wood-treating purposes. However, the number of wood-preserving plants has grown so rapidly within the last four years that this country is not now able to supply its own demand for coal-tar creosote.

A brief study of the importation columns of the trade journals shows the effect of the growth of the wood-preservation industry. In the whole year of 1904 the New York imports amounted to only 3,500,000 gallons. By the end of 1907 the importation had increased to 17,500,000 gallons, while for the present year conservative estimates place the imported coal-tar creosote at between twenty-two to twenty-five million gallons.

The year has started most auspiciously; during a five-weeks' period in December and January the importation through New York alone was 15,000 tons, giving a weekly average of 3,000 tons, or 68,000 gallons. It is significant that during this same period the importation of related by-products from coal kept pace with that of creosote. Ammonium carbonate, chloride, sulphate, and "sal ammoniac" entered to the amount of 104, 227, 1,260, and 400 tons, respectively. If these had been all made into the sulphate, the equivalent product would have been 460 tons per week. The estimated ratio of twenty pounds of sulphate to one and one-half gallons of the creosote oil would make an equivalent production of 69,000 gallons of creosote. This is not far different from the 68,000 gallons which were really imported. Since these ammonia products and creosote are being imported in this relation, it is plainly evident that the production of creosote is not alone deficient, but also coal-tar products in general.

The production of creosote in this country will, in all probability, continue to be far less than the consumption.

A great help may be eventually afforded by the increasing use of wood-tar creosote, which has not been in high favor in the past. It is gratifying to note that within the last few years some of the more important wood distillers have been turning into a profit those oils and tars which were formerly run to waste. The demand for these products is increasing, and this recovered by-product has been asserted to be not only a revenue for the producer but also a valuable preservative for the treatment of structural timber.

An Important Tree Family

Recent investigations by the Bureau of Forestry emphasize the fact that the bulk of the forest wealth of the Philippine Islands is stored in the members of one family, botanically known as Dipterocarpaceæ, which name has been very aptly shortened to "Dipterocarp" family. The word means, literally, "two wings," because some of the members of the family have fruit with two wings. It is estimated that this one family contains more than three-fourths of the timber wealth of the islands. It is to the Philippines what the pine family is to temperate regions. It holds timber of all grades, from the hard and durable woods like Yacal and Mangachapuy, through a medium grade like Guijo or Apitong, to the softer timbers known commonly as Lauan.

Naval Stores Production

The production of more than 36,500,000 gallons of turpentine and more than 4,000,000 barrels of rosin, with a valuation of more than 14,000,000 for the turpentine and nearly $18,000,000 for the rosin, summarizes the output of the Naval Stores industry for 1908, according to the preliminary report of the United States Forest Service just completed. Of the eight Southern states, each producing more than 200,000 gallons of turpentine and 25,000 barrels of resin, Florida leads the list with 17,030,300 gallons of turpentine in 1908 against 15,572,700 gallons in 1907, and 1,932,114 barrels of rosin in 1908 against 1,774,370 barrels in 1907.

Government Helps Grazing

The beneficial results of regulated grazing were shown in a decided betterment of much of the National Forest range, during the fiscal year 1908. At the same time investigations in range improvements through reseeding, new methods of handling stock, the eradication of poisonous plants, and the destruction of prairie dogs brought important progress toward still better future use of the forests by stockmen.

The development of watering places is another means that is being pursued to the same end, while the killing of predatory wild animals by United States Forest Service hunters saved the stockmen losses probably greater than the entire amount paid in grazing fees. This amount was over $960,000. Through the enforcement of quarantine regulations and the distribution of blackleg vaccine other losses from disease were prevented.

South Dakota Preserves Wood

During the past summer the Forest Service installed an experimental wood-preserving plant at Englewood, S. Dak., in the Black Hills National Forest. The first treatments were made in August, but regular work did not begin until the middle of September. The plant has a twenty-four-hour capacity of 9,000 feet of timber B. M., and most of the treatments have been carried on in cooperation with the Homestake Mining Company.

The company now considers that the practicability of the process and of the type of plant have been demonstrated, and has expressed a wish to take over the plant and operate it independently on a commercial basis. Arrangements have accordingly been made to turn over the plant to the Homestake Company. An expert in wood preservation will be detailed to supervise the operation of the plant for several months, in order to complete the working out of the best details of the process and to assist the cooperating company in training its own employees to continue the work independently.

The objects of the Forest Service in establishing treating plants on the National Forests are two-fold—to investigate the cheapest and most efficient preservatives, processes and types of plants for the treatment of timber on the National Forests, and to encourage a more conservative use of timber by preservative methods. The arrangements which have been made with the Homestake Mining Company, it is believed, will insure the most satisfactory attainment of both of these objects. Other companies in the same region are strongly considering the establishment of similar plants for their own purposes.

Mexico's Supply of Longleaf Pine

An aggregate area of 6,000,000 to 7,000,000 acres of longleaf pine, in every way suited to turpentining, briefly indicates the extent of the only partially developed naval stores resources of Mexico.

A peculiar and interesting feature of the Mexican turpentine belt is that the turpentine producing trees are found only in the mountains at high altitudes, a condition directly reverse to that existing in the United States, where trees at an altitude of 2,000 feet are unproductive so far as turpentine is concerned.

Carey B. Townsend, of New Orleans, who has spent some time investigating naval stores conditions in Mexico, has given an interesting account of his observations. Speaking of the characteristics of the Mexican tree, he says:

"The Mexican turpentine pines present a different appearance from our trees in the United States. The bark is thicker, nature providing this as a protection against the cool nights of the high altitudes. The needles, too, are shorter and coarser than those of our southern pines. The appearance of the Mexican pines differs materially in the altitude in which they are found, the trees at 8,000 to 9,000 feet presenting a sharp contrast to those at 5,000 or 6,000 feet. A close investigation with proper tests convinced me that there is no difference in the yield or quality of the gum.

"Turpentine runs freely in Mexico when the temperature is sixty degrees or above. While there is little or no flow at night, the first rays of the morning sun striking the trees start the gum running freely and this only lets up when darkness comes. I have never seen better running pines in my entire observation, which has extended from Cape Fear to the Sabine River. Owing to the cool nights it is proper to estimate the yield of the Mexican pines at twenty-five per cent. less than the best output of our southern pines.

"The atmosphere evidently affects the quality of the crude gum, as I noticed that the rosin produced from the old and high faces was of an unusually good quality, grading form "I" to "M," instead of "D" to "G," as in the United States. As to the relative yield of turpentine from a given quantity of crude, it is about the same in Mexico as in the United States."

Why Wood Decays

Piles driven by the hut dwellers of the Baltic centuries ago are as sound to-day as when first placed. The wooden coffins in which the Egyptians buried their dead are

still preserved in perfect condition after thousands of years of service.

The longevity of timber under these two extremes of climate and moisture conditions has naturally made people ask, What causes wood decay? The answer is, fungi and bacteria, low forms of plant life which live in the wood and draw their nourishment from it. These organisms are so small that a microscope is required to see them, yet their work results in the destruction of billions of feet of timber each year, and the railroad corporation with its cross-tie bill running up into seven figures and the farmer who spends a hundred or so dollars a year for fence posts are alike drawing upon the knowledge of experts in all parts of the world in efforts to learn the most economical and most satisfactory method of preserving wood against the inroads of decay. In studying the means of preventing decay wood-preserving experts have learned many things about the obnoxious fungi which sap the life of timber.

The small organisms can grow either in light or in total darkness; but all of them require requisite amounts of air, food, moisture and heat. If one or more of these essential requirements is lacking, they cannot live, and the decay of timber will not take place. Wood constantly submerged in water never rots, simply because there is an insufficient supply of air. This condition accounts for the soundness of the old Baltic piles. On the other hand, if wood can be kept air-dry it will not decay because there will then be too little moisture. The timber used by the Egyptians will last indefinitely so long as it is bone-dry.

There are a great many cases, however, where it is impossible to keep wood submerged in water, or in an absolutely air-dry condition. In fact, a large percentage of the timber which is used is exposed to the weather, and is subjected to decay simply because it contains enough air and enough water for the decomposing organisms to get a foothold. Decay is most serious where the atmosphere is warm and damp, because these conditions are most favorable for its development. In the coal mines of Pennsylvania timber decays in two or three years because the temperature is warm and constant and the air is damp. And in the South, the warm, humid atmosphere often causes the timber rapidly to decompose.

Decay may be prevented by two general methods, by treating the wood with antiseptics, thus poisoning the food supply of the organisms which cause decay, and by treating it with oils which render it waterproof. A combination of these two methods is most commonly used, as when wood is treated with creosote which fills up the pores in the timber and keeps out water and is also a powerful antiseptic.

The United States Government considers the investigations of the preservative treatment of timber of such importance that the business of one branch of a bureau in the Department of Agriculture—the "Office of Wood Preservation" in the Forest Service at Washington—is given over entirely to the work of experiments in cooperation with railroad companies and individuals in prolonging the life of railroad ties, mine props, bridge timbers, fence posts and transmission poles. Advice and practical assistance is furnished all who request this advice of the Forester. The lengthening of life of timber means the saving of thousands of dollars annually through doing away with the heavy expense of labor and cost of material for renewals.

Damage by Barkbeetles in Northwest

It is well known how enormous is the damage done by fires to the forests of the Northwest, but there are other enemies of the trees of this region. Insects are also active destroyers of live timber.

The Forest Service has lately found that in one locality in Washington a species of barkbeetle—*Dendroctonus ponderosæ*, the entomologists call it—has been killing spots of thrifty young Douglas fir and doing thousands of dollars of damage. These beetles ordinarily breed only in small numbers between the bark and the wood of damaged, dying, dead or recently felled trees, but when suitable breeding places become particularly numerous and favorable, they increase so enormously in numbers that they are forced to take up their residence in living trees, which they promptly kill.

The fact that these barkbeetles find such favorable breeding places in old logging works is a strong additional reason, the Forest Service concludes, for burning over slashings after logging. If the beetles become *excessively* abundant only when they have the unconsumed debris from logging to breed in, and if they will kill valuable timber when they do become excessively abundant, foresters ask why leave this debris to facilitate propagation?

CONSERVATION

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North Platte Project, Nebraska. Spring Canyon Flume, Inside View, Interstate Canal

W. J. LUBKEN, AUG. 29, 1907

its of the irrigable land in Nebraska, the distance is fifty miles, and it is estimated that 400,000 acres of land in Wyoming and Nebraska, or more than double the total area of land cultivated in the entire state of Rhode Island, will be divided into small farms and irrigated.

The comparison afforded by the following table, showing the dimensions, cost and effectiveness of the Pathfinder and three large eastern dams, is most interesting:

Dam	Height in ft.	Length in ft.	Contents in cu. yds.	Cost	Storage capacity acre-feet
Pathfinder..	215	500	60,400	$1,200,000	1,025,000
Wachusett.	228	971	273,000	2,226,000	192,000
New Croton	297	1,072	833,000	7,631,000	92,000
Ashokan...	220	[1]4,800	[2]7,900,000	12,700,000	368,000

[1]Masonry, 1,000 feet, and earthwork, 3,860 feet.
[2]900,000 cubic yards masonry and 7,000,000 of earth.

It will be seen that the Pathfinder dam, which cost only $1,200,000, has a storage capacity more than ten times that of the New Croton which cost six times as much.

One hundred miles from the storage dam a low diversion dam has been thrown across the river, which turns the waters into the Interstate Canal, to supply lands in Wyoming and Nebraska. This canal when completed will be 150 miles long, but at present only ninety-five miles have been excavated. It has a capacity at the headgates of 1,400 second-feet. Hundreds of miles of laterals have been constructed to distribute the water over the lands.

One of the most attractive features of the valley is its sunny, invigorating climate. The summers are always comfortable and the winters are relatively mild. The general elevation is about 4,000 feet above sea level. The soil is a rich, sandy loam, with a crop-producing capacity that to the farmer of the humid region seems incredible. Oats yielding 120 bushels per acre and weighing forty-five pounds to the bushel have been grown, and the average yield for the valley probably will exceed sixty-five bushels. Three crops of alfalfa are cut during the year, often yielding five tons to the acre, and fifty bushels of corn per acre is a low yield. The region is particularly adapted to the culture of sugar beets. As high as twenty-eight tons per acre have been produced with a sugar content of fifteen per cent. Apples, plums, small fruit and berries are grown for home consumption. Vegetables bring good prices, and the potatoes especially are of superior quality.

Hog and poultry raising and bee culture have proved very profitable. Back of the valley and extending for hundreds of miles is the vast public range, upon which graze many thousands of cattle and sheep. There is a heavy demand for forage crops for winter feeding, and a large part of the irrigable lands will be profitably devoted to these crops for many years.

Under the terms of the Reclamation Act all of the land under this project which belongs to the public domain is open to entry under the homestead law in farms of about eighty acres. Each settler is required to pay his share of the cost of building the irrigation works. This amounts to $45 per acre, payable in ten annual installments without interest.

Among all the great irrigation works now under construction by the Government, none is richer in historical associations than the North Platte project. It occupies more than 250 miles of the old overland trail which was followed by the California gold seekers and by the Mormons in their migration westward. The old highway is distinguishable in scores of places. With an average width of more than 100 feet it stretches on, mile after mile, now overgrown and distinguishable from the general surroundings only by the difference in vegetation. Its great width is principally due to the fact that the Mormons traveled in great companies, their wagons often moving in a solid phalanx five or more abreast. Beside the trail at numerous points lonely headstones mark the graves of those who perished on that western journey. To those who have read "The Adventures of Captain Bonneville," "Astoria,"

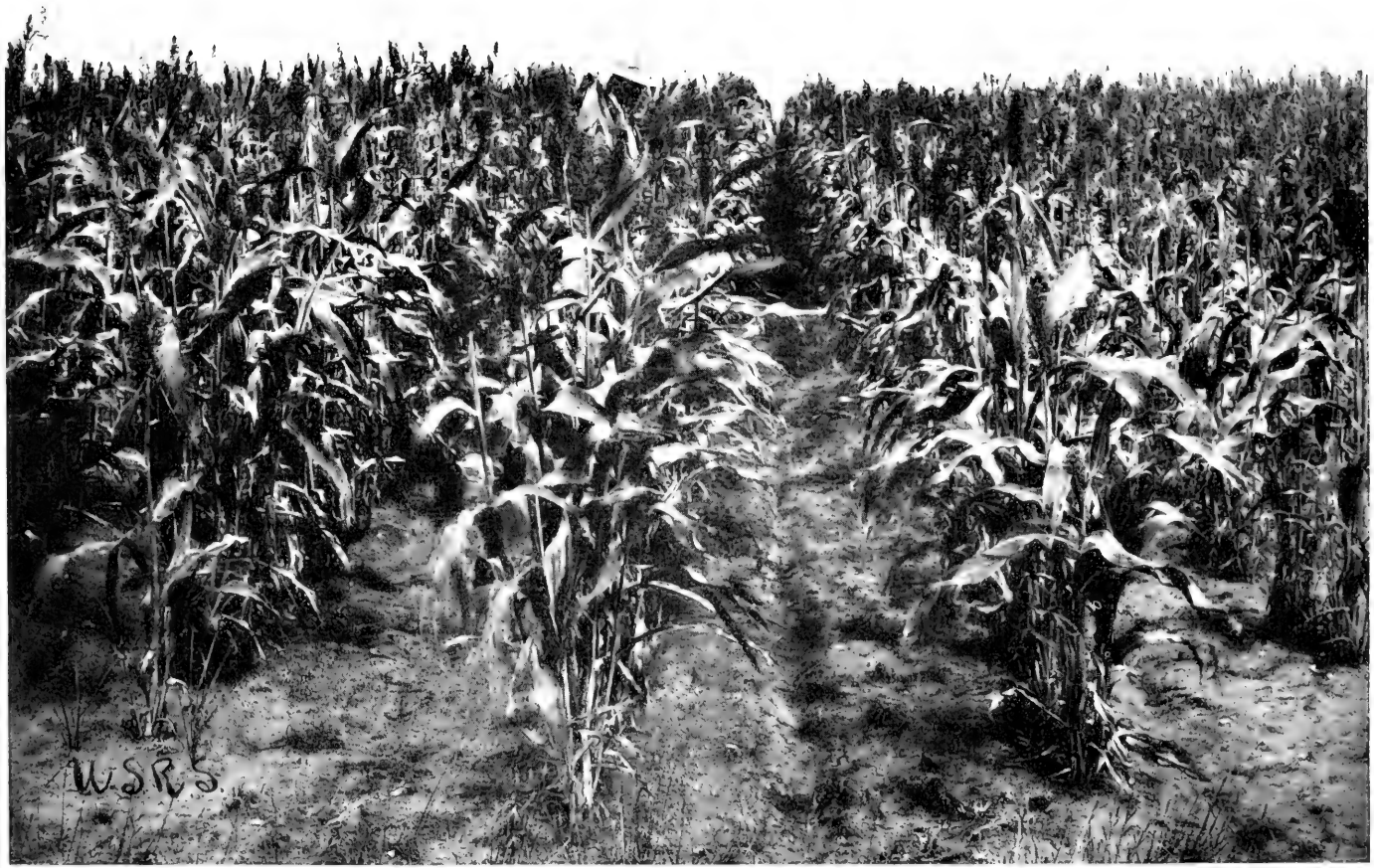
Pathfinder Dam, Nearly Completed, March 21, 1909. Dimensions: Height, 215 Feet; Length on Top, 500 Feet

North Platte Dam Site, from Point Just below Line of Dam Site, Showing Location of Dam Site between Granite Walls. North Platte Project, Nebraska W. J. LUBKEN, SEPT. 25, 1909

the discoveries of Captain Fremont, histories of Mormon emigration and of the Forty-niners, such fiction as "The Virginian," and the adventures of Buffalo Bill, this valley will be familiar and full of interesting associations. But the greatest change in all the history of the valley has been brought about by the construction of the great irrigation system, now well on its way to completion. Already the dreary monotony of plain and sky has been broken, and thousands of homes and fields of green dot the landscape. Lands which a few years ago were valued at from $1 to $5 per acre are increasing rapidly in value and now sell readily at from $20 to $50. Most of the land for which water is now available is in private ownership, but many of the farmers who have holdings in excess of that for which the Government will furnish a water right must dispose of part of their land at reasonable prices.

To subdue the land one has but to turn the sod. The soil is fertile, the water supply practically unlimited, and the climate delightful. All these combine to make the life of the new comer a pleasant one. A railroad extends the entire length of the project, and the numerous towns along this line have more than doubled in population since the initiation of the Government irrigation project. The influx of thousands of farmers to the valley has created a demand for all classes of labor. Mechanics are scarce, carpenters in demand, and brick masons, plasterers, plumbers, blacksmiths, and in fact all men with trades, will find good openings in these rapidly growing communities. The manufacturer, the banker, and the merchant are also in demand.

That these opportunities are not being overlooked is evidenced by the hundreds of letters of inquiry which are being received by the statistician of the Reclamation Service at Washington. To meet the demands of the homeseekers requiring information the Reclamation Service has also established offices at Denver, Colo., and at Chicago, Ill. To a farmer who is looking for a good location this section offers an excellent opportunity.



North Platte Project, Nebraska. Growing Sugar Cane on the Dutch Flats, Interstate Canal

Irrigation in Eastern Washington, Showing What Can Be Raised between Trees

WATER CIRCULATION AND ITS CONTROL

By BAILEY WILLIS, M.C.E., United States Geological Survey

(*Continued*)

Outline of Methods of Control

ENGINEERING CONTROL OF SURFACE FLOW

THE engineer aims to regulate surface flow through methods of storage, diversion, or confinement in an established channel. His selection of method is determined by the topographic conditions of the particular locality primarily, and also by the balancing conditions of need and cost. The result is a reservoir, canal, or other structure designed to be permanent, to meet the greatest emergency which may arise, and to supply such water or afford such relief from water as conditions require. When practicable the investment should return to the people at least a fair interest on the cost. These limiting conditions are so well understood and engineering practise is based upon such a thorough knowledge of fundamental mechanical principles that in any given case the engineer's calculation may be implicitly trusted, provided that the factors of run-off, fluctuation and sediment, which are fundamental elements of the problem, do not at any future time exceed the maximum limits which past experience leads him to assume. This provision implies that the progress of settlement and the exploitation of our natural resources should not unfavorably modify the relation of run-off to ground storage and evaporation. Through ignorance, carelessness, and greed, the farmer, herdsman and lumberman are constantly violating this provision, as we shall see when we come to the consideration of the specific relation of their activities to the partition and distribution of precipitation. The engineer is now called upon to regulate run-off, the irregularity of which is persistently aggravated by these widespread activities; he is required to take care of sediment whose volume is constantly increased by vicious methods of agriculture, grazing, and deforestation, and the Nation collectively spends millions on engineering while the people individually render the expenditure useless.

The engineer urgently needs the support of an educated, enlightened public opinion which will control individuals. In proportion as every landowner manages his property intelligently with regard to its perpetual value and the welfare of the commonwealth, the engineer's problem will shrink within those limits of reasonable magnitude and cost which it now threatens to exceed.

Let us consider some of the examples of the engineer's methods of regulating surface flow by storage, drainage, diversion, and canalization.

The construction of reservoirs for the storage of waters is, in comparison with its possibilities, very slightly developed in the United States. A few examples will illustrate the magnitude and purposes of existing works.

The Croton reservoir system cost Greater New York $86,359,562 up to 1898; and estimates on extensions and improvements are $161,000,000. The city can afford it, for the system supplies pure water to 4,000,000 persons, among whom, considering one benefit only, the death rate from typhoid fever was, in 1905, sixteen per 100,000, as against more than 100 per 100,000 in certain cities supplied with polluted river water.

On the upper Mississippi a reservoir system has been gradually installed

Irrigation in Eastern Washington, Showing What Can Be Raised between Trees

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Outline of Methods of Control

ENGINEERING CONTROL OF SURFACE FLOW

THE engineer aims to regulate surface flow through methods of storage, diversion, or confinement in an established channel. His selection of method is determined by the topographic conditions of the particular locality primarily, and also by the balancing conditions of need and cost. The result is a reservoir, canal, or other structure designed to be permanent, to meet the greatest emergency which may arise, and to supply such water or afford such relief from water as conditions require. When practicable the investment should return to the people at least a fair interest on the cost. These limiting conditions are so well understood and engineering practise is based upon such a thorough knowledge of fundamental mechanical principles that in any given case the engineer's calculation may be implicitly trusted, provided that the factors of run-off, fluctuation, and sediment, which are fundamental elements of the problem, do not at any future time exceed the maximum limits which past experience leads him to assume. This provision implies that the progress of settlement and the exploitation of our natural resources should not unfavorably modify the relation of run-off to ground storage and evaporation. Through ignorance, carelessness, and greed, the farmer, herdsman, and lumberman are constantly violating this provision, as we shall see when we come to the consideration of the specific relation of their activities to the partition and distribution of precipitation. The engineer is now called upon to regulate run-off, the irregularity of which is persistently aggravated by these widespread activities; he is required to take care of sediment whose volume is constantly increased by vicious methods of agriculture, grazing, and deforestation, and the Nation collectively spends millions on engineering while the people individually render the expenditure useless.

The engineer urgently needs the support of an educated, enlightened public opinion which will control individuals. In proportion as every landowner manages his property intelligently with regard to its perpetual value and the welfare of the commonwealth, the engineer's problem will shrink within those limits of reasonable magnitude and cost which it now threatens to exceed.

Let us consider some of the examples of the engineer's methods of regulating surface flow by storage, drainage, diversion, and canalization.

The construction of reservoirs for the storage of waters is, in comparison with its possibilities, very slightly developed in the United States. A few examples will illustrate the magnitude and purposes of existing works.

The Croton reservoir system cost Greater New York $86,359,562 up to 1898; and estimates on extensions and improvements are $161,000,000. The city can afford it, for the system supplies pure water to 4,000,000 persons, among whom, considering one benefit only, the death rate from typhoid fever was, in 1905, sixteen per 100,000, as against more than 100 per 100,000 in certain cities supplied with polluted river water.

On the upper Mississippi a reservoir system has been gradually installed

Upper Dam on Otay Creek, near San Diego, Cal., Looking across the Canyon. This and the Sweetwater and Bear Valley Dams, All in Southern California, Are Curved with Arch Upstream

Minidoka Reservoir Site, Idaho

since 1880 to control high and low stages of the river for navigation. Lake levels were raised and low, flat lands were flooded. The topographic conditions were favorable and the cost for lands and improvements submerged was low. In sixteen years the Federal Government expended $1,525,000.[1]

Storage reservoirs for irrigation waters were established in the arid West by private enterprise in the early settlement of the regions, but work on a large scale began after the passage of the reclamation act, in 1902. The Reclamation Service has twenty-eight projects in various stages of progress. They will make available for homes 1,910,000 acres, at a cost of $70,000,000, or $36.65 per acre.[2]

In any particular case the cost per acre-foot of storage capacity depends chiefly on the topographic situation, which determines the magnitude and character of the structures, and on the value of property to be displaced or submerged. In general, it costs less per acre-foot to store a large body of water than a smaller one.

The efficiency of a reservoir may be said to be its capacity to retain the water which ought to be stored. If it will hold all the surface flow of its drainage basin, less the amount used and evaporated during any time, its efficiency is 100 per cent. In proportion as it fails to do this during floods its efficiency falls below the maximum. A reservoir which will have an efficiency of 100 per cent is being built by the Reclamation Service on the Rio Grande above El Paso. It will retain more than the entire annual precipitation, approximately three times the surface flow of the drainage basin, and when it is completed floods which have been disastrous will be absolutely abolished.

If other conditions are alike, the efficiency depends on the amount and distribution of the waters from rain and snow melting. These vary according to broad districts. The factor which primarily determines cost, namely, the character of topographic basins which may be dammed, also varies broadly, and according to the distribution of these two factors we may distinguish at least four regions which are unlike in regard to storage possibilities.

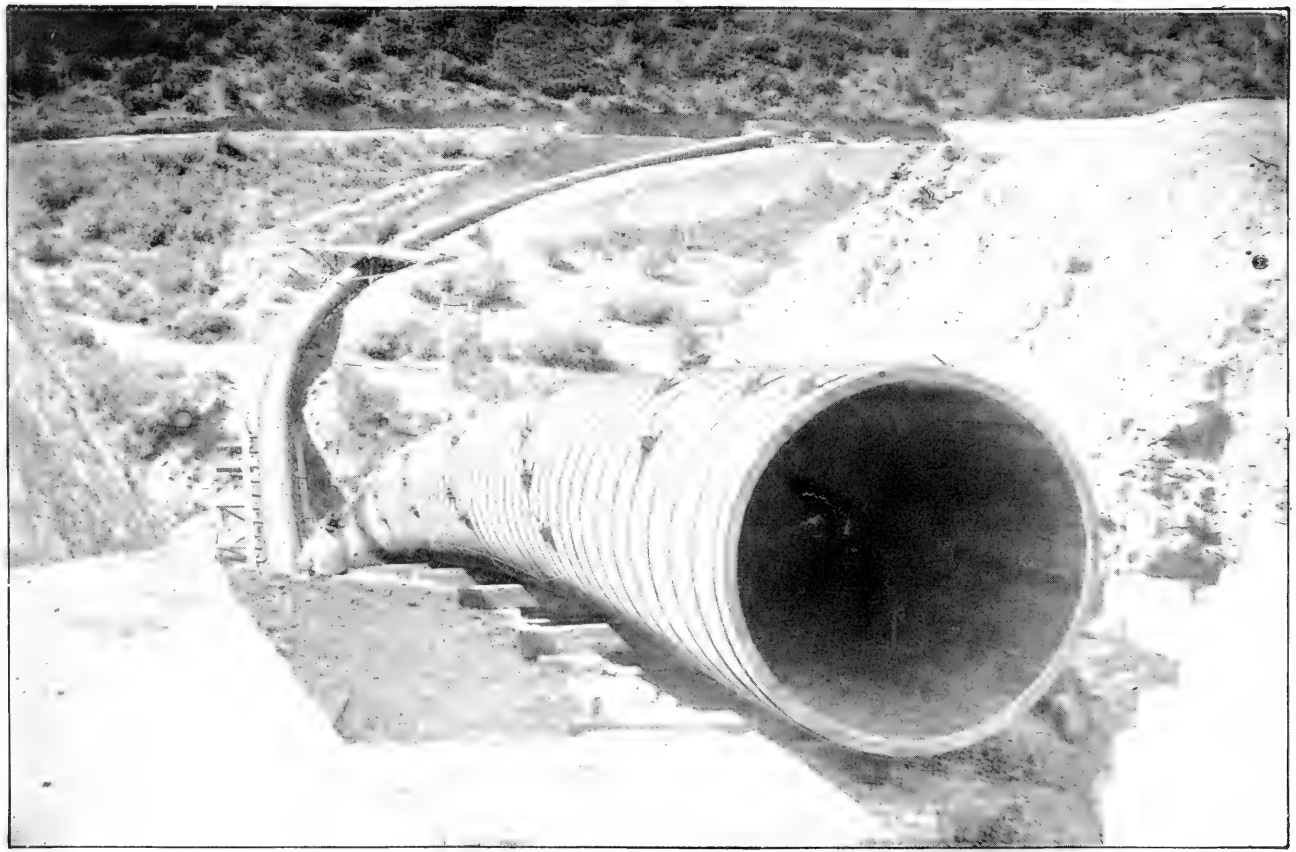
The arid plains and basins of the West afford conditions of minimum or moderate cost and maximum efficiency for reservoir storage. The experience of the Reclamation Service has been cited.

Another region where reservoirs of moderate cost and adequate efficiency are possible is that of lakes and swamps which lie within the area covered in a recent geologic epoch by the great ice sheet. It includes parts of the Dakotas, Minnesota, Wisconsin, Illinois, Indiana, Michigan, and, in a less degree, New York and New England. In this region there are thousands of lakes, each one of which is a natural reservoir, and many more swamps, each one of which is a shallow but practicable reservoir site. The experience with the Government dams on the upper Mississippi gives the best insight into the value of these reservoir conditions.

A third district which may be distinguished with reference to the possibilities of reservoir storage is found in the prairie states—Iowa, Illinois, and Ohio—and in areas of similar topography, population, and precipitation. In that part of those states which lies outside of the old ice limit, streams as a rule run in ravines or narrow valleys, which, however, have moderate fall and would, in many localities, afford practicable conditions for reservoir storage. The cost of farm lands and town sites which must be submerged is such, however, as to render capacious reservoirs too costly, provided any other means of control be practicable. Here the question of cost will limit the construction of large reservoirs. The lands are farmed and upon the farmer must rest the responsibility to the Nation for a proper regulation of the water flow.

[1] Annual Report, Chief of Engineers, U. S. Army, part 2, p. 1439, 1906.
[2] Blanchard, C. J.: Home-making by the Government. Nat. Geogr. Mag., April, 1908.

The Flood in Salt River Valley, Ariz. View Looking Toward Tempe Butte from the North End of the Southern Pacific Railroad Bridge, Showing Flooded Farms on the North Side of Salt River; also Santa Fe's Wrecked Bridge, Caused by Flood on the Night of April 12, 1905



Redwood Stave Pipe (52 Inches in Diameter) Crossing Warmsprings Canyon near Redlands, Cal.

The topographic character of the region is favorable to the construction of large numbers of small reservoirs to catch the flood run-off from near-by fields, and this item in farm equipment should become as much a matter of public interest and control as the maintenance of public roads. But the silt from badly tilled fields will render reservoirs useless unless the farmer prevents erosion. The larger factor in control must be found in improved methods of tillage and crop rotation.

A fourth district which presents special conditions in regard to storage is that of the Appalachian Mountain region. Here topographic forms are such as to render reservoir construction both difficult and expensive. The narrow valleys alone offer possible sites. Their steep gradients necessitate high dams for reservoirs of moderate capacity. Where wide bottom lands afford better opportunities important towns are commonly located. Moreover the efficiency of such reservoirs must be low, because the flood run-off is torrential and some considerable part of it must be permitted to escape. We may not, however, conclude that reservoirs are impracticable.

The Appalachian Mountains have always had and will always have special relations to national development. Their mountain wall guarded the colonies during a century of French and Indian warfare. Eventually occupied by American enterprise, the region became through its resources in minerals, lumber, and water power a dominant source of national strength and wealth. It can never support a large agricultural population, yet the mountain dwellers will cultivate their fields in its upland valleys so long as the soil remains. Its mineral wealth will certainly be exhausted, but its forests and streams, those two intimately related and most valuable factors in the Nation's prosperity, need never be impaired though continually used.

These mountains possess a power to do harm which is not less than their power to confer benefit. The floods that gather from their rills traverse the richest cities, manufacturing districts, and valleys, and exact annually an enormous tribute. The cost in dead loss, in lessened values, and crippled industries will eventually force the Nation to protect itself. There are men—engineers, too—who believe they can fetter the full-grown flood, but the commonwealth which trusts to them alone and neglects the agencies of forestry and agriculture that divert the raindrops will suffer till it has bought wisdom dearly.

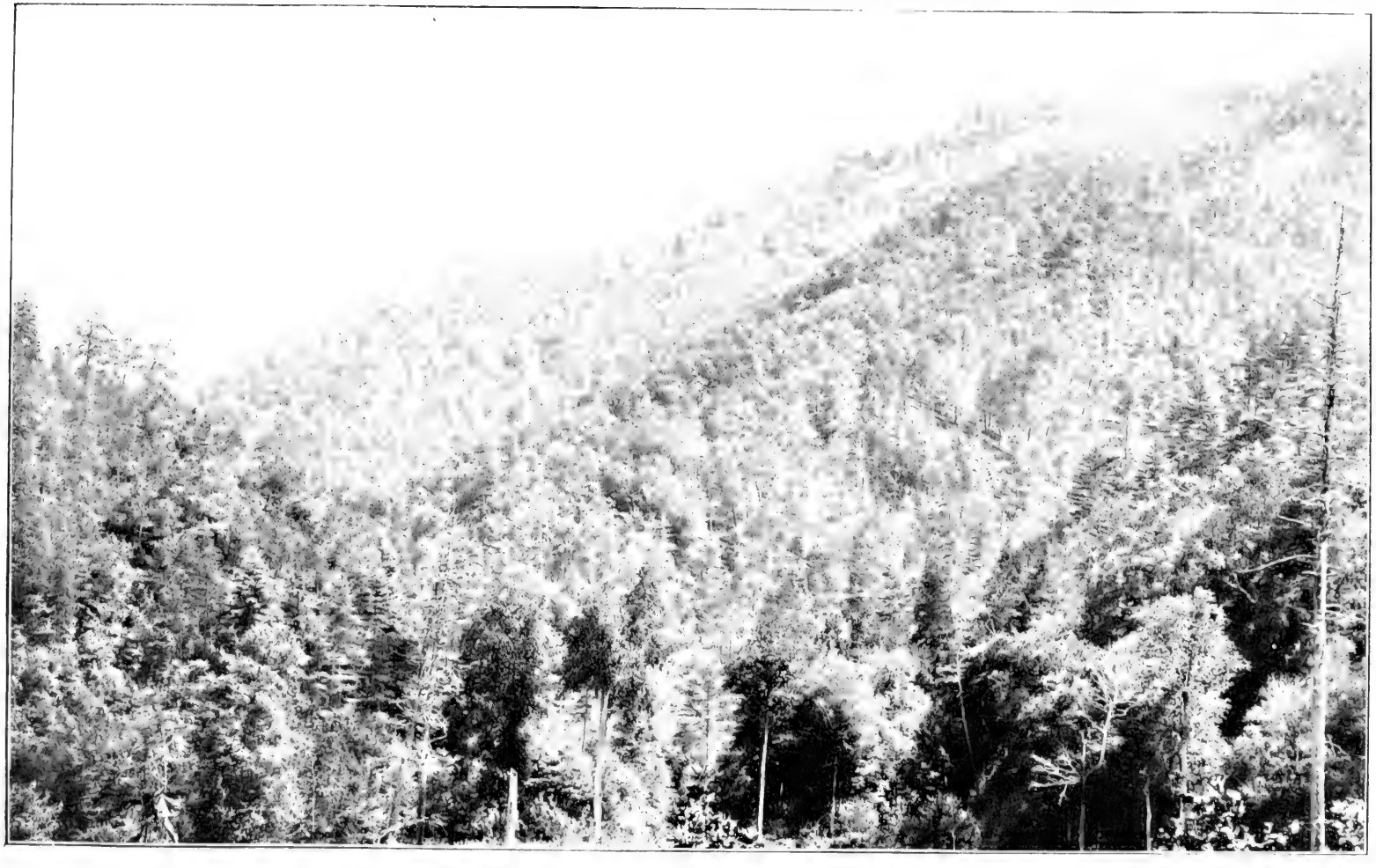
Thus throughout this mountain region the problem of controlling surface waters is not only particularly difficult, but its solution is peculiarly important. The engineer has here a grave and difficult task to perform, and even under the unfavorable local conditions the storage reservoir must take its place as one of the features of the system of regulation.

In our general discussion drainage is next. It stands in direct contrast to storage. It promotes quick discharge, increases flood run-off, and dries up swamps that storage would convert into reservoirs. No region from which injurious floods gather should be drained, for the drainage system will increase the floods. On the upper Mississippi, for instance, we would not drain the reservoirs produced by artificial dams, nor should we drain swamps that empty into them or into the river below them without duly considering to what extent our left hand is undoing the work that our right hand has done.

Yet drainage has its place in the national management of surface waters. It is appropriate in lands liable to overflow and which may safely be permitted to return the waters promptly to the stream as the river falls. It is permissible in lands whose value when drained exceeds the value of lands that the drainage waters may submerge. Here, as indeed generally, throughout this whole question of conservation the resulting value determines whether or no the thing should be done.

Diversion canals are designed to take a part or all the water of any system and conduct it from the channel in

The Gorge of the Linville River across the Blue Ridge. On These Steep, Rocky Walls Are Forests Which Should Be Preserved Forever



Mixed Hardwood and Pine Forest on Oconaluftv River, Swain County, North Carolina. On the lower mountain slopes and ridges the pines are often mixed with the hardwoods. But whatever the nature of the trees, the frequent fires are destroying the undergrowth and humus and thinning out the trees, thus diminishing the commercial value of the forest, facilitating the erosion of the soil and lessening its capacity for storing water

which it may be wasted or become harmful to the point where it shall be applied to some useful purpose. A mill race is a diversion canal on a small scale, and the Chesapeake and Ohio Canal, which diverts a part of the waters of the Potomac to a channel where they may be useful to navigation, falls in a similar class. In connection with the irrigation projects of the Reclamation Service, diversion canals constitute an important feature. In some instances they lead directly from rivers which are capable of furnishing sufficient water at all stages; in other instances they lead from reservoirs where water is stored to maintain the desired flow when the tributary streams would be inadequate to the purpose. In none of these cases has the diversion canal any special relation to the conservation of water. It introduces a siding in the general through route of circulation and discharges its water freight at the point where it is wanted. It serves in some measure to regulate surface flow, but that object is subsidiary to a major purpose, which may be power or irrigation or navigation.

Canalization is a method of river control which consists in reducing the river to the condition of a canal by the introduction of dams, locks, and sluice gates. The current of the open river is then replaced by slack water. The discharge is permitted through locks as required by passing boats, or over sluiceways when the volume of flood run-off becomes greater than the amount which can be safely stored in any reach of the river between dams. The most important project for canalization is that of the Ohio River, concerning which we may quote from the report of a board of army engineers, dated December 15, 1906.[3]

The board finds—

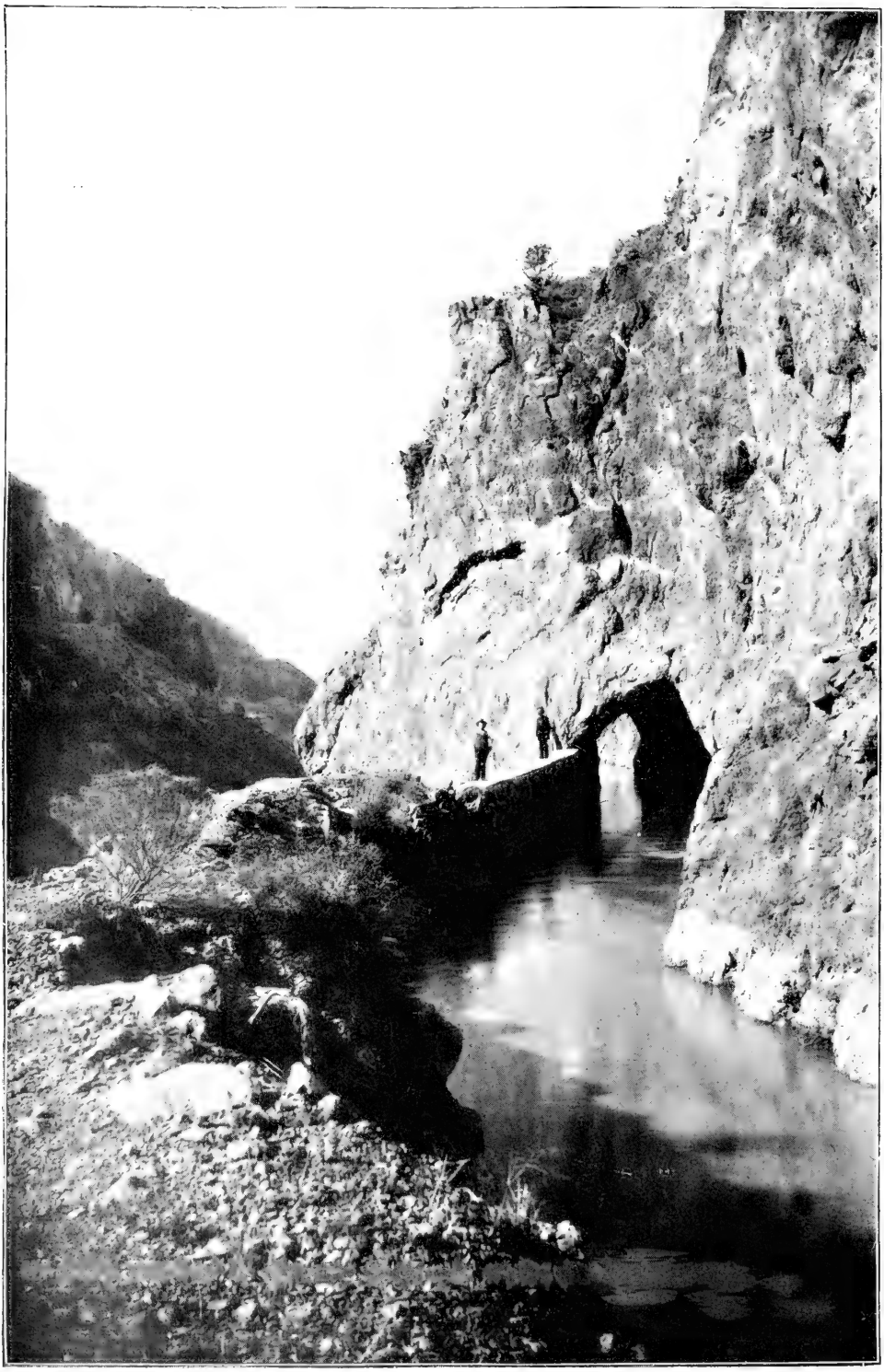
> that a six-foot navigation at low water can be established in the Ohio River from Pittsburg to Cairo by the construction of forty-five locks with movable dams, at an estimated cost of $50,962,266, in addition to funds heretofore appropriated and authorized; that a nine-foot navigation over the same length of river can be established by the construction of fifty-four locks and dams, at an estimated cost of $63,731,488. * * *
>
> The board gives exhaustive consideration to the question of present and probable commerce, both down stream and up, and it appears that the present commerce of the river is approximately 9,000,000 tons per annum, of which a large proportion is downstream. Having in view the fact that a canalized river offers an upstream navigation lower in cost and quicker in transit than an open-river project, the board, arguing from the known natural resources of the section and its population, concludes that a river improved by this method will afford facilities for the cheap exchange of mineral, agricultural, and manufactured commodities, which from their low value and bulk cannot be exchanged unless such cheap facilities are offered, and that there is every probability that the improvement of the Ohio River by canalization, as proposed, would induce a very large future commerce, which does not now exist, in addition to retaining and greatly facilitating and cheapening the commerce which the river now bears.

In discussing the maintenance of the nine-foot project, the board estimates it at $800,000 per annum, not including the dredging of silt, which would accumulate in slack water, or at $1,000,000 per annum if this item be included.

This project, which was reviewed and recommended without qualification by the Board of Engineers for Rivers and Harbors, in a report dated October 18, 1907, has for its object the single purpose of promoting inland navigation, and it illustrates clearly the relation which any plan for canalization of a stream bears to the general problem of water circulation. The plan deals with the water after it has reached a navigable river, when it is no longer a question of control of surface waters, but merely one of more or less effectively regulating their distribution and flow. The delay which may be imposed by storage in slack-water basins is not an appreciable factor in reducing the damage due to floods such as those which now annually work havoc in the Ohio Valley. Moreover, the project itself establishes interests which lie within the zone liable to flood, and in proportion as it is successful and such in-

[3] 60th Cong., 1st sess., H. R. Doc. 492.

Original Southern Appalachian Mountain Forest, Transylvania County, North Carolina



Conveyance of Water for Irrigation. Tunnel of Bear River Canal, Utah

Link River and Gravity Irrigation Ditch, Klamath County, Oregon. In the Same Section of Country as the Government's Klamath Project

terests grow in value, so grows the necessity for diminishing and preventing floods. Thus canalization bears the same relation to plans for conserving and controlling water circulation that any concentration of civilization bears to it. It increases the burden of responsibility for proper measures of control, whether in detail as applied to raindrops or in gross as applied to flood run-off, and the larger the wealth to be protected the greater the justification for large expenditures on account of protection; but more than this, for it is not a question of engineering and financial expense alone; the larger the national interests involved the greater the individual responsibility of every patriotic citizen to his local community and to the commonwealth in general for a proper discharge of his obligation to take care of his share of the Nation's assets.

CONTROL OF GROUND STORAGE AND RUN-OFF THROUGH AGRICULTURE

On a reasonable estimate one-half of the domain of the United States must eventually be farmed to maintain the population and prosperity of the country. The essential characteristics of the great farming area, exclusive of irrigation districts, is that it shall have soil and sufficient rainfall. Rain falling on soil is partly stored as ground water, but also partly runs off. The stored water is absolutely necessary to the farmer's prosperity, which will increase as he increases ground storage; the other is wasted, and if it causes erosion is destructive.

In considering the relation of the farmer's activities and the methods which he can employ to increase ground storage and decrease erosion we must distinguish between lands that are level or nearly so and lands that have a more or less pronounced slope.

Water control on plains.—In regions of great plains or plateaus, where lands are level or nearly so, the methods which may be used by the farmer to increase ground-water storage are the methods of good tillage which at the same time yield the largest crops. They consist in deep plowing, proper cultivation during the growing season, crop rotation, and the maintenance of an open condition of the soil during the periods of fallow. The object of these methods is to increase the capacity of the soil reservoirs and to open and keep open the channels through which the rain or melting snow has access to them. Run-off and erosion are restricted in proportion as this aim is secured.

To grow large crops takes a large amount of soil moisture. The soil gets it directly from rains or in seasons of drought from the ground water which is supplied by rains that pass down through the soil to the water table. The rain that soaks in is stored for the crop. The rain that runs off is taken from what might be stored, and is not only lost water but, being muddy, is also lost soil. Good tillage reduces these losses by maintaining those conditions of soil and subsoil under which a large proportion of a given rainfall will be absorbed.

In general, we say that an open soil will absorb most water. The openness of texture of a soil depends upon the sizes of the particles of which it is composed and the relative numbers of particles of these several sizes—that is, its mechanical composition. There is for any kind of soil a state at which it is in the loosest and best physical condition—that is to say, a state of arrangement of soil particles according to size and spacing in which there may be the largest amount of water gathered about the particles as capillary films and between them in delicate columns. The condition is one which is well known to farmers as that which will yield the best crops. This mechanical condition of the soil is reached by plowing, harrowing, and cultivating when the soil is neither too moist nor too dry.

The facility with which rain enters a soil depends upon its being in the above-described condition—open, yet

View of a Great National Irrigation Project. Congressional Party Gathered in Circle During Speaking at the Opening of the Newly Completed Headworks of the Main Truckee Canal, Nevada

Irrigated Strawberries Pipe for Carrying Water Shown in Front of Picture

not too open. The films of water within it are then of such size and are so distributed that they support the open texture. When rain falls it enters each little capillary tube between the grains and penetrates rapidly in the many minute channels. Thus the soil, though moist, absorbs more water than if it had been drier to begin with.

When soil is very dry and powdery rain does not penetrate far into it. There are several conditions that produce this well-known result. Much water is used in filling the large volume of the small spaces between the soil grains; the capillary films are still separate at the bottom of the sinking moisture and they sink deeper only as they join, and the air in the soil, being imprisoned by the water that fills the upper layer, offers effective resistance to percolation.

The absorbent character of a soil determines the amount which the immediate surface will take in, but it does not determine the rate at which water will soak into the lower layers of the soil and subsoil; if the latter is impermeable, the pores of the surface soil may become so filled that no more water can enter, and the rest of the rain runs off. This happens when a heavy rain falls on a field that has been plowed only three or four inches deep, leaving an unbroken, clayey subsoil. If the field is level, pools of water will stand over it till they dry up. If the field be on a slope, the gathering water runs off along and across the shallow furrows and takes more or less soil with it. Where the subsoil is broken to twelve or fourteen inches by deep disk plowing the same heavy rain sinks in completely and is stored for the crops when needed. The soil also stays.

Thus on plains the conditions which affect percolation of rain into the soil and subsoil and which are consequently to the advantage of ground-water storage are—

(*a*) That the cultivated surface shall be level or but gently sloping;

(*b*) That the surface soil shall be in that condition which is best described by the gardener's term of "live soil;"

(*c*) That the lower soil and subsoil should afford the largest possible amount of space into which the water from the surface may run.

Another means which is at the farmer's disposal is that of crop rotation. Clean cropping year after year exhausts the plant food and humus of the soil, affects unfavorably the mechanical condition of the soil, and brings it into a state in which its fertility is greatly reduced and it is most easily eroded. In order that these effects should be prevented it is important to introduce a rotation of crops, including grass or clover, whose deep and thickly matted roots help to open up the texture of the soil and to restore that essential constituent, humus.

We have thus far considered only how the farmer can produce a condition of the soil and subsoil which will reduce run-off and increase ground storage. It is also important when the water is in the ground to keep it there, except as crops need it. It should not be wasted by useless plants nor by evaporation.

The waste by weeds is obvious. A growing weed takes water which the useful crop might have. The remedy—keeping out weeds—is equally obvious and is limited simply by cost.

Evaporation exhausts ground water most effectively when there is free circulation from the ground water to the surface. This happens when the films of water about the soil grains are in contact and there is ready movement in them. As the water immediately at the surface is vaporized an additional supply is drawn to the surface through the capillary films from below. This is evaporated in turn and more is drawn up, and so through evaporation and capillary attraction the soil moisture is gradually dissipated into the air.

That condition of dryness which stops the upward movement of ground water by breaking the continuous water films is not readily established in humid regions, where the ground water lies not far below the surface and rains are not infrequent. Thus it appears that since in humid regions the farmer can-

Orange Grove, Showing Method of Basin Irrigation

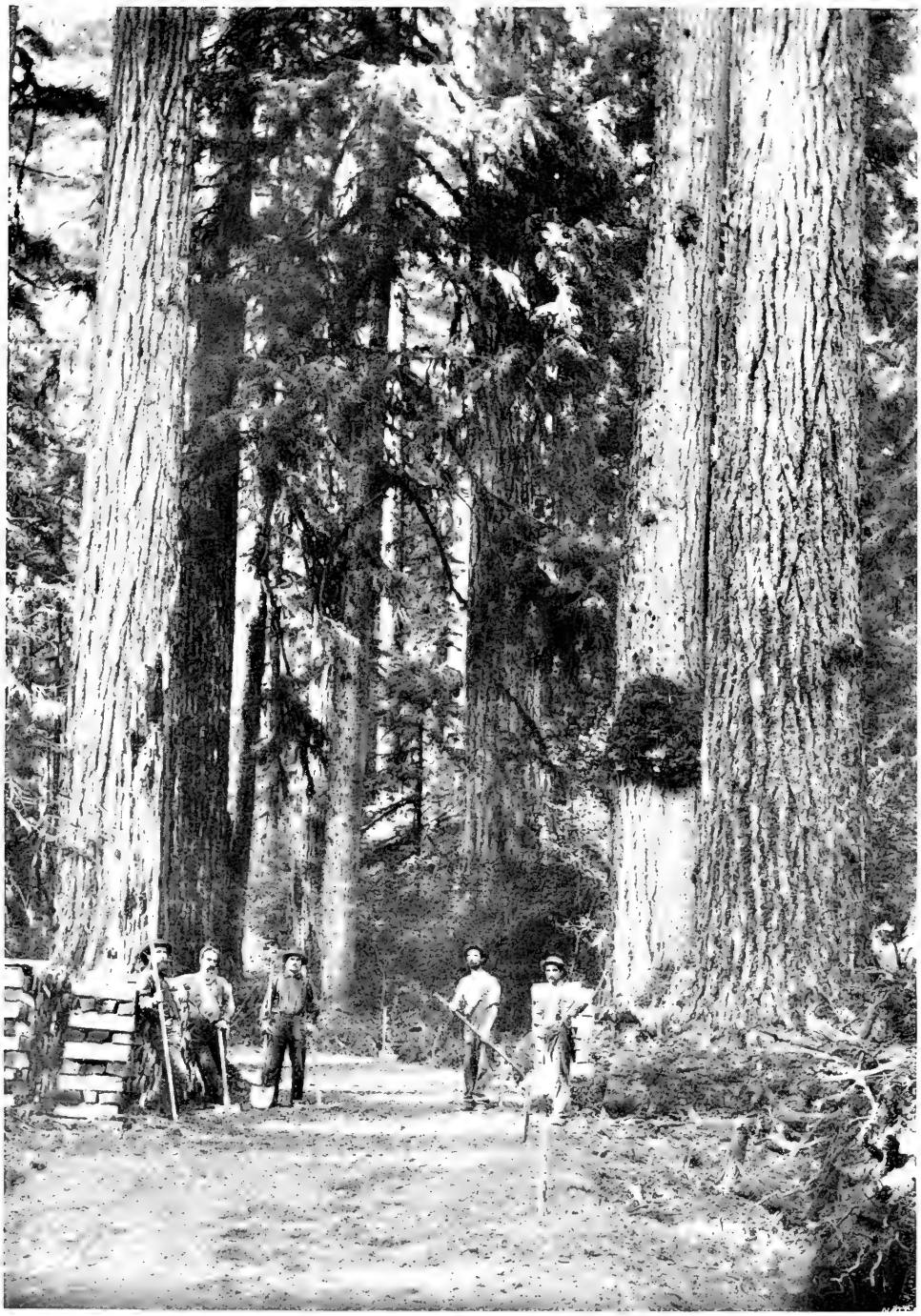
not effectively restrict evaporation, he must resort throughout the entire year to every method of cultivation, and from year to year to the method of crop rotation, to keep his ground in the best possible condition for the largest storage of ground water, from which will follow also the largest return of any one crop. In the arid region nature comes to the aid of the farmer and gives him a means of stopping the loss of the precious moisture of which under the best conditions he can scarcely conserve enough.

When the farmers of America understand how to store and keep water in the ground they will have learned how to grow larger crops. Our average yield of wheat instead of being as it now is fourteen bushels to the acre, will then be nearer the average yield of Great Britain, thirty-two bushels.

Water control on slopes.—In regions where steep slopes are cultivated the methods appropriate to level fields find their application also, but they are insufficient, for the tendency of the water to run off lessens the time of its contact with the surface, and thus increases the proportion which escapes at the expense of the proportion that is stored. In a like degree erosion begins and is maintained on slopes, the soil is undercut and removed, and the subsoil or rock exposed. Forests would prevent this, but if the steep slope is cleared for cultivation it is necessary to substitute a series of steps for the smoothly inclined surface, in order to reduce these effects to a minimum.

This introduces a condition which is not yet necessary in America to any great extent, but which is general throughout Europe and Asia, namely, terracing. The object is to catch rain and snow on a level. The level may be the furrows of a plow or of a harrow, provided the slope be so gentle that these suffice to hold back the water and prevent it from running and gullying the fields. On steeper slopes the harrow and the plow are inadequate, and the farmer is obliged to introduce low steps or terraces which vary in character from a little bank of sward to walls of stone. The fields above the

Reclaimed Desert Lands, Southern California: Formerly Covered with Cactus. In the Foreground a Young Orchard, behind This an Older Orchard, and in the Distance the Arid Hills



A Typical Forest Scene in Western Washington

banks of sward or above the stone wall are carefully leveled and the water which falls upon them is retained. Agriculture is thus extended not only over far-spreading plains and lowlands, but up the steep banks of river gorges and ravines. The famous vineyards of the Rhine are planted on rock wall terraces, on steep slopes such as we abandon to erosion. As our population increases and the demand for agricultural land becomes more urgent we, too, will build terraces, and high river banks throughout the humid regions will grow special products. Land hunger will eventually force us to it—not soon, however—and in the meantime our steep, cleared lands cannot be left a prey to erosion. They must be recovered where gullied and must be protected from gullying by watchful care, such as that which guards Holland from the sea. Our enemy is no less dangerous, not a whit less insidious and persistent. Since terracing is a possibility of the future only, we must restore the forest trees. They have held the soil during ages and on them we can confidently rely.

We are wont to think that reforestation is a need of high mountains only, but the need is not thus limited. It extends to all steep cleared slopes. Thousands of miles of these stretch along our rivers, from Georgia to Maine, from Mississippi to Minnesota. Throughout the humid region they border every river. Along all their length, in all their ramifications that penetrate the richest agricultural districts, they must necessarily be covered by trees.

From the plains and gentle slopes appropriate to farming there rise in all hill and mountain districts steeper slopes that are not appropriate to farming. When farmed they are quickly eroded and destroyed. It may be set down as an obvious economic principle that no land is appropriate to a use which destroys its usefulness. This principle is not affected by the fact that ignorant persons clear and cultivate such land extensively. In the southern Appalachian Mountains it is commonly but five years from virgin forest to abandoned fields. The mountain slopes are not agricultural lands. Themselves destroyed by erosion, they damage other lands and the water courses below them. When that damage is assessable by law upon the ignorance that causes it, agriculture will be restricted to appropriate fields.

(To be concluded)

Salt River Dam Site, Arizona

A MILLION WOMEN FOR CONSERVATION

IN HER report as chairman of the waterways committee of the District of Columbia Federation of Women's Clubs, at the annual meeting held in Washington, D. C., May 5, 1909, Mrs. Lydia Adams-Williams, the writer and lecturer on conservation, and the first woman to take up the work, said in part:

"The subject of the conservation of the natural resources of the Nation is the uppermost one before the people of the United States to-day.

"The District of Columbia Federation of Women's Clubs has the honor of being the first woman's organization to adopt resolutions in favor of the conservation of natural resources; these resolutions were adopted in November, 1907, following an address by your chairman on 'waste of natural resources and need for conservation.' In this great movement, it is a high honor and one for congratulation that the D. C. Federation of Women's Clubs led all the other women's clubs of the country in the national movement for conservation. The resolutions were published in full in CONSERVATION, the official magazine of the American Forestry Association, in the issue of May, 1908.

"The second woman's organization to adopt conservation and to take active interest in the work is the National Society of the Daughters of the American Revolution. Your chairman submitted the resolution on conservation which the D. A. R. adopted, and she especially urged them to take up the work. The resolution was adopted in April, 1908, at the time of the annual convention, by the National Executive Board. The resolution was published in CONSERVATION, in the issue of May, 1908, and it also received wide publicity throughout the United States.

"The third woman's organization to adopt conservation is the General Federation of Women's Clubs. In June, 1908, your chairman attended the biennial meeting of the General Federation of Women's Clubs, in Boston, as a representative of the D. C. Federation of Women's Clubs, and as one of the speakers on forestry; also as the representative of the magazine CONSERVATION.

"In May, 1908, before the biennial convention, your chairman wrote Mrs. Decker about forming a conservation committee in the General Federation; and, while at the convention in Boston, she urged upon Mrs. Decker, the outgoing president, and upon Mrs. Moore, the incoming president, and upon many of the officers and directors of the General Federation the necessity of appointing a conservation committee. Later, after the adjournment of the biennial, she wrote Mrs. Philip N. Moore, the new president, and again urged the formation of a conservation committee; Mrs. Moore replied, in September, 1908, as follows: 'At our recent board meeting in Colorado Springs we made a subcommittee on waterways, which, with our present committee on forestry, will form our conservation committee.' Later the subcommittee on waterways was changed to a regular committee.

"Your chairman also attended the Woman's National Rivers and Harbors Congress, and spoke on conservation, and made a motion, which, after debate, was carried, changing the constitution to include conservation as one of the objects of the organization.

"To summarize briefly, the four leading women's organizations of the United

States, comprising nearly a million members, and embracing practically all the women's clubs in the country, have taken up conservation in the following order, and that your chairman is the one who urged them to take up the work, who wrote the resolutions, and who addressed them on the subject of conservation:

"1. The District of Columbia Federation of Women's Clubs, with seventeen affiliated clubs and 5,000 members, adopted conservation November, 1907.

"2. The National Society of the Daughters of the American Revolution, with 956 chapters and over 58,000 active members, represented in every state in the Union and in Mexico, Havana, and Hawaii, adopted conservation in April, 1908.

"3. The General Federation of Women's Clubs, with over 5,000 affiliated clubs and a membership of 800,000, with clubs in every state and in China, England, India, Mexico, South America, and West Australia, added a waterways committee to the forestry committee, 'to form a conservation committee,' in September, 1908.

"4. The Woman's National Rivers and Harbors Congress, organized in June, 1908, with seven members, which has now grown to a strength of 12,000, adopted conservation of the natural resources as a part of the constitution at the biennial meeting at Washington, D. C., in December, 1908."

THE GREAT TREES OF CALIFORNIA

By ARCHIBALD HOPKINS

Deep rooted in the bosom of the earth,
Thirsting for light, they thrust their tops on high,
To hold communion with the bending sky,
Whispering their ancient lineage and birth,
And far-off memories of a slender girth.
They listen to the swooping eagle's cry;
They murmur gently to the zephyr's sigh
Mingling soft breathings with the songster's mirth.
Unmoved, they see the centuries come and go;
Thousands of years their towering, titan forms
Have stood defiant to the fiercest storms.
Like sculptured pillars toward the blue they soar;
The dim, majestic forest aisles below—
Nature's vast temple, mystical and hoar.

HOW THE HOUSE VOTED

An Analysis of the Vote of March 1, 1909, in the House of Representatives on the Weeks Bill

By EDWIN A. START, Boston, Mass.

ON THE 1st of March, 1909, the Weeks bill, so-called, reported by a majority of the Committee on Agriculture, was debated for two hours in the House of Representatives and passed by a vote of 157 to 147. While no mention was made in the bill of the Southern Appalachian or White Mountain forests, the measure being general in its form, it was understood to be framed primarily in the interest of these great national projects, they being conceded to be the most urgently needed enterprises in the way of water protection. Votes for or against this bill were therefore votes for or against the Appalachian forests. As this was the only time in which the question had come to an issue on the floor of the House a careful study of the vote is worth while and we ask the attention of the press and friends of the measure throughout the country to the data given below.

How did your representative vote?

THE ROLL CALL

The Vote in the House of Representatives on the So-called "Weeks Bill," S. 4825, on March 1, 1909, Was as Follows:

YEAS, 157

Acheson
Allen
Ashbrook
Bartholdt
Bates
Bede
Bell, Ga.
Bennet, N. Y.
Bennett, Ky.
Brodhead
Brownlow
Brundidge
Burleigh
Burnett
Burton, Del.
Calder
Candler
Capron
Cassel
Caulfield
Cockran
Cocks, N. Y.
Cole
Cook, Pa.
Cooper, Pa.
Cooper, Tex.
Cooper, Wis.
Coudrey
Craig
Crawford
Currier
Darragh
Davidson
Davis
Dawes
Danby
Denver
Diekema
Douglas
Draper
Edwards, Ky.
Ellerbe
Esch
Estopinal
Favrot
Finley
Flood
Foelker
Fornes
Foster, Ind.
Foster, Vt.
Foulkrod
Fuller
Gaines, Tenn.
Gardner, Mass.
Gardner, N. J.
Gilhams
Gill
Gillespie
Gillett
Glass
Godwin
Goldfogle
Greene
Guernsey
Hale
Hall
Hamilton, Mich.
Harding
Harrison
Haskins
Heflin
Henry, Conn.
Hepburn
Higgins
Hill, Conn.
Hinshaw
Hitchcock
Hobson
Hubbard, W. Va.
Hughes, N. J.
Hull, Iowa
Hull, Tenn.
Humphreys, Miss.
Johnson, S. C.
Jones, Va.
Keliher
Kennedy, Ohio
Kimball
Kinkaid
Lamb
Landis
Langley
Law
Lawrence
Lee
Lenahan
Lever
Longworth
Loud
Lovering
McCall
McKinney
McLachlan, Cal.
McLaughlin, Mich.
McMorran
Madison
Mann
Martin
Maynard
Moon, Tenn.
Morse
Mudd
Nelson
Nicholls
O'Connell
Padgett
Page
Parsons
Perkins
Peters
Pollard
Porter
Pou

Prince
Rainey
Ransdell, La.
Reeder
Reynolds
Richardson
Roberts
Robinson
Ryan
Saunders
Slemp
Small
Sperry
Stanley
Stephens, Tex.
Sturgiss
Sulloway
Sulzer
Swasey
Talbot
Taylor, Ohio
Thomas, N. C.
Thomas, Ohio
Tirrell
Townsend
Waldo
Washburn
Watkins
Webb
Weeks
Wiley
Willett
Wood

NAYS, 147

Adair
Aiken
Alexander, Mo.
Andrus
Barchfeld
Barclay
Barnhart
Bartlett, Ga.
Beale, Pa.
Beall, Tex.
Bingham
Bonynge
Bowers
Boyd
Brantley
Burgess
Butler
Campbell
Carter
Chaney
Chapman
Clark, Mo.
Conner
Cook, Colo.
Cousins
Cox, Ind.
Crumpacker
Cushman
Dalzell
Davenport
Dawson
De Armond
Dixon
Driscoll
Durey
Dwight
Edwards, Ga.
Ellis, Oreg.
Englebright
Fairchild
Fassett
Ferris
Fitzgerald
Fordney
Foss
Foster, Ill.
Fowler
French
Gardner, Mich.
Garner
Garrett
Goebel
Gordon
Graff
Gregg
Gronna
Hackett
Hackney
Haggott
Hamilton, Iowa
Hamlin
Hammond
Hardwick
Hardy
Haugen
Hawley
Hay
Hayes
Helm
Henry, Tex.
Hill, Miss.
Holliday
Houston
Howard
Howell, N. J.
Howell, Utah
Howland
Hubbard, Iowa
Huff
Humphrey, Wash.
Jenkins
Johnson, Ky.
Jones, Wash.
Keifer
Kennedy, Iowa
Kitchin
Knopf
Knowland
Küstermann
Lindberg
Livingston
Lloyd
Lorimer
Loudenslager
Lowden
McCreary
McGavin
McGuire
McHenry
McKinlay, Cal.
Macon
Madden
Malby
Miller
Mondell
Moore, Pa.
Moore, Tex.
Murdock
Murphy
Needham
Nye
Overstreet
Parker
Payne
Pujo
Rauch
Rucker
Russell, Mo.
Russell, Tex.
Sabath
Scott
Shackleford
Sheppard
Sherley
Sherwood
Sims
Slayden
Smith, Cal.
Smith, Tex.
Snapp
Southwick
Spight
Stafford
Steenerson
Stevens, Minn.
Tawney
Thistlewood
Tou Velle
Underwood
Volstead
Vreeland
Wallace
Wheeler
Wilson, Ill.
Wilson, Pa.
Young
The Speaker

ANSWERED "PRESENT," 10

Booher
Cary
Cravens
Ellis, Mo.
Goulden
Griggs
McDermott
Olmstead
Riordan
Wanger

NOT VOTING, 72

Adamson
Alexander, N. Y.
Ames
Ansberry
Anthony
Bannon
Bartlett, Nev.
Birdsall
Boutell
Bradley
Broussard
Burke
Burleson
Burton, Ohio
Byrd
Calderhead
Caldwell
Carlin
Clark, Fla.
Clayton
Floyd
Focht
Fulton
Gaines, W. Va.
Graham
Hamill
Hughes, W. Va.
Jackson
James, Addison D.
James, Ollie M.
Kahn
Kipp
Knapp
Lafean
Lamar, Fla.
Lamar, Mo.
Laning
Lassiter
Leake
Legare
Lewis
Lindsay
McKinley, Ill.
McLain
McMillan
Marshall
Moon, Pa.
Mouser
Norris
Olcott
Patterson
Pearre
Pratt
Pray
Randell, Tex.
Reid
Rhinock
Rodenberg
Rothermel
Sherman
Smith, Iowa
Smith, Mich.
Smith, Mo.
Sparkman

Sterling	Weisse
Taylor, Ala.	Williams
Watson	Wolf
Weems	Woodyard

So the rules were suspended and the bill passed.

The Clerk announced the following pairs:

For the session:

Mr. Sherman with Mr. Riordan.
Mr. Boutell with Mr. Griggs.
Mr. Wanger with Mr. Adamson.

Until further notice:

Mr. Addison D. James with Mr. Lamar of Florida.
Mr. Woodyard with Mr. Taylor of Alabama.
Mr. Weems with Mr. Rothermel.
Mr. Watson with Mr. Williams.
Mr. Sterling with Mr. Rhinock.
Mr. Smith of Michigan with Mr. Reid.
Mr. Rodenberg with Mr. Pratt.
Mr. Moon of Pennsylvania with Mr. Lassiter.
Mr. McKinley of Illinois with Mr. Lamar of Missouri.
Mr. Smith of Iowa with Mr. Randell of Texas.
Mr. Pray with Mr. Patterson.
Mr. Pearre with Mr. McDermott.
Mr. Olcott with Mr. McLain.
Mr. Norris with Mr. Leake.
Mr. Lafean with Mr. Kipp.
Mr. Knapp with Mr. Hamill.
Mr. Kahn with Mr. Cravens.
Mr. Hughes of West Virginia with Mr. Floyd.
Mr. Gaines of West Virginia with Mr. Clark of Florida.
Mr. Focht with Mr. Carlin.
Mr. Calderhead with Mr. Caldwell.
Mr. Burke with Mr. Byrd.
Mr. Birdsall with Mr. Broussard.
Mr. Anthony with Mr. Burleson.
Mr. Bannon with Mr. Bartlett of Nevada.
Mr. Olmsted with Mr. Ollie M. James.
Mr. Marshall with Mr. Fulton.
Mr. Burton of Ohio with Mr. Clayton.
Mr. Alexander of New York with Mr. Sparkman.
Mr. McMillan with Mr. Ansberry.
Mr. Ellis of Missouri with Mr. Smith of Missouri.
Mr. Cory with Mr. Weisse.
Mr. Graham with Mr. Legare.
Mr. Jackson with Mr. Wolf.
Mr. Ames with Mr. Lindsay.

On this vote:

Mr. Goulden with Mr. Bradley.

The SPEAKER. The Clerk will call my name.

The Clerk called the name of the Speaker, and he voted "No," as above recorded.

The result of the vote was then announced as above recorded.—*Cong. Record.*

SUMMARY BY STATES AND SECTIONS

States	Vote on Weeks bill, Sixtieth Congress			Sixty-first Congress Alignment on Weeks bill			
	Yeas	Nays	Not voting	Yeas	Nays	Not recorded	New members
NEW ENGLAND							
Maine	4	..	..	4	..	..	..
New Hampshire	2	..	..	2	..	..	..
Vermont	2	..	..	1	..	..	1
Massachusetts	13	..	1	13	..	1	..
Rhode Island	1	..	1[1]	1	..	..	1
Connecticut	4	..	1[2]	4	..	..	1
	26	..	3	25	..	1	3
MIDDLE							
New York	17	11	9	13	11	7	6
New Jersey	3	4	3	3	4	1	2
Pennsylvania	10	12	10[3]	6	11	8	7
Delaware	1	..	..	..	..	..	1
	31	27	22	22	26	16	16

[1]No member from one district.
[2]The Member-at-large, Mr. Lilley, who would have voted for the bill, was then serving as governor of Connecticut.
[3]One member not reported

SUMMARY BY STATES AND SECTIONS—continued

States	Vote on Weeks bill, Sixtieth Congress			Sixty-first Congress Alignment on Weeks bill			
	Yeas	Nays	Not voting	Yeas	Nays	Not recorded	New members
CENTRAL							
Michigan	8	3	1	7	3	1	1
Ohio	10	5	6	8	5	1	6
Indiana	3	9	1	..	6	..	7
Illinois	5	13	6	5	12	5	3
Wisconsin	5	4	2	5	2	2	2
Minnesota	2	7	..	1	7	..	1
Iowa	2	7	2	1	4	1	5
Missouri	3	9	4	2	7	1	6
North Dakota	..	1	1	..	1	..	1
South Dakota	2	..	..	1	..	..	1
Nebraska	4	1	1	3	..	1	2
Kansas	2	4	2	2	4	2	..
Oklahoma	..	4	1	..	3	..	2
	46	67	27	35	54	14	37
ROCKY MOUNTAIN AND COAST							
Montana	..	..	1	..	..	1	..
Wyoming	..	1	..	..	1	..	..
Colorado	..	3	..	..	..	..	3
Nevada	..	..	1	..	..	1	..
Idaho	..	1	..	..	..	..	1
Utah	..	1	..	..	1	..	..
Washington	..	3	..	..	2	..	1
Oregon	..	2	..	..	2	..	..
California	1	6	1	1	6	1	..
	1	17	3	1	12	3	5
SOUTHERN							
Maryland	3	..	3	3	..	1	2
Virginia	7	1	2	7	1	2	..
West Virginia	2	..	3	2	..	3	..
Kentucky	5	3	3	4	3	2	2
Tennessee	6	4	..	4	4	..	2
North Carolina	7	2	1	6	1	..	3
South Carolina	4	1	2	4	1	2	..
Georgia	2	6	3	2	6	2	1
Florida	..	..	3	..	..	2	1
Alabama	6	2	1	5	2	1	1
Mississippi	2	3	3	2	2	1	3
Louisiana	4	1	1	3	1	1	1
Arkansas	2	2	3	1	2	3	1
Texas	3	11	2	2	11	2	1
	53	36	30	45	34	22	18

The influence of the party leaders on both sides of the House has always been used against this legislation. Its weakness in certain sections is attributable to the strength of the party machine with the representatives from those sections. It is also to be observed that west of the Mississippi there were but nineteen votes for the measure, while fifty-six were cast against it. Is this the return that the men of the West make for the liberal way in which the national treasury and the vast national domain has been used to build up the states of the far West and to insure their future prosperity?

PARTY DIVISION

The party alignment on this essentially non-partisan measure has no especial significance, but it is of some interest and the facts it shows may be of service. Expressed in percentages .429 of the Republicans and .376 of the

Democrats voted for the bill and .388 of the Republicans and .376 of the Democrats voted against it. Those not voting were almost equally divided as to political affiliations. Therefore on this question the Democratic leaders seem to have held their forces rather better than the Republicans, notwithstanding the number of Democratic states that were directly interested. The following table shows the vote by states as divided on party lines:

	Yea		Nay		Not voting	
	R.	D.	R.	D.	R.	D.
Alabama	..	6	..	2	..	1
Arkansas	..	2	..	2	..	3
California	1	..	6	..	1	..
Colorado	..	..	3	..	..	..
Connecticut	4	..	..	..	1	..
Delaware	1	..	..	..	..	..
Florida	..	..	..	..	..	3
Georgia	..	2	..	6	..	3
Idaho	..	..	1	..	..	..
Illinois	4	1	11	2	3	3
Indiana	3	..	5	4	1	..
Iowa	2	..	6	1	2	..
Kansas	2	..	4	..	2	..
Kentucky	3	2	..	3	1	2
Louisiana	..	4	..	1	..	1
Maine	4	..	..	..	..	..
Maryland	1	2	..	..	2	1
Massachusetts	10	3	..	..	1	..
Michigan	8	..	3	..	1	..
Minnesota	2	..	6	1	..	..
Mississippi	..	2	..	3	..	3
Missouri	3	..	..	9	1	3
Montana	..	..	..	..	1	..
Nebraska	3	1	1	..	..	1
Nevada	..	..	..	..	..	1
New Hampshire	2	..	..	..	..	..
New Jersey	2	1	4	..	..	3
New York[1]	9	7	10	1	6	3
North Carolina	..	7	..	2	..	..
North Dakota	..	..	1	..	1	..
Ohio	8	2	3	2	5	1
Oklahoma	..	..	1	3	..	1
Oregon	..	..	2	..	..	..
Pennsylvania	7	3	10	2	7	2
Rhode Island	1	..	..	..	..	..
South Carolina	..	4	..	1	..	2
South Dakota	2	..	..	..	..	..
Tennessee	2	4	..	4	..	..
Texas	..	3	..	11	..	2
Utah	..	..	1	..	..	..
Vermont	2	..	..	..	..	..
Virginia	1	6	..	1	..	2
Washington	..	..	3	..	..	..
West Virginia	2	..	..	..	3	..
Wisconsin	5	..	3	1	1	1
Wyoming	..	..	1	..	..	..
	94	62	85	62	40	41

RECORD OF THE STATE DELEGATIONS

Members whose names have an asterisk (*) are not members of the Sixty-first Congress. The new members who takes their places in the present Congress are given at the end of each state list. The figures preceding the names are the numbers of the Congressional districts.

Yea	Nay	Not voting
Alabama		
2. A. A. Wiley*	3. H. D. Clayton	1. G. W. Taylor
4. W. B. Craig	9. O. W. Underwood	
5. J. T. Heflin		
6. R. P. Hobson		
7. J. L. Burnett		
8. Wm. Richardson		
New member.—2, S. H. Dent, Jr., D.		
Arkansas		
2. S. Brundidge, Jr.*	1. R. B. Macon	3 J. C. Floyd
6. J. T. Robinson	7. R. M. Wallace	4. W. B. Cravens
		5. C. C. Reid
New member.—2, W. A. Oldfield, D.		
California		
7. J. McLachlan	1. W. F. Englebright	4. J. Kahn
	2. D. E. McKinlay	
	3. J. R Knowland	
	5. E. A. Hayes	
	6. J. C. Needham	
	8. S. C. Smith	

[1]One independent from New York voted "Yea."

Yea	Nay	Not Voting
Colorado		
At large. G. W. Cook*		
1. R. W. Bonynge*		
2. W. A. Haggott*		
New members.—At large, E. T. Taylor, D.; 1, A. W. Rucker, D.; 2, J. A. Martin, D.		
Connecticut		
1. E. S. Henry		*At large.* G. L. Lilley* (Mr. Lilley was in Connecticut serving as governor)
2. N. D. Sperry		
3. E. W. Higgins		
4. E. J. Hill		
New member.—At large, J. Q. Tilson, R.		
Delaware		
At large. R. Burton*		
New member.—At large, W. H. Heald, R.		
Florida		
		1. S. M. Sparkman
		2. F. Clark
		3. W. B. Lamar*
New member.—3, D. H. Mays, D.		
Georgia		
7. Gordon Lee	1. C. G. Edwards	2. J. M. Griggs
9. T. M. Bell	5. L. F. Livingston	3. E. B. Lewis*
	6. C. L. Bartlett	4. W. C. Adamson
	8. W. M. Howard	
	10. T. W. Hardwick	
	11. W. G. Brantley	
New member.—3, D. M. Hughes, D.		
Idaho		
At large. B. L. French*		
New member.—At large, Thomas R. Hamer, R.		
Illinois		
2. J. R. Mann	1. M. B. Madden	4. J. T. McDermott
12. C. E. Fuller	3. W. W. Wilson	9. H. S. Boutell
14. J. McKinney	5. A. J. Sabath	17. J. R. Sterling
15. G. W. Prince	6. W. Lorimer	19. W. B. McKinley
20. H. T. Rainey	7. Philip Knopf*	21. B. F. Caldwell*
	8. Charles McGavin*	22. W. A. Rodenberg
	10. G. E. Foss	
	11. H. M. Snapp	
	13. F. O. Lowden	
	16. J. V. Graff	
	18. J. G. Cannon	
	23. M. D. Foster	
	24. P. T. Chapman	
New members.—7, Fred Lundin, R; 8, Thomas Gallagher, D.; 21, J. M. Graham, D.		
Indiana		
1. J. H. Foster*	2. J. C. Chaney*	6. J. E. Watson*
9. C. B. Landis*	3. W. E. Cox	
12. C. C. Gilhams*	4. L. Dixon	
	5. E. S. Holliday*	
	7. J. Overstreet*	
	8. J. A. M. Adair	
	10. E. D. Crumpacker	
	11. G. W. Rauch	
	13. H. A. Barnhart	
New members.—1, J. W. Boene, D.; 2, W. A. Cullop, D.; 5, R. W. Moss, D.; 6, W. O. Barnard, R.; 7, Charles A. Korbly, D.; 9, M. A. Morrison, D.; 12, Cyrus Cline, D.		
Iowa		
7. J. A. Hull	1. C. A. Kennedy	3. B. P. Birdsall*
8. W. P. Hepburn*	2. A. F. Dawson	9. W. I. Smith
	4. G. N. Haygen	
	5. R. G. Cousins*	
	6. D. W. Hamilton*	
	10. J. P. Conner*	
	11. E. H. Hubbard	
New members.—3, C. E. Pickett, R.; 5, J. W. Good, R.; 6, N. E. Kendall, R.; 8, W. D. Jamieson, D.; 10, F. P. Woods, R.		

	Yea	Nay	Not voting
Kansas			
	6. W. A. Reeder	2. C. F. Scott	1. D. R. Anthony
	7. E. H. Madison	3. P. R. Campbell	5. W. A. Calderhead
		4. J. M. Miller	
		8. V. Murdock	
Kentucky			
	2. A. O. Stanley	4. B. Johnson	1. O. M. James
	7. W. P. Kimball*	5. S. Sherley	3. A. D. James*
	9. J. B. Bennett	8. H. Helm	6. J. L. Rhinock
	10. J. W. Langley		
	11. D. C. Edwards		
	New members.—3, R. Y. Thomas, Jr., D.; 7, J. C. Cantrill, D.		
Louisiana			
	1. A. Estopinal	7. A. P. Pujo	3. R. F. Broussard
	4. J. T. Watkins		
	5. J. E. Ransdell		
	6. G. K. Favrot*		
	New member.—6. R. C. Wickliffe, D.		
Maine			
	1. A. L. Allen		
	2. J. P. Swasey		
	3. E. C. Burleigh		
	4. F. E. Guernsey		
Maryland			
	2. J. F. C. Talbott		1. W. H. Jackson*
	4. John Gill, Jr.		3. H. B. Wolf*
	5. S. E. Mudd		6. G. A. Pearre
	New members.—1, J. H. Covington, D.; 3, John Kronmiller, R.		
Massachusetts			
	1. G. P. Lawrence		5. B. Ames
	2. F. H. Gillett		
	3. C. G. Washburn		
	4. C. Q. Tirrell		
	6. A. P. Gardner		
	7. E. W. Roberts		
	8. S. W. McCall		
	9. J. A. Keliher		
	10. J. F. O'Connell		
	11. A. J. Peters		
	12. J. W. Weeks		
	13. W. S. Greene		
	14. W. C. Lovering		
Michigan			
	1. E. Denby	3. W. Gardner	6. S. W. Smith
	2. C. E. Townsend	8. J. W. Fordney	
	4. E. L. Hamilton	12. H. O. Young	
	5. G. J. Diekema		
	7. H. McMorran		
	9. J. C. McLaughlin		
	10. G. A. Loud		
	11. A. B. Darragh*		
	New member.—11, George A. Loud, R.		
Minnesota			
	3. C. R. Davis	1. J. A. Tawney	
	8. A. Bede*	2. W. S. Hammond	
		4. F. C. Stevens	
		5. F. M. Nye	
		6. C. A. Lindbergh	
		7. A. R. Volstead	
		9. H. Steenerson	
	New member.—8, Clarence B. Miller, R.		
Mississippi			
	1. E. S. Candler, Jr.	2. T. Spight	5. A. M. Byrd
	3. B. G. Humphreys	4. W. S. Hill*	7. F. A. McLain*
		6. E. J. Bowers	8. J. S. Williams*
	New members.—4, T. U. Sisson, D.; 7, W. A. Dickson, D.; 8, J. W. Collier, D.		

	Yea	Nay	Not voting
Missouri			
	10. R. Bartholdt	1. J. T. Lloyd	4. C. F. Booher
	11. H. S. Caulfield*	2. W. W. Rucker	5. E. C. Ellis*
	12. H. M. Coudrey	3. J. W. Alexander	13. M. R. Smith*
		6. D. A. DeArmond	16. R. Lamar*
		7. C. W. Hamlin	
		8. D. W. Shackleford	
		9. Champ Clark	
		14. J. J. Russell*	
		15. Thomas Hackney*	

New members.—5 W. P. Borland, D.; 11, P. F. Gill, D.; 13, P. Elvins, R.; 14, C. A. Crow, R.; 15, C. H. Morgan, R.; 16, A. P. Murphy, R.

Montana

At large. C. N. Pray

Nebraska

1. E. M. Pollard*	3. J. F. Boyd*	5. G. W. Norris
2. G. M. Hitchcock		
4. E. H. Hinshaw		
6. M. P. Kinkaid		

New members.—1, J. A. Maguire, D.; 3, J. P. Latta, D.

Nevada

At large. G. A. Bartlett

New Hampshire

1. C. A. Sulloway
2. F. D. Currier

New Jersey

2. J. J. Gardner	1. H. C. Loudenslager	8. Le G. Pratt*
4. I. W. Wood	3. B. N. Howell	9. E. W. Leake*
6. W. D. Hughes	5. C. N. Fowler	10. J. A. Hamill
	7. R. W. Parker	

New members.—8, W. H Wiley, R.; 9, E. F. Kinkead, D.

New York

1. W. W. Cocks	7. J. J. Fitzgerald	2. G. H. Lindsay
3. O. G. Foelker	19. J. E. Andrews	8. D. J. Riordan
4. C. B. Law	23. G. N. Southwick	15. J. Van V. Olcott
5. G. E. Waldo*	24. G. Fairchild	18. J. A. Goulden
6. W. M. Calder	25. C. Durey	20. T. W. Bradley
9. H. M. Goldfogle	26. G. R. Malby	21. S. McMillan*
10. William Sulzer	29. M. E. Driscoll	27. J. S. Sherman*
11. G. V. Fornes	30. J. W. Dwight	28. C. L. Knapp
12. W. B. Cockran*	31. S. E. Payne	36. De A. S. Alexander
13. H. Parsons	33. J. S. Fassett	
14. William Willett, Jr.	37. E. B. Vreeland	
16. F. B. Harrison		
17. W. S. Bennet		
22. W. H. Draper		
32. J. B. Perkins		
34. P. A. Porter*		
35. W. H. Ryan*		

New members.—5, Richard Young, R.; 12, M. F. Conry, D.; 21, Hamilton Fish, R.; 27, C. S. Millington, R.; 34, J. S. Simmons, R.; 35, D. A. Drisco'l, D.

North Carolina

1. J. H. Small	2. C. Kitchin
3. C. R. Thomas	8. R. N. Hackett*
4. E. W. Pou	
6. H. L. Godwin	
7. R. N. Page	
9. E. Y. Webb	
10. W. T. Crawford*	

New members.—5, J. M. Morehead, R.; 8, C. H. Cowles, R.; 10, J. G. Grant, R.

North Dakota

At large. A. J. Gronna *At large.* T. F. Marshall*

New member.—L. B. Hanna, R.

	Yea	Nay	Not voting
Ohio			
	1. N. Longworth	2. H. P. Goebel	5. T. T. Ansberry
	3. J. E. Harding*	4. W. E. Tou Velle	10. H. T. Bannon*
	6. M. R. Denver	7. J. W. Keifer	13. G. E. Mouser*
	8. R. D. Cole	9. I. R. Sherwood	14. J. F. Laning*
	11. A. Douglas	20. P. Howland	16. C. L. Weems*
	12. E. L. Taylor, Jr.		21. T. E. Burton*
	15. B. G. Dawes*		
	17. W. A. Ashbrook		
	18. J. Kennedy		
	19. W. A. Thomas		

New members.—3, J. M. Cox, D.; 10, A. R. Johnson, R.; 13, C. C. Anderson, D.; 14, W. G. Sharp, D.; 15, James Joyce, R.; 16, D. A. Hollingsworth, R.

Oklahoma			
		1. B. S. McGuire	2. E. L. Fulton*
		3. J. S. Davenport*	
		4. C. D. Carter	
		5. Scott Ferris	

New members.—2, D. T. Morgan, R.; 3, C. E. Creager, R.

Oregon			
		1. W. C. Hawley	
		2. W. R. Ellis	
Pennsylvania			
	2. Joel Cook	1. H. H. Bingham	4. R. O. Moon
	5. W. W. Foulkrod	3. J. H. Moore	8. I. P. Wanger
	9. H. B. Cassel*	6. G. D. McCreary	13. J. H. Rothermel
	10. T. D. Nicholls	7. T. S. Butler	14. G. W. Kipp*
	11. J. T. Lenahan*	15. W. B. Wilson	17. B. K. Focht
	19. J. M. Reynolds	16. J. G. McHenry	18. M. E. Olmstead
	23. A. F. Cooper	21. C. F. Barclay	20. D. F. Lafean
	24. E. F. Acheson*	22. G. F. Huff	29. W. H. Graham
	25. A. L. Bates	27. J. G. Beale*	31. J. F. Burke
	26. J. D. Brodhead*	28. W. P. Wheeler	
		30. J. Dalzell	
		32. A. J. Barchfeld	

New members.—9, W. W. Griest, R.; 11, H. W. Palmer, R.; 12, A. B. Garner, R.; 14, C. C. Pratt, R.; 24, J. K. Tener, R.; 26, A M. Palmer, D.; 27, J. M. Langham, R.

Rhode Island			
	2. A. B. Capron		

New member.—1, W. P. Sheffield, R.

South Carolina			
	4. J. T. Johnson	3. W. Aiken	1. G. S. Legare
	5. D. E. Finley		2. J. O. Patterson
	6. J. E. Ellerbe		
	7. A. F. Lever		
South Dakota			
	At large. Philo Hall*		
	At large. E. W. Martin		

New member.—Charles H. Burke, R.

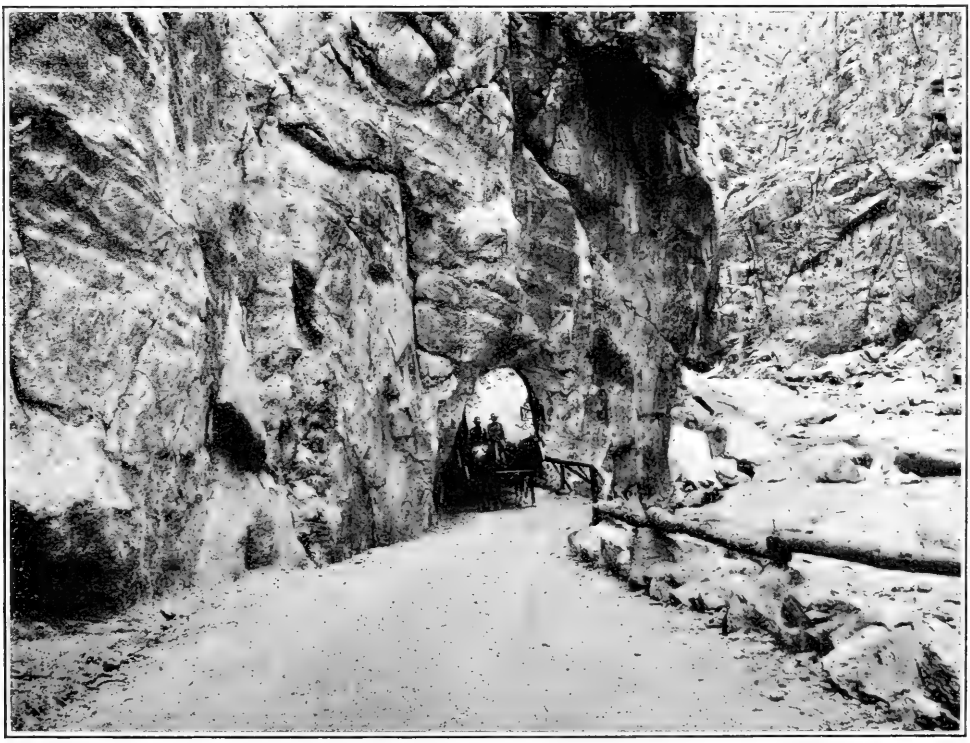
Tennessee		
1. W. P. Brownlow	5. W. C. Houston	
2. N. W. Hale*	8. T. W. Sims	
3. J. A. Moon	9. F. J. Garrett	
4. Cordell Hull	10. G. W. Gordon	
6. J. W. Gaines*		
7. L. P. Padgett		

New members.—2, R. W. Austin, R.; 6, J. W. Byrns, D.

Texas		
2. S. B. Cooper*	1. M. Sheppard	4. C. B. Randell
12. O. W. Gillespie	3. G. Russell	10. A. S. Burleson
13. J. H. Stevens	5. Jack Beall	
	6. Rufus Hardy	
	7. A. W. Gregg	
	8. J. M. Moore	
	9. G. F. Burgess	
	11. R. L. Henry	
	14. J. L. Slayden	
	15. J. N. Garner	
	16. W. R. Smith	

New member.—2, Martin Dies, D.

	Yea	Nay	Not voting
Utah			
		At large. Joseph Howell	
Vermont			
	1. D. J. Foster		
	2. Kittredge Haskins*		
	New member.—2, Frank Plumley.		
Virginia			
	1. W. A. Jones	7. James Hay	4. F. Lassiter
	2. H. L. Maynard		8. C. C. Carlin
	3. John Lamb		
	5. E. W. Saunders		
	6. Carter Glass		
	9. C. B. Slemp		
	10. H. D. Flood		
Washington			
		At large. W. L. Jones*	
		At large. F. W. Cushman (now 2d dist.)	
		At large. W. E. Humphrey (now 1st dist.)	
	New member.—3, Miles Poindexter, R.		
West Virginia			
	1. W. P. Hubbard		3. J. H. Gaines
	2. G. C. Sturgiss		4. H. C. Woodyard
			5. J. A. Hughes
Wisconsin			
	1. H. A. Cooper	3. J. W. Murphy*	4. W. J. Cary
	2. J. M. Nelson	5. W. H. Stafford	6. C. H. Weisse
	7. J. J. Esch	9. G. Küstermann	
	8. J. H. Davidson	11. J. J. Jenkins*	
	10. E. A. Morse		
	New members.—3, Arthur W. Kopp, R.; 11, I. L. Lenroot, R.		
Wyoming			
		At large. F. W. Mondell	



Detail View of Completed West Entrance of Tunnel Just below Shoshone Dam Site on Canyon Road, Shoshone Project, Wyoming

EDITORIAL

How Water Transportation Saves

A large manufacturer in Pittsburg, Pa., who uses one and one-half million tons of coal annually, recently testified before a Congressional committee that his coal was brought from the mines to his mill, via the Monogahela River route, for 3½ to 4 cents a ton. When, however, navigation on the river was suspended for any reason the railroads charged 44 cents a ton for transporting the coal between the mines and the mill, or eleven times as much for the same service. —*From the Report of the Deep Waterways Committee of the Chicago Association of Commerce.*

A ratio of 3½ to 44! Is it a matter for surprise that, with traffic for long periods seriously congested, and Congress and the Interstate Commerce Commission endeavoring to regulate railway rates, the demand should be voiced for the rehabilitation of our inland waterways and their active use for purposes of navigation?

Kansas City's Fight for Her River

KANSAS CITY, Mo., is pushing an aggressive campaign for the renewed use of the Missouri. The city feels that it is suffering from railway discrimination, and that its future is thereby menaced. Says the *New Orleans Picayune:*

Kansas City has found its trade placed at great disadvantage because the railroads that once made it a prominent commercial center have moved on and are bestowing their favors on other places, leaving Kansas City in the lurch.

For instance, an adjustment of railway rates recently gave cities south of Kansas City rates which shut Kansas City out of territory where it formerly sold large quantities of goods, and when an explanation was sought it was learned that the rates had been made because of potential or actual water competition from the East, via Galveston. Enjoying no such location, Kansas City was cut off from the benefits which cities south of it were given. An attempt was made to boycott the Missouri, Kansas and Texas Railway, in order to compel it to give Kansas City better rates, but this movement was met by a boycott against Kansas City in the territory affected. The only course which seemed open to Kansas City was to revive river transportation.

The *New Orleans Times-Democrat* says:

The Kansas City crusade is one of the most vigorous and best organized projects ever started in this country. That city has apparently made up its mind that its commercial and industrial prosperity depends upon reopening the Missouri River, and using it as a freight route to the Gulf. It is either "the river or—go back," says the *Kansas City Star,* and it expresses the opinion that Kansas City has reached its zenith unless it can free itself from the railroads and utilize the splendid opportunities offered it by the Missouri River.

It is maintained that the railroads have deliberately attempted to destroy transportation by water. Says the *Kansas City Star* of May 12th:

The railroads caused the decline of navigation on the Mississippi. They did it by paralleling the river with lines of tracks on each bank and by making the freight rates in competition with the steamboats so low that the boats could not meet the competition and live. Then the railroads bought the steamboat stock under fictitious names, took the boats out of the carrying trade and raised their rates to double the old steamboat rates and more.

The methods here described are, of course, not unfamiliar to the student of modern industrial warfare. The statements sound like echoes from the stories of meat and oil. The policy is sometimes to undersell your competitor until you have killed him; in other cases it is to bear the stock of his concern and buy it up at bottom figures, in either case making the consumer, afterwards, pay the cost of the process.

With characteristic energy and enterprise Kansas City is pushing what seems to be a practical project to remedy the situation. It is raising a mil-

lion dollars to get a boat-line on the Missouri River, "1,550 miles from blue water." The promoters of the enterprise plan to guard against the first of the methods whereby Mississippi River transportation was destroyed by securing pledges of patronage from shippers before the boat-line begins operations. To prevent the boat-line from falling into hostile hands a clause in the charter of the new company vests the voting power in the board of directors, who, it is said, will be free from railroad influence.

Says a promoter of the enterprise:

> We will build steel-hull boats of light draft that will carry the freight up and down the Missouri River and later into the Gulf of Mexico and through the Panama Canal to the Pacific coast.
>
> The Government is now spending an appropriation of $600,000 on the Missouri River between the Mississippi and the Kaw. This money is going into snagboats, lighthouses, and channel improvement. We are going to keep up the campaign for the improvement of the river. The Government, under the constitution, has control of the navigable streams of the country, and it is a government's duty to keep those streams in condition for traffic.
>
> St. Louis will profit almost as much by the steamboat lines as Kansas City.

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Missouri for Waterways

NOT only the city but the state is pushing the waterways fight. Governor Hadley has recently issued a statement giving figures to show discrimination in the matter of railway rates, and indicating that a certain railroad is endeavoring to block an investigation by the Interstate Commerce Commission into interstate rates in Missouri. Telegrams have been sent the Missouri senators asking them to protest against the investigation. Governor Hadley states that he has received several telephone messages advising him that agents along the line of the railway in question went to shippers and requested them to sign prepared telegrams protesting against this investigation.

The Missouri legislature is asking Federal aid for the Missouri River. The House of Representatives, by a vote of 110 to two, has recently adopted a joint and concurrent resolution to this end. The resolution recites:

> *Whereas,* the great rivers of Missouri, the natural highways for commerce, if properly cared for by the National Government, would be the means of saving millions of dollars in freight rates to the people of Missouri and adjacent territory; and,
>
> *Whereas,* the appropriations that have been made heretofore by Congress have been so meager that the practical benefits arising from such appropriations are undiscernible; and,
>
> *Whereas,* the exigencies of the times require the National Government to take charge of this matter; therefore, be it
>
> *Resolved,* That the United States senators and members of Congress from Missouri be urgently requested, one and all, to use their utmost endeavors to secure sufficient appropriations by the Federal Government for the improvement, navigation, and maintenance of said rivers for the uses and purposes of commerce.

The House of Representatives followed up this resolution by appropriating $5,000 for a waterways commission to obtain data regarding navigable rivers, overflowed lands, proposed levees, and such information as will facilitate legislation to assist deep-water projects. Members of the commission are to be appointed by the governor.

Regarding this action the *Kansas City Star* says editorially:

> The action is in keeping with the progressive and enterprising spirit of the times and is in pursuance of the recommendations of the National Rivers and Harbors Congress.
>
> The amazing thing is that members of Congress should need the greatest reinforcement that may be brought to bear on them to take action in favor of waterways improvement when the merits of the proposition are so manifest and overwhelming. It is said that within a few years the railroads of this country will spend $5,000,000,000 in improvements in order to keep pace with the country, and Mr. James J. Hill declares that even with this expenditure the pace cannot be kept. Yet the Government hesitates to authorize the issuance of 500 millions in bonds, at the rate of fifty millions a year, to improve its inland waterways, when these waterways, with only a small proportion of their capacity in use, already carry nearly one-third of the tonnage and at a cost of about one twenty-third of the cost of rail shipment.

State Parks

AMONG the many good things promoted by the American Civic Association is the establishment of state parks. America is familiar with the idea of the national parks, splendid examples being afforded by the Yellowstone and Yosemite. We are likewise familiar with city parks, such as the Central, in New York City, Lincoln, Jackson, Garfield and the like in Chicago, and the Public Gardens in Boston, but the idea of a state park seems somewhat apart from the thought of our people.

True, certain states, as Massachusetts, New York, California, Pennsylvania, and New Jersey, do maintain state parks, yet the large majority of states do not, and in most of them the proposal to establish such parks has probably never been agitated.

But why should not the park be as regular a feature of the state as of the city? In many of our states are found magnificent examples of scenic beauty which, through lack of state ownership, suffer from neglect if not from devastation. These should be preserved as a part of the permanent heritage of the people. Again, recreation, contact with nature and familiarity with her beauty contribute materially to the health and well being, physically, mentally, morally and spiritually, of a people. In times of rush and drive, such as those in which most of us are now living, they are almost essential to complete sanity. The remoteness of our great national parks renders them inaccessible to most. The state parks might well supply the needs of many of these dwellers in country districts and in villages far removed from these recreation grounds, and at the same time out of convenient reach of the city.

It is a curious fact that, beginning as did all our states, both north and south, with exaggerated ideas of the place and power of the state as compared with the Nation, a surprising number of things that, to the great advantage of their inhabitants, our states might do without stretching their powers, have been left undone. It will be recalled that Secretary Root, some two years since, called attention to this fact. In very many important respects the powers of an American state are almost or quite equal to those of a European state; and yet, so impressed have we become with the majesty and might of the Nation, that state powers, obvious and fundamental, are, in numerous instances, but slightly used if used at all.

It is true that, within the last two years, many of our states have materially increased their activities. Examples are found in their treatment of corporations and, notably, in their interest, beginning a year ago, in the great conservation movement so auspiciously opened with the White House Conference. Subsequent events have demonstrated the readiness of several states to act along conservation lines. It is to be hoped that one of the measures to receive earnest and careful attention from the states will be the establishment of public parks.

Towns without Taxes

IN OUR news columns appears an item on the "immense profits of German forests." Numerous towns and cities maintain large holdings, Baden having 10,576 acres, yielding an annual net profit of $66,080, or approximately $6.25 an acre, Freiburg having 8,085 acres, yielding a net profit of $46,336, or $5.79 an acre, and Heidelburg, 6,860 acres the clear profit on which each year is $12,635. The village of Aufen, with 220 inhabitants, has 163 acres of timberlands, the proceeds from which suffice for all the expenses of the little community.

In the village of Braunlingen, which has 1,601 inhabitants and 4,507 acres of forests, there is an allowance to the citizens of firewood and 100,000 board-feet of lumber is given to churches, schools, and other public institutions. From the timber sold, the net income is $21,600,

and Braunlingen not only is free from all communal taxes, but is enabled to establish electric plants, water-works, and other public improvements.

In FORESTRY AND IRRIGATION for September, 1907 (pages 446 and 447) was published a clipping from the London, England, *Bystander,* regarding the town of Faleide, Norway, of which it was said: "The town of Faleide, Norway, imposes no taxes on its lucky inhabitants. During the last thirty years the authorities of Faleide have sold over $5,000,000 worth of trees; and, by judicious replanting, have provided for a similar income every thirty years. In consequence of this source of commercial wealth, there are no taxes in Faleide, and local railways and telephones are free, as well as education—and drinks upon the king's birthday."

There is a proverb in the United States that two things are inevitable, namely, "death and taxes." The cases of Braunlingen, Faleide, and the other towns named above, appear to be exceptions. In commenting upon the Faleide situation, FORESTRY AND IRRIGATION called attention to sources of municipal income, aside from the taxpayer's pocket, in other towns than those named. Ancient Athens derived a substantial revenue from her silver mines at Laurium. The town of Fairhope, Ala., owns a wharf, fees for the use of which constitute a valuable source of revenue for the village. The city of Chicago still owns her sixteenth section, set apart for school purposes, from the rentals of which the city derives a splendid annual revenue.

America is coming to realize that there is money in wood. As this fact, however, is borne in upon her more strongly through the progressive depletion of our timber supply and the consequent enhancement in price of all wood products, why may not American cities and towns emulate the example of the European towns above mentioned, buy up cheap lands in the neighborhood of their limits, maintain them in forests managed according to forestry principles, and sell the annual product, to the material advantage of their municipal treasuries?

Public Activity Plus Private

FROM Colorado comes an interesting story of private enterprise. A cowboy becomes a great irrigator.

Some ten years ago officers of the U. S. Geological Survey were surveying the raw prairie in Otero County. A cowboy spent the night with them, became interested, stayed with them a few days and told them what he knew of the country. They, in return, showed him one of the best reservoir sites in the country, and told him how water could be had and what territory it might irrigate.

The cowboy took the hint. For ten years he nursed his project, surmounted difficulties without number, organized a company and at last succeeded. To-day the works are finished. The dam of one reservoir contains 303,000 cubic yards, and that of another 155,000. The lateral canals are twenty-two miles long. The reservoirs will irrigate 10,000 acres of land. Water is now running into them, and farmers are ploughing all over the district.

"But," inquires one, "why private irrigation? Have we not a great national irrigation service? Has not Uncle Sam taken up this work of redeeming the desert? Why should he not carry it through to the end? Is not private irrigation reactionary and individualistic? Will it not lead to abuses, and result in the long run in more harm than good?"

These questions are exactly on a par with questions once, at least, raised by an opposing school of thought. "Why," they asked, "should government take up work of this kind? Is it not thereby transcending its functions? Is it not invading the field of private initiative and narrowing the opportunity for individual freedom? Is it not erecting a bureaucracy upon the ruins of a republic, sanctioning 'the great political superstí-

tion' and paving the way for 'the coming slavery?' "

However wise the men who have propounded these two sets of questions, the questions themselves are by no means profound. The opposing viewpoints from which they proceed are equally superficial. No one but the doctrinaire nowadays insists either that the Government shall do everything in the field of industry, or that it shall do nothing at all. On the one hand, it is clear, as set forth many years since in the Encyclopedia Britannica by a distinguished British economist, that "out of the mere conflict of private interests can never come the well ordered commonwealth of labor." Sore experience has taught the civilized world that to leave all industry to unregulated private activities is to open a Pandora's box of ills. On the other hand, no country, with the possible exception of Ancient Peru, has ever yet attempted the other extreme of turning all industry over to government; nor, so far as can be judged, is any country likely soon, if ever, to do so.

In public affairs, as in private, common sense exercises an influence which, in the long run, usually proves dominant. We now know that it does not square with sound common sense to leave individuals and corporations to do absolutely as they please in business. On the other hand, common sense sees no reason for turning all business over to government. In the matter of irrigation, for example, the reason for not doing so is clear. We have an arid area which, not long since, was greater than the entire Roman Empire. Our Government is not ready to undertake, alone, the task of reclaiming this vast region. It has not the funds available. There is not the public demand that it shall perform the entire work. To be economical, its efforts must ordinarily be conducted on a large scale. Yet operations on a small scale are likewise necessary. To handle these, individuals and companies are often far better adapted than is a great government. Again, governments are proverbially slow of movement. While they are merely pondering the question of policy, and wondering whether to strike out on a new line years may elapse during which important interests will suffer. Individuals, however, if interested, can move quickly. Under the joint stock system, to-day so common, or under some form of group cooperation, funds from many sources can promptly be brought together into a single considerable fund, and projects of appropriate magnitude launched and carried through to success before government will have even made up its mind whether to act or not.

In the present stage of industrial development, and possibly for many years to come, it seems probable that the general good will be best served through the participation in industry of both private individuals and government. The two are complementary. The one supplies the place which the other leaves vacant. Each can learn from the other and each can, in some respects, stimulate the other to good works.

How far the present tendency toward public ownership and administration may be carried, and to what extent it will limit private initiative, it may be difficult to forecast. Throughout the world, an extraordinary drift toward increase in governmental activities is clearly discernible. Nevertheless, to infer that because governments are increasing their activities they will continue to do so until they have absorbed all industry is as logical as to assume that, because one for a time has been walking northwards, he will not stop until he has reached the north pole; or, because an infant is growing, it must necessarily continue to grow until it has exceeded the size of the Brobdingnagians of Gulliver's Travels. As stated, communities and nations, like individuals, learn by experience. Experience has taught the civilized world that government must go into business in certain fields for

certain objects and under certain limitations. Experience likewise may be relied upon to teach us how far it should go. Should it go too far, there is always the possibility, under popular control, for it to retrace its steps.

Prosperity to Be Genuine Must Be General

IN OUR news columns are references to the marked increase in investments in water transportation. The editorial from the *Wall Street Journal*, there quoted, ends with the paragraph:

"No threat to our railroad development as a whole is implied. Such water facilities in fact have usually brought more new business to the railroads than they have taken away."

In these few lines is recognized a great principle too little understood. To far too great an extent the old maxim has prevailed that "One man's gain is another's loss." As a matter of fact no proposition could be found more baseless in philosophy. To an increasing degree we are coming to see that the same principle is unsound in business. Reference is made in these columns to the old-time fight of railroads against waterways. Happily, this hostility is passing. Such representative railway men as President James J. Hill and W. W. Finley do not hesitate to declare in public that the railways, instead of opposing the development of our internal waterways, with the accompanying increase in transportation facilities, welcome this movement as helpful, not simply to shippers or to the country at large, but to the railways themselves.

In a very fundamental sense individuals, industries, communities, and nations rise or fall together. A genuinely good thing is good not simply for one, but for all. A gain derived at the expense of others is factitious, specious, ephemeral, a will-o'-the-wisp.

That this principle applies to nations was emphasized by President Roosevelt in his address to the North American Conference on the Conservation of Natural Resources when he said, "The ablest man will do best where his neighbors also do well. It is just so with nations. In international relations the great feature of the growth of the last century has been the gradual recognition of the fact that instead of it being normally the interest of one nation to see another depressed, it is normally the interest of each nation to see the others elevated."

One of the strongest and most striking pieces of work ever done by Mr. Herbert Spencer was the demonstration in his "Principles of Sociology" that society is organic, that its members are parts of a living whole, and interdependent. Let this principle once be recognized and far-reaching conclusions will flow therefrom, not the least important of which is that all should welcome a good thing and help to push it along, conscious that, whether we see it or not, the real good which comes to one will be diffused throughout the community, yielding, directly or indirectly and sooner or later its blessings to all.

New Jersey Protects Woodlands

BY AN act approved April 12, New Jersey has provided for the protection of the woodlands of the state. The act provides that wherever in the state woodland adjoins the right of way less than 110 feet from the roadbed of a railroad whose locomotives consume coal or wood, a fire line shall be constructed.

At a distance not less than 100 feet, nor more than 200, from the outer rail on each side the track, and parallel with the track, a ten-foot strip of land shall be entirely cleared of combustible matter. Where the land is swampy, a ditch three feet wide dug to the permanent water level may replace the bared strip. From between this strip or ditch and the roadbed all combustible materials must be removed, except that standing trees above three inches in diameter and not less than six feet apart

may be pruned rather than felled. Standing trees must be not less than six feet apart.

The Forest Park Reservation Commission is made the administrative body, with power to authorize the omission of a fire line or to enforce the construction of such lines, the decision of the commission in all such cases being final.

Copies of this act may be obtained from Mr. Alfred Gaskill, Forester, Trenton, N. J., and may well serve as the basis of similar legislation in other states where fires are frequently kindled by sparks or hot cinders from locomotives. The lessons taught by the experiences of recent years, notably of last fall, regarding damages from forest fires thus kindled should not be forgotten. If they lead, as they are apparently leading in New Jersey, to the enactment and enforcement of appropriate protective legislation the great loss resulting from these fires may, in part at least, in the future be compensated.

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Waste of Resources Due to Fire

AT THE recent joint meeting of four great national engineering societies held in New York City, Mr. Charles Whiting Baker spoke from an engineer's standpoint of the meaning of the continuous waste of property due to fire. His paper, as published in *Insurance Engineering* for April, deserves a résumé.

The fire losses of the United States for 1907 totaled $215,000,000. About half this loss was upon buildings burned or injured; the other half was upon contents. One thousand four hundred persons lost their lives in fires and 5,650 were injured. These fires occurred in 165,250 buildings, and the average damage to each building and its contents was $1,667. In addition to these direct losses by fires were indirect losses, as through interruption to business, maintenance of fire departments, insurance companies, etc.

To comprehend the magnitude of this fire loss, Mr. Baker asks us to picture a city street, on lots with an average frontage of sixty-five feet, and with buildings placed closely together. This street would be a thousand miles long, and would reach from New York City to Chicago. At every thousand feet would be found the ruins of a building from which an injured person was rescued; at every three-quarters of a mile, the blackened wreck of a house in which some one was burned to death.

Let this fire begin on January 1 and be driven by a high wind; eating its way forward at a rate of nearly three miles a day, it would have to burn for a year before consuming the entire double row of buildings. On finishing this street at midnight on December 31, 1907, it would immediately begin upon a second, similar street, burning it throughout the entire year of 1908.

Nor is this the showing for an exceptionally bad year. "The statistics of fire losses gathered for many years by the National Board of Fire Underwriters show that the annual fire loss has been steadily increasing." In the ten years ending with 1887, the annual loss averaged $92,000,000; in the ten years ending with 1897, it averaged $132,000,000; and, in the following decade, $203,000,000.

Let us compare our fire loss with that of European countries. The losses for the people of the United States in 1907 "represented an annual per capita tax of $2.50 on every man, woman and child in the population," or $15 on every head of a family of six persons. The per capita fire loss in the principal European countries reads: Italy, 12 cents; France, 30 cents; Austria, 29 cents; Germany, 49 cents. "It is only in Russia and Norway, where wooden buildings form a considerable portion of the whole, that the fire loss per capita approaches even half of our own per capita rate."

A chief cause of this loss Mr. Baker finds in the disposition of our people, including our engineers, to "run on in a rut." Wooden buildings were once

cheapest; hence we conclude that they are still cheapest; we, therefore, still build them and permit them to ascend in smoke.

Says Mr. Baker: "I do not overstate the case when I say that our American cities and villages are made up almost wholly of fire-trap buildings. We have lagged far behind in our adoption of better and safer methods of building construction. We must, for at least a generation to come, pay the penalty of heavy charges for fire protection, heavy insurance rates, heavy fire losses. And we must continue to bear this heavy tax until we rebuild our cities with fire-resisting structures."

Mr. Baker points to new building materials, and says: "It was the circular saw and the railway that created cheap timber throughout the nineteenth century, and housed the people of the United States in cheaply built and easily burned wooden buildings. It is the rotary kiln for burning Portland cement, the rock drill, the brick press and a thousand other modern inventions that are to create the incombustible buildings which the twentieth century is to construct."

Mr. Baker points out that not only the buildings, but their contents, must be protected, and commends the work accomplished by the factory mutual insurance companies of New England. These companies, insuring chiefly mills which handle cotton, have reduced the rate of loss to about 5 cents per annum for a hundred dollars insured, "a rate of loss little more than a tenth, probably, of the average fire loss on all classes of buildings in the United States."

Mr. Baker next indicates the losses due to forest fires, especially those of September and October last, and aptly says: "What I most want to make clear to you is that unless and until you create in every forest state of the Union effective laws and effective organizations to prevent forest fires—unless and until you do that thing—all our talk of conserving the forests is vain. We cannot get away from economic laws. We cannot expect a man to preserve valuable woodlands uncut when a forest fire may at any time wipe out the property entirely. And the higher the price of lumber goes, the greater the inducement to cut off the trees."

In closing, Mr. Baker points out the connection between the losses due to the burning of buildings and their contents and the general question of conservation. He says: "It is just as much of a drain on the forests to burn up the boards and the timber in a house which must be rebuilt as to burn up the trees before they are cut down and sawed. And not only timber but iron, tin, lead, zinc—all the materials used in building construction and a vast amount of merchandise contained in buildings is devoured annually by the flames." Clearly, the prevention of this waste is an end which may properly enlist the interest and effort of every friend of the conservation of natural resources.

What Shall We Do about It?

REFERRING to the editorial in CONSERVATION for May entitled: "How It Is Done," a friend of conservation, himself a lumberman, writes:

An article of this character, in my opinion, is calculated to do great damage to forest conservation. First, it antagonizes and in a measure destroys the better judgment and sympathy that lumber operators have relating to forest conservation. Second, it creates in the minds of people who have not studied the question the opinion that the lumbermen of the country differ only in acts from pirates in that the work that they do is not at present punishable under the law. Of the two results of articles of this kind, if persistently published, I think the last result cited, inflaming the public mind against the lumbermen, will be the more harmful for the reason that the public mind will become crystallized to a line of action or laws that will be aimed to punish the lumbermen rather than to conserve the forests. I might incidentally remark that the lumbermen now are getting about all of the punishment they can bear.

A little farther over in the magazine, on page 295, editorially, is an article entitled "The Community Must Care for Itself." This article seems to me to be nearer the

line of thought that the public must be educated to in conservation. It is unfair to ask the individual to take on and carry any scheme of practical conservation as an individual proposition. While it is eminently fair that the individual should contribute his fair share as an individual, the community must also contribute its share. This one thought, it seems to me, if persistently brought to the public mind, will crystallize public thought so that they will be willing to adopt some practical scheme of conservation. I am of the opinion that any national law affecting conservation that would affect the individual owners of forest areas alike, would find more advocates among the individual forest owners than would oppose it. The community would, of course, be compelled to contribute its share by paying the increased cost of production.

CONSERVATION appreciates the compliment the writer pays by frankly describing the situation as he sees it. As in the second editorial referred to, this publication has uniformly held and taught that the responsibility for forest destruction rests chiefly not on the individual but on the community, and that a condition which a daily growing number is coming to deplore is traceable chiefly not to the "greed" of the one, but to the ignorance and indifference of the many.

CONSERVATION recognizes that no one better knows the nature and needs of the woods than does the lumberman, and that many of the more progressive lumbermen are ready and eager to apply to their holdings those well-established principles of forestry which, in the long run, are best—not only for the people as a whole, but also for the woods and for those whose business it is to harvest the woods. This publication is aware, however, that in a large class of cases those who would thus apply these principles are restrained from so doing partly by competitors who are not ready to do likewise and partly by a public which will not require lumbermen in general to improve their methods.

It is a hopeful sign that, notwithstanding these embarrassments, there is on record a large number of cases in which lumber concerns have sought advice in the matter of better methods, while a smaller number have actually acted upon this advice. Yet, by the best testimony available there remain, under present policies, but some thirty-three years of life to the timber supply of the United States. In view of this fact and of the consequences which must flow therefrom, CONSERVATION earnestly invites expressions of opinion from lumbermen as to the actual, practical solution. The problem is before us; what shall we do about it?

NEWS AND NOTES

Good Words for Conservation

Words of appreciation for CONSERVATION are pouring in. Ex-Governor Guild writes from Boston regarding the May number: "The last copy of the magazine is the best, I think, ever issued; and I am particularly pleased with the papers of Mr. Bailey Willis and the illustrations."

Then, again, State Forester F. W. Rane, of Massachusetts, puts his views in a nutshell. He says: "May is a great number. Congratulations."

Setting an Example

Ex-Governor Pennypacker is about to plant ten acres with forest trees on his farm as an example to surrounding farmers.

Senator Root Planting Trees

A writer in the *Utica Observer* furnishes a table of the persons who have planted trees in Oneida County this year, and the number each has planted. The total is 86,000. Of these Hon. Elihu Root, of Clinton, planted 64,000, or nearly three-fourths of all. Of his trees, 31,000 were obtained from the Forest, Fish and Game Commission, and the remainder came from the nurseries of other states and Europe. The following are the three varieties and the number of each which he is actually planting: White pine, 16,400; Norway spruce, 15,200; red pine, 5,200; red oak, 6,000; black locust, 5,200; chestnut, 5,000; basswood, 5,200; white ash, 6,000.

Progress in Massachusetts

The office of the Superintendent for Suppressing the Gypsy and Brown-tail Moths, by an act of the legislature of Massachusetts, has been combined with the office of State Forester under the title of the latter. Governor Draper and his council appointed F. W. Rane to the new position on April 14, at a salary of $5,000. The office of State Forester has been moved from the State House to No. 6 Beacon Street, Boston, Mass.

Conservation in Rhode Island

The act providing for a survey of the natural resources of the state passed both branches of the general assembly last night. The work is to be done under the direction of the Commissioner of Industrial Statistics, George H. Webb, in cooperation with the Rhode Island State College and the Federal Government.

Colonel Webb will appoint as the agent to make the survey Charles W. Brown, assistant professor of geology at Brown University.

Conservation in Arkansas

The Arkansas Conservation Commission, recently appointed by Gov. George W. Donaghey, held its first formal meeting on April 21, and effected a permanent organization by the election of Governor Donaghey, chairman, and Sid B. Redding, secretary.

Letters were read from the officials of the National Conservation Commission and from the Joint Committee on Conservation, urging the Arkansas body to begin effective work and requesting that the new state association cooperate with the national organization.

Correspondence was presented from nearly every state in the Union, including various governors and state conservation officials, advising of the progress of the movement in different states and offering suggestions concerning the work.

The governor appointed a special committee to draft a report with suggestions as to the lines on which the commission shall proceed, following which the commission adjourned to meet again in about sixty days.

What Illinois Women Want

In renewing its activities, the Illinois Federation of Women has adopted this platform of things to be accomplished:

"A concerted fight against billboard advertising.

"A movement to establish public comfort stations in the cities of Illinois.

"An investigation of the treatment and care of dependent and delinquent girls in the state.

"A state campaign for a sane Fourth of July.

"A movement to secure a woman physician in every public institution where there are women inmates.

"A campaign to secure the pine woods of Ogle County as a state forest reserve.

"A campaign for the passage of the Eastern Forest Reserve bill, establishing a reserve in the Appalachians and White Mountains.

"An effort to secure women's dormitories at the University of Illinois."

The Ogle County White Pines

Illinois clubwomen are pushing a bill which has for its aim the protection of the slim woodland resources of Illinois. This bill calls for the purchase and reservation by the state of the famous "Ogle County white-pine forest," to be under the administration of a proposed forestry board.

As a rich prairie and farming community, the state cannot afford to part with the few remnants of natural beauty that remain to her. The pine woods of Ogle County, less than 100 miles from Chicago, like Starved Rock, belong to her ancient history. In this 500 acres is to be found part of the original forest of white pine which at one time stretched north into the greater forests that grew about the Great Lakes.

The trees represent the southern limits of their species and have dignity in the eyes of botanists and students of natural history as the last of a splendid army of evergreens, now strangers and unknown to the present generation who till farms over the areas once covered by large forests.

The forest is of that character dear to the botanist and bird lover. At the southern end is a fine growth of young pines, and along the east bank of the creek are the red, white, bur, scarlet and chinquapin oak, white and slippery elm, large-tooth aspen, black walnut, butternut, shagbark, pignut, mockernut hickory, sycamore, hackberry, white and black ash, black and choke cherry, wild plum, basswood, hoptree, black willow, and June berry.

A great variety of blooming plants, vines, and shrubs make the woodlands beautiful at all seasons of the year.

State Parks Win Public Favor

One of the most important projects advocated by the American Civic Association is that of state parks—the purchase and control by the states of areas comparatively extensive which would afford recreation grounds for the citizens and, at the same time, conserve the natural resources and natural beauty of scenery possessed by every commonwealth.

The State of Wisconsin has begun action along this line, having undertaken an examination and appraisement of its resources with a view to setting aside parks. The handling of this work has been entrusted to a board consisting of Messrs. T. E. Brittingham, E. E. Browne, and W. H. McFetridge, assisted by Mr. John Nolen, a landscape artist of national reputation and a member of the executive board of the American Civic Association. While Mr. Nolen's report dealt especially with four prospective Wisconsin state parks, its general suggestions are of universal application. First of all, Mr. Nolen expressed the wisdom of prompt action by the states "while the property desired can be purchased at a reasonable figure and at a price which would prove an excellent investment from a purely money viewpoint." As to the object of state parks, he said that they should be selected with a view to conserve natural resources and natural beauty of scenery.

"There are thousands of persons in every section of the country in need and in search of the wild and beautiful places of nature, and in almost every state of the Union there are places fitted to supply their need and reward their search. It would seem like a clear case of demand and supply. Most of these places are not of such a character as to form national parks, nor are they so situated as to serve the needs of a single city. The result is, that they either are being ruthlessly destroyed or are gradually drifting into private possession for purely private uses."

Mr. Nolen referred to the several state parks maintained, in a restricted way, by Massachusetts, New York, California, Pennsylvania, New Jersey, and a few other states, and then, discussing the general requirements, he said, in substance:

"The main purpose of state parks is to refresh and strengthen and renew tired persons, to fit them for the common round of daily life. They should be large to accommodate great numbers, 2,000 or 3,000 to 5,000 acres. They should be accessible, within a reasonable distance, and at a reasonable cost. Air and climate should be salubrious, and the situation should be healthful. The property acquired should be reasonable in cost; seldom would a state be justified in paying more than $100 an acre for land, and $25 has been the average price. They should be 'natural' stretches of land of intrinsic beauty. They should be of uncommon beauty, a distinction among landscapes, an irresistible appeal to the nature lover."

In justification of the investment of state money in such parks, Mr. Nolen said, regarding Wisconsin, but of equal force as to other states:

"State parks would, in common with the forest reservations—the great economic value of which is now unquestioned—preserve and

protect just so much more of the woodland of the state and the stream flow dependent upon it. They would provide the best method of preserving places of historical and scientific interest. They would secure a necessity of modern life before it is too late.

"State parks would give an economic return from tourists and visitors.

"State parks are the only means of preserving, protecting, and appropriately improving places of uncommon and characteristic beauty.

"Finally, these parks would make, as no other agency can, adequate and permanent provision for wholesome out-door recreation and pleasure.

"If it is right for the state of Wisconsin to spend $1,250,000 upon charitable and penal institutions, as it did in 1908, made necessary in part at least by unfavorable physical and social conditions, is it not wise and good to spend something upon preventive measures which would make such institutions less necessary? Who questions nowadays that simple recreation in the open air amid beautiful natural surroundings contributes to physical and moral health, to a saner and happier life? These parks are the only security that the future holds out for persons of small means."

Immense Profits of German Forests

In view of the general interest in municipal or communal forests, as advocated in this country by the American Civic Association, the report obtained by S. B. Elliott, of the Pennsylvania Forestry Reserve Commission, concerning the practical value of such woodlands in Germany is a remarkable document. This shows the actual profits obtainable from public forests.

There are 1,342,944 acres of forests in Baden, which state has a total area of 3,726,665 acres. Of the wooded lands, 577,465 are owned by communities and corporations. In Baden, 1,350 of the 1,564 communities have forests and, in addition, 287 schools, churches, hospitals, and other similar corporations are engaged in practical forestry. From these public forests there are allowed to be cut yearly 261,724,300 board-feet of timber, which has a value of $3,600,000 free of expense of cutting.

As an instance of the communal forests, the city of Baden has 10,576 acres, the income from which is $100,471, as against an outlay of $33,391, so that the net profit is $66,080, or approximately $6.25 an acre. In Freiburg, the forests cover 8085 acres, representing a total income of $84,166, with an outlay of $37,330, or a profit of $46,836, or $5.79 an acre. In Heidelberg, the forests cover 6860 acres. The income is $39,834 and the outlay $27,199, showing a profit of $12.635. Heidelberg still is acquiring land, and that expense necessarily reduces its net income.

In the village of Braunlingen, which has 1,601 inhabitants and 4,507 acres of forests, there is an allowance to the citizens of firewood and 100,000 board-feet of lumber is given to churches, schools, and other public institutions. From the timber sold, the net income is $21,600, and Braunlingen not only is free from all communal taxes, but is enabled to establish electric plants, waterworks, and other public improvements.

Even in the village of Aufen, with only 220 inhabitants, there are 163 acres of timberlands. This gives 2,000 board-feet of firewood to each citizen, and the 85,000 board-feet of timber sold nets more than $1,400, which is sufficient for all expenses of the little community.

These advantages of public forests could be multiplied to the number of every community having them. According to the latest report, the various German states having productive communal forests are: Prussia, 6,309,109 acres; Bavaria, 2,041,450 acres; Wuertemberg, 466,203 acres; Alsace-Lorraine, 373,417 acres; Baden (domains), 239,896 acres; Hessia (state and domains), 177,923 acres; Prussian Crown, 165,492 acres; and Fuerstenberg, 74,493 acres.

In Hessia, forests are being planted upon land hitherto devoted to agriculture.

The Biltmore Fires

Dr. C. A. Schenck, Director, Biltmore Forest School, writes:

"As regards the forest fires at Biltmore, I am glad to say that the newspaper reports have been exaggerated. Only two acres of my plantations were destroyed; 12,000 acres of primeval forests were run over by fire, and, naturally, the young growth was annihilated.

"By many years' protection, the vegetable mold on the ground had accumulated, and a dense stand of young growth had been produced. Both are gone. * * * All our fires were of incendiary origin."

Yale Forestry Students in Texas

A Yale party consisting of two professors and twenty-nine senior students is in Texas studying forestry. Says the *Somerville* (Mass.) *Reporter:*

"The party is in the east Texas yellow-pine district, encamped in the thickest of the timber territory, in the very jungles of pine, and in the last term of their course in the Yale Forestry School, though they are far from New Haven, they are doing full work daily and getting credit for it, and will graduate in June with just as much effect to the diplomas as the B.A.'s and the LL.B.'s and the B.D.'s and the other fellows in cap and gown and marching processions who

finish their course with all the ceremony and display of the commencement occasion."

The party came on the invitation of Mr. J. Lewis Thompson, of the Thompson Bros. Lumber Co. Mr. Thompson provided a cabin containing bunks for the entire party. The students, however, preferred tenting outside.

The *Reporter* continues:

"'Better'n New Haven,' is the way one of the foresters described the eating. Probably the fare isn't any better, maybe not as good; but the exercise in the woods, the open air, and the pine-scented atmosphere and the clear sunshine, and a score of other features, all have influence combined to create wonderful appetitites, and the joy bell at the mess hall never fails to bring unanimous response."

American Pomological Meeting

The executive committee of the American Pomological Society, a national organization, has accepted a joint invitation tendered by the Ontario Fruit Growers' Association, the Niagara District Fruit Growers, and the St. Catherines Horticultural Society to meet at the city of St. Catherines, Ontario, Canada, September 14-16, 1909.

The secretary of the general executive committee is Mr. P. W. Hodgetts, of Toronto. The secretary reports that an unusually large number of state horticultural societies have appointed delegates to attend the meeting. This will insure a wide representation and a diversity of interest which will present exceptional opportunity for considering in a satisfactory way legislative questions of interstate significance. A great exhibition of Canadian-grown Lake Ontario fruits will be in progress at the time of the meeting.

The fruit region between Niagara and Toronto is the most intensively cultivated region in Canada. Excursions through this famous section will be arranged for the pleasure and profit of the visitors.

The program may be expected to include the latest and best in the entire field of pomology.

Remember the Raisin!

The interest of much of the United States has been centered upon California Raisin Day, April 30, as a result of the determined and systematic campaign being carried on by the raisin growers of the Golden State to convince the people of this country that raisins are not only an article of dessert to be used on rare and state occasions such as Thanksgiving and Christmas, but an every-day, staple article of food. When one pauses to consider that a pound of raisins is equal in food value to nearly a pound and a half of beef, as shown by United States Government analysis, it is a matter of wonder that raisins have not long ago become a part of the daily food of the people. This fact has been recognized for hundreds of years by the people of European countries, where the consumption of raisins per capita is about five or six times greater than in America.

From all indications, the growers will succeed in their endeavor to bring the heretofore unrecognized raisin into its own as a cheap, popular food for all the people, as no more nutritious and nourishing fruit exists.

The Counties Committee at Work

A special train containing over 100 delegates from various commercial bodies of San Francisco and northern counties left on May 7 for Del Monte, where representatives of all the other counties of the state were waiting for the opening of the convention at nine-thirty on the morning of the 8th. The one great topic to be considered was the conservation of the natural resources of California, this being the first state-wide movement instituted anywhere in the country for such a purpose. The conservation of the natural resources of California was the subject-matter of resolutions, reports and addresses. Delegates from sixty-three affiliated organizations assembled in the art room of the Hotel Del Monte to plan new steps in the cooperative movement that has proved so far-reaching in the upbuilding of the Golden State.

Among the results of the deliberations were unanimous endorsement of the proposed $18,000,000 bond issue for the improvement of the state's highways; the signing of a petition to the National Government for the opening of Yosemite Park to automobiles, and the endorsement of suggestions for highway tree-planting and the conservation of forest areas.

Resolutions were adopted praising the conservation policy of the Federal Government; endorsing the plan proposed by the Rivers and Harbors Congress for the issuance of Government bonds for the improvement of navigable rivers; endorsing the Federal Government's action in reducing the charges upon electric power developed by the use of stored water; thanking Congress and the state legislature for appropriations made in aid of the viticultural industry, and endorsing the work of the United States Weather Bureau.

Utilizing a Volcano

An American in Hawaii has discovered a new use for a cheap and common article, and a new way of preparing it. The article is the giant fern, and the method of preparing it is to cook it over a volcanic crack,

after which it becomes a highly acceptable object of diet for hogs.

Peter Lee, an American, has a ranch right on the edge of the great crater of Kilauea, on the Island of Hawaii, some 200 miles from Honolulu. All about the tremendous cauldron of nature spread dense forests for many miles down the easy slope of the mountain's sides. Very much of this tangle of vegetation is made up of great tree ferns, many of which tower fifty feet or more in the air, like great feather dusters. The great trunk or stem of this fern, frequently a foot or more in diameter, is composed of a pulpy, fibrous mass enclosed in a hairy harder covering. Peter Lee discovered that this pulp contains a large amount of starches and sugars, and that by steaming or cooking these are rendered soft, and are greedily eaten by the hogs.

In many places about the volcano, sometimes several miles from the active central pit, cracks have formed in the hardened lava surface which covers the whole mountain, and from these fissures heat and steam perpetually escape. To construct a gridiron over one of these heat cracks, and to pile upon it the fern-trunks, cut into cord-wood lengths, was the acme of simplicity and effectiveness. In the course of a few days the steam has thoroughly softened and cooked the ferns, and all that remains to do is to split each stem with an ax, when the swine will devour them voraciously.

Dr. E. V. Wilcox, director of the Hawaii Experiment Station, believes that Hawaii's ferns may come to be of considerable economic importance as a stock food. Fern roots have had some value in this line in some parts of the Northwest, where the growth is comparatively scanty, and if the food value of Hawaiian ferns prove as high, large tracts of forest land are likely to acquire a new value.

Mr. Newell's Visit to Hawaii

In the Fifth Report of the Board of Commissioners of Agriculture and Forestry of the Territory of Hawaii occurs this paragraph, which, in view of Mr. Newell's long and important connection with the American Forestry Association, should be of especial interest to the readers of CONSERVATION:

"The event of greatest importance in conservation matters in Hawaii during 1908 was unquestionably the visit to the islands in the autumn months of Hon. F. H. Newell, Director of the United States Reclamation Service. Following almost immediately Secretary Garfield's return to the mainland, it shows that Hawaii's claims for recognition are not only being heard but responded to from Washington. Already Mr. Newell has been of signal assistance to the territory in getting the plans for a hydrographic survey definitely under way. The coming year will see no small development along that line. All of which leads to making Hawaii a better place to live in and consequently to its development as a true American community.

"At the invitation of the governor, the Superintendent of Forestry accompanied Governor Frear and Mr. Newell on a portion of their tour of the other islands, going with the party to Molokai and Kauai. On these trips it was possible to discuss with Mr. Newell a number of forest problems on the ground. Needless to say, many valuable suggestions was one result of these informal conferences."

Conservation in Hawaii

On March 1 last the Governor of Hawaii and his conferees who attended the Governors' Conference in Washington last May appeared before the Hawaiian legislature and delivered a series of addresses. From these extracts are taken. Gov. Walter F. Frear said, among other things:

"Congress in general believes in helping states and territories that help themselves. It is now helping us in many ways. It is beginning to help us in the matter of forests, which is one of our most important natural resources, not merely for the purpose of the timber, but mainly for the purpose of conserving the water, for purposes of irrigation and power and domestic use. We need to experiment with a view to obtaining new varieties of trees which will be good for timber and which will grow at our high elevations, particularly where now scarcely anything will grow."

Mr. Ralph S. Hosmer, Superintendent of Forestry, and chairman of the Territorial Conservation Commission, says, in part:

"Fortunately, on the windward side of the islands there are numerous streams, which, with the artesian water in other places, are sufficient to supply most of the needs for water if the forests and the streams are handled in a judicious manner. Because of the steep, short water-sheds, it is essential that there be maintained a cover of vegetation on the catchment basins of the water-sheds. Without such a cover of vegetation, the water quickly runs away, not only being lost to human use, but doing considerable damage through the erosion of the upper parts of the valleys and the flooding of valuable lands below. The Hawaiian forest is admirably adapted to act as a protective cover on the water-sheds. When the water-shed is covered with vegetation the dense tangle of trees, shrubs, vines, ferns, and moss retards the run-off, prevents erosion and stores up the rainfall. The water is then gradually given out to feed the springs and streams, which results in a fairly constant flow. The native forest is the best possible cover for the water-shed. Consequently, in view of the value of water to

the territory, the only wise course is to protect the forest cover on all the streams that are or may be needed for economic use. The preservation of the forest saves the waters. The assurance of a dependable supply makes possible the development of land that could not otherwise be turned to useful account. In Hawaii, lands, waters and forests are interdependent, so that a policy of conservation is essential.

"The Hawaiian forest is easily damaged from fire, cattle, and from other causes, and it is essential in order to get the best results that the forests be protected. That the forests may be better protected and more easily handled to the end that the waters they safeguard may be used in economic ways, forest reserves have been created and will continue to be set apart.

"There have now been established sixteen forest reserves on the four main islands of the group with a total area of 444,116 acres. Of this sixty-one per cent. is Government land. It is probable that the creation of forest reserves will go on until eventually about three-fourths of a million acres will be so included, and these forests should be maintained and kept intact so that the water from their streams may be turned constantly to human account.

"At this point I may say that the relation of the forests to the streams is essentially the feature of Hawaiian forestry and that wherever there are streams, the forests should be protected. In some of the leeward districts there are forests which may be treated from a commercial standpoint, because in those localities there are no running streams and only a few springs to be conserved. But far and away the most important use of the Hawaiian forest is that it protects the streams. Wherever there is a water which may be turned to account this is the chief value of the forest. * * * The Federal Government, through the Forest Service, has this year given the sum of $2,000 for experimental work in planting pines, spruces, and firs at high elevations on Mauna Kea and Haleakala. Inclosures are now being made in which experimental lots of these trees will be set out. This is a step that should lead in time to the afforestation of those mountains.

"The relation of forests, waters, and lands is of peculiar importance and interest in Hawaii. These three natural resources are interdependent. The essential need at the present time is for the careful study and investigation of the local water problems by trained men—the experts of the United States Geological Survey at Washington—as a preliminary step to the extension to Hawaii of the Reclamation Service."

Dr. Jared G. Smith said:

"The actual amount of water that falls in that Kona forest—and that forest is on the dry side of the island—amounts in the course of a year to 400,000 billion gallons of water, an amount that is absolutely beyond comprehension. And yet no effort has been made to conserve that water. We have just had a drought affecting the whole dry side of the Island of Hawaii. We had to buy water, but during years past and for all time there has been this enormous quantity of water that could have been, much of it, conserved for the benefit of agriculture, not only in the Kona district, but elsewhere on the island. Not one per cent., I think not one-tenth of one per cent., of the water supplied by the rainfall is now preserved for use by the plantations or by the farmers. It is a money proposition; it is a business proposition. * * *

"Without the forest to retard the run-off, there follows flood and destruction. We have all of us seen the ocean reddened for miles from the land with the surface soils from our cultivated fields. We have seen fields, the entire surface, swept into the ocean. This loss is not simply a loss to the individual plantation or the individual farmer affected, but it is a loss to the territory—it is taking away from the natural resources of the territory some of its capital. Besides the actual conservation of water, in order that we may use it, besides the actual preservation of forest in order that we may use it, and besides, well, besides both these, we must conserve both the forest and the water in order to save our soils. Water is necessary for the growth of plants, it is necessary for our domestic stock. If any one of us discovers that he has a hole in his money pocket, he mends it; it seems to me that the territory has a hole in its money pocket, and the legislature should see that there is a hole there and try to stop it, in order that loss of actual property resources shall no longer continue."

Judge Sanford B. Dole said:

"It is, I believe, ascertained that the air from forests is cooler than the air from lands devoid of vegetation, and this is one reason why clouds appear above forests and not over surrounding regions that are devoid of vegetation and where the air above them is saturated, is full of moisture; the cooling air is more likely to produce showers than the air from other regions which are bare of vegetation. It may be said, perhaps more correctly, not that forests create showers or produce them, but rather that they allow the showers to come down. * * *

"I say that the question of the protection of rainfall is something to be considered in view of the interests of the small landholders; that if possible the droughts which sometimes occur and drive them away from their homes, which make water an article to be supplied by the quart for drinking purposes and sometimes not obtainable even then, should be lessened—that the conservation of forests there in that region reaching from North to South Kona, Kau and in the Puna district, is something to be considered from the standpoint of the small landowner. The same condition exists in

Kula on Maui. It was a terrible hardship to those people last year to have to leave their homes because they had no water and had to drive their live stock miles away every other day to get water to keep them alive. In Kau the ground was strewn with cattle which had starved to death for want of grass and water."

Protecting Water Supplies

Says the *Cleveland* (Ohio) *Plain Dealer:*

"While a few theorists—and increasingly few—still argue against the prevalent notion that an intimate relationship exists between forests and stream flow, it is noticeable that those who have the responsibility of conserving water supplies adopt the general and the sensible view. Those on whom the responsibility rests to supply the cities with an unfailing supply of water display no doubt that the existence of forests about the sources of streams tends to regulate their flow and insure their stability.

"The State Forester of Massachusetts recently made a report, discussing in a comprehensive manner the large question of forest influence on water supply, a subject of live interest to many municipalities in that commonwealth. He proposes a program of reforestation for the protection of the watershed near Fall River, which is applicable in a general way to other communities in that and other states.

"There is evidence here and there of an intention on the part of various states to cooperate with the National Government in the conservation of natural resources. Is it not possible that municipalities will find it to their interests to join in the same movement in order to protect their sources of water supply?

"The importance of an adequate and reliable supply of pure water is paramount in every city. Those which must depend on streams or upon artificial or natural reservoirs will find it increasingly difficult to protect and insure their supplies unless some progressive policy of conservation is followed."

Good Work by the Pennsylvania Railroad

The Pennsylvania Railroad is planning to set out this spring more than 1,000,000 trees. This will make a total of 3,430,000 trees which have been planted in the last three years to provide for some of the company's future requirements in timber and cross-ties. This constitutes the largest forestry plan yet undertaken by any private corporation.

Heretofore the company's forestry operations have been confined to a limited area between Philadelphia and Altoona. This year, however, 65,000 trees are being set out on tracts of land near Metuchen and New Brunswick, N. J. In addition, there are to be planted within the next month 207,000 trees near Conewago, Pa., 186,000 in the vicinity of Van Dyke, 334,000 at Lewistown Junction, 7,000 at Pomeroy, and 205,000 at Denholm.

The bare places in the locust-tree plantations, which were started some years ago, are being filled in with new seedlings, in order that these may follow as a second growth after the older trees have been removed for fence posts and other purposes. Of the trees that are to be set out this spring, 893,000 are red oak, 40,000 Scotch pine, 29,000 locust, 14,000 hardy catalpa, 14,000 pin oak, 5,000 European larch, 3,000 chestnut, 3,000 yellow poplar, 2,000 black walnut, and 1,000 white pine.

The policy of encouraging reforestation on the part of the public has been actively pursued this spring. Some 151,000 trees have been furnished, practically at cost, to private corporations and individuals. In addition, 8,000 privet hedge plants have been supplied to private individuals. Privet hedge plants to the number of 7,000 are to be set out to ornament boundary lines along the company's right of way.

A special effort has been directed this season to growing ornamental shrubbery for use in parking the lawns around stations and unoccupied spaces along the roadway. To save the time required to grow these from seed, 6,000 plants have been imported from France. They will be placed in beds, at the company's nursery at Morrisville, N. J. Part of them will be ready for transplanting next year, and the remainder in 1911.

Indicative of the scope of the forestry plan of the company this year is the fact that at the Morrisville nursery alone, approximately 1,250,000 trees have been dug, bundled, and shipped to places along the railroad. The area occupied by these trees has been plowed, fertilized, and is to be replanted with about 200 bushels of acorns. Half a million coniferous seedlings, which were grown last year, are being set in transplant beds to remain for a year before being set out permanently. In addition to the above, there will be planted this spring about 100 pounds of pine and spruce tree seed, which should produce about a million plants. These in time will be transplanted in permanent locations.

Growth of the Forest Service

In a display paragraph on its front page, *The Prairie Farmer* of May 1, publishes the following:

"Gifford Pinchot was made chief of the Division of Forestry during the Spanish-American War. At that time the division was composed of eleven persons, six of whom were clerks and five scientists. Some idea of the growth of the Forest Service, as it had later come to be known, is apparent when it

is understood that over 400 persons are now in the work of the bureau. A dozen years ago almost nothing was known about forestry in this country. During the past few years Mr. Pinchot has attained a world-wide reputation on account of his work in developing the Forest Service. Probably no factor has contributed more to the success of this work than Mr. Pinchot's attitude in getting close to the soil, and doubtless no item of his policy has brought greater practical results than his practical assistance for forest owners. Mr. Pinchot's career is an excellent illustration of what a man of independent wealth may accomplish when he devotes his life along lines for the betterment of the public."

Mr. Pinchot at Delta

In the course of his recent western trip Mr. Gifford Pinchot visited Delta, Colo. At his meeting the Opera House was packed to the doors. The *Delta Independent* said:

"But very little opposition has ever developed on the western slope to the forestry system, and in Delta and Montrose counties there doesn't seem to be any at all. The stock interests here appear to be a unit in its favor, hence the head of the Service found himself entirely among friends."

In the course of his remarks, as reported in the Delta papers, Mr. Pinchot said:

"The Service is for the public good instead of private gain and to provide more homes for our people.

"The forest policy is both democratic and republican and fights special privilege for public good.

"It is probable that our coal measures will be exhausted by the middle of the next century. Our iron ore will be gone in forty years and our supply of oil and gas in about the same time.

"At the inauguration of the Forest Service we found that there was great waste of our resources going on. As an illustration ninety per cent. of our water, which is so much needed in the arid sections, was going to waste. By the middle of the century 150,000,000 of our own people will have to be fed from our own soil and no good citizen will deny that the people should apply the same rules to the government of the nation that one would to his family, and that nothing be wasted.

"Monopoly is the opposite of conservation. Foresight is necessary to success. Conservation means the ordinary business principles applied to government.

"The forest areas are great and evils creep into the Service, but with the cooperation of local people we can succeed in our work. We have endeavored to ascertain where wrongs have been done so that we might remedy them. Complaints have been of two classes: From those who could not get what they should have, and from those who wanted what they should not have. To the latter we have no apologies to make. This Service stands for the small man—the home-maker. Prospectors may enter the reserves for legitimate work, but we do not intend to allow persons to take up land, under the guise of mining, for some other purpose.

"We are pushing out the work of the Service from Washington to the various district offices, to those on the ground, and we believe that the men in the districts are good men. Before leaving Washington I saw President Taft and he said to tell the people out in Colorado that the administration is back of the Forest Service and is trying to work with the people of the West for their own best good.

"If, by mistake, injustice has been done to any man, it will be corrected, so far as I have the power.

"The general forest policy has been established, and it will move along under the new administration as under the old.

"I do not believe the change in presidents will have any effect on the forest policy; I have seen no signs of it.

"Of the total amount received from those who received direct benefits from the use of the varied resources of the National Forests of Colorado last year, twenty-five per cent., or $59,761.28, was turned over to the state to be used in the development and maintenance of roads and the public-school system.

"The Forest Service exists not only to protect the National Forests. It exists just as much to develop the Nation and the states in which they lie, and it has no stronger desire than to promote and foster the development of Colorado and every other western state. No more complete mistake about the National Forests has ever been spread abroad than that they are shut against development and use."

Mr. Pinchot was listened to with the utmost attention, and at the conclusion of his address he was heartily applauded.

Other speakers, including Hon. Frank C. Goudy, John C. Bell, M. D. Vincent, and Judge A. R. King, also spoke.

To Examine National Forest Boundaries

The Forest Service plans a thoroughgoing examination of National Forest boundaries and an inquiry into the character of any inferior areas which may appear to be unsuited for National Forest purposes. Special effort will be made to exclude from the National Forests land better suited for agriculture than for forest purposes.

Withdrawal of Public Lands

The Secretary of the Interior has temporarily withdrawn from any form of disposition whatever under the public-land laws the following tracts of land:

Ten thousand two hundred and forty acres lying in Tps. 20 and 21 S., R. 28 E., Willamette Principal Meridian, for the Emigrant Creek Reservoir in connection with the Harney Project, Oregon.

Under the Deschutes Project, Oregon, Willamette Principal Meridian: Sixteen thousand six hundred and forty acres in T. 24 S., R. 6 E., for Crescent Lake Reservoir; T. 23 S., R. 6 E., all of unsurveyed township, for Odell Lake Reservoir; 23,040 acres in T. 25 S., Rs. 6 and 7 E., for Big Marsh Reservoir.

Senate Committee to Visit Irrigation Projects

United States Senator Thomas H. Carter of Montana, chairman of the Senate Committee on Irrigation and Reclamation of Arid Lands, advises R. Insinger, chairman of the Board of Control of the National Irrigation Congress, that he will attend one or more days at the seventeenth session in Spokane, August 9 to 14, but he does not believe the committee will be able to be present in a body. He adds:

"The committee will start on a tour of inspection of the various reclamation projects of the Government about September 1, accompanied by the Secretary of the Interior and the Director and Chief Engineer of the Reclamation Service."

The committee, which is composed of thirteen Senators, will visit the projects in Kansas, Nebraska, North and South Dakota, Montana, Wyoming, Colorado, Idaho, Washington, Oregon, Nevada, Utah and California, passing one or more days in every community to familiarize itself with what has been accomplished under the Federal Reclamation Act, and to ascertain if any changes are required in the statute to make it more effective.

Irrigation in Washington

More than 100,000 acres of land, exclusive of Government projects, will be added to the irrigated area in eastern and north central Washington this year, and arrangements are also under way to put water on thousands of acres of land in northern Idaho and Oregon, western Montana and southeastern British Columbia. As most of these lands will be devoted to apples, peaches, pears, and plums, it is estimated that from 7,000,000 to 10,000,000 trees will be planted during the next fourteen months, giving employment to hundreds of men in various parts of the Inland Empire this spring, next fall and the spring of 1910.

Reports are also current in Spokane that the Federal Government will take up the Benton and Kittitas projects, 877,800 acres, in Yakima, Klickitat, and Benton counties, already reported upon by the Reclamation Service, and it is believed that the Palouse projects, 100,000 acres, abandoned by the Reclamation Service because of the lack of funds, will receive attention this year. Other government works in Washington to be taken up include 50,000 acres in the Ellensburg district, 200,000 acres in the Rattlesnake and Coal Creek districts, and 10,000 acres in the Okanogan country.

The Government will in time have reclaimed 1,500,000 acres of wholly or partly waste lands in the state of Washington at an estimated cost of $50,000,000, which is prorated among the owners of the land where water is used. The projects in operation and under construction by the Reclamation Service include these works in the Yakima Valley: Sunnyside, 90,000 acres, to cost $1,600,000; the Tieton, 30,000 acres, costing $1,500,000, and the Wapato, 120,000 acres, to be completed at a cost of $1,500,000.

The National Irrigation Congress at Spokane

Prepartions for the National Irrigation Congress, in Spokane, August 9 to 14, are being vigorously pushed. Mr. R. Insinger, chairman of the board of control, is the leading promoter. Governors Shallenberger of Nebraska, Campbell of Texas, Spry of Utah, and Ansell of South Carolina have named delegates, as have also Mayor Crittenden of Kansas City, Mo., and Mayor Fugard of Pueblo. The latter city expects to send a special train or two and capture the Congress for 1910. Senator Jonathan P. Dolliver, of Iowa, chairman of the Committee on Agriculture and Forestry, who is planning an extended trip throughout the Pacific Northwest, announces that he hopes to attend the congress.

Senator Dolliver is deeply interested in the problems pertaining to agriculture and forestry, also questions of deep waterways, drainage, good roads, and home-building, all of which questions will be discussed by experts, including statesmen, scientists, railroad presidents, and financiers.

Dr. J. G. Schurman, President of Cornell University, announces the appointment of Prof. Liberty Hyde Bailey, director of the College of Agriculture at Cornell, as the representative of that institution. Professor Bailey was head of President Roosevelt's farm-life commission and, as such, toured the Inland Empire and Pacific Northwest last fall, acquiring familiarity with western conditions, including irrigation, forestry, waterways, swamps, reclamation and the like.

August 13 has been fixed upon as Governors' Day, when chief executives of the northwestern states and others of the East and South, will be present at the invitation of Gov. Marion E. Hay, of the state of Washington. President Taft and several members of his Cabinet are expected, and

accredited delegates from various parts of the world to the number of 4,500 or 5,000 are expected.

Mr. Pinchot to Attend National Irrigation Congress

Mr. Gifford Pinchot, Chief of the Forest Service, who will be one of the speakers at the sessions, writes to Mr. Insinger that he will be at the congress from start to finish. Mr. Pinchot also probably will visit a number of places in the Northwest following the sessions in Spokane. It is expected he will be accompanied by several officers of the Service on his western trip.

Competition for Next Irrigation Congress

Competitors are multiplying for the next irrigation congress. E. W. Palmer, secretary of the Pueblo Business Men's Association, writes to Mr. Hooker that a strong effort will be made to secure the 1910 congress for his city. Chicago, the great convention city, will also press its claim as a logical center for the next congress. Advices have been received that a special train of boosters will come from that city to Spokane with the endorsement of the Chicago Association of Commerce and officials of railroads. It is also known that the South will make a strong bid for the congress, the most persistent contender being Charleston, S. C. A report is also in circulation that two other cities are planning to invite the Congress to meet in the middle West.

Land and Irrigation Exposition

A movement has been started to hold a United Land and Irrigation Exposition at the Coliseum in Chicago beginning November 26, coincident with the opening of the International Live Stock Exposition. Railroad and land interests in Chicago are back of the movement. To the *Chicago Tribune*, as a disinterested party, has been delegated the financial and executive responsibility for this exposition.

The purposes of the United States Land and Irrigation Exposition, as pointed out by Secretary Robert P. Cross, "are to illustrate to prospective settlers methods of cultivation, and to show what can be produced on lands now under irrigation, on lands on which crops may be successfully raised by 'dry farming,' and on lands still undeveloped where rainfall is bounteous."

"The United States Land and Irrigation Exposition, as proposed," says the *Prairie Farmer*, "is deserving of full and hearty support and will doubtless meet with the hearty sympathy of all who are interested in developing and conserving the national resources."

Nebraska No Longer "Wild"

A breezy reporter for a Chicago newspaper wrote of "brushing by the wilds of Nebraska," and referred again to "the forlorn wastes" of that state. In an interesting pamphlet, the *Twentieth Century Farmer* calls him down. Following are a few extracts relative to the alleged "wilds" and "wastes:"

"'The forlorn wastes of Nebraska,' wrote the *Record-Herald's* correspondent. 'Forlorn wastes' that produced 178,000,000 bushels of corn, 56,000,000 bushels of oats, 43,000,000 bushels of wheat, 8,000,000 bushels of potatoes, 2,000,000 tons of alfalfa, $50,000,000 worth of cattle and $12,000,000 worth of hogs in 1908! 'Forlorn wastes' that sell for from $75 to $350 an acre. 'Wilds of Nebraska'—and Nebraska with 7,000 school buildings, $8,000,000 in the permanent school fund and $27,000,000 worth of school lands pouring more millions into that fund every decade!

"'Barren wastes' from which ascends the smoke from manufacturing plants that have a capitalization of $50,000,000, employ 20,000 wage-earners and pay $10,000,000 a year in wages while turning out finished products worth $175,000,000 on the open market!

"There is more of pauperism, human suffering and abject misery in one ward in the city of Chicago than there is in the whole state of Nebraska. In the 'wilds of Nebraska' there are school houses with room enough therein to accommodate every Nebraska child of school age, and on Nebraska's 'barren wastes' is raised enough of wholesome food to give every child a breakfast before he goes to school and put a full dinner pail in his hand when he starts. On these 'barren wastes' we have erected and maintain the fourth largest state university in the Union and two of the largest normal schools in the country. On these 'barren wastes' 897,000 milch cows, worth an average of $31 a head, are converting nutritious Nebraska grasses into $7,000,000 worth of butter and cheese, and the happy wives and daughters of farmers are seeking the nests of the industrious Nebraska hen and collecting $18,000,000 worth of eggs.

"'While traveling in the wilds of Nebraska' and 'gazing over the forlorn wastes of Nebraska' the *Record-Herald* reporter missed a whole lot. For each man, woman and child in Nebraska there is an average of $159 deposited in the banks of the state. For each child of school age the state expends $27 a year in educational work and for each enrolled pupil an average of $30 a year."

Investment in Water Transportation

"Within a few months a new thirty-five-foot channel will connect the lower Mississippi with the Gulf of Mexico. This is only one of the numerous developments in the way of transportation by water. Projects are already under way which mean an investment of hundreds of millions of dollars in the course of probably no more than ten years. Among them is the work on the New York State canal system, involving the expenditure of $101,000,000 of public funds. Several millions more will be required for the canal terminals made necessary by this method of navigation.

"The Business Men's League of St. Louis has already enlisted some millions of dollars in the effort to restore the Missouri and Mississippi river traffic, with terminals at St. Louis, at Kansas City, and at New Orleans. Two new coastwise steamship lines will within a month or more be operating between Philadelphia and the Gulf. On the Pacific coast the development of Mexican and American trade relations is adding to the shipping there, including the Hill line connecting the north coast terminals with San Francisco.

"The impulse to internal navigation and to coastwise commerce is manifested further in Congressman Ransdell's bill to organize a department of transportation, in the advocacy of the issue of $50,000,000 of United States bonds for the improvement of canals and interior streams, and in the survey of the project for a coastal canal extending from Boston harbor to Galveston.

"No threat to our railroad development as a whole is implied. Such water facilities, in fact, have usually brought more new business to the railroads than they have taken away."—*Wall Street Journal.*

"Kansas City is raising a million dollars to get a boat line on the Missouri River, 1,500 miles from blue water. New York State is spending $101,000,000 improving the Erie Canal. Canada is spending $100,000,000 making a canal from Lake Huron to the St. Lawrence River, and the state of Illinois is spending $20,000,000 to get deep water from Chicago to the Mississippi. Beaumont, by the way, will very shortly vote $400,000 to get deep water down to the Port Arthur outlet, enabling her to bring deep-sea ships up to city wharves in the Neches River."—*Houston* (Tex.) *Chronicle.*

To Reclaim Oklahoma Land

Many thousands of acres of the richest agricultural lands in Oklahoma, now uncultivated, are to be reclaimed and made permanently useful under a law of the first legislature that permits counties and communities to cooperate with the Federal Government in the drainage of swamp and overflow lands. Throughout almost the entire course of the Deep Fork and Little River, and for long stretches along the North Canadian and Washita, are large areas of land that are either swamp or subject several times a year to inundation. The soil is as rich as may be found, of great depth, and capable of producing heavy crops for an indefinite period. The reclamation of these lands will be a source of wealth to their owners.

Since January 1 surveyors and Federal engineers have been at work in Johnston County preparing for the drainage of 5,995 acres of land contiguous to Sandy Creek. About eight miles of canals, and a number of levees will be built, at a cost of $30,000, which will be charged against the land in proportion to the benefits derived.

Work on the Washita bottom lands in Marshall and Johnston counties will begin as soon as the Federal Government makes a complete survey of the Washita River from the upper edge of Garvin County to the mouth of the river, giving an estimate of the cost of the drainage of the entire river country.

Surveys are under way in Lincoln County to reclaim Deep Fork lands.

The Largest Fountain in the United States

Near the Great Falls of the Missouri in north-central Montana are some very large springs that present certain unique geologic features and suggest an interesting problem as to the source of the water. These springs, known locally as Giant Springs, were discovered in 1804 by Captain Lewis, of the Lewis and Clark expedition, who described them as the "largest fountain in the United States."

These springs, which are on the south side of Missouri River, about three miles below the town of Great Falls, Mont., issue through large joints in a medium to coarse grained sandstone on the bank of the river at the water's edge and in the bed of the river itself. The situation of the springs makes exact measurement of their flow very difficult, but the difference between two measurements of the flow of the Missouri—one above and the other below the springs—has been assumed to be the quantity of water furnished to the river by the springs. According to E. T. Nettleton, this amount is approximately 638 cubic feet a second—the equivalent of more than 400,000,000 gallons every twenty-four hours—a veritable underground river. The water, which boils up with considerable force, is clear and relatively pure, containing no more dissolved salts than the average well-water of the Great Falls region. It has a temperature of about fifty degrees Fahrenheit.

No use is made of the water at Giant Springs. The report by Mr. C. A. Fisher, published by the Geological Survey, as Water-supply Paper 221, is distributed free.

The Smoke Nuisance

The smoke plague of American cities has been conquered by science according to the statement of Federal experts who have been studying the problem for a number of years. They not only make the assertion that smoke prevention is possible, but stand ready to prove it by actual demonstration to any one sufficiently interested, and are proving it every day at the United States Geological Survey Experiment Station, at Pittsburg, Pa. In that smoky city the plant is being operated absolutely without smoke and the experts are burning a coal considered refuse by the trade, costing, delivered at the station, 88 cents a ton.

"Some may say that this can only be done at an experiment station and not at a commercially operated plant," said H. M. Wilson, chief engineer, Technologic Branch, United States Geological Survey; "but the investigation conducted by the Government leads to a different belief. Employees of the Survey visited industrial establishments in the larger cities of Illinois, Indiana, Kentucky, Maryland, Michigan, Missouri, New York, Ohio, and Pennsylvania and found more than 200 plants being operated without smoke and with a gain in economy, for smoke these days means waste.

"The investigation indicates that the clean, comfortable American city with a normal amount of sunshine is not far off. Smokeless cities only await a quickened public conscience to the fact that this nuisance means uncleanliness, poverty, wretchedness, disease, and death. The public has only to realize that smoke in the cities costs in merchandise in stores and warehouses, more than $600,000,000 a year. This loss in money is based on the statement of the Chicago smoke inspector that his city suffers a loss each year of $50,000,000. More than a third of the people of this country live in the great and moderate-sized cities."

The Geological Survey has been endeavoring by experiments for several years to increase the efficiency with which the fuels of the country are being used and this led to a study of the smoke problem, for smoke is waste due to imperfect combustion. The statement is now made that in fifty per cent. of the industrial plants of the United States, more than ten per cent. of the coal bill can be saved each year by the smokeless burning of coal and five per cent. in the other plants. This would amount to several million dollars.

The experts who had immediate charge of this investigation were D. T. Randall and H. W. Weeks, engineers of the Technologic Branch of the Survey, and they have just made their report which will soon be issued by the Geological Survey as a bulletin. Mr. Randall maintains that it is not necessary to use any one certain patented furnace to obtain smokeless conditions. Many types of furnaces and stokers burn coal without smoke.

"Credit is to be given to any one kind of apparatus only in so far as the manufacturers require that it shall be so set under the boilers that the principles of combustion are respected," says Mr. Randall. "Stokers or furnaces must be set so that the combustion is complete before the gases strike the heating surface of the boiler. When partly burned gases at a temperature of, say 2,500 degrees Fahrenheit strike the tubes of a boiler at, say, 350 degrees Fahrenheit, combustion is necessarily hindered and may be entirely arrested. The length of time required for the gases to pass from the coal to the heating surface probably averages considerably less than a second, a fact which shows that the gases and air must be immediately mixed when large volumes of gas are distilled, as at times of hand firing, or the gas must be distilled uniformly, as in a mechanical stoker.

"The fireman is so variable a factor that the ultimate solution of the problem depends upon the mechanical stoker—in other words, the personal element must be eliminated."

Maine's Peat Bogs

The United States Geological Survey, in Bulletin 376, reports the results of an investigation of the peat bogs of Maine.

"The field tests and analyses recorded in this report show that Maine posessses immense resources of peat of excellent quality for fuel and other purposes. In the southern and eastern parts of the state deposits of good quality are most abundant in Androscoggin, Kennebec and Penobscot Counties, and especially in Washington County. In the northern part of the state tests were made only in Aroostook County along the Bangor and Aroostook Railroad. Peat resources as great as or greater than those of southern Maine undoubtedly are to be found in the forested lake districts of the northern part of the state. There utilization is so remote that testing them for the purpose of the report was not warranted, but they must be considered in estimating the total peat resources of the state. These resources, except for experimental plants near Lewiston and Portland, are at present undeveloped.

The area of peat land actually tested in preparing the report is estimated at twenty-five square miles. The average depth of the peat is about ten feet. It is calculated that the bogs tested are capable of yielding at least 34,000,000 short tons of air-dried machine peat which, at $3 a ton, would represent a value of more than $100,000,000. It is probable that the deposits tested form only one-tenth to one-fifth of the total peat resources of the state."

The bulletin 376 may be obtained free from the Director of the U. S. Geological Survey, Washington, D. C.

To Save Miners' Lives

Four stations for the training of miners in rescue work have been established recently by the big coal companies of the country and several more are in contemplation. This is a direct outcome of the demonstrations in rescue work being made by the United States Geological Survey, Technologic Branch, at its experiment station in Pittsburg, Pa., and at the subrescue station in Urbana, Ill.

"The fact that these stations have been established is gratifying to the Geological Survey," said Director George Otis Smith "It shows the operators and mine owners are taking interest in this humane movement, and it is bound to result in a decrease in the number of deaths in the mines. The sole purpose of the Government in taking up this work was to demonstrate its usefulness. It is not the intention to make the rescue station work permanent.

"Perhaps the most complete of these private stations is that of the Frick Coke Company, which employs 30,000 men. The station has been erected at the Leisingring mine, near Connellsville, Pa., in easy reach of all the Frick company's mines. There is a corps of six men being trained in the use of the oxygen helmet, a device that admits artificial breathing for two hours in the most deadly gases known. In order that the men be given practical experience in the use of these helmets, a part of the station has been devoted to an air-tight room which is filled with gases that will not support life. The men are being given a daily drill in this gas-filled room and are gaining confidence in the use of the helmets. Within a short time, the corps will visit the Government experiment station at Pittsburg, where the members will be given further instructions by the Federal experts.

"Whenever a disaster occurs in any of the Frick company's mines, the rescue corps will respond at once and will immediately enter the mine for the purpose of bringing to the surface miners who have been injured or are unconscious from the effects of gases. With these helmets, the rescuers can enter any gas-filled mine where it would be sure death for the miner to go. In many disasters the men fortunate enough to be outside of the mine when the explosion occurred have had to remain at the surface for hours, waiting for the ventilation to drive the gases out, knowing all the time that their comrades were dying."

Other rescue stations have been established at Fairmont, W. Va., at the Marianna mine in Pennsylvania, where 150 lives were lost last November, and at Zeigler, Ill.

Mr. J. W. Paul, who has charge of the rescue work for the Government, left Washington recently for Europe, where he will study rescue work at the European stations. "In the short time we have been operating we have saved the lives of six men," said Mr. Paul, "and if we did nothing more, the results would warrant everything that has been done so far by the United States in trying to reduce the accident death rate in the mines. But I am satisfied more good will come from our efforts. The four stations just established will be the means of saving the lives of many miners; and we all know, many a poor fellow, imprisoned in a mine filled with the dread fire-damp, has lived in agony for hours before he died. I understand that the operators are to establish many more stations."

Mississippi's Rank in Naval Stores Production

Mississippi held fourth place among the states figuring in the naval stores industry last year, outranking Louisiana, North Carolina, South Carolina, and Texas. The three leading states were Florida, Georgia, and Alabama. The states making the most marked advances in the production of naval stores last year were those using improved methods in turpentining, and it is safe to predict an even better showing in Mississippi when the cup and gutter and the cup and apron systems are used more widely.

The production of more than 36,500,000 gallons of turpentine and more than 4,000,000 barrels of rosin, with a valuation of more than $14,000,000 for the turpentine and nearly $18,000,000 for the rosin, summarizes the output of the naval stores industry for all states in 1908, according to the preliminary report of the United States Forest Service just completed. The study was provided for in a special appropriation of $10,000 by Congress and the report contains the most complete and accurate statistics ever gathered for the naval stores industry in this country and covers the production for both 1907 and 1908, giving comparative figures for the two years.

Of the eight southern states, each producing more than 200,000 gallons of turpentine and 25,000 barrels of rosin, Florida leads the list with 17,030,300 gallons of turpentine in 1908 against 15,572,700 gallons in 1907, and 1,932,114 barrels of rosin in 1908, against 1,774,370 barrels in 1907.

Georgia, Alabama, Mississippi, Louisiana, North Carolina, South Carolina, and Texas follow in the order named. The comparative report of the production by states is as follows:

	1908		1907	
	Turpentine gallons	Rosin barrels	Turpentine gallons	Rosin barrels
Florida....	17,030,300	1,932,114	15,572,700	1,774,370
Georgia...	10,347,800	1,203,059	10,119,500	1,173,575
Alabama..	3,744,050	446,909	3,544,300	418,496
Mississippi	2,277,850	277,704	2,232,500	255,307
Louisiana..	1,696,250	195,804	1,134,100	126,346
N. Carolina	732,300	131,907	916,400	168,561
S. Carolina	559,800	72,125	586,950	75,057
Texas.....	200,650	28,661	74,350	7,609
	36,589,000	4,288,283	34,180,800	3,999,321

While these figures show an increase of 2,408,200 gallons of turpentine and 288,962 barrels of rosin for 1908 over 1907, there was a marked decrease in the value of the product for 1908 as compared with the preceding year. This was due to the great decrease in the prevailing prices for turpentine for 1908 and the slight decrease in the prevailing prices for rosin during the same year. The value of the product for the two years follows:

Turpentine, 1908, $14,112,377.32; 1907, $18,283,309.93; rosin, 1908, $17,783,509.61; 1907, $17,317,059.93; a difference in the value of the combined output of $3,704,482.93 in favor of 1907.

The increase in production for 1908 over 1907 was due more to favorable weather and labor conditions than to increased operations. But few operators increased their operations, owing to the disorganized condition of the market at the time operations commenced. Figures upon which the report of production for the two years is based were secured by a system of correspondence and personal visits to the points of production by agents of the Forest Service.

To Create Municipal Forests

A forward step of vast significance in the utilization of forest lands adjacent to cities in Pennsylvania has been taken by the passage of a bill entitled "An act to permit the acquisition of forest or other suitable lands by municipalities for the purpose of establishing municipal forests and providing for the administration, maintenance, protection and development of such forests."

The bill, as presented, is at the suggestion of the American Civic Association, which has made the subject of the preservation of forests one of its great activities. Legislation of the character contemplated by the Pennsylvania bill is new to the United States, but not new to European countries, Germany in particular. Municipal forests in that country have been acquired and developed during a period of many years. They have been more than an addition to park systems—they have been a source of revenue to the municipalities maintaining them. The same results would be accomplished by the application of the municipal forest idea in America. The extent to which Germany has recognized the value of its forests is illustrated by the fact that in the single province of Baden, of its 1,564 communities, 1,350 own their own forests and in addition 287 corporations, such as schools, churches, and hospitals, possess forest land. From an aggregate of 1,342,944 acres in the state these local corporations are allowed to cut yearly 261,724,300 board-feet of timber and wood, with a net value of about $3,600,000. The city of Baden alone owns 10,576 acres, from which it has derived a net income of $66,079.68, or $6.25 per acre, all of which goes to the general fund for the maintenance of the municipality.

The Pennsylvania law makes possible similar returns for its townships, boroughs, and cities, the control of the forests thus acquired to be directed by the commissioner of forestry of the commonwealth. What Germany can do the United States ought to equal and exceed, notwithstanding the fact that Berlin is proposing at the present time to expend $10,000,000 in the acquirement of forests.

Of this law Dr. J. T. Rothrock, Consulting Forester for Pennsylvania, says: "I regard it as one of the most important forestry measures that we have secured in this state. It cannot fail of good results. We are indebted to the President of the American Civic Association, more than to any other one man, for its introduction and passage. It involves no expenditure of state funds and there is no reason why it should not lead to like enactments in every other state, and every reason why it should."

Saving Storm-felled Trees from Borers

Experts of the Department of Agriculture have been studying the work of insects in storm-felled pine in the South, especially the work of the borer known to lumbermen as the "sawyer." The results should be of immediate interest to owners of timber felled or damaged by recent storms in the Southern States.

It has been found that the sawyer begins work in the bark of felled trees very promptly, and that it reduces the value of the timber about one-third within two months, a reduction which represents many millions of dollars annually.

This loss may be largely prevented by prompt action on the part of the timber owners. As soon as possible after a destructive storm an estimate should be made of the amount of felled timber that can be converted into lumber before the sawyers begin to enter the wood. Trees that cannot be worked up with little delay can be protected in either of two ways: (1) The bark may be removed from the trunks, or (2) the logs may be cut without removing the bark and placed in streams or ponds. The sawyers will do practically no damage to timber from which the bark is removed within a month after their attack begins. In case of logs placed in water, they will continue their work only in the parts which are not completely submerged.

To timber felled in winter or early spring the methods recommended should be applied by May 1 for best results. Timber felled during the summer should be worked up, or have the bark removed, or be placed in water within one month after the sawyers begin to work in the bark.

Consumption of Pulp Wood in the United States

The Census Bureau issued on May 15 a preliminary report on the consumption of pulp wood in the United States during the calendar year ending December 31, 1908. In it is found the following table:

Kinds of wood	1908 Quantity, cords	1908 Cost	1907 Quantity, cords	1907 Cost
Total	3,346,106	$28,040,697	3,962,660	$32,360,276
Spruce, domestic	1,487,356	13,024,104	1,795,278	15,358,027
Spruce, imported	672,483	7,130,457	905,575	8,689,159
Hemlock	569,173	3,423,789	576,154	3,270,700
Poplar, domestic	279,136	2,235,448	352,142	2,763,889
Poplar, imported	23,081	184,326	19,798	167,039
Pine	84,189	512,013	78,583	506,517
Cottonwood	45,679	324,053	66,084	469,422
Balsam	45,309	327,624	43,884	332,984
Miscellaneous	139,700	878,883	125,162	802,539

Japan Fights Paper Famine

The Japanese also have looked over the contents of their industrial stores and have decided that something must be done toward conserving their remaining supplies of raw material for paper-making.

In Japan, paper is used for almost everything from the silver-figured partitions of the Buddhist temple to the rude hut walls of the laborer; from the silklike vestments of the priest down to the rainproof shield of the traveler. In fact, the ingenuity of the Japanese is only matched by the variety of uses to which paper may be adapted.

The work of the United States Government toward determining the amount of paper materials used and the source of future supply is being followed by the Japanese, according to an advice from U. S. Consul John H. Snodgrass, at Kobe. The imminence of the danger is apparent from the fact that the Japanese authorities have requested the paper-mills department of the Mitsu Bishi Kaisha to take over some 7,500 acres of the bamboo forests of Formosa.

It is known that the bamboo tree has been the raw material from which the Japanese have recently made the larger portion of their paper products; so it is thought that, by introducing improved methods of forest cultivation and harvesting, this tract of woods will furnish yearly 10,000,000 bamboos adapted for conversion into paper pulp.

No matter whether the paper company will establish its mills in Formosa or ship the bamboo to Japan in a partly finished state, the development of this new source of raw material will be of high importance and may overcome the necessity of the island empire looking to foreign countries for the future supply of paper pulp.

Waste in Iron Menaces Race

A London dispatch to the *New York Herald* says:

"Mr. Allerton S. Cushman, assistant director of the Office of Public Roads in the United States Department of Agriculture, has been warning the iron and steel people in England against the waste that is going on in the world's natural resources. To the *Herald* correspondent Mr. Cushman expressed some very strong views on this subject. He said the increasing consumption of the world's supplies, and the constant decay of materials menaced the future of the human race. If the present insane riot of trade continued the time was not so very far distant when the members of the human race would find themselves in a very difficult situation.

"If the processes of civilization were to be carried on, it seemed quite certain that civilization must learn to conserve more efficiently its stores of iron and steel already manufactured and seek methods to prevent the almost resistless tendency of iron to return to its lethargic union with oxygen. If steel could by any means whatsoever be ennobled and protected from corrosion future conditions could be viewed with complacency.

"Probably we could not to-day, with all our boasted knowledge, build an iron monument like that at Delhi, which with no protective covering had stood since the dim beginning of history without rust or decay. It was his belief that we had started now on the right track, and that a very few years would see very decided improvement, not only in the incorrodibility of material manufactured, but also in methods of preserving iron and steel after manufacture. The waste of iron and steel also meant the waste of coal, and the whole problem of conservation of these resources was one of the most important now facing civilization."

Mr. Cushman went to London as a delegate to the International Congress of Applied Chemistry, which opened May 22.

CONSERVATION

OFFICIAL MAGAZINE OF THE AMERICAN FORESTRY ASSOCIATION

CONTENTS FOR JULY, 1909

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Typical Orchard Home in the Inland Empire Southwest of Spo'ane

Vol. XV JULY, 1909 No. 7

IRRIGATION IN THE INLAND EMPIRE

IRRIGATION by Government projects covering more than 2,000,000 acres of lands in the West, and by private projects covering some 11,000,000; possibilities under intensive cultivation and the advantages of community life in localities where orchards, fields, and gardens are watered by artificial means, and problems of forestry, deep waterways, reclamation of swamp lands, good roads, conservation of resources and home-building, all will be brought prominently to the fore during the seventeenth sessions of the National Irrigation Congress. This meeting will be held in Spokane, August 9 to 14, when between 4,000 and 5,000 accredited delegates and representative business men of the United States and Canada, Europe, the Latin republics, China, and Japan will meet under the presidency of George Eames Barstow of Texas.

The board of control, through its executive committee, headed by R. Insinger, is arranging a comprehensive program, including addresses by statesmen, scientists, bankers, and experts in their various lines of endeavor, and discussions by delegates. In addition, there will be demonstrations by officials of the United States Reclamation Service of the scientific application of moisture. These will take place in the state armory, where the congress meets.

There will also be parades of progress, showing the development of the Northwest, and a march in review by the industrial and irrigation army of 10,000 men, representing the various districts in which intensified farming is practised. The thoroughfares and buildings in the city will be decorated and illuminated by myriads of electric lights, and there will be massed exhibits of the resources of the country, the unfurling of the colors of the nations, patriotic airs by massed bands, the singing of the irrigation ode by a large chorus of trained singers and renditions of national and state hymns by school children.

Though there are now approximately 200 private irrigation projects in what is called the Inland Empire, embracing 150,000 square miles of territory in eastern Washington, northern Idaho, western Montana, northeastern Oregon, and southeastern British Columbia, and

Lower Falls in

scores of private works in other parts of the West, the Government of the United States early recognized the possibilities of the land in the Northwest, where its operations cover more than 1,000,000 acres. More than that, the economic value of irrigation has become so established there is no longer doubt, if any existed, that the West, once called the Great American Desert, is bound to become the home of the highest agricultural civilization of all America.

The largest of the Government's works in the state of Washington is the Sunnyside project, in the Yakima Valley. It covers 99,000 acres, and will cost $2,253,000. The Tieton project, in the same valley, will reclaim 30,000 acres, at a cost of $1,800,000, and the Wapato, also in the Yakima Valley, will eventually take in 120,000 acres at a cost of $3,600,000. The Okanogan project, in the county of the same name, will water 9,000 acres, at a cost of $585,000.

In addition to these, the Government has authorized the Kittitas and Benton projects, covering several hundred thousand acres in Washington. The Indian and Reclamation Service estimate that $25 or less will cover the cost for water right on the reservation. This is about one-half the cost of watering land under other canals in the Yakima Valley. There are also twenty successfully operated private irrigation projects in this valley.

Government officials report that eventually more than $20,000,000 will be expended by the Reclamation Service in the state of Washington in reclaiming 500,000 acres of land now entirely or partly waste. Of this, 50,000 acres will be in the Ellenburg district.

The Government projects in southern Idaho are the Minidoka, with an area of 160,000 acres, to be completed at

the Heart of Spokane

an estimated cost of $4,000,000, and the Payette-Boise, 200,000 acres, costing $3,000,000; while Oregon has the Umatilla project, 20,000 acres, costing $1,200,000; and the Klamath, part of which extends into California, 165,000 acres, costing $5,950,000.

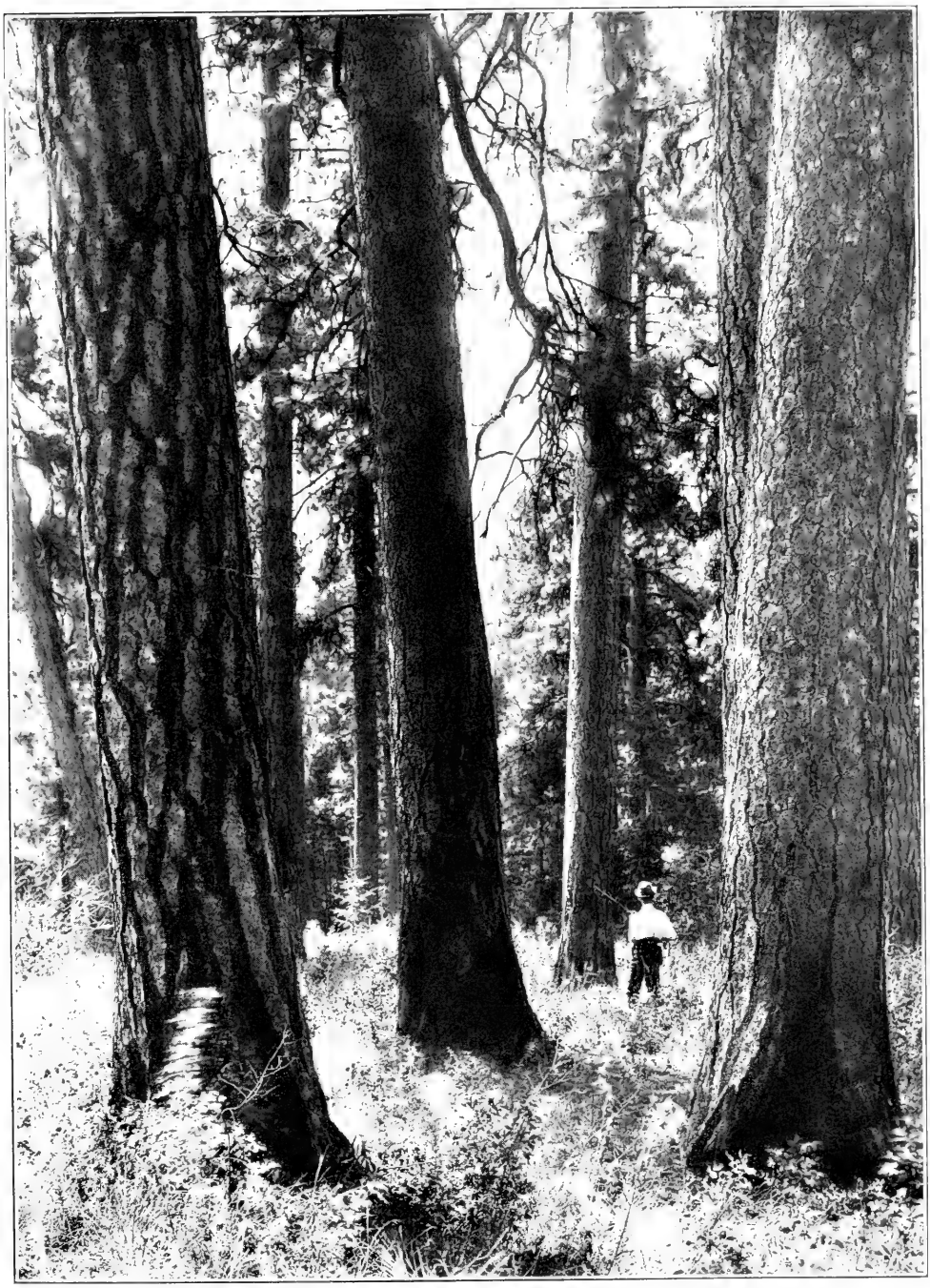
The projects in Montana are the Huntley, 33,000 acres, cost $840,000; the Milk River, including Saint Mary, 30,000 acres, cost $1,200,000, and the Sun River, 16,000 acres, costing $500,000. The Lower Yellowstone project in Montana and North Dakota takes in 66,000 acres, and will cost $2,700,000 when completed.

Two hundred private projects are in operation in the Inland Empire. Numerous irrigation canals have been constructed in Chelan County, which has the Wenatchee, Chelan, and Entiat valleys. There are also important works along the Columbia River in eastern Oregon and in the Spokane, Kettle Falls, Bitter Root, and Snake River and Clearwater valleys. One hundred thousand acres of land in the Spokane Valley is capable of irrigation. The Spokane River, near-by lakes, and an underground stream, flowing through the valley, are used by these plants, one of which raises the water by means of electric pumps from wells, ninety-seven to 140 feet in depth.

The extent of operations on irrigated lands in the Northwest will be better understood when it is known that the value of the apple and other fruit crops in the Inland Empire amounted to $14,000,000 in 1908. It will be $60,000,000 in 1912, by which time several million trees, set out in the last two years, will come into bearing, and others planted between 1903 and 1906 will have reached maturity.

This is only the beginning of the fruit industry in the Northwest, where mil-

Where Dollars Grow on Trees in Irrigated District, Eastern Washington



Part of a Stand of Yellow Pine in Southeastern Washington

Pend Oreille River, Water Used to Irrigate Lands in Calispal Valley, Northeast of Spokane

lions of acres of land, now flecked with the dusty green of sagebrush, are awaiting the refreshing moisture to make it blossom like the proverbial rose. Irrigation does much more for the growing of crops than does rain, as the natural element gives nothing except moisture, while the waters diverted from the mountain sides bring with them new fertility.

Irrigation is no longer an experiment in the western country; it is a confirmed success from commercial and financial viewpoints. It has been demonstrated that under irrigation these lands will produce paying crops of anything which grows in the temperate zone. The products are noted for their brilliant coloring, unusual size, and excellent flavor, and they command the markets of the world. Vegetables in almost endless variety and the choicest vine and tree fruits follow each other in rotation and fill out the season.

Five to ten acres of land in the irrigated districts will provide shelter, food, and raiment for a family and enable its owner to put aside from $500 to $1,000 a year. Scores of hundreds of men and women, many of whom came from the crowded cities, are doing that much or better to-day, and the development of the country, now yet in its infancy, will provide a safety-valve against the impending dangers of congestion in the cities of the East.

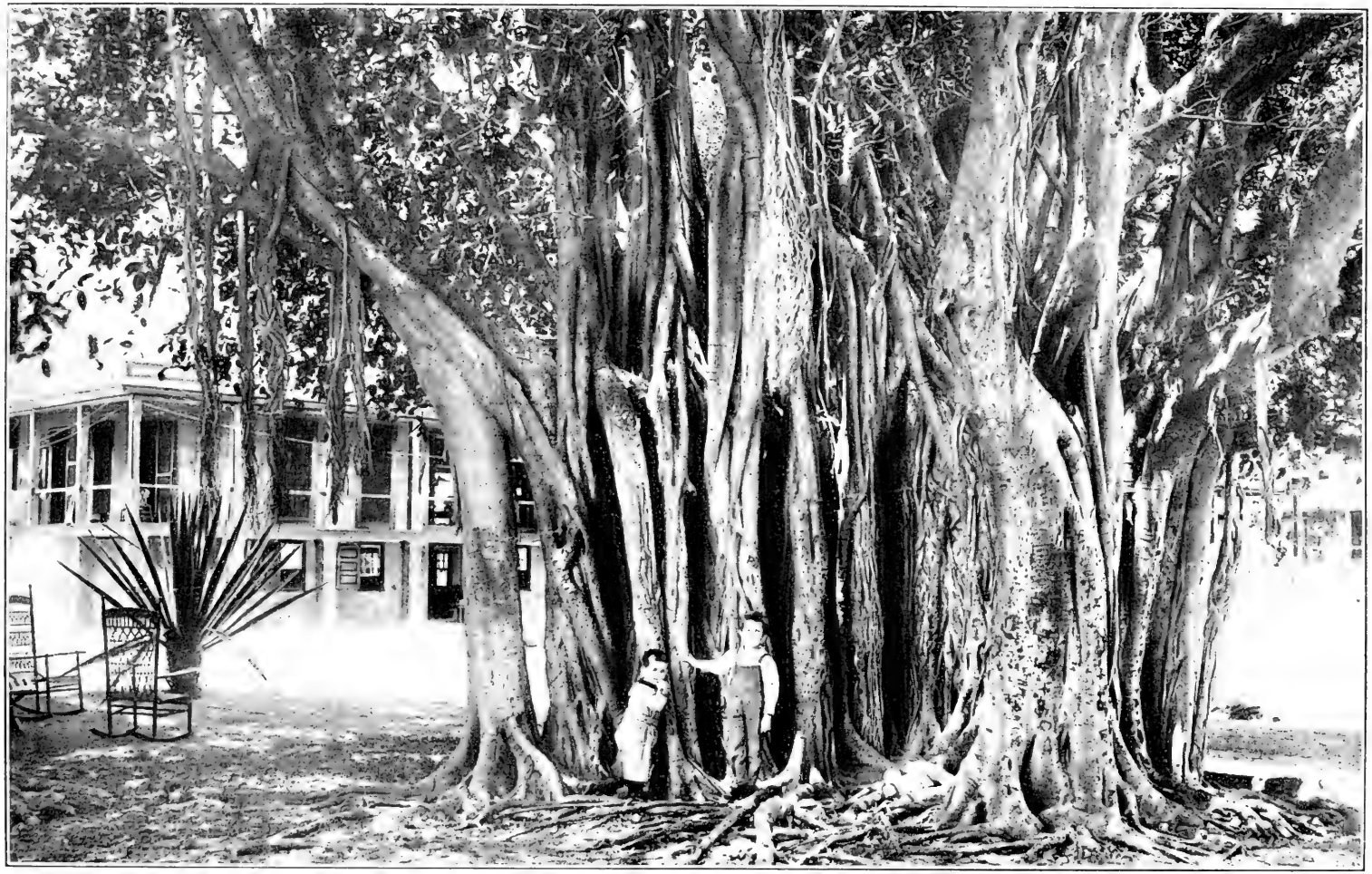
A FOREST CONFERENCE IN THE WHITE MOUNTAINS

AUGUST 3, 4, and 5 promise to be interesting days in New Hampshire. In connection with the annual meeting of the Society for the Protection of New Hampshire Forests, beginning on the evening of August 3, and continuing through the 4th, the directors of the American Forestry Association will hold a meeting, and there will be a gathering of the state foresters of the New England and Middle Atlantic states. It has been decided to make the occasion a forest conference, under the auspices of the New Hampshire Society. Hon. Frank W. Rollins, formerly governor of New Hampshire, will preside. Mr. James S. Whipple, forest commissioner of New York State, will give an address, illustrated with lantern photographs, showing what has been done in the great Adirondack and Catskill reserves, especially in reforesting them. Mr. Austin F. Hawes, state forester in Vermont; Mr. F. Wm. Rane, state forester in Massachusetts, and Mr. Edwin A. Start, secretary of the Massachusetts Forestry Association, will take part. Full reports will be made of the progress of the Appalachian Bill. There will be excursions on August 5 to Mt. Washington, Mt. Echo, overlooking the great burned areas in the Zealand Valley, and to other interesting points.

The sessions of the conference will be held at the Mt. Pleasant House, Bretton Woods, N. H., one of the most comfortable and best-appointed hotels in the mountains, and located in the heart of the Presidential Range. A special rate of $3 a day is made to those who come from a distance.

An excursion may be arranged up Hale Mountain, named for Rev. Edward Everett Hale, a large mountain near the center of the White Mountains, but little visited because of its comparative inaccessibility and the absence of any trail. Prior to the unexpected announcement of his death, Doctor Hale himself, it was hoped, would attend the conference in person.

Members of the American Forestry Association who may be sojourning in New England in August will be cordially welcome.



Banyan, or "Wild Fig Tree of India," in Key West. Largest One in the United States

THE BIG BANYAN OF KEY WEST, FLA.

By MRS. R. A. ELLIS

NO NATURAL growth in the United States has attracted more admiring attention from travelers who see it than the big Banyan, or Wild Fig tree, in front of the army post at Key West.

This island-town, the southernmost under our flag, is quaintly interesting in every way; and its avenues, lined with gracefully waving cocoa palms, wide-branching tamarinds, tall sapodilloes, and Cuban laurels, hold visitors in a continuous state of ecstatic admiration as they drive or go by car from end to end of this seventeen-mile-long rock thrown up in the Mexican Gulf.

But when we turn out by the barracks and rest under the shade of this vast spreading Banyan tree, wonderful gift of the Orient to the Occident, silence is the first tribute we pay its beauty and charm.

Here is the fig-tree of the East. The prophet made us acquainted with it when he promised, "Thou shalt rest under thine own vine and fig tree," and in this pleasant shade, deep and wide, we begin to comprehend the significance of such a promise, especially to the sun-weary Eastern peoples.

The name Banyan, attaching to it because such trees were originally used as bazaars or marts by the early Hindu merchants—"banians," in their language, who traded by caravan from the ports to the interior—came long ago to be used popularly, and now we seldom hear another. Yet it is really the fig-tree, the Ficus Bengalensis.

Here is indeed a "forest in a single tree." Slender roots, like feelers, are being continually thrown out from its lateral branches. These speedily find and grasp the soil, and soon are sturdy new trunks, for the stancher support of the ever-expanding crown.

In India, the tree has long been planted extensively for shade, and the Key Westers are now trying experiments with it for the same purpose. It is easy to see how valuable it will prove amid tropic heats, being of comparatively rapid growth and frequently covering a space of 300 feet in diameter, and easily attaining a height of eighty feet. The fruit is merely the size of a cherry, and of little value.

Nature here shows another of her coquettish inconsistencies. Why shouldn't she have fastened her huge, dangerous-looking clusters of cocoanuts among these wide, substantial branches, and hung the light bunches of figs, or cherries, up there in the plumy crown of the swaying palm?

A FIELD FOR INVENTIVE GENIUS

Need of a Substitute for the Wooden Railroad Tie—Description of the Keystone Steel Railroad Tie

By MRS. LYDIA ADAMS-WILLIAMS

OF THE many forms in which wood is used, railroad ties occupy fourth place in the total yearly expenditure, sawed lumber being first, firewood second, and shingles and laths third. It has been calculated that the amount of wood used each year in ties is equivalent to the product of 600,000 acres of forest, and that to maintain every tie in the track two trees must be growing.

In the construction of new track and for renewals, the steam and street railroads used, in 1906, over 100,000,000 cross ties, at an average price of 48 cents per tie, an approximate value of over $48,000,000.

The woods used varied, but oak largely predominated, forty-four per cent., or nearly one-half of the ties consumed, being made of that wood. Southern pines came second, being utilized for about one-sixth of all the ties laid. Other woods used were, in the order of their consumption, Douglas fir, cedar, chestnut, cypress, western pine, tamarack, hemlock, redwood, lodgepole pine, white pine, and others.

This immense yearly drain upon the forests for railroad ties alone, covering a large variety of the principal woods grown, emphasizes the need of inventive genius to discover some substitute for wood.

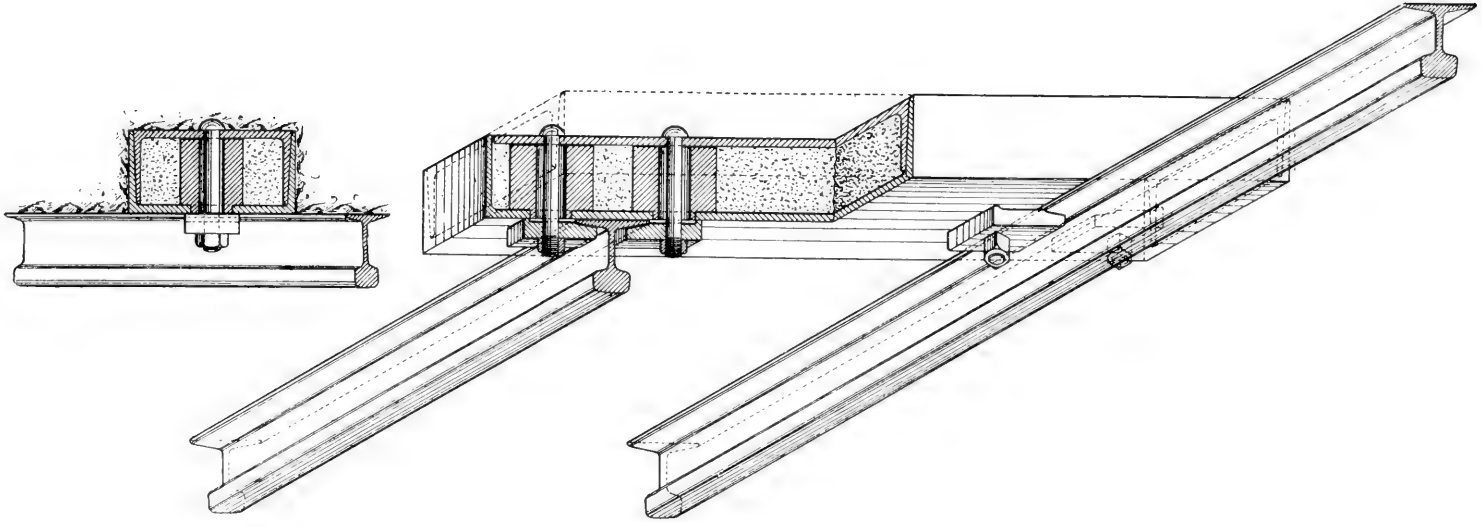
With nearly 300,000 miles of railroad trackage, and approximately 2,800 ties to the mile, there are over 800,000 ties constantly subject to wear and decay. When it is considered that the service of the longest-lived tie timbers in general use—white oak, Douglas fir, chestnut, tamarack, and spruce—is but seven years, while with some, as the black oak, it is but four years; and when it is further considered that the supply of hardwood is waning and that a timber famine is almost at hand, the fact becomes apparent that there is a vital necessity for inventing some tie to take the place of the wooden tie.

Statistics gathered by the Forest Service prove that the timber supplies of the country, at the present rate of consumption, will be exhausted in thirty-three years.

To the unscientific and untraveled person who gazes with admiration almost amounting to reverence upon some particularly fine stand of timber which his limited vacation trip brings to his attention, the widely heralded fact that the timber supplies will soon be exhausted seems a fallacy unworthy of belief.

What do we mean by saying that a timber famine is at hand?

Scattered throughout the United States there are from 500,000,000 to 700,000,000 acres of land, upon which more or less timber is growing. The Forest Service in its estimate of the timber now standing places the highest figure at 2,000,000,000,000 board feet, while the lowest figure of the standing timber is 1,400,000,000,000 board feet. We are cutting and using timber at the rate of 100,000,000,000 board feet a year, while the annual growth is but a third of the consumption or from thirty to forty billion feet. Subtract forty from 100 and we see that we are using each year 60,000,000,000 more board



Steel Railroad Tie, Eight Feet Long, Eight Inches Wide, Five Inches Thick. Patented July 3, 1906. Dawson Hoopes, Patentee

feet than grows each year. Divide 2,000 by sixty and we have an indication that the timber will be exhausted in a little over thirty years—to be exact, in thirty-three and one-third years.

With a timber famine almost at hand, the wood-using industries will welcome any practical invention that will tend to lessen the drain upon the forests. Many substitutes are talked of to take the place of wood, but even with them all we still need to exercise the utmost care and economy in the use of our wood resources.

An invention which will greatly lessen the drain upon the wood supply is a steel railroad tie patented by Mr. Dawson Hoopes, of Philadelphia, and known as the Keystone steel tie.

The tie, which is eight feet long, eight inches wide and five inches thick, has its body formed of two channel-shaped beams of steel, of different cross-sections and one fitting over or embracing the other to constitute a box-like structure, with bolts for clamping the rails thereto. The tie is filled with some non-metallic material, as slag or concrete, which, while in the plastic condition, may be poured in and allowed to set or harden to give solidity to the tie as a whole.

Experiments prove the Keystone steel tie to be eminently satisfactory, and filling in all respects the requirements of the ordinary oak tie, combining, as it does, great strength and stability, and conforming closely to the shape and resiliency of the wooden tie, with the added advantage that its usefulness covers a period ten times as long as does the best wood tie in use.

On account of the shortage of wood pulp, the invention of this tie is welcomed by the wood-using industries and by newspapers. It is predicted that the tie will meet with wide use, especially in the Philippines, China and South America, as the fact that it can be shipped in parts, and assembled and filled with concrete afterward, makes it desirable for transporting a long distance.

A Scene in the Everglades

WORK ON A NATIONAL FOREST

No. 11. The Personal Equation

By CHARLES HOWARD SHINN, Supervisor, Sierra National Forest

IT IS the 1st of May up here in the forest, and all the world is moving on to growth and strength. Everywhere new life has risen like a happy flood. Everywhere the rangers are ready in the same old spirit of unspoiled confidence that they have taught each other, and their supervisor, up here in old Sierra.

Sometimes it has been said to me that those forest men who really understand the secret fashioning of the one central principle which I have ever striven to set forth in these articles do not in the least need the lesson, while on the other hand those who most painfully need it are not conscious of its lack nor capable of its comprehension.

This must be true in some degree of every fact, large or small; the friends of the fact, since time began, have uttered in effect the same criticism. But if one yielded to it, even in thought, it would be a treason like Arnold's. In all men I have ever known there is hidden, though often too deep and silent, enough comprehension to follow the blazed trail, when once they find it.

It is not given to many of us to blaze a trail so well and so wisely that along that broadened path a railroad shall some day run. Very few men in all the ages that have been can rise to the full certitude of Kipling's Pioneer.

Do you remember him? Kipling's name for him is "The Explorer." The poem is in the *Five Nations*. That, and the "Chant Pagan," redeem a thousand times over all the vulgar, trivial, and ignorant things which Kipling has written. Read it again, and rejoice with the pioneer of the pioneers who had set his mark on his land forever, and who said to those who were to build the sites he had chosen,

> Have I named one single river? Have I claimed one single acre?
> Have I kept one single nugget (barring samples)? No; not I.
> *Because my price was paid me ten times over by my Maker.*
> But you wouldn't understand it. You go up and occupy.

Something of this pioneer feeling comes to one every now and then, almost blinding him with its intensity of white fire. It undoubtedly came with immense force and in an especial way to the man whose whole leadership of the new forest movement in America was made possible only because of his "explorer's imagination;" he heard, and still hears, the call of that which "lies hidden behind the ranges."

What is it that binds the hearts of men to a great cause such as forestry, and makes it dearer to them with each revolving year? And what is the one thread that runs through all that I have written or said, these years in the Sierras? It is, I think, the recognition of the infinite preciousness of the "personal equation." I am convinced that we should so deal with all men, and with our fellow-workers, and with those under us and those over us, that the best there is in each one's personal equation (both theirs and ours) shall truly find its fullest development.

The heart of it all is so to live that we can put ourselves in the other fellow's place, see with his eyes, pulse with his heart, think with his brain, sorrow with his errors, and rejoice with his successes, deal with him as a friend and a brother, lift him to new levels

Forest of Noble Fir, Hemlock and Red Fir in Oregon

by putting into his soul a passionate desire for some larger thing. Nor can we ever help another until we learn how to take help from him.

I know a splendid ranger, great and joyous, who once said of his supervisor: "He makes me feel as if I was going to be on trial for my life pretty soon, with just a hair of prejudice against me in the mind of the court." It was said at a camp-fire; it drifted wide, and came to be the final judgment of the mountains. Somehow the "personal equation" had been cast out of the balances, you see, and when that falls to the ground there is very little left.

I heard of a ranger once, who said to his superior officer, "I like this new work of mine so much better than what I used to do."

"Yes," said the officer, "all of us are delighted with your success."

"It was the best thing I ever did, to ask you to change me out of grazing into timber. You know that time you came along under these sugar pines, about midnight, and tumbled into my tent, and we had breakfast by starlight, and we talked of when we were boys, you in Maine and me in California? Then we talked about the work, and I was some worried because people was saying I was doin' things badly (but I never telled you how I felt). Then somehow we began to talk about timber, and it come to me suddenlike that I belonged there."

"I remember all about it, Jim; and I thought then what a good suggestion you had made."

The officer rode away a little later, and as he looked back to the tent, he thought to himself: "How good it is that amongst us we were able to tune that harp without breaking a string; not one is even frayed. It was worth the trouble."

Only the blue-eyed wife of that old officer, who had been a ranger himself, and an inspector and a supervisor and many things besides, knew how slowly, patiently, for weeks on end, he had dropped into that grazing ranger's mind some seeds of the thought that while it was better fun to work in timber, he had really been a pretty decent grazing man, and gained friends for the Service, and was truly making the transfer himself.

"Now, why did you take all that trouble?" she had once asked, a little anxious lest her man should not have enough sleep. "It is the first duty of a subordinate, surely, to do what he is told to do."

"That is true," he replied. "It is dead easy to force an issue. But what we must have is the highest possible loyalty of the man to the Service, paid for not in coin of the realm, but in as absolute a loyalty of the Service to the individual. The Service must never destroy, nor in the slightest degree injure, even for an hour, the honorable self-respect of the least of its faithful servants. If it often does that, the ax is laid at the root of the tree."

"Yes; I know that your *personnel* reports have cost you more thought than all else put together."

"Certainly; for the divine 'personal equation' is the best thing there is in human nature. Yield to it, use it, guide it, until out of each separate temperament you get the pure flame of that unquestioning loyalty that knows itself honored and understood."

"But Jim often did poorly as a grazing ranger, and you never told him so."

"He did the very best he knew how, for several years, openly and eagerly. He did many things so well that the memory of them will long remain. It is a part of my business to carry every honest ranger over such hard places."

"I can hardly understand that."

"Because the Service had justly accepted responsibility for him, on the whole, for several years. It was merely a question of getting him where he could do better work for the Service which he loved utterly. Even if it had been worse, no truly wise official could run the risk of taking away from him all that gave him value—his self-respect."

"But how about his temperamental faults and blunders?"

"All of us have those. There are

Skidding Red Fir in a Washington Forest

times when they may be helped in some degree. For the most part the Service owes to its faithful servants neither praise nor blame, but comprehension."

The officer reached up to his desk and took down a journal. He turned slowly back some six months and found an entry. "There," he said to his wife. "That was my entire report on Jim's case."

It read: "I have seen a good deal of Jim Blank lately. He is a fine, big fellow, with ambitions, and I find that he wants to take up timber work. This will especially suit his make-up, and he goes into it from the bottom, at his own request, for he feels that he is needed there more than in grazing. This case is therefore closed with a good, long credit-mark for Jim, and absolutely nothing official against him."

The officer's wife cried out in dismay: "Dear me! Was *that* all you said? Why, your notes on that case would have made a book. Nobody will ever know what you did for Jim."

"You and I know," said the officer, very soberly, seeing as he spoke a ranger's cabin near a saw-mill; a ranger's wife and baby; the ranger himself, a busy, happy, effective man whose sincere love for the forest had been strengthened by an all-containing leadership.

"Do you remember the story," he asked her, "the story about the Promethean fire? It is said that the Titan who so loved earth stole that fire and brought it across blue spaces in a fennel stalk! Evidently that was not material fire—it was that spiritual flame, a spark of which in each earth-born man makes him one with the gods themselves. Underneath all the differences of temperament, of education, of surroundings, that to which we must ever speak is that spark which Prometheus carried in the fennel stalk and set in all hearts forever."

He put his arm about his wife's waist and they went off into the garden and gathered roses together. And I think he told her more than I have written here, for when they came back tears and laughter were mingled in his eyes, and laughter and tears were in hers.

But after they sat down he said:

"Now, you must remember that this is the way of it: Every single item in a report may be true, and yet the things left out, the unseen facts, the relations of the several parts, the putting together, may all be so wrong that the sum-total becomes absolutely false. You can make a mosaic of precious stones on the very Tomb of the Prophet in sentences that blaspheme the throne of Allah.

"Yes," he continued, more to himself than to her, "we should be able to rejoice in all healthy differences of temperament, in all the divine problems of the personal equation. All good and earnest men know their own shortcomings better than we can tell them; it is enough that we with larger comprehension cheerfully analyze these shortcomings, and as cheerfully accept what cannot be helped.

"There was once one who walked by Gennesaret, and there he found rude fishermen, and somehow changed them into the mighty apostles of a new religion, without changing their temperaments, without stupidly violating any of those higher spiritual laws of a perfect understanding. Therefore, their souls blossomed like roses set in new soil, under new planets."

Again the silence fell between them, as they looked out over mountains and forests.

"There is," he said, "a far greater virtue than mere loyalty, so often, and so lightly on our lips. It gathers all virtues together and explains them to themselves. Not yet has it had a name; no pantheon holds its marble impersonation. And still, since men began to be, their secret prayers have gone forth all unconsciously, age after age, for the gift in even small degree of this crown of all virtues. It is that by which the Master dealt with His fishermen; it is that by which we must deal with our rangers. Its name, in those higher places where it rules, is Comprehension; mercy, truth, justice, imagination, and all the divinities are its advisers—but ever it casts the deciding vote."

PRACTICAL FOREST WORK FOR ADVANCED STUDENTS OF NEBRASKA FOREST SCHOOL

WORK in the forestry courses at the University of Nebraska has recently been augmented to a marked degree. Within the past year the advanced students have been making a field study of forest and lumbering conditions in northern Wisconsin under the direction of Professor Phillips, Assistant State Forester Moody, various cruisers and the owners of several wood-using industries in the region. Mr. Moody is thoroughly acquainted with forest work and has lumbered in Maine and Washington; he has worked for the United States Forest Service in Maine and Colorado and has been Assistant State Forester of Wisconsin for the past three years. Because of Mr. Moody's broad training in both practical and theoretical forestry, his time with the students will be of the highest value.

The region about Rhinelander was selected as being the best suited for the work, as that city has the greatest variety of high-class wood-using industries of any city of its size in the United States. The locality is rich in hardwoods and conifers, is in the center of a great area devastated by the forest fires of the past season, and is also centrally located in the areas held as state forest reserves. It is considered that no better region could be selected in the entire United States for a detailed study of practically all the great phases of lumbering and forestry, and that a month under such favorable conditions is worth at least three times that length of time in a less favorable region. A happy feature of the work has been the enthusiastic attitude of the lumbermen in doing their utmost to supply the students with full information.

The work in the forest was first taken up from the standpoint of forest types, silvical descriptions of the more important species and the value of the forest for protection. A particularly interesting feature was the work being done by the Wisconsin Valley Improvement Company, which is authorized to construct and maintain a system of reservoirs on the tributaries of the Wisconsin River for the purpose of producing a uniform flow of water and thereby conserving and improving the water supply throughout its entire length. This company is doing the greatest work of its kind east of the Rocky Mountains and heartily cooperates with the state forestry officials in retaining the forest cover about the headwaters of streams. This work conveys an interesting object-lesson, since the northern states have been suffering from damaging floods in early spring and a decided shortage of water during the summer months. The Wisconsin River is receiving active attention at the present time because of the large number of important industries depending on its water supply for power. These industries have been confronted by a summer shortage, causing them to limit operations from one to three months at a time. The spring floods of the more important streams of Michigan, Wisconsin and Minnesota alone have caused millions of dollars of damage annually, and such work as is being done by the Wisconsin Valley Improvement Company marks a wonderful step in flood prevention in this region.

Wasteful Lumbering Methods in a Longleaf-pine Forest

Sluiceways of a Splash-dam (Minnesota)

Special attention was paid to the past methods of lumbering as contrasted with the careful forest exploitation of the present. Comparisons were also made as to the relative waste incurred by the various industries and the need of even more conservative utilization than now exists. Northern Wisconsin, in conjunction with the other lake states, has suffered from immense trespass cases in the past and is having a large number of small cases at present. Various areas were inspected where private, state and national trespass had taken place, and instruction was given as to the general methods of procedure in each case. To gain a working knowledge of estimating a stand of timber, the students cruised after an expert and then compared their results with his. The various methods of estimating as used in forestry investigations were performed in the field and compared with cruising methods. Detailed studies were made of the items of cost and the methods employed in each step of the wood operations at the camps of the Robbins and the Brown Brothers lumber companies, while general studies were made at two other camps.

At Rhinelander the students were taken through the paper and pulp mill which uses both the mechanical and the chemical method of manufacturing paper and has a reputation of being unsurpassed in rapidity of production by any mill of its size in the country. Mr. F. S. Robbins, of the Robbins Lumber Company, who did all in his power to make the trip a success, took personal charge of the study in his mills and gave an exact statement of the cost of each operation and the factors influencing it. Mr. Robbins' sawmill has a capacity of 130,000 board feet per day and has in connection a planing mill, dry kiln, flooring plant, interior wood-working plant, shingle mill and lath mill. He utilizes every available species of conifers and hardwoods, and all material which is not used for higher class products is used for cord wood. Similar trips were also taken through a high-class veneer factory and a refrigerator factory. Side trips were taken to a large charcoal and wood alcohol plant and a large combined tannery and sawmill.

The winter trip was planned as a regular feature of the forestry course, designed to supplement the spring trip which was taken to the Dismal River National Forest where extensive plantations of forest trees are made in the sand hills of Nebraska. The students also visit local nurseries and forest plantations. Still better training is planned by requiring each student to spend one full summer vacation in the forest, which is aimed to give a more complete training than could possibly be given in a field course in forestry. To improve the teaching facilities in forestry the space assigned to the forestry department at the university has been increased more than five-fold and the equipment has been increased tenfold. Besides the five professors who teach technical forestry subjects several special lecturers have been secured to give courses of five to fifteen lectures each along the lines of forestry in which they are authorities.

Brown Lake Reservoir Site Washington

FORESTRY IN MASSACHUSETTS

By F. W. RANE, State Forester

IT IS with a degree of pleasure that I am able to report that our Massachusetts people have been very considerate of the recommendations of their state forester during the past few years, and that the people generally of the good old Bay State are offering cordial and hearty cooperation toward establishing a definite constructive and practical forest policy.

One of the greatest hindrances the writer had to contend with in beginning his work in this state was forest fires. Here, as elsewhere throughout the Union, this demon was running rampant. A campaign was begun in the fall of 1906, and during the winter following the legislature enacted our present state and town forest warden system.

The Massachusetts forest warden system is headed by the state forester. Each board of selectmen of the towns is required to appoint a forest warden who, in turn, must be approved by the state forester. Each warden is therefore responsible to both the state and town. The forest warden has the authority to appoint his own deputies and to discharge them. He is clothed with sufficient power to represent the town's forest interests. The state forester requests that the selectmen appoint a public-spirited and broad-minded person for this office. This law is already in effect, and from one year's experience the results accomplished have exceeded expectations. With a corps of 350 forest wardens (one in each town and city) each with an organized working force of deputies and sympathetic, public-spirited backing, the state forester has an army of men thoroughly enlisted in bettering our Bay State forestry conditions. As a result of this organization more valuable data were received relative to forestry matters during the past year than has been possible heretofore.

The enactment of a bill on reforestation whereby the state forester is given a definite appropriation of $10,000 a year for future work along this line alone marks the beginning of a practical demonstration of forest planting throughout the state. Over half a million of trees were set by private individuals last year, and the prospects are very bright for at least a million and a half being set this spring. It is believed our reforestation law is well adapted to this state. The state forester already has about 1,300 acres on hand for planting.

A forest fire protection act was passed last year by our general court, that is bound to accomplish great good. One of the greatest drawbacks to a stalwart, progressive movement in forestry is the destruction and wanton waste caused by fire. This act centralizes authority in the state and town with the idea of determined results.

A code of regulations as to fires set by railroads has been passed upon to the satisfaction of all parties concerned, and it is believed that when the Massachusetts policy has been perfected our present great losses from this cause of forest fires will be minimized.

Massachusetts has recently passed a law exempting from taxation all plantations of young forest trees for a period of ten years after the trees have grown two feet on the average in height and stand six by six feet.

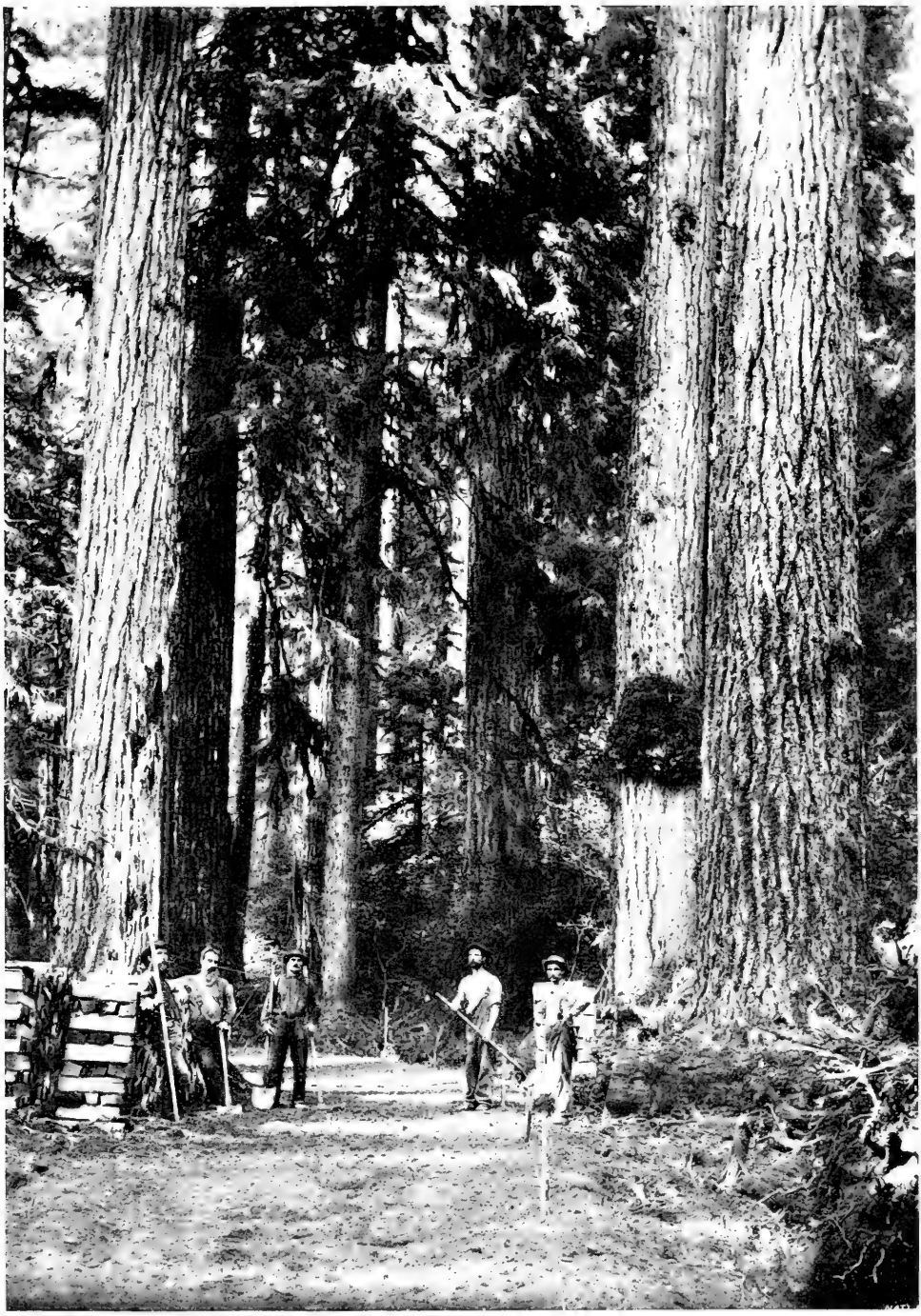
The state forester, forest wardens, and fish and game deputies are all clothed with the power to arrest without a warrant all persons found in the

act of setting a fire in violation of the law.

Besides the special regulations and enactments above referred to, the office of state forester acts as a clearing house for our Massachusetts people in assisting in every way possible toward accomplishing results in forestry. Free, expert advice is given anywhere throughout the state, forestry literature is sent out in large quantities. The state forester has been in constant demand for public lectures, and everything looks extremely encouraging and hopeful for good results in the near future.

We, here in Massachusetts, are beginning to realize that the old Bay State of the future, from a forestry standpoint, will be just what we propose to make it; and it is believed we are awakening to our responsibilities.

Lumbering Approaching Forestry. Many Small Trees Left. Saplings Cut to Strew Road Worst Fault



A Typical Forest Scene in Eastern Washington

THE NATURAL TAXATION OF TIMBERED MINING LAND

By ROBERT B. BRINSMADE, E.M.

A COMMON objection to the natural* tax on land values is the alleged impracticability of estimating such values for purposes of taxation. It is the object of this article to show that this evaluation is not only practicable, but can be achieved without the introduction of any untried methods.

The land values with which assessors have to deal, may be divided into five kinds, viz: franchise, farming, townsite, timber and mining. In the case of franchise values, which include the rights of way and easements of railroads and other public-utility companies, the franchise may be evaluated by capitalizing the average annual surplus income after the cost of operation and repairs and the interest on all construction costs has been subtracted from the gross earnings. The more risky the investment, the higher should be placed the rate of interest on which the capitalization of the annual surplus is based. This class of values is now regularly estimated in New York State to comply with the Ford franchise-tax law.

The evaluation of farming land is well understood, having been studied for centuries, by assessors and boards of equalization, both in this country and Europe. Though townsite appraisement is not so thoroughly systematized, such legislation as the New York law requiring the separate assessment of land values and improvements has done much to perfect methods of evaluation. The system devised by W. A. Somers, of St. Paul, which starts with certain determined sites in each precinct and evaluates the surrounding lots by definite rules, has met many severe tests, and if not yet perfect bids fair soon to become so.

When we enter upon the appraisement of timber and mining land, however, we find ourselves tossing on a sea of contrary currents. While we can base farm values on the supposition of a perennial average crop and townsite values on a continual annual rent; we have to consider for timberland, a crop that will take from twenty to 100 years to mature and for mining land, a crop of minerals that can only be reaped once. Besides the evaluation we must provide, in the case of timberland, for its harvesting without undue waste, fire risk or ill effects on soil or water courses, and in the case of mining land, that its exploitation shall not only be economical, but harmless to life and to surface structures.

Until the inauguration of the forest-reserve policy, the quicker that the timberlands of the National and State governments were reduced to absolute private ownership, the better were our politicians pleased. In fact, many great fortunes were obtained by the theft of Government timber with the connivance of prominent officials. At this point, a distinction must be made between woodlands, that must be cleared to prepare for farming in the great valleys of the rain belt, and those forests on steep slopes or scanty soils, whose destruction makes only a desert. It is the last class that should be preserved and which requires special legislative treatment.

The assessment of timberland at its full value as standing timber, places a premium on its speedy denudation and tends to prevent the reforesting of the

*See "Natural Taxation," by T. G. Shearman.

land, when the wild growth has once been cleared. On the contrary, the entire release of timberland from taxation is class legislation and a denial of communal rights in land values.

Any efficient system for woodlands must include not only their correct taxation, but a strict control of their harvesting. A permit to cut timber over any considerable acreage should only be given after the logger's plans have been approved by the State forester, even when the land is privately owned. In this way, scientific methods of cutting could be assured and the dangers of soil destruction and forest fires eliminated.

A royalty system, based on a stumpage charge on the felled trees, has worked well in the public forests of British Columbia and is the method now commonly employed here, by private landowners, in selling their timber to loggers. The same scheme could be applied to the taxation of private woodland by making it tax-free until cut, when it would pay to the State the same proportion of its gross stumpage value as was assessed on the annual economic rent of farming or townsite land. In order to prevent the holding of large tracts of ripe timber for speculative purposes, as is now done in the case of Southern pinelands, another proviso would be necessary. This could be effected by charging an annual stumpage tax against all ripe timber whether cut or not. This tax on a given tract would be the minimum stumpage annually due to the Government, in case of a systematic cutting of the timber in sections, on some approved plan of permanent forest preservation. This advance stumpage tax could be deducted from the amount to be collected, when the timber was actually reaped. It would thus not mean double taxation or the undue forcing of legitimate cutting arrangements; but it would make it too expensive for any one to hold great areas of ripe timber unexploited, for speculative purposes.

The relative value of different woodlands is easily estimated, as the trees are in plain view and it is only necessary to note the number and size of the trees of each species and to figure the factors of expense in transfering the timber from the forest to the market. For mining land, the valuation is more complex as the minerals are originally hidden underground and the net value of many types of deposit can not be estimated till the ore has been brought to the surface and worked over into its marketable form. A royalty on output is thus the most practical system of assessment, and not only is it the method of taxation now used by the Mexican government for its great mineral industry, but it is the time-honored scheme used by private landowners, both here and in Great Britain, as a means of collecting revenue from mining land.

During the Spanish rule in America, one-fifth of the output of metals (gold and silver mostly) went to the crown as a tax; and, though the percentage taken has varied, the bullion tax is still a favorite method of collecting mining revenue in free Spanish America. Such a tax on gross output, however, though easy to assess and collect could only conform with natural-tax principles when the cost of bullion production was the same for all mines, and this is never the case.,

Where a mine is both owned and operated by the same company, the simplest way, to levy a land-value tax, is to take a percentage of the net profit remaining, after interest on betterments (as well as operating and maintenance expenses) has been deducted from the gross earnings. This would be an income tax, assessed on the unearned income only, and thus would differ from the Montana system, which levies on the whole net income without deducting interest. When the operator only leases the mining ground from the landowner, it is customary to pay a certain royalty per ton on all ore extracted; the tax should in this case be assessed against this royalty (provided it represents the whole economic rent), which is analagous to the stumpage payment on timberland.

To prevent that speculation which has now locked up much of our iron and coal lands in a few hands, it would be necessary to supplement the tax on royalty by provision for a minimum annual royalty charge on each deposit, to be payable whether the mineral had been extracted or not. For known ore reserves, the royalty should be calculated on the basis by which most leases of the Lake Superior iron mines are now secured from private landowners. It has not proved difficult to fix the minimum annual royalty equitably after the quantity of ore available has been ascertained by boring.

In the case of unexplored mineral ground, the condition of retention by the holder should be the same as is now required for mining claims on national land; i. e., a certain minimum quantity of development work should be performed on each claim annually. But sufficient inspectors should be provided in each mining district to ascertain if such work were actually accomplished. The present custom of the Land Office, to trust to a sworn statement of the claimholder, often enables "bad" men to make fraudulent affidavits each year and thus tie up, for speculation, numerous claims: This now occurs in any district where log-rolling or intimidation can prevent the other inhabitants from denouncing such perjuries.

It need hardly be mentioned that the national apex law, which enables the owner of the vein's outcrop to follow a non-vertical vein indefinitely in depth, should be repealed and a law limiting ownership to the surface side lines (as in Mexico, etc.) substituted. Though the lawsuits ensuing from quarrels of mine-owners, due to the ambiguous apex law, has helped to scatter widely the profits of land monopoly, through the conduits of the legal and mining-expert professions; it will no longer be of advantage to the community with the adoption of natural taxation and the ensuing equitable distribution of wealth.

An auxiliary change should be the separation of mineral from surface rights in agricultural land; and this reform should apply not only to all the remaining Government land, but also to all tracts in private possession on which mineral has not yet been discovered. This separation is a feature of the Code Napoleon and applies not only in Mexico and other Latin countries under that code, but has had a partial application in such British colonies as Canada, Australasia and South Africa. If such a separation had been in force here, it would have obviated such absurdities as the enrichment of the Oklahoma Indians from royalties on oil lands, which they never lifted a finger to develop. The reform would not only stimulate prospecting east of the Missouri River, but would prevent the failure of many operators, in such districts as the Missouri and Wisconsin zinc-lead fields; as the operator would be allowed to retain the royalty, now going to the landowners, unless such royalty represented a true economic rent.

The proposed mining fiscal system would entirely free from taxation not only all mines in the development stage, but also all those producers which actually show no *net* profit above expenses and interest on betterments. It would indirectly subsidize the prospector to perform the necessary service of opening new ore deposits, and at the same time render available the great revenue from the profitable mines, most of which is now untouched by taxation.

State mine inspection is now confined to the enforcement of rules for the protection of life; but, except in the coal districts, such inspection is apt to be perfunctory. Inspection should not only be made rigid for all mines, but should be extended to supervise the general working plans as suggested for timber tracts. Operators must be prevented by law, from wasting the Nation's mineral resources, and the only method by which it can be done is the enforcement of scientific economy by state supervision.

The proposed taxation changes would stimulate rather than hinder legitimate lumbering and mining. They would

not only prevent unnecessary deforestation and the hogging of ore bodies; but through their hindrance to land speculation would tend to raise competitive wages and to give the small operator a more equal chance with the trust. As shown in my article in the Chicago *Public* for April 24, 1908, the general effect of the natural tax would be to increase the incomes of the poor from the present privileges of the rich; while leaving the middle class unaffected in their incomes from privilege, but benefited in their earnings as salaried workers. These effects would be soon produced by the outlined reforms in the lumber and mining industries.

In the United States, we have the curious spectacle of the most scientific people in wealth production, lagging far behind much younger nations in applying science to wealth distribution. This is due not only to the entrenchment of vested wrong behind complicated legal barriers, but also to the hetereogenity of the population and to the fact that its dominant native element is still too blinded by the extreme individualism of a recent pioneer life to be fully alive to communal interests and rights.

Shore Line of Moss Lake

In the Pineries near Du Bois, Pa.

WATER CIRCULATION AND ITS CONTROL

By BAILEY WILLIS, E.M.C.E., United States Geological Survey

(*Concluded*)

CONTROL OF RUN-OFF THROUGH GRAZING

ABOUT twenty-five per cent. of the area of the United States is so situated with reference to topographic and climatic conditions that it will best raise hardy grasses and must be devoted chiefly to grazing. The principal area is that of the great plains, extending from northwestern Montana around the base of the Rock Mountains to Texas, but including also portions of the basin region on the west. Within this area the governing condition is a meager precipitation. The soils are appropriate to agriculture, the mountain ranges above the plains are suited to forestry, but both agriculture and forestry require more water than the grass that feeds herds, and they are accordingly limited in distribution in this region. The herdsman's prosperity depends absolutely upon the grass. It is proved beyond dispute that overgrazing injures the grass, partially removes the protective cover, and promotes erosion. Erosion eventually results in the removal of all herbage, produces bare, gullied badlands, and makes restocking with grass impossible.

The method available to the herdsman for the limitation of run-off and the prevention of erosion is to increase the stand of the natural grass cover, upon which alone his herds depend. In some small areas he may find it necessary to adopt the usual methods of agriculture to check erosion, establish soil, and re-cover the surface with grasses, but in general that which any intelligent herdsman does to maintain the range upon which his herds live is that which he must do to prevent erosion and to limit run-off. Thus intelligent grazing promotes both individual and general welfare.

The preservation of grass upon the semiarid plains is of vital interest, probably, to the farming states, Minnesota, Iowa, and Missouri, and even more so to eastern Nebraska and Kansas. If it be true, as stated in the opening discussion of conditions of precipitation (p. 265), that radiation from the hot plains checks rainfall, it would follow, should they be eaten bare and eroded to badlands, that the semiarid climate would extend eastward. The plains themselves would become more arid, the farming districts adjoining them would be affected by prolonged droughts, and the climate would be unfavorably modified as far east as the western margin of the moist-air currents that flow north from the Gulf. Iowa is interested in the grass that grows in western Nebraska.

FOREST CONTROL OF PERCOLATION AND RUN-OFF

The areas which must be kept forested in North America comprise twenty-six per cent. of the whole continent. Of the United States nineteen per cent. requires forest protection or will grow trees more profitably than any other crop. The necessity for this amount of forests rests on two imperative economic conditions, (1) the value of forest products, and (2) the protection forests afford to other essential needs and activities of civilized communities.

It is not proposed here to discuss for-

est products, except to point out that their value maintains forests in areas where agriculture might be pursued if the forest products were not more valuable than the possible agricultural products. The distribution of forests, considered with reference to their products, is wholly one of cash returns. On this basis alone, however, the percentage area now left us cannot economically be reduced until the increasing population begins to feel a scarcity of grain. The present price of lumber, the search for substitutes, and the coming timber famine sufficiently prove this.

Forests protect all civilized activities that depend on a regular supply of clear water or that are liable to injury from irregular and excessive flood run-off. They are not the only protecting agency. We have discussed the very great importance of engineering and good tillage in this respect. But wherever they grow forests do protect, and they do grow and protect where no other agent economically can.

This truth is challenged, for we inherit the habit of the ax and the saw, and the effects of our reckless use of these tools are not yet so conspicuous as to be clearly distinguishable in the gross result of natural and artificial activities. The challenge cannot stand, however, against any fair consideration of the relations of forests and water in contrast to those of bare slopes and water.

In the opening pages of this paper we considered those phases of water circulation that are known as precipitation, ground water, evaporation, and surface flow. Forests affect each one of these, and each will be discussed in turn in the order named, so that we may clearly distinguish the several aspects of controverted points.

Forests in relation to precipitation.— Precipitation consists of rainfall, and in cold climates of snowfall, also, and these two kinds of precipitation are differently affected by forests. Concerning forests and rainfall, unqualified statements have led to exaggeration and contradiction by which the real facts are obscured. When a vast plain like the upper Mississippi Valley from St. Louis to the Great Lakes is cleared and brought under cultivation, no notable change in the amount of precipitation is likely to follow, for the air currents which sweep over it come from the Pacific and from the warm humid atmosphere of the Gulf. They are loaded with moisture and are driven north toward cooler zones. Rain falls from them inevitably, in spite of any minor effect of radiation from the fields of Illinois or Ohio. Were the wide surface stripped of green and soil and left a region of rock and sand, as central Asia was,[1] then local radiation would doubtless increase the irregularity and violence of rains, but the air rising from our fields of grain, though not as cool as that above a forest, is not so heated as to materially affect the powerful rain-bearing currents. Moreover, the general evenness of altitudes and uniformity of radiation from the green covering over a wide area tends toward regularity of conditions and gradual rather than violent changes. The ocean of green, whether of trees or grain, ameliorates the climate in like manner, though not in like degree, as does an ocean of water. Hence it is reasonable to expect that the total precipitation and the run-off, as indicated by stream gauges on rivers fed from this region, will not show any decided change as a result of deforestation. This appears to be the fact, though careful observations of rainfall and run-off have been too recently begun and are made at stations too far apart to give satisfactory data for comparisons.

Deforestation of a mountain range presents a different case, since in the long run it results in extensive erosion and bare surfaces. Leaving this last

[1] Pumpelly, Raphael: Relations of Secular Rock Disintegration. *Am. Jour. Sci.*, vol. 18, Feb., 1879.

statement to be discussed under "Erosion," we may compare rainfall on wooded mountains with that on barren ranges on the basis of extended human experience. The mountains of southern Spain, the Pyrenees, the Basse-Alps of southeastern France, the northern Apennines, the Dalmatian and Grecian hills, have all been stripped and eroded. The change from green-covered slopes to brown, bare steeps has been accompanies by a change from beneficent rains to destructive downpours. Statistics of precipitation in earlier times are not available for comparison with those of the present, but historical evidence is entirely adequate to prove that deforestation of a mountain range has modified the conditions of precipitation in such a manner that occasional heavy, destructive rains replace gentle and more frequent showers, at least in the countries mentioned.

These countries differ from northern Europe in a measure as the semiarid region west of the 100th meridian in North America differs from the Mississippi Valley. To this fact is due in large part the difference of opinion which exists among European writers as to the influence of forests on precipitation, springs, and run-off. Those who have observed in northern Europe the effects of deforestation of flat lands under humid climates minimize or deny entirely any influence exerted by forests; while those whose experience is with warmer, more arid, and consequently more critical conditions in mountainous southern Europe are convinced that forests exert an important beneficial influence upon rainfall, ground storage, and surface waters. To cite the latest conclusions we may quote from Cipolletti.[2]

It is generally admitted that regions covered with forests have a lower temperature than the open country, and the reason assigned for this is the evaporation from the surface of the leaves moistened by the rain, the area of which surface is estimated by Mr. Schleiden at fifty times that of the ground. Another cause is the constant evaporation during the vegetation season by exhalation of the same leaves, which Mr. Lafosse estimates at 150 cubic meters per hectare and day; and, finally, the large quantity of heat lost through the fixation of carbon, which the same Mr. Lafosse, upon the data furnished by Messrs. Lecart and Parisel, estimates, per hectare and day, at so many calories as will melt a block of ice 316 cubic meters. On the other hand, these same quantities of water which the forests continually emit into the atmosphere must help to increase the degree of humidity of the parts which immediately surround them. Thus, while on the one hand the temperature is lowered, the humidity is, on the other hand, increased; and hence it appears to be quite a logical and natural conclusion that within the forests the point of saturation of the air must be reached more quickly and more frequently than in the open, and consequently rain will also fall more frequently and in greater quantities.

This theoretical conclusion is borne out by abundant facts and experimental data.

Mr. Riedel quotes the island of St. Helena and Lower Egypt. On the former, owing to reforestations effected on a large scale, the rainfall has actually been doubled since the times of Napoleon I; and in Lower Egypt, where in the eighteenth century rain only fell on from ten to twelve days in the year, the number of rainy days nowadays reaches from thirty to forty, since some 20,000,000 of trees have been planted. On the other hand, on the shores of the Mediterranean, in Syria and Palestine, there are numerous regions which were formely in a flourising condition, but have become today arid and waste in consequence of the destruction of forests.

Mr. Ponti refers to the observations made at the Nancy school of forestry, which were confirmed in Russia by Professor Volsky, and by which it has been found that the rainfall in the interior of the forests was greater than outside of them. He adduces also the facts that in England, although it has not been possible to prove that the deforestation has caused here any reduction in the amount of rainfall or any appreciable change in the climate generally, it has been found nevertheless that the temperature is lower in forest-covered regions, the difference being as much as three degrees on the hottest days.

In regions where a considerable part of the precipitation is in the form of snow the forest catches it in the branches, protects that which falls to the ground from the sun, and retards its melting. These effects bear upon the proportions that evaporate or run

[2]Permanent Intern. Assn. of Navigation Congresses. X Congress, Milan, 1905. Report by Cipolletti, C., on Deforestation, etc.

off or sink into the ground and will come under those heads. It does not appear that forests influence the amount or distribution of snowfall.

Forests in relation to ground water.—Inasmuch as ground water and soil moisture are wholly derived from precipitation, any effect that forests may have in regulating rain extends to them. As compared with bare ground which receives all the rain and snow that fall, the ground beneath trees gets only a part, as they catch some proportion in their foliage. The percentage caught varies from twenty to forty per cent. of the precipitation measured in adjoining fields, according to the kind of trees, the density of stand, and other factors. Thus, if the conditions for percolation are the same under the trees and in the open the earth under the forest receives less than that under the bare surface. An approximation to this assumption is reached on level plains, provided the soil in the open be in an excellent state of tilth.

That proportion of the rain and snow which reaches the ground under the trees wets the mulch of mosses, leaves and decaying wood, and such part as is not thus absorbed seeps into the ground below. Only a small part escapes as run-off, unless the slopes be very steep. The mulch of decaying vegetable matter is extremely absorbent and will hold as much as fifty per cent. of its own volume, or two to three times its weight of water. From extended experiments in Germany with straw, leaves, and humus it appears that the moisture thus caught is evaporated to the air in dry seasons, and it would therefore be uneconomical from the point of view of ground-water storage to increase the surface litter beyond that required to prevent run-off. Under some conditions of forest maintenance it would probably be economical to keep the surface comparatively clean of litter and in an open state, such that the rain sifting gently through the foliage would be absorbed by the ground in a maximum degree.

The subsoil beneath the forest near the surface is moister than that beneath the adjoining fields. This is due chiefly to the covering of moist surface litter and to the relatively small evaporation at the ground surface. Deeper in the subsoil, at depths below a foot, the forest soil is often drier than that below the adjoining fields, for the tree roots take a large amount of water which is given off through the foliage. Thus, if we contrast the soil condition under the forest with that under the bare field we shall find the ground beneath the forest moister near the surface and drier below. The continuity of water films in the ground is a condition which promotes percolation, and the relatively moist surface layer thus aids the falling drops in reaching the deeper, drier layers when precipitation occurs. In the open, when the surface layer becomes measurably dried out and filled with air, a sudden rain may so occupy the pores of the immediate surface as to seal them against the escape of the underlying air, and the latter then prevents the percolation of water, and the impervious surface becomes one on which run-off is inevitable.

The total effect of trees in preventing some proportion of the rain from reaching the ground and in using some part of the moisture contained in the ground in their physiological processes is indicated by the depths to which they depress the level of ground water as compared with that in adjacent fields. Observations on this point have been made in Russia, France, and Germany, and the results are in agreement for European conditions. They were made on level ground, and the conclusions do not apply where run-off from the surface is copious. It is shown that—[3]

(*a*) The water table lies deeper below the surface under a forest than outside of it, if account be taken of the relief;

(*b*) The depression of the water table is more pronounced under old forests than under young plantations;

(*c*) The depression is more pro-

[3]Henry, E.: Les Forets de Plaine, Les Eaux et Forets, vol. 42, 1903, p. 161.

nounced in dry climates than where there is much rain.

The amount by which the water table may be depressed varies from a fraction of a meter to as much as three meters. It is observed in the level steppes of southern Russia, where the rainfall is moderate, that springs are found outside of the forests rather than in them. In citing these results, it is important to insist upon the distinction to be made between level and sloping surfaces. A comparison of the groundwater level beneath the forest with that beneath a flat field in which percolation is at a maximum gives an entirely different result from a similar comparison, in case the surface is so inclined as to permit run-off from the bare ground.

According to very careful and accurate observations made in Switzerland from 1903 to the present time and still in progress, it is found that the run-off from a wooded watershed is but sixty per cent. of that from a cleared watershed, all other conditions being the same; and that the maximum high-water level of the stream from the former is thirty to fifty per cent. lower than that of the stream from the latter.

The same observations establish the reciprocal fact that there is a larger and more continuous percolation of water into the ground and steadier flow of springs during drought from the wooded watershed than from the cleared watershed.[4]

Forests in relation to evaporation.—At the surface of the soil moisture passes into a state of vapor and is carried away by the air; this is evaporation. At the surface of a leaf moisture is given off by the living organism; this is transpiration. Evaporation is a physical phenomenon which increases with the dryness, temperature, and movement of the air; transpiration is a physiological phenomenon which depends upon the kind of plant and its response to the conditions to which it is exposed. Evaporation from the soil draws upon the moisture contained in the capillary spaces between the soil grains and extends down to the point where the soil is saturated—that is, to the water table in humid regions, or in arid regions to the point where the subsoil is so dry that the capillary films are no longer in contact. It continues until the available moisture in the soil is so reduced that the tension of the films about the soil grains becomes great enough to resist the tendency toward vaporization at the surface, and evaporation then practically ceases, although diffusion into the air spaces of the soil continues even at some depth. Transpiration from the surface of the leaf responds in some measure to sunlight and shadow, to humidity and dryness, and to temperature. Among these humidity is the most important. The rate of transpiration is, however, subject to physiological regulation, the mechanism of which is not understood. In certain experiments conducted by the desert laboratory it was found that in plants under examination the water loss due to transpiration was checked at temperatures above seventy-nine degrees Fahrenheit, whereas the checking action disappeared at lower temperatures.[5] Thus, some plants possess a means of defense against excessive transpiration during hot weather and drought, whereas the inert soil must go on yielding moisture almost to the last atom.

There is a certain amount of evaporation from the leaf surface, but it is exceedingly slight. It differs from transpiration in that it takes place through the tissue itself, whereas transpiration occurs through the stomata. A grape which has no stomata gives a good illustration of the very small amount of evaporation from such surfaces.

Underneath the trees in the forest

[4]Engler: Der Einfluss des Waldes auf den Stand der Gewässer. Centralblatt für das gesammte Forstwesen, Jan., 1907, pp. 35-40.

[5]MacDougal, D. T.: Botanical features of North American Deserts. Carnegie Institution, Publication 99, 1908, p. 86.

the conditions are much less favorable to evaporation from the soil than in a bare field near by, the humidity being higher and the temperature very much lower. Above the trees also the air is cooler and more humid than it is at the same altitude above bare ground. This last statement requires some explanation. Sunlight passing through the air raises its temperature somewhat, but a more important influence is that of the currents of air set up by contact with the surface upon which the sunlight falls. We all know the heat which rises from bare ground, and how comparatively cool is the sward. Similarly the surface of the ground is hotter than the surface of the foliage of a forest. The effect of radiation from these two contrasting surfaces is shown by the experience of French aeronauts to extend to a considerable height. According to E. Henry:[6]

> The cooling effect observed by æronauts in passing over forests of a certain extent is indicated by a marked descent of the balloon. It is a well-established fact that this effect was experienced by a number of military balloonists above the forest of Orleans, the balloon being at an altitude of about a thousand meters. It appears to be demonstrated by the balloon ascensions made up to the date of the statement that the influence of forests of similar extent (34,000 hectares, or about twenty square miles) is observable up to an altitude of 1,500 meters.

To sum up the preceding considerations: The effect of these complex relations has been made the object of investigation, particularly in Germany, through the study of the amount of moisture remaining in the soil under the various kinds of trees, and in the adjacent open. Some reference to these results has already been made; but the general conclusion is that the effects of transpiration from luxuriant foliage are very materially greater than those of evaporation from the bare level surface.

The most striking illustration of this factor is the effect of eucalyptus trees, which, planted in the Pontine marshes near Rome in 1870 (in the vicinity of the Convent of St. Paul of the Three Fountains), have lowered the level of the ground water several decimeters. In this case the transpiration from the water-loving eucalyptus is more vigorous than was the evaporation from the water and vegetation of the swamps.

The relation of the forest to run-off on level land is not an important factor. As we have already seen, it is possible to keep level fields in such a condition of tilth that the amount of run-off from them is no greater than that from the forest. On slopes the case is different. The effect of the forest is, first, to diminish the violence with which the rain strikes the ground and compacts it, for the drops are checked by the foliage. They fall from branch to branch and reach the ground with greatly diminished momentum and in a finer state. That portion which drops from the leaves comes in larger masses, but still gently. Beneath the forest the rain finds a moist soil whose capillary water is capable of vigorous downward circulation. The soil is also opened by the forest roots, and being protected from the compacting and cementing influences of a free exposure is decidedly porous. All these conditions militate against run-off and promote absorption. In consequence the run-off from forest areas gathers slowly as compared with bare slopes, and the ratio becomes increasingly favorable in regard to forests as slopes become steeper. This fact enters into the consideration of the value of forests in mountain regions as compared with those on plains. Ebermayer,[7] from whose paper many of the data used in this report have been taken, says:

> In view of the exact investigations which have been cited above, and which extend through thirty years, it is no longer possible to maintain the assumption so generally made, that forests increase the amount of ground water and constitute a storage reservoir for the supply of springs, at least not

[6] Henry, E.: Sur le rôle de la forêt dans la circulation de l'eau à la surface des continents. Comptes rendus du Congrèss des sociétés savantes en 1901.

[7] Ebermayer, Ernst: Einfluss der Walder auf die Bodenfeuchtigkeit, auf das Sickerwasser, auf das Grundwasser, und auf die Ergiebigkeit der Quellen. 1900. p. 38.

so far as plains are concerned. The draining effect of the forest is, on the contrary, so great that a much greater supply of water gathers in the depths beneath a treeless plain than beneath dense woods, provided that the underground conditions be the same in both cases. It follows that under these conditions the discharge of springs is not increased, but lessened, by woods. Decided emphasis must, however, be laid upon the fact that these conclusions hold primarily only for the plains, and are not to be extended inconsiderately to uplands and mountains. Although the influence of the woods upon soil, moisture, percolation, and ground water under like conditions must be the same in mountains as it is in lowlands, and only moderate differences are likely to appear, nevertheless the forest on the mountain differs very decidedly from that on the plain in regard to water control, inasmuch as in mountain regions, in consequence of the surface run-off of rain and snow water from the slopes, a factor is introduced through which wooded mountain slopes receive a much larger amount of water than bare, unwooded watersheds.

Forests in relation to erosion.—The emphasis which Ebermayer lays upon the loss through run-off from bare slopes is in no sense exaggerated. The detrimental character of this loss in relation to storage of water for all the activities of civilized communities, including navigation, cannot be exaggerated. Its effects have already been described in speaking of flood run-off, but we may here recur to the injury which it does, particularly with reference of the erosion of soil. If it were conceivable that we could adjust our activities to the loss of one-half of the available water through flood run-off it would still be inconceivable that we could permit the accompanying loss of the soil. Without soil the earth becomes a desert and without soil man must cease to exist.

This consideration is of prime importance everywhere, but it assumes overshadowing importance beyond any other in mountain regions of large rainfall. The Appalachian Mountains constitute such an area of great extent and of very marked character, and they occupy a very critical position in the center of the richest half of our country. Concerning the effect of uncontrolled run-off from this region we have, unfortunately, abundant evidence, the emphatic testimony of ruined and abandoned lands.

Summing up the observations of the thoroughly qualified and unbiased observer, L. C. Glenn, we are able to show what relation the destruction of the forest bears to run-off in the watersheds of the southern Appalachians.

Forty-six creeks and small rivers, whose watersheds may be described as timbered rather than cleared, are known, according to observation and local repute, in times of flood to rise gradually, to continue high for several days, and to subside slowly. They carry but little sediment and they maintain a good volume of water during dry seasons.

Thirty-eight creeks and small rivers in the same watersheds, whose slopes may be described as cleared rather than timbered, are known, according to observation and local repute, in times of flood to rise rapidly to extreme flood height, to carry excessive quantities of mud, sand, and gravel, and to fall quickly. In dry seasons they are very low, and the range from lowest to highest stages has increased and inflicted much damage in very recent years.

Two other classes of conditions may be recognized in Professor Glenn's descriptions: The one of valleys still timbered, but which are being damaged by beginning of logging and particularly by erosion of logging chutes; the other, of watersheds that are largely cleared but grassed, and which the grass protects from erosion, though not in the same degree from rapid run-off.

Such evidence as this, collected by a qualified and impartial observer with reference to individual watersheds, establishes for the region in question, comprising the mountains of North Carolina, Tennessee, and Georgia, the fact "that forests do exert a beneficial influence on stream flow by storing the waters from rain, preventing their rapid rush to the streams, and paying them out gradually afterward, thus acting as true reservoirs in equalizing the run-off."

These detailed observations sustain the general facts which every mountaineer

knows: That streams which flow from a forested area rise slowly, carry little sediment, and fall slowly in times of flood, and throughout the year are relatively far more uniform in their flow; whereas streams which flow from deforested regions rise quickly, carry heavy bodies of sediment, and sink early in the season of drought to minimum low-water stages.

On the basis of superficial observation it is sometimes said that deforestation as it is now proceeding in the Appalachian Mountains does not seriously affect the streams, because the forest which the lumberman cuts is soon replaced by an aftergrowth. It is true that the full effect of deforestation follows immediately upon lumbering only in extreme cases, but wherever the forest and the superficial forest soil are removed a beginning has been made in the process of erosion which will ultimately remove all the soil. The aftergrowth that follows the severe cutting and burning under modern lumber conditions is a weakened growth. It never covers the surface as the virgin forest did; it is always traversed by freshly cut gullies, and the level of channel grades is sunk below the surface from a few inches to ten feet or more. The advantage thus given to the eroding power of thousands of rills is not overcome by any natural process. Man alone can so direct and localize a defense as to make it effective, and he does it only at great cost. It is true that under favorable conditions the soil will maintain itself till the trees of the aftergrowth become merchantable timber, and that the processes of cutting, burning and partial erosion might under the most favorable circumstances be continued till several crops had been cut from the surface and a half a century or more had passed, but the result would be deferred merely. That result is to be seen in the bare mountains that stretch from Spain to Asia Minor and in those of northern China.

The forests have long protected the Appalachian Mountains; they were growing throughout the eastern United States when a great plain stretched unbroken from the Atlantic to the Mississippi, and they have continued their growth, though changing in species and in distribution, while the earth's surface has been raised to the heights from which the mountains are being carved. During the whole process the forests have conserved and protected the mountain slopes from washing.

Let us pause to consider the slow changes of the ages that preceded the advent of man, the destroyer, or possibly the protector.

On a vast plain covering the area of the eastern United States and Canada there grew a luxuriant forest. The plain was almost continuous.

Within the earth titanic forces gathered gradually till their power sufficed to raise the surface slowly and to elevate the plain. Rising in a zone that reaches from Canada to Alabama the elevated plain became a plateau from which many rivers flowed to the Atlantic and Pacific. As the slopes steepened, the waters, falling swiftly, cut their channels deeply and made canyons, which widened to valleys. Genial climates favored vegetation, which during the long, slow process of mountain growth and valley carving never was removed extensively. Woods prevailed and held the soil, always adjusting their growth to the very gradual changes of the valley slopes. If perchance a steep was bared by a sudden landslide it was in time washed clean to the hard rock and became a cliff, or caved and extended till vegetation could take a foothold again. Thus the mountains of to-day were slowly carved from the upraised mass, and ever through the ages the forest trees grew and flourished and died, generation after generation, in the soil their roots held fast and enriched and deepened. It was their destiny to outlive the mountains, whose inert mass must yield eventually to the unceasing attacks of erosion and be worn down again to a gently sloping plain, over which the forest should stretch its living covering. But man has come, he holds the forests' destiny in his hands, and his own is intimately linked with theirs.

Virgin Redwood near Crescent City

CHEMISTRY AND CONSERVATION

THE attitude of American chemists toward the conservation of natural resources is clearly shown by the proceedings of the American Chemical Society at its last (Baltimore) meeting. On this occasion the president of the society, Dr. M. T. Bogert, of Columbia University, delivered, to a large and enthusiastic audience, his presidential address on the subject of conservation. The address was immediately followed by the report of the committee appointed to cooperate with the National Conservation Commission. This report is signed by F. W. Clarke, chairman; H. W. Wiley, C. F. Hertig, S. W. Parr, and R. B. Dole, and reads as follows:

In May, 1908, a meeting of the governors of the different states was held at the White House in Washington to consider the conservation of our rapidly wasting natural resources. Following this meeting, a commission was appointed by the President of the United States to investigate the subject, and the principal scientific societies of the United States were invited to cooperate with it. The committee of the American Chemical Society, appointed in response to this invitation, now has the honor to submit the following preliminary report:

On December 8, 9, and 10 the National Conservation Commission met in Washington in joint conference with the delegates of other organizations and the governors of more than twenty states. The commission, in its elaborate investigations, had, so to speak, taken stock of our natural resources, and its report, therefore, was essentially statistical in character. It had estimated the magnitude of each particular resource, and had studied the rate of consumption of such substances as lumber, coal, iron, etc. It discussed the wastage of the land by preventable erosion, and its effects not only upon agriculture but also in reducing the navigability of streams. Questions like these were treated at considerable length, and their general character is all that need be mentioned just here. The data of the Commission were mainly classified under four headings, namely, minerals, forests, lands and waters, and under each one the evils to be remedied were pointed out with all the emphasis and clearness which the statistical method of investigation made possible. The Commission cleared the ground for study into the prevention or limitation of future waste; and the problem of conservation can now be taken up in a more intelligent manner than has been possible hitherto. We now know better than ever before what the evils and dangers really are; the next step is to discover remedies, and then, finally, to apply them. The public attention has been aroused; the people of the country are awakening to the necessity of greater prudence and economy in the use of our resources, and definite lines of action can now be laid down with a reasonable probability that they will be followed. Fortunately, the reports of the Commission are neither sensational nor unduly pessimistic; the results of their conferences are presented seriously, and in such a manner as to compel consideration; they are, therefore, all the more likely to produce permanent effects of great benefit to the American people. The utterances of the mere alarmist rarely carry conviction; but disclosures like these made by the Conservation Commission cannot be disregarded.

Up to the present moment chemistry has had little to do with the investigations of the Commission. Henceforward the chemist must be called upon in many ways, for the waste of re-

sources is often preventable by chemical agencies. Chemistry has already done enough to prove its potency, and its influence is felt in every branch of industry. Adopting the classification of the Commission, we shall find the chemist active under every heading. Under minerals, we must note that metallurgy is essentially a group of chemical processes by which the metals are separated from the ores; a separation which may be either wasteful or economical. Within recent years, within the memory of members of this society, the available wealth of the world in metals has been enormously increased. By the cyanide process for extracting gold, ores are now profitably worked which were formerly worthless, and at the same time the demand for mercury has been decreased. The Bessemer process for steel making, now also modified for use in copper smelting, is purely chemical; and its later modification, the Gilchrist-Thomas process, applies similar principles to phosphatic ores, which were previously of little value. Furthermore, in the last-named process, phosphatic slag is produced, which is useful as a fertilizer and helps to relieve the drain upon our rapidly wasting supplies of phosphate rock. Chemists are now studying, with much success, the problem of preventing corrosion in iron, a research which will prolong the life of iron structures and thereby reduce the waste of ore. The use of coal slack by briquetting methods is largely based upon chemical investigations; the salvage of by-products from coke ovens, such as tar and ammonia, is wholly due to chemical research; coal is further economized by the study of boiler waters and the consequent prevention of boiler scale. Even inferior coals, lignites, are now converted into what is known as producer gas, and so are transformed into the best kind of fuel. Petroleum is refined by chemical means, and every fraction of it is saved, either as illuminating oil, as gasoline, as a lubricant, as vaseline, or as paraffin. These are all notable achievements, but greater are yet to come. Enormous quantities of valuable substances are thrown into the atmosphere in fumes from smelters, which should, and probably can be, partly saved. Electro-chemistry is rapidly developing a large group of new industries, making such metals as aluminum, magnesium, and calcium available for use, and it is reaching out into other fields of electro-metallurgy in which electric heat, generated by water power, will be used for smelting other metals, thereby reducing the consumption of coal.

In forestry also, the influence of the chemist is distinctly felt. The sprays used for destroying noxious insects are chemical preparations. The manufacture of wood alcohol is a chemical process, which may be either wasteful or economical. Turpentine is now produced wastefully, but the waste can be diminished by careful refining, and furthermore, the chemist can aid in discovering substitutes for it. Substitutes for tan bark are also to be sought for by means of chemical investigations. Another distinctively chemical operation is the preparation of wood pulp for paper making, a process which is now wasteful in the highest degree. It is estimated that for every ton of pulp now made by the sulphite process, more than a ton of waste material is allowed to drain away into our streams. How to make this material useful is a chemical problem, and so also, in great part, is the investigation of other, now useless, fibers which may replace the more valuable wood. The preservation of wood from decay is still another art in which chemistry is predominant.

In preserving the fertility of our land, chemistry has an important part to play. Our knowledge of fertilizers, of the food on which crops can thrive, is entirely chemical so far as accuracy is concerned, and must be applied in accordance with chemical principles. A fertilizer which is useless, and therefore wasted on one soil, may be needed on another. Certain fertilizers, like the Stassfurt salts, Peruvian guano, the Chilean nitrates, and phosphate

rock are limited in quantity, and their future exhaustion must be considered now. What shall replace them in the future? Already processes have been devised for fixing the nitrogen of the atmosphere and rendering it available for plant food. Saltpeter and other nitrates can be and long have been made from waste materials, such as old mortar and animal refuse. The phosphatic slags have been mentioned in connection with metallurgical processes. These sources of fertility are important, but greater still is the source found in our municipal sewage. The problem of its salvage has been worked out in some localities, but in the United States the people are only beginning to be aroused to its importance. Enormous masses of material, easily available for fertilizing purposes, now drain into our rivers or directly into the sea. Another question, now under investigation, is the possibility of using our common feldspathic rocks in fine powder, to replace the potassium withdrawn by plants from the soil.

The relations between the chemical composition of water and the conservation of natural resources are of intimate and fundamental importance, and some of them have been mentioned under other headings. The rate at which the land surface of the United States is being transported to tide water has recently been estimated by means of chemical analyses of river water coupled with determinations of stream flow, and the results of the computations will doubtless assist considerably in studying soil erosion and the impoverishment of agricultural lands. In steam making the chemical quality of the water supply is an appreciable factor in fuel consumption, a subject to which reference has already been made. The scale that forms on the boiler shell and tubes, when water containing incrustants is used, is a poor conductor of heat and, consequently, causes increased expense for fuel. By detailed study of the chemical composition of available boiler waters, it is possible to select a supply having a minimum amount of incrusting, corrosive, and foaming constituents, thereby effecting appreciable economy in fuel. Chemical investigation of methods for purifying water supplies, not only for boilers but for paper manufacture, soap-making, and other great water-consuming industries, will enable manufacturers to make new and greater saving in many raw materials other than fuel.

Stream pollution by industrial refuse and by sewage is a source of enormous waste in our natural resources. The subject has been for many years a field of research for industrial, sanitary, and biological chemists in the United States, and their investigations have resulted in the improvement of manufacturing processes, the utilization of wastes, the purification of sewage, and the protection of domestic water supplies. When the presence of deleterious substances in our river and lake waters has caused loss of fish life and the destruction of oyster beds, the chemist and the biologist have detected the harmful ingredients and have suggested methods for their removal. River silt, an important source of detriment to navigation, is also estimated by the chemist. It has been fully demonstrated that the prevention of stream pollution lies not alone through injunctions and other legal proscriptions, but also in using waste materials or, when that is not possible, in rendering them harmless. The chemist has much to do in protecting and preserving the quality of our water supply. Upon that, in very great measure, depends the preservation of our highest resource, human life. Polluted waters distribute typhoid fever and other dangerous diseases, and so cause losses which should be, and really are, preventable.

The foregoing illustrations are enough to show, for present purposes, the intimate connection between chemistry and the study of conservation. They also bring out the fact that the classification adopted by the National Commission, although admirable for statistical research, is not final, and that it needs to be supplemented by a different subdivision of the data. The

facts to be investigated often fall under more than one heading of the classification, and actually interlock in every conceivable manner. To operate a placer mine, for example, abundant water is needed, while a deep mine requires timber for its shafts and levels. In building and occupying a house one covers land, uses lumber, brick, stone, and iron, introduces water supply, and burns fuel. In short, every phase of the conservation question affects the interests of everybody. If the investigation of our natural resources is to be made effective, it must be applied to individual industries, and in order to do that another scheme of classification would seem to be necessary. Such a scheme we venture to outline, but very briefly.

At the outset the problem can be divided into two parts, one relating to sources of energy, the other to material substances. The two are not really separable, but may advantageously be considered separately.

In the first place, the energy available for industrial uses may be classified under three heads, as follows: First, inexhaustible energy, such as solar radiation, wind power, tidal power, and, with certain limitations, the power furnished by flowing streams. Second, reproducible or renewable energy, like the power supplied by horses and other domestic animals. Wood, regarded as fuel, also falls under this heading, for forests can be artificially grown. Third, the exhaustible energy represented by mineral fuel, like natural gas, petroleum, and coal, which, once used, is gone forever. Under this classification the practical problems are, to economize the exhaustible energy, to encourage the development of renewable energy, and to discover new methods of using the inexhaustible energy.

Exactly the same classification applies to material substances. Some, like sea salt, limestone, and clay are, humanly speaking, inexhaustible. Agricultural and forest products are reproducible, some of them year by year. The metallic ores and such useful minerals as phosphate rock are, however, exhaustible, and need to be conserved.

With the aid of this very simple classification it becomes possible to analyze a specific industrial problem in such a manner as to make evident its factors of waste or economy. For example, sea salt is inexhaustible, and may be extracted by solar evaporation, which is a use of inexhaustible energy. Agricultural products are renewable, and their prodution chiefly requires the renewal energy of men and animals. But the smelting of metallic ores, as now conducted, involves the use of exhaustible material, both as ore and as fuel.

In most industries, however, the two sets of considerations are combined. Portland cement, for example, is made from inexhaustible substances, but is burned with exhaustible fuel. The latter factor in the industry, therefore, is the one to be carefully considered, while the first factor is negligible. Taking industry by industry we shall find that this condition of affairs is general, and that each one must be studied by itself with reference to its inexhaustible, reproducible, and exhaustible elements. In doing this a clear notion can be obtained as to the real needs of a given industry, and our attention can then be concentrated upon those features of it which particularly demand economy. We shall be able to locate evils with greater accuracy; to diagnose the industrial diseases, so to speak, and then to look intelligently for remedies. Many of the remedies must be sought for along chemical lines of research, which will develop economical processes of manufacture, utilize materials that are now wasted, or substitute cheap for costly substances. Cheap and costly, however, are words which need qualification. A substance or a process which is cheap to-day may be in reality wasteful with a temporary reduction in price at the cost of some permanent economy. For our purposes the two words imply a deeper discrimination than is carried by their ordinary use. Tempo-

rary efficiency and cheapness are to be discountenanced, while permanent economy for the benefit, not only of the Nation, but of the whole human race, is to be encouraged. This principle is sound, but its practical applications will involve many difficulties, and develop many conflicts with special interests. Like all ideals it cannot be realized absolutely, but it represents a standard of action toward which we must move, even though the ultimate goal of perfection may never be attained. Evils can be mitigated, although they may not be entirely removed.

THE PRESIDENT FOR CONSERVATION

President Taft, on April 30, addressed a letter to Mr. A. W. Shaw, editor of *System*, which has been made public. It reads:

WHITE HOUSE,
WASHINGTON.

April 30, 1909.

My dear Mr. Shaw:

The conservation of National resources is a subject which will properly claim from the present administration earnest attention and appropriate legislation. The necessity for a comprehensive and systematic improvement of our waterways, the preservation of our soil and of our forests, the securing from private appropriation the power (monopolistic) in navigable streams, the retention of the undisposed of coal lands of the Government from alienation, - all these matters are vitally (complete) important to the people of the United States, and to your constituency, the business men of the country.

Without the resources which make labor productive, American enterprise, energy, and skill would not in the past have been able to make headway against hard conditions. Our children and their children will not be able to make headway if we leave to them an impoverished country. Our land, our waters, our forests, and our minerals are the sources from which come directly or indirectly the livelihood of all of us. The conservation of our natural resources is a question of fundamental importance to the United States now - to the business man to-day.

Very sincerely yours,

Wm. H. Taft

Mr. A. W. Shaw,
Editor, "System,"
Chicago, Illinois.

ORGANIZATIONS WHICH HAVE PASSED RESOLUTIONS FAVORING THE ESTABLISHMENT OF THE APPALACHIAN NATIONAL FOREST

Adirondack Murray Memorial Association.
American Civic Association.
American Cotton Manufacturers' Association.
American Forestry Association.
American Institute of Electrical Engineers.
American Mutual Newspaper Association.
American Society of Civil Engineers.
Appalachian National Forest Association.
Asheville, N. C., Board of Trade.
Association for the Preservation of the Adirondacks.
Board of Trade, Charleston, W. Va.
Board of Trade, Columbus, Ga.
Board of Trade, Columbus, Ohio.
Board of Trade, Elkins, W. Va.
Board of Trade, Grand Rapids, Mich.
Board of Trade, Greenville, S. C.
Board of Trade, La Crosse, Wis.
Board of Trade, Nashville, Tenn.
Board of Trade, Savannah, Ga.
Board of Trade, Winston-Salem, N. C.
Board of Trade, Providence, R. I.
Business Men's Club of Huntsville, Ala.
California Promotion Committee (in convention at Petaluma).
Carriage Builders' National Association.
Chamber of Commerce, Atlanta, Ga.
Chamber of Commerce, Augusta, Ga.
Chamber of Commerce, Belton, S. C.
Chamber of Commerce, Boston, Mass.
Chamber of Commerce, Charleston, S. C.
Chamber of Commerce, Chattanooga, Tenn.
Chamber of Commerce, Columbia, S. C.
Chamber of Commerce, Cleveland, Ohio.
Chamber of Commerce, Los Angeles, Cal.
Chamber of Commerce, Newberry, S. C.
Chamber of Commerce, Parkersburg, W. Va.
Chamber of Commerce, Pittsburg, Pa.
Chamber of Commerce, Raleigh, N. C.
Chamber of Commerce, Sumter, S. C.
Commercial Club, Mobile, Ala.
Commercial Club, Montgomery, Ala.
Commercial Club, Louisville, Ky.
Colorado State Forestry Association.
Connecticut General Assembly.
Connecticut Lumber Dealers' Association.
Convention for the Extension of Foreign Commerce.
Counties Committee of California Promotion Committee.
Engineering Society of the Carolinas.
Daughters of the American Revolution, National Society.
Eastern States Retail Lumber Dealers' Association.
Federation of Women's Clubs, D. C.
Federation of Women's Clubs, Grand Rapids, Mich.
Federation of Women's Clubs, Toledo, Ohio.
Forestry Association and Women's Clubs, Paducah, Ky.
Forestry Club, University of Michigan.
Gadsden Commercial and Industrial Association, Gadsden, Ala.
Greater Charlotte Club, Charlotte, N. C.
League of Improvement Societies in Rhode Island.
Manti National Forest.
Manufacturers' Club, High Point, N. C.
Merchants' Association of New York.
Merchants and Manufacturers' Association of Milwaukee.
Michigan Agricultural College.
National Association of Manufacturers.
National Association of Box Manufacturers.
National Association of State University Presidents.
National Association of Cotton Manufacturers.
National Board of Trade.
National Hardwood Lumber Association, Atlantic City.
National Lumber Manufacturers' Association.
National Slack Cooperage Manufacturers' Association.
National Wholesale Lumber Dealers' Association.
New Century Club, Detroint.
New England Cotton Manufacturers' Association.
New York Board of Trade and Transportation.
North Carolina Legislature.
Pennsylvania State College, Faculty of School of Agriculture.
Pomona Grange of Oregon.
Public Meeting, Alma, Mich.
Public Meeting, Detroit, Mich.
Public Meeting, Jackson, Mich.
Public Meeting, Muskegon, Mich.
Public Meeting, Springdale, Conn.
Public Meeting, Wausau, Wis.
Rhode Island Institute of American Architects.
Science Club of University of Wisconsin.
Trinity College, Durham, N. C.
United States Hay Fever Association.
West Virginia State Board of Trade.
Women's Club, Bay City, Mich.

Women's Club, Eau Claire, Wis.
Wofford College Lyceum, Spartanburg, S. C.

As a further indication of the extent of interest in Appalachian-White Mountain legislation, the following list may be added:

List of Delegates to Congressional Hearing for Appalachian-White Mountain National Forest Reserve Before Committee on Agriculture, House of Representatives, Jan. 30, 1908.

APPALACHIAN NATIONAL FOREST ASSOCIATION

Ligon Johnson, President.
John H. Finney, Secretary and Treasurer.
R. Gordon Finney, Assistant Secretary.

STATE OF GEORGIA

Hon. Hoke Smith, Governor of the State.
Maurice W. Thomas, Atlanta.
Asa G. Candler, Atlanta.
Joel Hurt, Atlanta.
Sam D. Jones, Atlanta.
Maj. John S. Cohen, Atlanta.
W. G. Cooper, Atlanta.
Hugh M. Willett, Atlanta.
Harvie Jordan, Atlanta.
Will H. Shippen, Atlanta.
Isaac Haas, Atlanta.
R. J. Griffin, Atlanta.
F. L. Seeley, Atlanta.
Ralph Smith, Atlanta.
Oscar Pappenheimer, Atlanta.
John S. Corrigan, Atlanta.
Forrest Adair, Atlanta.
E. F. Morgan, Atlanta.
J. J. Spalding, Atlanta.
F. H. Hadley, Atlanta.
B. M. Hall, Atlanta.
A. H. Colcord, Atlanta.
A. M. Whaley, Atlanta.
Walter P. Andrews, Atlanta.
Samuel Dunlap, Atlanta.
J. H. McGowan, Augusta.
Oswell R. Eeve, Augusta.
Bowdrie Phinizy, Augusta.
Thos. W. Loveless, Augusta.
I. T. Hickman, Augusta.
W. E. Small, Macon.
W. E. McCaw, Macon.
T. J. Simmons, Macon.
W. A. Little, Columbus.
Fred B. Gordon, Columbus.
Gunsby Jordan, Columbus.
Leo Lowenherz, Columbus.
W. C. Bradley, Columbus.
J. D. Massey, Columbus.
Linton A. Deane, Rome.
Barry Wright, Rome.
Seaborn Wright, Rome.
J. Lindsay Johnson, Rome.
W. F. Dorsey, Athens.
Frank Shackleford, Athens.
Paul Gilreath, Cartersville.
Paul Akin, Cartersville.
C. P. Goodyear, Brunswick.
H. H. Dean, Gainesville.
John A. Smith, Gainesville.
H. A. Meikleham, Lindale.
A. S. J. Stovall, Elberton.
A. M. Kitchins, Cornelia.
Luke E. Tate, Tate.
Charles Barret, Union City.
J. S. Adams, Demorest.
Dr. Jeff Davis, Toccoa.
Dr. L. G. Hardman, Commerce.
Smith D. Pickett, Albany.
Claude N. Bennett, Thompson.

STATE OF VIRGINIA

Rorer A. James, Danville.
R. P. Barham, Petersburg.
S. S. Nottingham, Norfolk.
J. H. Lindsey, Charlottesville.
A. McG. Griggs, Portsmouth.
C. E. Thacker, Newport News.
M. H. Claytor, Roanoke.
John S. Bryan, Richmond.

STATE OF WEST VIRGINIA

W. B. Matthews, Charleston.
Col. C. B. Kefauver, Parkersburg.
R. B. Naylor, Wheeling.
L. J. Corbly, Huntington.
Hugh Shapps, Bluefields.
L. C. Lough, Fairmount.
Prof. M. S. Hodges, Morgantown.
Hon. Harvey W. Harmor, Parkersburg.
Hon. Stewart W. Walker, Martinsburg.
Howard Sutherland, Elkins.
Director James H. Stewart, Morgantown.
Prof. Henry S. Green, Morgantown.
Hu Maxwell, Washington, D. C.
Hon. Geo. C. Sturgiss, Washington, D. C.
Hon. W. P. Hubbard, Washington, D. C.
Hon. Jos. H. Gaines, Washington, D. C.
Hon. Harry Woodyard, Washington, D. C.
Hon. James A. Hughes, Washington, D. C.
Hon. S. B. Elkins, Washington, D. C.
Hon. N. B. Scott, Washington, D. C.
Secretary J. B. Garvin, Charlestown.
Isaac T. Mann, Bramwell.
Amos Bright, Sutton.
William D. Ord, Landgraff.
Col. Edward O'Tolle, Gary.
Hon. S. W. Willey, Hinton.
Hon. H. I. Shott, Bluefield.

STATE OF SOUTH CAROLINA

Prof. A. C. Moore, Columbia.
Dr. J. A. B. Scherer, Newberry.
W. C. Woods, Darlington.
James F. Neville, Walhalla.
E. H. De Camp, Gaffney.
Thomas A. Ratliff, Anderson.
H. N. Snyder, Spartansburg.
Prof. B. E. Geer, Greenville.
Hon. A. C. Kaufman, Charleston.
Executive Committee from South Carolina, E. J. Watson, Columbia, S. C.

STATE OF NORTH CAROLINA

J. P. Lucas, Winston-Salem.
W. I. Underwood, Greensboro.
Benj. Bell, Wilmington.
James H. Caine, Asheville.

James A. Robinson, Durham.
J. J. Fariss, High Point.
Geo. B. Crater, Raleigh.
E. R. Preston, Charlotte.
John T. Patrick, Wadesboro.
Wade H. Harris, Charlotte.
W. S. Lee, Charlotte.

STATE OF KENTUCKY

W. H. Mackoy, Covington.
Robt. A. McDowell, Louisville.
Col. J. B. Atkinson, Earlington.
A. T. McDonald, Louisville.
Frank H. Hartwell.
Geo. A. Newman, Louisville.
Prof. H. T. Brownell, Louisville.
W. E. Burk, Louisville.
Professor Marks, Louisville.
Webster Gazley, Louisville.
J. M. Johnson, Louisville.
Frank H. Miller, Louisville.
Lafon Allen, Louisville.

STATE OF ALABAMA

Hon. J. H. Wallace, Alabama Forestry Commission.
Hon. J. A. Wilkinson, Alabama Forestry Commission.

STATE OF TENNESSEE

L. C. Glenn, Vanderbilt University, Nashville.
Saml. B. Smith, Chattanooga.

NEW ENGLAND STATES

Philip W. Ayres, Forester, Society Protection of New Hampshire Forests; Forester Dartmouth College grant.

Henry A. Barker, Department Vice-president "Public Reservations," American Civic Association, representing mayor of Providence, Providence Board of Trade, and League of Improvement Societies in Rhode Island.

Robert P. Bass, New Hampshire Forestry Commissioner.

George Ward Cook, Haverhill, Mass., representing interests in the Merrimac Valley.

F. B. Davis, Lawrence, Mass., lumber manufacturer.

Thomas H. Dearborn, Concord, N. H., state entomologist.

C. F. De Forest, New Haven, Conn., representing Connecticut Lumber Association and state of Connecticut.

F. C. Dumaine, treasurer Amoskeag Manufacturing Company, of Boston.

Charles L. Elwell, Concord, N. H., recently speaker house of representatives.

R. E. Faulkner, Keene, N. H., New Hampshire Forestry Commissioner.

G. W. Field, Chairman Commission on Fisheries and Game, Boston.

Charles M. Floyd, Manchester, N. H., governor of New Hampshire.

C. C. Goodrich, Hartford, Conn., manager Hartford and New York Transportation Company.

H. S. Graves, New Haven, Conn., Yale Forest School and state delegate.

James P. Gray, Boston, hydrographic engineer, president Boston Manufacturers' Insurance Company.

M. J. Hapgood, Peru, Vt., representing the governor and State Forestry Association.

Henry R. Hayes, representing Stone & Webster, electrical engineers, 147 Milk Street, Boston.

E. F. Hitchins, Waterville, Me., state entomologist.

D. Blakeley Hoar, Brookline, Mass. Appointed by governor of Massachusetts.

Prof. John G. Jack, forest department, Harvard University.

Harlan P. Kelsey, Salem, Mass., vice-president department of nuisances, American Civic Association, president Civic League of Salem, Mass.

Lieutenant-governor Lake, Hartford, Conn.

A. E. Lang, Cornish, N. H.

George B. Leighton, vice-president American Civic Association, Monadnock Farms, New Hampshire.

Arthur Low, Fitchburg, Mass., president Park Hill and Lancaster Manufacturing Companies. Appointed by governor of Massachusetts.

J. Horace McFarland, Harrisburg, Pa., president American Civic Association.

Hon. John McLane, ex-governor of New Hampshire, Milford, N. H.

William A. Martin, Holton, Me.

George F. Mead, Boston, Boston Fruit and Produce Exchange and Boston Associated Board of Trade.

Rev. Daniel Merriman, 12 Bay State Road, Boston. Appointed by governor of Massachusetts.

F. W. Rane, state forester, State House, Boston, Mass. Appointed by governor of Massachusetts.

F. Gardner Richards, Rockport, Mass.

Frank W. Rollins, ex-governor of New Hampshire, president Society for Protection of New Hampshire Forests.

Harvey N. Shepard, Boston, representing Commonwealth of Massachusetts, Massachusetts State Board of Trade, Appalachian Mountain Club.

Edwin A. Start, secretary Massachusetts Forestry Association, representing that association and Commonwealth of Massachusetts.

Dr. M. F. Sullivan, president of the Board of Trade of Lawrence, Mass.

Dr. George F. Swain, professor of civil engineering Massachusetts Institute of Technology, member Boston Transit Commission, representing state of Massachusetts.

James P. Tolman, Boston, Mass. Appointed by governor of Massachusetts.

Justin E. Varney, Lawrence, Mass., cashier Bay State National Bank.

C. J. H. Woodbury, Boston, secretary National Cotton Manufacturers' Association. Appointed by governor of Massachusetts.

Charles T. Woods, director Maine Agricultural Experiment Station, Orono, Me.

EDITORIAL

Edward Everett Hale

AGAIN, "a prince and a great man is fallen in Israel." Another national figure—"the Tolstoi of America"—has gone from us. One of the cluster of great New England names, including Wendell Phillips, William Lloyd Garrison, Ralph Waldo Emerson, Webster, Holmes, Lowell, Longfellow, Sumner, Whittier, Freeman Clarke, Phillips Brooks, and Thomas Wentworth Higginson, he was almost "the last leaf upon the tree."

While, considering his advanced age of eighty-seven years, the death of Edward Everett Hale should not perhaps have been such, it was, nevertheless, a surprise to the country.

The public press abounds with stories of his life, and commendations of his multiplied services to humanity. Fuller mention may be made in a later issue of CONSERVATION. Here it is in order to say that he was for years an active worker in the cause of forestry and conservation—the patriarch of the movement. No face was more familiar at the meetings of the American Forestry Association, nor at hearings before congressional committees; and no words were listened to with more consideration than his, as he told of the great pine trees, tall and beautiful in the days when North America was discovered—trees under which as a boy he had slept, but which in recent years had been swept away, their places now being supplied with sumac and blackberry bushes. Of such a sight he would say, "It makes a man cry to see it!"

At the last two annual meetings of the American Forestry Association Doctor Hale was present and spoke with tremendous energy and earnestness for the forestry movement and especially for the Appalachian measure.

In the very heart of the White Mountains of New Hampshire, where he loved to summer, a large mountain has, in recent years, been named for him.

To many of our readers the following quotation, from the *Springfield Republican,* will appeal as peculiarly appropriate and suggestive:

"His presence will never be forgotten by any one who had seen and listened to him in the last thirty years at least, as he grew old and the great head with its mane of brown hair, his deeply lined countenance, his slightly stooping shoulders and his large aspect as a personality impressed every one. A man of simpler, sweeter, honester manner will never be seen in pulpit, in assembly, or on the street. No one will forget him who has lived in his day."

And the following telegram from President Taft to the Hale household is one in which many will be glad to join:

"Mrs. Taft and I extend to your our heartfelt sympathy in your great sorrow, and deeply regret the loss which the whole community suffers in the death of such an upholder and stanch advocate of sweetness and light, the liberal but truly religious spirit, Christian charity and tolerance, the brotherhood of man, and the fatherhood of God."

Forestry a Germ of the Conservation Movement

THE "Proceedings of the Conference of Governors of the United States" (White House, May 13-15, 1908) has recently appeared. It begins with a statement of the "origin and plan of the Conference." Following are the opening paragraphs:

"The idea of conserving the Nation's

resources arose partly from the recent forestry movement, partly from the still more recent waterway movement.

"The germ of the idea took form in an address by President Roosevelt before the Society of American Foresters (of which he was and is an associate member), March 26, 1903."

Following the above are several quotations from important utterances of President Roosevelt.

As has already been pointed out in these columns, the conservation movement has now taken a wide sweep, and when representatives of the different nations of the world shall meet at The Hague next September, as a result of President Roosevelt's initiative at the North American Conservation Conference held in Washington last February, this effort will have attained a world-scope.

To the little band of forestry pioneers who, in 1882, met in Cincinnati and organized the American Forestry Association, there is cause for profound congratulation as they behold the mighty tree now growing from the little seed then and there planted. Then, they were but blazers of a trail through a wilderness, leaders of an apparently forlorn hope, "hobby-riders," "alarmists," "cranks." Now, they have in their company official representatives from all the leading nations of the world. With another pioneer on a notable occasion they might with propriety exclaim, "What hath God wrought!"

Let Us Hear from the Schools

A HOPEFUL aspect of the conservation movement is the development of the forestry schools. Of these a considerable number already exists. This number is increasing and the quality of the schools is improving. They are leavening public sentiment and preparing young men for various aspects of forest work.

CONSERVATION desires to keep in touch with these institutions. It believes that a close connection between the schools and the magazine will be good for both and for the movement. It desires news notes from the schools regarding their work, plans and prospects, and articles from their professors. All these schools are now looking forward toward the beginning of the coming year. CONSERVATION suggests that it might be helpful to them to keep their work before its readers.

A Legislative News Bureau for Conservation

IT IS the desire of CONSERVATION to publish a record, as full as possible, of all national and state legislation on forestry and conservation matters. The endeavor will be made to treat with particular fullness such measures as may be introduced into the National Congress, to publish roll-calls on all important measures, and place the records of members directly before the country. It is highly desirable, furthermore, that a similar record may be kept of legislative procedure in the several states. That this effort may prove effective, it is essential that friends of the conservation movement shall furnish this magazine each month with the information necessary. In numerous instances friends reside in state capitals; in cases, they are themselves members of state legislatures. They are thus in peculiarly favorable positions to aid this publication in making a success of the proposed news bureau. With their aid it can become a highly important factor in the promotion of legislation necessary for the conservation of the resources of the states and Nation. CONSERVATION, therefore, calls for volunteers in every state in the Union to supply the necessary data. Whether legislatures be or be not now in session, prompt, affirmative replies will be greatly appreciated, that records may be begun and this office may know to whom to look for the necessary information.

The Point of View

THIS office has received an illustrated clipping describing an endless-chain crosscut saw. The clipping says: "The

endless-chain crosscut saw herewith shown is interesting as an invention for which much is claimed. Driven by a thirty horse-power gasoline engine, the saw travels at a speed of 2,000 feet per minute. It is said that it will fell a tree eight feet in diameter in less than fifteen minutes, and crosscut a log section in eight minutes. The machine sits on a turntable, and can be swung to cut in all directions and angles without moving the sled upon which it rests."

With this clipping comes the inquiry from a correspondent, "Do you use your influence in preventing the patenting and adoption and use of any such devil of destruction as would be inferred from the enclosed slip?"

In CONSERVATION for June was published an editorial containing a letter from a lumberman. A comparison of that letter with the one above will suggest to our readers the different viewpoints taken on the forest question, all of which, with its varied clientele, must be considered by CONSERVATION.

To our last correspondent we answer:

CONSERVATION, and the organization and movement it represents, do not object to improved machinery, whether for lumbering or for any other useful purpose. Time was when improved machinery was looked upon as an enemy, if not of the human race, at least of that section of it represented by the laboring class. Some of these, in England, for example, organized themselves under the leadership of one Ludd, and went about armed with big sticks smashing looms. This view is now hopelessly out of date. If work is to be done and machinery can be used, let it be used; and the better the machinery the more cordially it should be welcomed.

That the introduction of improved machinery raises problems in connection with the labor question, none appreciate more keenly than the writer. The remedy, however, lies not in smashing the machinery, but in solving the labor question.

But suppose that, as in the case in hand, the machinery is to be employed for the harvesting of lumber. Is it not true, we are asked, that the forests are already being slaughtered at a frightful rate?

The answer is, Unquestionably they are.

And shall we, then, encourage the use of machinery which can facilitate that slaughter?

To which our answer, unhesitating and unequivocal, must be, Yes.

And how, then, does our position on this question consist with our position that forests should be conserved?

Following is our reply:

The forests are for use. Of their uses, two are conspicuous: 1, For harvesting; 2, For protection.

The abuse appears when the harvesting is unwisely done, as when trees too small to be cut are cut and when trees that should be preserved for protection purposes are harvested. The remedy must be sought not in impairing the processes of harvesting, but in seeing, first, that they are properly performed, and, second, that they are applied only to the trees that should be harvested and not to the trees that should be preserved.

And who shall exercise this supervision? Here we repeat our familiar declaration, that the community itself must take a hand in this matter. Individuals may do something, and associations, commercial or public-spirited, may do more; but the community, in its organized form as city, state or nation, or all together, must unquestionably assert and exert itself if the evil is to be avoided and the good conserved.

Water-power Grabs in Wisconsin

IN LA FOLLETTE'S weekly magazine for May 22 is an article under the above heading by State Senator Winfield R. Gaylord, of Wisconsin.

Senator Gaylord notes the existence of the water-power trust against which President Roosevelt warned Congress and the country. He states that the water-powers of Wisconsin have been

conservatively estimated at 600,000 H. P. Each hydro-electric H. P. is estimated to equal about twelve tons of coal per year; the total, therefore, equaling 7,200,000 tons of coal per annum.

Of this water-power, the commercial value is suggested by such facts and figures as these: The bare location of one power site, with franchise, was sold for $10 per H. P., while another location is quoted at $9 per H. P. per annum.

In the paper and pulp hearing before Congress, on pages 1108 to 1112, Mr. Safford, engineer for the International Paper Company, said: "In New England, for the last twenty-five years, when power has been taken away from the owner by municipalities or by other companies, a fair price is about $1,000 per H. P. for the amount taken away. The average of thirty or forty sales of H. P. that I know of personally, most of which I have reported on, has been $300 per H. P." This power was conceded to be undeveloped.

On page 894 of the same hearing, Mr. Cowles testified that the paper mills at the Androscoggin River could sell their power at $40 per H. P. per annum.

On page 1030 of the same report, the official statement of the International Paper Company shows that they place a value of $50 per H. P. upon their undeveloped water-powers.

Obviously, in the light of such facts and figures, water-power is not a thing like air and sunshine, to be given away.

Furthermore, as Senator Gaylord points out, even such estimates of value may be slight in comparison with the value that these water-powers will assume in future years when wood and coal have largely failed and population, with its manifold needs, is vastly increased. In exactly the same way as city lands multiply in value with the multiplication of population, so these water-powers will probably multiply in value under the influences indicated.

In the light of these facts, we are not surprised that private companies are reaching out for such water-powers. At the present session of the Wisconsin state legislature nearly thirty bills were introduced asking for franchises for dams, while lobbyists thronged the corridors and committee-rooms pressing for these valuable privileges. An aggressive fight resulted, the end of which is not yet.

Senators who have opposed giving away the people's water-power properties point out, first, that the private companies do not adequately develop their water-powers, thirteen of the thirty franchises asked for having been covered by previous grants of the legislature but not developed; and second, that private development, as compared with public, is uneconomical. For example, in the case of the High Falls and Johnson Falls combination, the digging of a canal two and one-half miles long would give a combined head of 110 feet. The company, however, could not secure the riparian rights between these two points; the heads were, therefore, developed separately, with a waste of ten feet. The state, however, could secure the riparian rights and would avoid this waste.

In a paper before the American Society of Civil Engineers, in November, 1908, Mr. H. M. Chittenden, C.E., said: "When a power is planned or a reservoir built, it should be so planned from the start as to bring out its full possibilities. A private company can rarely do this. Generally its scheme does not require this, nor its resources permit; but a site once occupied by an inferior work may be perpetually barred from complete development. * * * Furthermore, the Government is building for all time, while the individual builds only for the immediate and near future. The case is similar to that of the landlord and tenant."

Like President Roosevelt, in speaking of the Desplaines River case (see CONSERVATION for March, page 170), and like President Taft in his letter to Mr. Shaw (see page 426, of this issue), Senator Gaylord takes his stand against donating these water-powers to corporations. His language is: "These

water-powers can be, and ought to be, held by the state, developed by the state, and their energy sold to such private persons as wish to use it. * * * Whatever is to be done with it, the state and the people of the state should keep control forever of these water-powers, which are the equivalent of so many coal mines, digging their own coal to the amount of over seven millions of tons every year."

The National Irrigation Congress

OF THE National Irrigation Congress, former President Roosevelt said: "This congress undoubtedly is one of the most important unofficial bodies in the country."

This congress meets annually. Its meeting this year will be held at Spokane, August 9 to 14, and promises to eclipse all former meetings in attendance and interest. The congresses are notable for the number and character of the delegates attending. Last year, for example, there were present the Vice-president of the United States, the governors of several western states, United States Senators, Congressmen, Government officials, state engineers of eight western states, scientific men, including experts of the United States Department of Agriculture, professors of state institutions, and editors of technical journals. This year the management expects from 4,500 to 5,000 accredited delegates from various parts of the United States, representatives from Canada, Europe, the South American republics, China and Japan, and President Taft, with several members of his Cabinet. On Governors' Day, August 13, governors of twenty-five states and territories are expected. Bankers, railroad presidents, scientists, experts on reclamation of arid and swamp lands, deep waterways, forestry, good roads, and home-building will have places on the program.

Among the speakers announced are James J. Hill, Gifford Pinchot, F. H. Newell, Dr. Geo. B. Angell, United States Senators Cummins and Jones, John Barrett, Director of the Bureau of American Republics, Governors Willson of Kentucky and Patterson of Tennessee, and other men of prominence. The cooperation and assistance of the United States Department of Agriculture, including the Forest Service, and the Reclamation Service, are promised.

Among the features announced are the following:

August 10, afternoon.—Parade of progress, showing the transformation of the Northwest from semi-savagery to civilization.

August 11, evening.—Illuminated parade of progress, representing various periods in the Northwest from 1805 to 1909. Indians from four reservations and districts in the Pacific and western states will join in this demonstration.

August 12, afternoon.—Parade and countermarch of the industrial and irrigation army, with 10,000 uniformed men in line. The official emblem of the congress, showing science bidding the desert drink, will be featured on an elaborate float.

A regiment from Ottawa, Canada, wearing the British uniform, is also expected. On August 9 the proceedings will be enlivened by the singing of the irrigation ode by a large chorus of trained singers, and the singing of state hymns by school children.

The avowed object of the congress is the familiar one: To save the forests, store the floods, reclaim the deserts, and make homes on the land.

Irrigation is gradually, even rapidly, making a garden-spot of the great American desert. The work, however, is but in its infancy, and congresses such as the one in question are potent factors in its promotion.

Reclamation is intimately connected with problems of vital moment to society. Present economic development is, in large measure, separating the citizen from the land. History records numerous like instances which, without exception, have brought trouble, sometimes peril, to the state. Agrarianism, whether in ancient Rome or in modern

Russia, is portentous. The attempt of the Gracchi to place landless men upon land largely unused brought civil strife. Modern civilization to-day faces congestion in great cities, and a problem of unemployment imperatively demanding solution. Upon the arid and semi-arid lands of western America, not to mention swamp lands easily susceptible of reclamation, are opportunities which might readily provide for millions of human beings, relieve economic pressure, and transmute discontent into satisfaction and acute misery into happiness. In this viewpoint, the reclamation of our western wilderness constitutes an appeal of the first order to the citizenship and statesmanship of to-day.

Mr. Arthur Hooker, secretary of the board of control, will present a resolution memorializing Congress to issue three per cent gold bonds, running 100 years, to the amount of $5,000,000,000, or as much thereof as may be necessary, for the following purposes:

One billion dollars for drainage of 100,000 square miles of overflowed and swamp lands.

One billion dollars for the irrigation of 40,000,000 acres of arid and semi-arid lands.

One billion dollars to construct and improve deep waterways.

One billion dollars for good roads and national highways.

One billion dollars for forest protection, reforestation, and conservation of the forest resources.

To provide the funds for the above-named projects, or any of them, other methods than those of bond issues might be conceived; furthermore, such an enterprise, because of its very magnitude, will impress some as chimerical. Nevertheless, it will be recalled that President-elect Taft, in his Belasco-theater speech, conceded the possible wisdom of bond issues for conservation purposes; furthermore, properly handled, such an enterprise might represent to the Nation not a mountain of debt, but a great and highly profitable investment, not only yielding large pecuniary returns, but, for years to come, promoting social and economic peace and tranquillity.

President Hill on Conservation

WISE words were those uttered by Mr. James J. Hill at the opening of the Alaska-Yukon-Pacific Exposition on June 1. "The idea of a federation of the world," said he, "comes near its realization in the great expositions that assemble actual evidences of man's progress in self-development and toward his development of the earth. This exposition may be regarded as the laying of the last rail, the driving of the last spike, in unity of mind and purpose between the Pacific Coast and the country east of the mountains. It is the witness of a constantly broadening tie which is both the price we pay for civilization and the boon that it confers upon us. * * * As it was the commonwealths of the Middle West and Northwest that, in their rise, swung the Nation, like a ship swaying with the tide, slowly but surely toward the ideals of freedom and union that have molded us to what we are, so it may well be that the destiny of the United States will be decided in some great crisis hereafter by the men, the wealth, the industry, the ideas to be born generations hence in the wide spaces, under the clear skies, amid the bracing airs of our giant child of the North that occupies the place of honor here to-day."

Speaking of the influence of the West, Mr. Hill said: "No less weighty should be its contribution to the formation of national ideals, the shaping of national ambitions, the direction of national policies. Out of the West have come formative impulses that enriched the history of the country. It is the goal of the enterprising and fearless. While others deliberate, it acts. While they count consequences, it looks upon results as already nearing accomplishment. If the star of empire in history has moved westward, it followed rather than led those bold spirits by which empires are made and upheld. Here, on

the westernmost verge of the continent, where progress must pause for a moment, like the early voyagers, before venturing across the broad Pacific to remake that Orient which beheld some of her earliest conquests, may well be exhibited in pronounced and admirable form the qualities that have always marked the American West."

Such language reveals in Mr. Hill a genuine son of the Republic—a man who has breathed the air of the prairies and the mountains; who knows something of the mighty sweep of our national domain and has felt something of the spirit that has made and is yet to make America great. Speaking of the exposition, Mr. Hill continues: "In its execution is the vigor of youth that should ripen into a splendid maturity. In everything is the magnificent self-confidence without which there can be neither great qualities nor great achievements. The Pacific Coast is drawn to a large scale. The mountains, the ocean, the distances; even the forms of sea and vegetable life are fixed on a generous plan. Such surroundings should be incompatible with human pettiness. Man should emulate nature by growing into greatness of interest, purpose, thought and character. It would almost seem as if nowhere else could there be such inspiration from environment for the development of a worthy civic spirit, as well as for great material creations."

Passing to the question of natural resources, the speaker continued:

"The first and most imperative word, I need hardly say, one which the country has come to hear with much respect and not a little fear as to its future, is 'conservation.' I put it first, not only because it belongs there in the scheme of national politics, but because it particularly needs to be repeated and emphasized among the people of the North Pacific Coast. You have been following the footsteps of your ancestors farther east, who are now beginning, at great cost of labor and wealth, to repair the consequences of errors that still seem to you natural and proper acts. From California northward to the extreme of Alaska there are to-day probably more unimpaired natural resources than in all the rest of the country. Your great forests are falling; but so immense were they that man has not yet compassed their destruction. You have seen what happened to New England and to Michigan and to Wisconsin and Minnesota; what will be the condition of the South in a few more years?

"You still possess the principal supply of timber in the United States. Will you take steps to guard it, to prevent waste for the sake of immediate gain to a few individuals, until lumber shall become a luxury and the very poor must huddle in houses of mud or sod, like the peasantry of the Old World? If that argument does not appeal, will you consider the economic effect of the future decline and disappearance of what is now and might remain always one of your greatest industries? Will you realize what this country must become when stripped of its forests; the washing away of the soil, the inevitable changes in climate, the devastations of torrential overflow and disastrous drought, the barren bleakness of your mountains and the desolation of your valleys when the forests have gone? If you do, your earnest work for forest conservation will begin to-day."

As at the White House Conference a year ago, President Hill again called attention strongly to the importance of soil conservation. He said:

"It is on record that the best soil in this state produced, when the first settlers came, from forty to sixty bushels of wheat an acre. How many farmers get that now? The temptation is almost irresistible in a country like this, where the new soil needs but the touch of water to burst into wonderful fertility, to grasp a present profit without thought of the future. But this apparently exhaustless soil acts like all others when abused. Treat it as those of our older states have been treated, take away all and give nothing back, and it is only a question of time how soon your lands, too, will decline in productivity and re-

cover less readily than those which had less to lose. The procession of American farmers that have moved recently into the country just north of our western states should point the moral. They were wasters, or the children of wasters, who had exhausted nature's bounty and were moving on. Take care of your soil before it is too late, and it will take care of you and sustain and increase your prosperity forever. Neglect and waste it, and no earthly power can save you from the consequences."

Mr. Hill also called attention to the great salmon industry, capable of such splendid development on the coast, yet, like other industries directly dependent upon natural resources, already menaced by wasteful consumption. He called attention to the possible wealth of the West in water-power. Speaking of Alaska, he said: "Among its mountains and scattered through yours all the way down to Mexico there is water-power enough undeveloped to perform all the work done west of the Mississippi. Are these resources being guarded for posterity, or are they being so disposed of that their future employment will be conditioned upon the payment of a perpetual tax to their appropriators?"

It is a notable fact that the impressiveness of a sermon depends primarily not upon the text, nor even the matter, but upon the preacher. Others have said such things as Mr. Hill said on this occasion. From them, however, the warnings have too often been regarded as the mouthings of an alarmist, or the vain imaginings of a theorist. Not always, especially in America, have the words of the expert, the specialist, the man of science been accorded due weight. Here, rather, it is to the business man, the captain of industry, the successful man of affairs, that we have turned for advice and guidance. That Mr. Hill is such a man, no one can question. His utterances, therefore, upon such a question as that of the husbanding of our resources carry peculiar weight. It is to be hoped that they may be widely quoted, repeated, and reenforced until they have produced the conviction that influences conduct.

Destruction of Fish

IN LINE with the warning given by President Hill to the people of the great Northwest regarding the destruction of their salmon, comes a warning from the East regarding a similar destruction of fish. Says the *New York Herald* in its issue of June 7:

"Here is the great Delaware River, once prolific in fish and making fertile its banks; to-day pollution of its waters by the waste of factories makes the surviving fish unfit to eat and menaces the health and comfort of those who live near. And the Government, ever paternal, proposes to restock the river with fish from abroad, while it does nothing to stop the pollution. The very repairing of loss is likely to prove a waste.

"Cases of much the same character could be found nearer home. In tidal waters, such as encompass this city, the results of pollution are much less serious, but the problem will be pressing before many decades."

The one discordant note in this editorial is that regarding the "paternalism" of the Government. With the evidence already piled mountain-high all about us, and daily climbing higher, that governmental "do-nothingism" is, throughout the civilized world, now out of date, and that governments in future must, at the least, earn their keep to justify their existence, the talk of "paternalism" has a strangely Rip Van Winkle-like ring.

Further, as has been already stated in these columns, the term "paternalism" has no place in speaking of the government of a republic. In an absolute monarchy, in which a Louis XIV can say, "I am the State;" can refer to the people of the nation as "his children," and treat them as such, the government may properly be spoken of as "paternal." Where, however, as in the France of to-day, and in the United States, the people have attained their

majority, dispensed with their "pater" and taken charge of their own affairs, it is as absurd to speak of their joint activities as "paternal" as it would be so to speak of the joint activities of a group of brothers who have gone into partnership. Antiquated terms often die hard. The term in question is no exception. Let all intelligent people, however, recognize that in the United States its day is past, and hasten to lay it finally away to rest.

Responsibility for Forests

IN AN editorial on June 11, the *New York Press* endorses a statement from the *Engineering News* that the "deforestation of this country cannot be adequately checked by the establishment of forest reserves by the Federal Government and the various states." "Public reserves," it declares, "and the Government encouragement of forest cultivation must be supplemented by the efforts of hundreds of thousands of individuals."

This declaration is in line with one made by Secretary Wilson at the last annual meeting of the American Forestry Association. As will be recalled, Secretary Wilson on that occasion said: "The American people can do a great many things without Congress; a very great many things." He then proceeded to urge individuals, associations and corporations to do their utmost toward conserving existing forests and establishing new ones. "Let us not," he said, "sit down and make faces at Congress because they will not buy these Appalachian and White Mountain ranges. * * * It does not prevent associations of men from taking hold and planting trees. It does not prevent the farmer from providing a legacy for the next generation by planting trees on the land that will not grow grasses or grains, but will grow trees."

Continuing, the editorial writer in the *New York Press* strikes a different note and says, "It has got to the pass now in this country that a man who plants a tree has a claim to be considered a public benefactor, while the man who wantonly destroys one is a public enemy.

"Individual responsibility for the preservation of the forests of the Nation has not been sufficiently impressed upon the public at large. There is needed in this respect not only a 'campaign of education,' but a campaign of repression. Those great forest fires which every year, from Maine to Texas and from Seattle to Florida, sweep away vast quantities of precious timber are generally the result of the actions of the careless, the mischievous, or the criminal. Surely, the forests are as worthy of protection as the game of the country, and guardians of the forest as necessary officers as game wardens; surely it is the duty of both state and Federal governments to see to it that adequate penalties are provided for the punishment of those who, through carelessness or wantonness, start forest fires."

Self-preservation is the first law of nature; likewise it is the first law of nations; and national life, like individual life, rests upon an economic base. If governments may not, by adequate pains and penalties, protect the foundations which underlie their very existence and that of the individuals who compose them, we may well inquire, "Why government at all?"

BACK NUMBERS WANTED

The office of CONSERVATION desires a few copies of the issues for May and September, 1899; January, February, and March, 1907, and November, 1908, for which it will pay twenty cents each.

Any having available copies will oblige by advising this office.

NEWS AND NOTES

Government to Study Eucalyptus Planting

Plans are being made to have a special study undertaken by a representative of the United States Forest Service in the near future to determine the feasibility of the culture of the eucalyptus tree in the lower Rio Grande Valley and along the Gulf Coast of Texas.

The importance of eucalyptus culture from a commercial standpoint in California has within the past few months aroused general interest throughout the country concerning these rapid-growing trees, and the district office of the Forest Service at Albuquerque receives almost daily inquiries as to the feasibility of planting eucalypts in the Southwest, particularly in the state of Texas.

Eucalypts are native to the coast region of Australia and Tasmania, where at least 150 distinct species are recognized. They were introduced into California about 1850, and first planted near San Francisco for ornamental purposes. The extremely rapid growth of certain species, their value for fuel, lumber, and special products have resulted in the undertaking of extensive investigations concerning the habits of these trees and their commercial uses and possibilities. Fully 100 species have been introduced into the United States.

The eucalypts are adapted to a subtropical climate, and the limits within which they may be planted for commercial purposes in this country may be broadly defined as that bounded by the frost-line. They are therefore adapted for planting in the warmer portions of California and in parts of southern Arizona and Texas. There is considerable area, however, in southern Texas where it is likely that the more hardy of the eucalypts can be successfully planted.

Timber Seasoning and Wood Preservation

In recent years the importance of preserving timber from decay by the use of various antiseptics has been generally recognized in the United States. The value of properly seasoning timber before such treatment is not so generally known, though it is one of the most important features of the treatment.

There are three main advantages to be derived from the proper seasoning of timber, namely: The increase in strength of the timber, the greater ease of injection of antiseptics for preserving the timber, and the saving in freight charges due to the decreased weight.

From thorough tests made by the Forest Service on various pieces of timber, it appears that thoroughly air-dry or seasoned timber has about double the strength of the green material. It is well-known to all operators of wood-preserving plants that antiseptics are not only difficult to inject into green wood, but that it is practically impossible to obtain a uniformly satisfactory treatment of such material at an economic cost, for the purpose of insuring a prolonged life.

The last item would at first seem too trifling to be worthy of discussion, but from data obtained only recently it appears that western yellow pine lost fifty per cent. of its green weight after three to five months' seasoning. This means a saving of fifty per cent. of the freight charges and a corresponding saving in the handling of the timber, and is therefore a far too important point to overlook.

Considering these three points, it will be seen that there is not only a material saving in the seasoning of timber, but also a proportionate increase in the value of timber as a structural material. The seasoning of timber is never an expensive operation, even when done artificially. In the southern parts of the United States, a satisfactory degree of seasoning could be obtained by exposure of the timber to the air for a period of three to six months. In some of the northern states, however, a somewhat longer period is necessary to secure satisfactory results.

Forest Conservation in Germany and the United States

Germany faced the same great timber supply problem early in the nineteenth century that the United States faces to-day, and in solving it developed heavy producing and well-administered forests which are models for the rest of the world.

A study of the systems of forest management and wood utilization in the two countries offers many interesting comparisons. The United States takes 260 cubic feet per capita annually from the forests; Germany uses but thirty-seven. In other words, this country is already using seven times as much timber per capita as is Germany.

American forests are now producing not more than twelve cubic feet per acre; German forests are producing forty-eight cubic feet per acre annually. Germany has reduced waste and consumption and increased production.

The United States has as rapidly growing trees and as good soil as Germany, and foresters say it is reasonable to think that this country will be just as successful as the European country in high per acre production when every owner of timberland gets down to proper conservation and development of his forest property. It is known that the United States must continue in the future, as in the past, to rely upon its own forests for the great bulk of wood which is used. Despite the introduction of many substitutes, it is not possible to conceive the time when it will be practicable to do without wood for many uses. Granting this, foresters say, it follows that as a Nation and as individual citizens everything possible must be done to put the forest land of this country upon a permanent productive basis.

The ultimate aim must be to cut no more from forests than they produce each year, and to make their yearly growth equal to the needs of the people. As in Germany, forest conservation in this country means just two things, first, the fullest possible utilization of the present supply of timber, which will make it last longer; and second, the handling of forest lands in such a way that succeeding crops of timber will be secured.

At present only about one-fifth of our standing timber is in public forests. This term is used to cover the National Forests, state forests, the timber on Indian and military reservations, and National Parks. These forests are being managed according to the principles of scientific forestry so far as funds available for their administration permit. While the extent of the public forests will undoubtedly be increased in the future, it is not likely that for a very long time to come they will contain even as much as half of the timber supply. Four-fifths of our forests are now owned by individuals, companies, or corporations. The manner in which these forests are handled is, therefore, of the utmost importance in conservation.

If the lumber industry in the United States is to live, it means that large manufacturers will have to protect and develop their forest property. The land must be lumbered with care, fire must be kept out, young growth protected, and every principle of forestry applied to the management of the land so that it will continue permanently productive instead of becoming a burned over and barren waste, as has been the case of the forest regions which have passed through periods of excessive destruction as the result of careless lumbering methods . . .

Mr. Weyerhaeuser on Forest Taxation

The *Norfolk Virginian and Pilot* says editorially:

"It is not difficult to see the force in the argument of Frederick Weyerhaeuser, the western lumber king, that the policy obtaining in many of the states of taxing standing timber excessively has contributed and is contributing to forest exhaustion in this country. Such taxation, as Mr. Weyerhaeuser points out, both encourages the conversion of growing timber into lumber and discourages the replanting of denuded areas. This fact has long been recognized in Europe, where, as a general rule, timber is by law exempt from taxation until it has secured its growth and becomes suitable for lumber. It is also beginning to be appreciated here, as is evidenced by the action of some of the states in placing only a nominal tax on lands devoted to forest culture. Forest conservation and reforestation mean infinitely more than the preservation of a timber supply. They mean conservation of many other natural resources of incalculable value as well. The state's duty is, therefore, not only to encourage timber growing, but even to compel and supervise it if necessary."

Taxing a Forest Grant

An attempt to place on the tax rolls lands in the forest reserves subject to the Government grant to the Northern Pacific Railway Company will be made by the Tax Commission of the state of Washington this year in all probability.

The condition of the railroad grant in the forest reserves was called to the attention of the commission recently by the filing in Snohomish County of deeds from the railway company to individuals for four valuable quarter sections of timber land in the Forest Reserve. These deeds contained indefinite descriptions of the land, in that giving the section, township and range, the numbers were "subject to Government survey." The lands have not yet been surveyed.

The assessor of that county has been instructed by the commission to place the four quarter sections on the tax rolls and it is expected a lawsuit will result which will determine the taxable character of such timber.

The grant to the company was of each alternate section of land for twenty miles on both sides of the right of way.

When the forest reserves were designated the railway company was given the option of accepting scrip for lands in its grant and taking up lands elsewhere. It is declared that for sections of little value the company has taken scrip, but has retained the more valuable timber lands. The fact that the tak-

ing of scrip for lands in the forest reserves was made optional is looked upon by the Tax Commission as conclusive that the grant from the Government was absolute. This theory is further strengthened by the deeding of unsurveyed railroad lands within the forest reserves by the company to individuals.

The area of timber land involved, it is said, will be enormous, and if the Tax Commission is successful the result will be a big addition to the assessed valuation of property owned by railway companies in Washington.—*Portland Oregonian.*

Government Encouraging Willow Culture

The Government is right in the midst of the harvest of a most unique crop at its experimental farm near Arlington, just across the Potomac from this city, where a corps of laborers in charge of trained foresters are preparing for the annual free distribution of 100,000 basket willow cuttings.

Uncle Sam is encouraging the growing of high-grade willow rods in this country, and in the five years since the establishment of the holts at Arlington approximately a half million select cuttings have been distributed among farmers, with directions for planting and preparing for market. Particular attention is given to selecting the varieties and strains best suited to the soil where the plantings will be made.

Willow craft is an industry which is constantly growing in importance in this country, yet the culture of basket willow in the United States made very little progress until five or six years ago. Even now, practically all of the best grades of basket willow are imported from Europe, chiefly from France. Experiments have shown that the best grades of willow can be grown in this country at a good profit.

This year's harvest began early in March. Four approved varieties are being sent out, and only the best and most thrifty rods are selected for distribution. The management of the holts and work of free distribution of cuttings is charged to the United States Forest Service. Cuttings for experimental planting and information on management of the willow holts are furnished those who make the request of the Forester at Washington.

The Government recognizes the importance of good cuttings, a point more commonly overlooked than the matter of cultivation. Only the best and most thrifty rods are selected for each season's distribution.

Cuttings of new and untried basket willows were obtained from Europe a year ago and planted in the Service's experimental ground.

The Forest Service is receiving a constantly increasing number of requests for basket-willow cuttings. These requests come from farmers all over the country, many of them coming through members of Congress. The Service is endeavoring to stimulate the basket-willow industry in this country by distributing cuttings of the most approved varieties of willow and the four varieties tested for the last five years in the experimental holt at Arlington, Va., can now be confidently distributed.

Seasoning Eucalyptus Poles

The Government has undertaken a study to determine the proper method of seasoning eucalyptus poles, particularly those cut from trees which, owing to a large number of knots, will not make clear lumber. Such poles have shown a tendency to check and warp after being cut, probably due to improper methods of seasoning, which has been a great obstacle to their more extensive utilization.

Experiments will be carried on by the United States Forest Service to determine the method of seasoning which will prevent this checking and warping. One series will be conducted on the Sutro Estate which is in the fog belt, and another on the Pacific Land Investment Company's holdings at Newark, which is out of the fog belt.

Forty-eight growing trees, thirteen inches in diameter and having a clear length of thirty-four feet, will be selected and marked by an officer of the Forest Service. These two groups will be handled in the same way, twelve trees of each group are to be girdled and allowed to die and season standing, with the bark on, and the other twelve will be felled and laid on skids in the open and seasoned in this manner. Six of the twelve felled trees of each group will be peeled, and the other six, will be left with the bark on.

The skids will be so constructed that the poles will be at least one foot from the ground to allow a free circulation of air. The poles will be left on the skids for from six to eight months, and observations taken as to checking, warping, shrinkage, and loss of weight. The same observations will be obtained from the standing poles, with the exception of the weight.

When a sufficient period of seasoning has elapsed, determined by the weight of the skidded poles, the standing poles will be cut and their weights found. The condition of these poles will then be compared with the condition of the skidded poles, and a proper method of seasoning outlined which will be available to all interested in the use of eucalyptus timber.

Forest Resources of South America

The forests of South America are principally tropical, but in the Andes Mountains and the southern end of the continent are found forests of a temperate and sub-arctic

character resembling somewhat those of the United States and Canada.

The tropical forests are totally different from our north woods. There are no solid stands of single species or even of a few mixed species. Instead, hundreds of kinds of trees grow thoroughly mixed and scattered through the whole forest. This is one of several reasons that make logging in tropical forests so expensive and often unprofitable.

Rubber hunters have explored nearly the whole tropical forest in search of that necessary article of commerce, but aside from that South American forests have only been cut into for a few miles back from the coast and the principal ports and rivers. Even in this area only the species at present most valuable for commerce have been thus far cut, for example, cedar, mahogany, rosewood, lignum-vitae, fustic, and ironwood. Railroads, where they exist, charge such exorbitant freight rates that they have not much encouraged exploitation of the forests. In addition to this, the sparsity of population and lack of labor have also retarded development of the forests.

Most of the woods growing in these tropical forests are very heavy, hard, and rich in color. Greenheart is so hard that it nicks the axes of the choppers and will last for over 100 years in water.

Growth is so luxuriant and rapid that ruins or abandoned farms are promptly covered with a dense young growth of trees and vines that in a few years obscures the marks of civilization. The great forest of the Amazon basin is 1,100 miles long east and west by 750 miles north and south. It covers nearly a million square miles in Brazil. But as it lacks construction timbers it cannot be looked to for relief from the approaching scarcity in that kind of wood.

This Amazon forest presents the usual features of tropical growths, a tangle of vines weaving the great trees together and obscuring the sky, and leaves hanging from the branches like ropes, while underneath is a snarl of shrubs and creeping plants in which are hidden many species of fibrous plants and cacti with their sharp stings and thorns.

The tropical American woods are peculiarly adapted to withstand the ravages of insects and climate. In Paraguay, timbers of lapacho and quebracho which were used by the Jesuits in constructing their missions, are still well preserved in the ruins. In contrast to this, our own North American woods, which are so extensively imported for construction in South America, rapidly decay and are eaten by insects.

Just as in this country, not only in the old days but even to-day on the frontier, so also in South America in Colombia, Chile, and other states, the forests are cut down and burned, to clear land for agriculture.

The transportation difficulties in the mountainous countries are so great that the cities of the west coast depend wholly upon imports, chiefly from the United States, for their lumber. Their own mountain forests, which are reported to be very extensive and valuable, are inaccessible.

In Colombia at least the Australian eucalyptus has proven a vigorous grower, just as it has done in California. The American consul at Bogota reports that this tree reaches merchantable size in twenty to twenty-five years without cultivation.

Over-cutting of Connecticut's Forests

It has been estimated that the amount of wood annually consumed in the United States at the present time is 23,000,000,000 cubic feet, while the growth of the forest is only 7,000,000,000 feet. In other words, Americans all over the country are using more than three times as much wood as the forests are producing. The figures are based upon a large number of state and local reports collected by the Government and upon actual measurements.

The state forester of Connecticut, in a recent report, has given figures on growth and use for New Haven County, which give many more valuable details than are generally to be obtained, and well illustrate how the forest is being reduced by overcutting. In this county a very careful study was made on each township of the amount of forest, the rate of growth, and the amount of timber used. For the year 1907 the timber used was 120,000 cords, in the form of cordwood, lumber, ties, poles, and piles. The annual growth on all types of forest land, including the trees standing on abandoned fields, for the year, reached a total of 70,000 cords. Thus the amount cut yearly exceeds the growth by 50,000 cords.

The amount of standing timber considered as merchantable and available for cutting within the next few years was found to be 1,200,000 cords. Each year the annual growth increases the supply on hand by 70,000 cords, while the use decreases it by 120,000. The net reduction is, therefore, 50,000 cords a year. If the cut and the growth remain at the present figures, the supply of merchantable timber will be exhausted in about twenty years. At the end of that time there will be a large amount of forest standing in the county, but it will be in tracts under forty years of age, containing wood below the most profitable size for cutting. Cordwood could still be cut, but supplies of the most profitable products, like ties and lumber, would be practically exhausted.

Connecticut's case illustrates what is meant when the exhaustion of the timber supply is spoken of. It does not mean that

every tree will be cut and that the ground will be bare. It means, on the other hand, that year by year the people of the country are cutting more timber than the forest grows, and that within a comparatively short time the continued loss will have so reduced the forest that it will be difficult and expensive to obtain timber of useful size in sufficient quantity.

Fire Waste Through Carelessness

Mr. C. M. Goddard, president of the National Fire Protection Association, says, in the *Insurance News,* of Philadelphia:

"A cigarette thrown into a bale of cotton, loss $30,000; using a highly inflammable fluid for cleaning by open flame artificial light, loss $150,000; improperly set hot-air furnace, loss two lives and $75,000; sparks from a locomotive near a wood-working plant, loss $750,000; smoking cigarettes while spreading rags, loss $13,000,000.

"All of these instances occurred within less than a year and within a circle of 100 miles radius. Fires are carelessly started in the woods, and for weeks this fall our forests were burning at the rate of a million dollars a day.

"Our average annual fire loss for the past six years has been $250,000,000, and it is a conservative statement that fifty per cent. of this loss, or $750,000,000 during the six years, was due to easily preventable causes; that is, carelessness.

"We are not only the most careless, but the most reckless nation on earth, we live for the present, rather than for the future. We tolerate conditions, in our goodnatured way, that would not be allowed in Great Britain, Germany, or France. To this characteristic of the American people is due the fact that we lead the world in the loss of life and property from carelessness, for it is a regrettable fact that the large majority of our so-called accidents are due to mismanagement or blunders."

He states that the National Fire Protection Association is endeavoring to correct this evil by means of an educational campaign and adds:

"Why should we allow the manufacture and sale of the parlor-match, which is known to annually destroy millions of property and over 500 lives in this country, when the use of properly made safety-matches would prevent this loss?

"Of what use is it to 'conserve our natural resources,' about which so much is being said and done, if we make no effort to conserve our created resources—that is, our natural resources after we have spent time and labor on them to fit them for our use?

"I believe there is no more important problem before this nation to-day than that of reducing our annual fire loss, which is nearly ten times that of other civilized nations.

"Fifty per cent. of the fire waste in this country is due to carelessness."

Needless Work Is Waste

Says the *San Francisco Chronicle:*

"The conservation movement has not assumed a very radical form. In order for it to achieve a real success it will have to hammer into the minds of the American people, and, for that matter, the minds of the people of other countries, that there is much waste which is disguised by the appearance of gain. It is as wasteful to burn coal to carry cotton to be manufactured in countries where the textiles are not used as it is to burn it to no end at all. Manufactures should be conducted as near as possible to the source of the supply of the raw material and power, and to the people who will consume the finished product."

Two Projects in Eastern Oregon

Says the *Portland* (Oreg.) *Journal:*

"Surveyors and engineers have been ordered into the field to complete surveys and estimates for the Malheur government irrigation project. A surveying party is being formed at Boise by F. E. Weymouth, supervising engineer of this reclamation district. Secretary of Interior Ballinger has announced that he wishes the survey hastened sufficiently to permit his personal inspection and investigation when he comes West in June, at which time he will visit the project. He has signified his purpose of completing the work at once.

"The protest filed by private interests against the building of the Government project was heard in Washington, at which time Secretary Ballinger stated it was the policy of the Government not to interfere with private projects, provided private interests can show they are financially able to complete the work.

"He also stated that before the Government would concede that private parties have an interest in the Malheur project, they must show decisively they can complete it and at a reasonable cost, and that the people want a private project.

"It is now possible that two projects may be built, the Owyhee project, covering lands on the Owyhee River and crossing into Idaho territory, to be built by private interests; and the Malheur project, covering the Malheur and Willow River lands surrounding Weiser, Vale, and Ontario, to be built by the Government. The Reclamation Department has not signified its intention of abandoning the Malheur project in deference to private interests, but it may allow private interests to build the neighboring

project, as the two would reclaim a much larger territory than either alone.

"The outcome depends largely on the sentiment of the people, which, on the Owyhee, is for private irrigation, and in other parts of the territory emphatically for the Government project, as representing more permanent work."

Governors Expected at Irrigation Congress

It is expected that on Governors' Day, August 13, chief executives will be in attendance from Idaho, Oregon, Montana, Utah, Nebraska, Wyoming, Colorado, Missouri, New York, Kansas, Texas, New Mexico, Kentucky, Florida, and other states.

Mr. Arthur Hooker, Secretary of Board of Control, is authority for the statement that at least twenty-five governors and most of the Western senators and congressmen will attend the sessions in Spokane the second week in August, when there will also be a number of railroad presidents, financiers, and experts who are interested in reclamation of arid and swamp lands, forestry, deep waterways, good roads, and home building. He says:

"This congress will be of vital interest to every state and territory in the Union, from the fact that the objects to be discussed affect them individually or collectively in one way or another. The presence of the governors and members of Congress in Spokane during the week of August 9 will afford an excellent opportunity for them to discuss many things of mutual interest. The presence of President Taft and members of his Cabinet at the irrigation congress will also influence a large gathering, and we look forward to entertaining a large number of delegates and visitors."

Forestry in the Schools

Forestry is attracting wide attention among the schools of this country and Canada. * * * The public-school teachers say that they find in it a fascinating study for children, and one which, by furnishing much tangible material on which to work, develops the child's observation. Although the public schools of Iowa are in the vanguard of the movement, Connecticut schools are not so far behind, and as a text-book are using several of the public documents issued by the Forest Service, including Bulletin 173 as a primer of Forestry.—*Hartford* (Conn.) *Times.*

Mr. Pinchot on Forestry in Arkansas

At a reception in Washington of the Arkansas Society to the Societies of the Mississippi, Missouri and Texas, on June 7, Mr. Pinchot said:

"Everywhere we have found that the Southern people appreciate and support the fundamental principles of the Forest Service, which is to put every piece of land to that use in which it will best serve the interests of the people of the country, whether that be a forest use, an agricultural use, or any other.

* * * * *

"The problems which these forests present are in many respects different from those of other National Forests. I do not, however, anticipate any serious difficulty in dealing with these conditions. The important problems are those connected with homestead and timber and stone entry, with grazing, and with control of fires and the related question of protecting the cattle from ticks.

"It has long been the habit of the Arkansas people to set fire to the dry grass and brush in these forests for the purpose of eradicating these ticks, and it is not improbable that the effort which the Forest Service has made to prevent these fires altogether was to some extent mistaken. A very careful study of the whole situation is now in progress. The Service has a strong desire to do justice to every man and to adapt its methods of administration, in every point, to local conditions. The support of the general policy of the Service in Arkansas appears to be thoroughly well established, but certain points of friction still remain. These we shall do our best to remove altogether during the coming summer."

The Moral Aspect of Forestry

"Men do not go into the forestry profession to make money, to get rich, or to have an easy thing of it," said Gifford Pinchot, chief forester of the Government, during a recent address. "They go into it because they love hardiness, because they love the real things of life, and because they want to identify themselves with a movement that benefits not only their own generation, but generations to come.

"I have always held that a man cannot be a good forester without being a good citizen. He is working not merely for himself, or for his employer, or for his own generation, but for people he will never see, to better conditions he will never encounter. The essential fabric of his whole aspiration is foresight. And yet this quality of foresight he must temper with deliberation, in order that his results may fit conditions that are more or less elastic. Plans that have been made far in advance to fit a situation that ought, in the nature of things, to exist, sometimes have to be revised because that situation has unexpectedly changed.

"The principle of 'best use' enters to an important degree into the profession of forestry, by which is meant the using of a forest so that each particular factor of which it is

composed is brought to its fullest efficiency, not only for the present, but for the future. When you pass the idea of immediate use, regardless of consequences, and accept the doctrine of foresight, you come to the 'moral' aspect of forestry. That moral feature is the one on which Theodore Roosevelt said his whole administration was based—the assuring of equality of opportunity. With the forester it means that the man in the streets, the everyday American, shall get an equal share in that particular natural resource of his country."—*American Cultivator*, Boston, Mass.

Saving the Big Trees

Under the above heading, the *Lubec* (Me.) *Herald* says:

"One of the commendable acts of Congress was the passage of the Calaveras big-tree National Forest bill. The Calaveras grove is one of several in California that contain some of the largest and most remarkable tres in the world. A giant redwood would be dwarfed among these trees. They should be regarded as a splendid treasure for the entire country, and all of them should be preserved and guarded with the greatest care.

"There were some doubts about the right of the Government to make the purchase, but fortunately they were dispelled or had no effect except upon overcautious minds. The result is that everything that can be done will be done to protect the trees. There is no longer any danger that they may be cut down and sold for lumber; the Forestry Service will see that they are not injured by man and will take every precaution to save them from destruction by fire."

A New Pest

The *Peoria* (Ill.) *Star* says:

"Forty years ago a beetle was imported from South America and made its appearance in Baltimore. It attacked the foliage on the elm tree. Little by little, it has become a pest, and it has been slowly making its way westward. It has now appeared in the eastern counties in Indiana. The state entomologist of that commonwealth calls the attention of the public to the fact, and says that if the beetle is allowed to continue its work uninterruptedly, it will destroy all the elm trees of the state, and as these are the choicest shade trees we possess, it is highly incumbent upon us to look out for this new enemy. What with the timber thieves destroying the forests, the lumber ring controlling the wood-pulp output, and the bugs eating up our shade trees, our forests are in a bad way."

Michigan Forest Fires

Press dispatches of May 27 reported forest fires raging in the vicinity of Negaunee, Mich., resulting in the complete destruction of the town of Dalton. A special train took the people of the place to safety. Many fishing parties in the woods were in danger. There had been no rain in the vicinity for weeks.

Pursuing Timber Thieves in Michigan

Under Land Commissioner Russell and his men, firms of the upper section of the state who have been robbing state tax lands of timber with impunity are being brought up with a sharp turn and in many counties trespass on state lands to steal timber is suddenly becoming decidedly unpopular.

For one thing, the department has made a radical change in the manner of seeking trespassers and prosecuting them for their thievery. Since January this year, when Commissioner Russell assumed direction of the land department, ninety-eight cases of trespass have been investigated, which is a record unequaled for many years, it is said. The department has done away with the old plan of engaging as trespass agents local men, who either might be robbing the state themselves or who might be allowing their friends and neighbors to take the timber.

He has four general trespass agents out looking after timber thieves, and five examiners who are assisting in the work.

* * * * *

The policy of the department is said to be to enforce the statute regarding trespass and comparatively few adjustments are made. From the cases disposed of the state has received $1,790.04, and with other cases pending the amount will run to at least $2,200.84, received since January. From the reports of trespass agents it is shown that 429,771 feet of timber, 10,000 posts, 5,085 ties, and several hundred poles and mining props have been taken, which causes one to wonder how much was taken when the trespass agents were not so active.

A large portion of this stolen timber has been seized, the state mark placed thereon, and is held pending the settlement of the cases. Much of it will revert to the state and will net several thousand dollars in addition to what has been secured.

Of the twenty-two criminal cases started fourteen are now pending in circuit court, eight have been convicted, three are awaiting sentence, three have paid fines, and two are serving sentences, not a case having been lost so far.—*Grand Rapids* (Mich.) *Press.*

Forest Work in Virginia

Gov. Claude A. Swanson, of Virginia, is seeking to promote Forestry in the Old Dominion. In a letter dated June 3 to Mr.

Overton W. Price, associate forester, Governor Swanson says:

"I am deeply interested in encouraging the preservation of the present forests and the growth of new forests within this state. From observation it seems to me that this state, if properly and scientifically treated, would very rapidly reforest itself, much to the advantage of the entire state and to the profit of the owners of the soil. I am desirous of having a scientific examination to ascertain the best means of accomplishing this; the best places where the new forests should be permitted to grow; the best means of preserving them and suggestions as to general scientific treatment. I believe incalculable good could be done in this state if this subject was taken up in a broad and scientific way."

Arrangements have been made for cooperation between the state and the Forest Service. The governor will incorporate in his message to the general assembly suggestions of legislation looking to the end which he desires to see accomplished, and will strongly urge that attention be given to the matter by the lawmakers.

Afforestation by Newark

With a view of protecting its water supply and at the same time preserving its forests, the city of Newark is now spending considerable money and labor in forestry work at the Newark watershed at Charlottesburg and Oak Ridge. It may be fifty or sixty years before the city reaps a harvest from this sowing; that is, getting financial returns for the lumber to be derived from the forests, but in the meantime the miles of trees will aid in the preservation of the water in the watershed.

Since the nursery work was begun the assistant engineer and his force of men have planted 40,000 young trees and thousands more will be planted in the seed next fall.—*Paterson Guardian.*

Forestry Work in Vermont

Vermont is vigorously addressing herself to the forest question. At its last session the state legislature abolished the office of forestry commissioner and chose a board of agriculture and forestry, empowering it to secure a trained man to investigate conditions, promote reforestation on a scientific basis, and act as the state fire warden. The board selected as its first state forester Mr. A. F. Hawes. In 1903 Mr. Hawes was graduated from the Yale Forestry School and became state forester of Connecticut. He studied the forestry situation in France and Germany and, after some additional service in Connecticut, accepted the offer made him by Vermont.

Mr. Hawes figures that the total annual product of the forests of the Green Mountain state is worth $10,000,000, and that the total area of forest and waste lands is 3,719,000 acres, about sixty-four per cent of the total area of the state. Mr. Hawes says also that since 1880 the total lumber cut of the state has reached about 2,000,000,000 feet and that this amount has been drawn largely from the principal or capital, and not from the annual growth of the forests.

A campaign of education will be waged throughout the state, partly through public meetings held under the auspices of the board and partly through the bulletins which will be issued from time to time. By interesting the teachers in forest problems, it is hoped that they will talk up the subject in their schools, awaken the interest of the pupils therein, and cause them to become thoroughly alive to the forestry problems of the sate.

"One of the most important functions of the office of state forester," says Mr. Hawes, "is that of fire warden. The fire warden in each town is the local warden, and they are all under the direction of the state forester, who, with two assistants, will next summer make a thorough investigation throughout Vermont as to forest fires, causes, amount of damage, and means of protection.

"The state forester will cooperate with lumbermen and farmers desiring to improve their lands and prevent them from going to waste. * * * The best farmers, who are continually bringing up the productive capacity of their fields, have entirely overlooked the fact that their wood lots are producing only a small portion of the income which they could produce."

A Chair of Silviculture at Yale

The Yale Forest School in particular, and the cause of conservation in general, are to be congratulated upon the gift of $100,000 by Mrs. Morris K. Jesup for the establishment in that institution of a chair of silviculture, to be known as the Morris K. Jesup Professorship of Silviculture.

Because of the present unfortunate lack of authoritative, scientific information in regard to the reproduction, either natural or artificial, of American forests, of their growth, and of the best time and methods of cutting them, such an endowment as this by Mrs. Jesup will aid materially toward actual conservation of our wooded areas and the reforesting of those already laid waste.

Annual Meeting of Connecticut Forestry Association

The annual meeting of the Connecticut Forestry Association was held in May in West Hartford, with about fifty of the leading forestry men of the state in attendance. At the business meeting preceding the ad-

dresses these officers were elected for the coming year:

President—Prof. H. S. Green, director of the Yale Forestry School, New Haven.

Vice-presidents—Dr. E. H. Jenkins, of the New Haven Agricultural Experiment Station; Everett S. Geer, Hartford; Theodore L. Bristol, Ansonia.

Recording secretary—F. H. Stadtmueller, Elmwood.

Corresponding secretary — Miss Mary Winslow, Weatogue.

Treasurer—Alfred Spencer, jr., Hartford.

Auditor—Appleton R. Hillyer, Hartford.

Advisory board—The above officers and Mrs. Jessie B. Gerard, South Norwalk; George D. Seymour, and W. O. Filley, New Haven.

Publishing committee—Dr. E. H. Jenkins, Prof. H. S. Graves, and Miss Mary Winslow.

The constitution of the association was so changed that the annual meetings would be held on the first Saturday in May in place of the Saturday following Arbor Day, as heretofore. The report of the secretary showed a membership of 126, a gain of twenty members during the year. That of the treasurer showed a balance on hand of $132.09. At the morning session an address on "Forestry Legislation and Future Forest Policy in the State" was given by W. O. Filley, of New Haven, acting state forester. George Towne, of Union, also gave an address on "Fire Protection." At the afternoon session, which followed a basket-picnic lunch, Prof. J. W. Toumey of the Forestry School, Yale University, gave an address on "Forest Planting." The matters of fire protection and importance of adequate appropriation by the sate for the maintenance of the state forester, ex-officio fire warden, were emphasized. The feeling was unanimous that the present fire-warden law was fully adequate, if given a proper chance, which it has never had, owing to the lack of funds to put it into proper execution. A bill is before the present legislature to increase the appropriation of the state forester so that this matter can be rectified and a better system of forest conservation in this state begun.

Dry Farming

Two ways, thus far, of conquering the desert have been devised: First, irrigation; second, dry farming. At Billings, Mont., on October 26, 27 and 28, the fourth Dry-farming Congress will be held. Its secretary is John T. Burns, Billings, Mont., and it has issued an interesting bulletin.

Natural Resources to Produce Revenue

Representative Sheppard of Texas evidently is a believer that the Federal Government should resort to some other method of procuring revenue than by that of taxation. To make his ideas effective, if possible, he has introduced in the House a resolution for the creation of a commission to investigate and report at the earliest practicable moment on the method of utilizing the minerals, the timber, the water-power, the hot waters, and other resources of the public domain in such a manner as to make their production of the largest possible value to the Federal Government. The resolution provides that the commission shall consist of the Secretary of Agriculture, the Secretary of the Interior, the Director of the Geological Survey, one Senator, one Representative, and two business men.—*North Dakota Farmer.*

Face to Face With a Water-power Trust

Far-sighted captains of industry, realizing what the next generation will bring forth—reduction in the fuel supply with its complement, an enhancement of cost—and anticipating the advancement that will come in the art of utilizing hydro-electric power, have already seized advantageous points, and even now a small group of "interests" controls a third of the present water-power production; that is, produces power the equivalent of that proportionate part. * * * This, and preceding generations, have realized the significance of monopoly in those things which are vital factors in the lives of all consumers, whether it be heat, light, food products, or transportation. Yet all these united must be multiplied to be tantamount in power to the monopolistic Colossus which is yet but a suckling, nurturing itself at the breast of its foster-parent, the public. For heat, light, and transportation, and the power that turns the spindles and grinds the corn, will be the product of transmuted water-power within the lifetime of our children.—Charles Edward Wright, Assistant Attorney to the Secretary of the Interior, in the *Annals of the American Academy of Political and Social Science.*

The Water-power Monopoly

With more than forty water-power grab bills in Congress and predatory corporations grasping at every available water site in the country without recompense, President Taft is urged by Water-power Expert John L. Mathews, in the June *Hampton's,* to curb the growing power of what threatens to be a greater trust than Standard Oil. He declares, "A new monopoly more terrible than has ever threatened the country, paying nothing, demanding all, its members have gone to Congress and borne away perpetual franchises to the greatest of our last remaining resources. Only the determined stand of President Roosevelt and Forester Gifford Pinchot has so far come between them and victory."

It was the Rainy River Dam bill which President Roosevelt vetoed. Rainy River, a

broad, deep stream, forms the boundary for a considerable distance between Minnesota and Canada.

"For making paper, for milling in transit the wheat which passes through, there is not in the world a more favorably situated power. It is available in Canada and in America, on either side of the tariff wall," says Mr. Mathews.

"Congress and the state gave away all public rights in the fall. It happened that the company was restricted in the time allowed to build its dam, and when the time expired had made barely a beginning. The corporation owners asked and secured an extension of time from Congress, and this extension President Roosevelt vetoed. The bill was passed over his veto, but not until the company had executed a contract by which its grant expires in ninety-nine years, and in the meantime the Secretary of War may regulate the charges which it can make for power."

Of the so-called grab bills in Congress, it is asserted that "two great corporations, the Westinghouse and the General Electric, and other smaller corporations which are said to be subsidiaries of these two great companies, already control more than half of the most valuable water-power in the country—that which falls down from the Appalachians from the Potomac River southward to the Gulf. Many of the applicants for grants were dummies for the corporations, and it was evident that there was a "hurry-up" rush on foot to grab, before the people woke up, the greater part of the yet undeveloped power sites.

"Nor was the importance of this to be seen at once, or to be realized until first the President and then the people could be made to grasp the tremendous importance of water-power. For generations we had used it sparingly, turning with it no machinery which could not be reached from the water-spun turbine by a belt or shaft. Suddenly, in a wonderfully short time, we have entered and advanced far in a new series of inventions by which we are able to develop power at any fall, in the form of electricity, and carry it even hundreds of miles, with but slight loss, to be used for commercial purposes wherever needed. In ten years we will be sending power 1,000 miles, and the most remote mountain streams will be contributing to run our railways, to light our cities, to take the smoke from our factories, and even to do the ordinary work about our farms and homes—lighting, heating, plowing, milking, churning, ironing, cooking, and all that coal and animal power do now.

"There is in the United States developed and unharnessed in our rivers and brooks more than 50,000,000 horse-power in water capable of being turned into electrical energy and transmitted to homes, farms, and factories. This can perhaps be increased fifty or even 100 per cent by proper conservation. Yet even in the original figure it means the equivalent of 650,000,000 tons of coal every year mined, transported, and consumed; or, as we waste half of our coal in getting it from the ground, it represents the diminution of 1,000,000,300 tons in our available supply of coal.

"We actually mine and ship each year about 500,000,000 tons of coal. So the water-power, the bulk of which we are giving over to monopoly, represents more than the equivalent of all our coal; represents the only hope for cheap living; represents a fuel or source of power which, while controlled by the people, can be used for public income and for regulating costs; but which, when alienated as we are alienating it, will create a trust that will make of the meat trust a pigmy, and that by simply adding pennies to its charges for power will reduce us to a slavery which would make the Standard Oil magnates gasp with envy. Such a state of affairs would surely produce a revolution. Only sane and radical action can avoid such a contingency."—*The Wichita* (Kans.) *Eagle*, May 23, 1909.

Water-power Sites

Says a writer in the *Washington Times* of May 31:

"Apparently with a view to meeting the criticisms that have been bestowed on the Interior Department, more especially on Secretary Ballinger, by some of the friends of the movement for the conservation of natural resources, a statement has been issued from the United States Geological Survey explaining just what is being done with respect to the withdrawals of public lands from entry for the purpose of protecting water-power sites.

"Secretary Ballinger not long ago succeeded in drawing a fire of bitter attacks on the charge that he was hostile to conservation because he threw open to entry over a million acres of land which Secretary Garfield, to protect water-power sites, had withdrawn from entry.

"The statement of the Geological Survey sets forth that, in fact, there has been prompt action in protection of public interests. It says that, 'acting upon the specific instructions of the Secretary of the Interior, the United States Geological Survey has begun the investigation of water-power sites on the public lands. Since April 23, the date of the Secretary's order, the Director of the Survey has recommended eleven temporary withdrawals in aid of proposed legislation affecting the disposal of water-power sites on the public domain.'

"The withdrawals in question aggregate 236,365 acres of public lands in Utah, Colorado, Wyoming, Montana, Idaho, and Oregon, and have been approved by Secretary Ballinger. It is explained that the present policy is to protect the public by withdrawing all public lands containing possible power sites, and at the same time not withdrawing land of no value for power purposes. It is said by the Director of the Geological Survey the withdrawals made and such as will be made before the next regular session of Con-

gress, 'will be ample to protect all the more important water-power sites undisposed of on the public domain, and enable Congress to intelligently legislate for their disposition.'"

A Conservation Commission for Iowa

On June 7 Gov. B. F. Carroll named the first state drainage and conservation commission that Iowa ever had, in accordance with the law passed by the recent legislature setting aside $5,000 for preliminary steps toward making Iowa rivers navigable.

By people who are interested in improvement of Iowa waterways and the conservation of the state's natural resources, the creation of this board is regarded as the most important act of the legislature.—*Des Moines* (Iowa) *Capital.*

Favors a Conservation Commission for Canada

Hon. Clifford Sifton, who represented Canada at the International Conference on Resources in Washington, is now advocating the appointment of a Canadian commission to carry out the principles promulgated there. He is supported in his campaign by Hon. Sydney Fisher, one of the other Canadian delegates. In his first public address after returning from Washington Mr. Sifton, the other evening, asserted that the preservation of forests called most loudly for action. The creation of a commission, he believed, would give a minister support in carrying out a more aggressive policy.

Conservation of Daylight

Speaking of "the movement for the conservation of natural resources through the better utilization of daylight," the *Grand Rapids* (Mich.) *Herald* said editorially:

"The select committee of parliament which gave the pending British bill a unanimously favorable report, 'its advantages far outweighing any objections thereto,' cite among other such advantages these: Bunching the leisure, especially of wage-earners, at the end of the work day; bettering the health of all classes, and especially the eyesight; an enormous aggregate saving in expense for artificial light, and materially reduced consumption of liquors by reason of more outdoor daylight recreation and less resort to drinking places. It also appears from the report of the parliamentary committee that the principle of the measure has the support of the British chambers of commerce in all the principal cities; of the borough councils; of all the great railroads; of the general federation of trades unions; of the postoffice department with reference to the handling of all but the relatively small amount of continental mail; of the press—in fact, a support that is 'surprisingly unanimous in all quarters, considering the little favor with which the proposition was received by the public when the measure was first introduced.'"

Forest Fires in Maine

After all conversation, law, and expenditure, enormous tracts of forests in northern Maine are being destroyed by fire. The disaster involves farmers as well as lumbermen, for thousands of bushels of potatoes have been prematurely roasted to a cinder. On whom does the responsibility rest? Is not the carelessness of lumbermen and of hunters largely responsible for awful waste of forests? Is not the moral factor of American industry minimized by high finance and by the tainted conscience which characterizes not only the sugar trust, but many of us outsiders—rich and poor—concerned only for the present moment? Though we ignore Him, there may yet be a God in Israel. The first firebrand is the real devil.—*Lewiston* (Me.) *Journal.*

Bark Affects Penetration of Wood Preservatives

The Government has gone into the study of every phase of wood preservation. One of the features which has been neglected is the effect of patches of inner bark on wood in preventing proper penetration of preservatives.

In conducting some tests on the treatment of pine in Louisiana and Alabama, in 1907 and 1908, it was noticed that very little or no creosote entered the wood through even the thinnest layer of adhering bark.

In the creosote treatment of timbers, it is rare that the entire stick is penetrated by the preservative. The value of the treatment consists largely in the creation of an exterior antiseptic zone around the untreated interior portion. If this outer zone be broken the value of the treatment is to a large extent lost.

In the case of piling, the effect of any small portion of untreated wood extending from the outer surface to the interior of the pile is especially injurious, because of the manner in which teredoes work. This parasite enters the wood when small, making but a tiny hole, perhaps no larger than a pinhead. As teredoes grow, they increase the size of their borings, and, if present in large numbers, they will very quickly so riddle and weaken a pile that it will break off with a very slight strain. Access to the interior of a treated pile might readily be gained through small, untreated portions of the outer surface of the wood, which, because of bark adhering at time of treatment, absorbed no preservative, with the result that all of the interior untreated portion would be riddled, leaving only the exterior creosoted shell sound. It is probable that

many of the failures of creosoted piling are due to this cause.

With other forms of timber the effect may not be so quickly seen or so disastrous, but in a similar manner decay may extend to the interior through any untreated portions communicating with the exterior.

Government Studying Yellow Pine

A study of conditions in the yellow-pine forests of the Southwest, made during the past season by the United States Forest Service at the recently established Coconino Forest Experiment Station, has brought out very strikingly the difficulty of securing natural reproduction in this type of forest.

In northern Arizona, perhaps at least half of the forest is without young growth of any kind, and old cuttings are frequently barren wastes. The most important factors in bringing this about are the climate, fire, methods of cutting, disposal of brush, and grazing; in most cases two or more of these factors work together in preventing reproduction.

While the study has not yet been completed, the preliminary results are of great practical interest and value, and point to the methods of management which must be used in this type of forest. Light cuttings, disposal of the brush by lopping and scattering, and the exclusion of sheep until the cut-over areas have a satisfactory young growth, are recommended.

Magazines Pushing Conservation

The magazines are giving a good deal of space to the conservation question. *The Annals of the American Academy of Political and Social Science* for May and *The Chautauquan* for June are special conservation numbers, and worthy of careful study.

Vanishing Forest Giants

Says the *Waterbury* (Conn.) *Republican:*

"The lumbermen cut down a hemlock tree 455 years old in the Adirondacks near Utica the other day. It measured thirty-three inches in diameter at the butt. So slow is the growth of the few great trees that remain of the virgin forests of the East that this hemlock was forty years old when Columbus discovered America. Yet it was less than a yard in diameter. You can find in our ruined woodlands stumps of first-growth timber that was five or six feet in diameter when cut. There are old houses in Connecticut and Massachusetts in which you can see doors, a yard or so wide, that were sawed out of one board. It must have taken at least ten generations to grow such trees.

"Such timber is now found only on the Pacific coast. The Seattle Exposition management is boasting of a Forestry building with a colonnade of fir logs five feet in diameter. Indeed, the contract for the erection of the building reads that the wooden pillars should not exceed five feet in diameter, so that the contractor should not supply larger logs because they happened to come handier. But the Pacific coast will come sooner or later to our condition."

Wood-waste Distillation

As evidence of the growing interest in the distillation of wood-waste may be noted the establishment of a publication, "The Wood-waste Distilleries News," which first appeared in Cleveland, Ohio, in May. Its editor is Carl von Hartzfelt, M. C.

RECENT PUBLICATIONS

"The Principal Species of Wood: Their Characteristic Properties." By Charles H. Snow, Dean of the School of Applied Science, New York University.

Large 8vo, xvi+203 pages, figures in the text; 37 full-page half-tones. Cloth, $3.50. John Wiley & Sons, New York.

The second edition of "Principal Species of Wood," issued last year by Prof. Charles H. Snow, of New York University, will be gladly welcomed by those who are familiar with the first edition, and should prove of interest and value to wood users in general. The new edition keeps the same arrangement and discusses the characteristics of the different species in the same way as the first, but the typographical errors present in the first edition have been corrected and the whole book slightly enlarged. Considerable additional material is contained in the introduction, in which the author takes up more fully the structure and uses of wood, the life of trees, and discusses briefly the subject of forestry. The misspelling of "humis" for "humus" is unfortunate, but the material contained in the discussion of this and related topics is trustworthy.

The book is intended chiefly for engineers and for those who are interested in the structural properties of timber; but, in spite of its technical character, contains much material of interest to the general reader. It is attractively published and contains a great deal of valuable information regarding the different species of American woods which has never before been brought together in such available form.

S. T. D.

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Mouth of the Miami River

PHOTO BY KAUFMAN, MIAMI, FLA.

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THE EVERGLADES OF FLORIDA AND THE LANDES OF FRANCE

By DR. JOHN GIFFORD
Founder of The Forester (Later, Conservation)

DURING a recent visit to the great work of reclamation now in progress in the Everglades of Florida, I was impressed with its resemblance in many respects to the great work the French have accomplished in the Landes of France, and with the fact that ex-Governor Broward, after many trials and tribulations, is succeeding, just as did the French engineers after similar troubles. The drainage of the Everglades is now well under way, and almost every unprejudiced person who visits this work becomes an enthusiastic convert. Just as the French engineers practically added a new province to France, Broward has been instrumental in promoting a work which will convert a vast, useless waste into what promises to be the most productive part of Florida, if not the most productive area of land of equal size in the whole United States of America. This drainage is being done at the insignificant cost of about $1 per acre; and when done the land will be ready at once for the plow and for the production of tender crops, the like of which cannot be produced elsewhere in the United States, and at a time when the rest of the country is frost-bound. This is no small area; it is many miles in extent, and is capable of yielding, at small outlay, enormous crops of the most delicate tropical products, as well as northern vegetables in mid-winter. A visit to this region, even at this time, at the very beginning of the work, since it is a colossal task, will convince the most skeptical person that this is no idle dream or wild land scheme, but a feasible, practical piece of good business. After inspecting this work, one naturally wonders why it was not done long ago. It is not a complex engineering problem; it is merely a matter of digging, so that the water in this great Everglade basin can flow into the sea. Behind the giant maws of these dredges which, when they work day and night, are literally eating their way through rock, mud and sand at the rate of a mile a month per dredge, there are left broad, navigable canals, which are

A Native of the Landes on Stilts

comparable only to those of Holland, and which will afford miles of placid water courses, avenues of traffic for the products of the land, and a never-ending source of enjoyment to pleasure craft.

In the case of the Everglades, the exit of the water to the sea is prevented by a limestone rim. In the case of the Landes it was due to a bank of wind-blown sand, which clogged all outlets to the sea. The resemblance of the two conditions is much closer than is at first apparent, since this very rock rim was once, no doubt, limestone sand blown in by the wind and later hardened into rock. I think geologists now generally recognize that this rocky rim is of eolian formation. The main difference between the two propositions is that, in the case of the Landes, it was silicious sand, which did not harden into rock, but remained mobile, shifting back and forth with every caprice of the wind, while, in the case of the Everglades rim, it was limestone sand, which soon hardened into solid limestone rock. As in sand dunes, the wind laminations show in the rock like leaves in a book, recording forever the character of its formation.

Before further describing the Everglades, let me quote from my notes made a few years ago, while visiting the

Landes of France. Not only are the physical conditions similar, but there was the same opposition at the start. As in the case of the Everglades, the work in France was pushed by the personal initiative and persistency of one or two men, and the method of securing the funds for the purpose was very much the same. In the early part of this century (before 1857), the condition of the flat, triangular plain known as the Landes, which is roughly bounded by the Bay of Biscay, the River Adour and the River Garonne, and the Medoc, was, in brief, as follows: There were miles of marshy, almost treeless wastes, covered mainly with a low growth of herbage. It was wet, unhealthy and sparsely inhabited. The few people who lived there depended upon their flocks. The accompanying picture shows a native of the Landes standing upon stilts, watching his sheep. He is dressed in a heavy sheepskin paletot. By standing on stilts, these shepherds can easily see their sheep in the bushes and grass, and can easily follow them through wet and marshy regions. Their spare time is spent in knitting stockings. The condition of the Landes is due to the immense sand dunes, which arrayed themselves along the shore of the Bay of Biscay. They moved inland, covered villages and occluded inlets. Bremontier tells of a dune which advanced in a violent tempest at the rate of two feet in three hours. The damage done by these moving sands so increased that the government officials studied the work and devised and executed plans; and now, thanks to de Villers, Chambrelent and Bremontier, the pioneer workers, the Dunes and Landes are covered with a beautiful growth of the maritime pine. The region is now a famous health resort, combining the beauties and pleasures of the seashore with those of a well-managed pine forest, which extends almost to the edge of the ocean.

There are evidences that originally the Dunes were fixed naturally by forests. These forests were destroyed by vandals, and all attempts to stop these menacing mountains of sand failed. In 1778 a talented engineer, Baron Charlevoix de Villers, was sent to Arcachon for the purpose of forming a military post.

Forest of Maritime Pine on the Dunes in Gascony. The White Sand in the Foreground Is the Edge of the Fire-line

A Typical Everglade Scene Ten Miles South of Lake Okechobee

He saw at once the necessity of fixing the sand, and was, according to Grandjean, the first to establish the fact that the way to fix the Dunes is by means of plantations of pine. He met with troubles in his work, and was finally sent back to the Island of Santo Domingo.

In 1784, Bremontier began the work, and it is said that, by using the results of de Villers' labors, he finally succeeded in fixing the moving sand.

The fixation of the Dunes rendered possible the work of M. Chambrelent, which was the reclamation of the Landes by drainage and plantings. It is a unique example of personal initiative. M. Chambrelent, a young engineer in the Department of Bridges and Roads, in 1837, was sent to the Gironde to study the drainage of 800,000 hectares of land in the districts of Gascony and the Landes. His conclusions were not accepted, so he bought some land and put in effect the measures he advocated. In 1855, the results of his experiments were submitted to an international jury. The jury was so favorably impressed that it recommended the application of Chambrelent's plans for the entire region, and in 1857 a law was passed requiring the Communes to do this work. The Communes paid for it by selling a part of this land, which increased in value after the completion of the work. This region was 100 meters above sea level, flat and sandy. It was underlain with a hardpan called "alios." In summer it was a bed of burning sand, in winter in a state of constant inundation, while between the two was a period of pestilence. The country was characterized by sterility and insalubrity.

A complete system of drain ditches was dug and the seeds of pine were sown. In 1865 all works of drainage were complete. By the fixation of the Dunes and the drainage of the Landes 650,000 hectares of land were made productive. Fomerly, if one wished to buy land he mounted a hill and called in a loud voice; the land over which his voice carried was worth 25 francs. "A man," says Grandjean, "was forced to take some of this sand for a debt. He became a millionaire later by selling it in small parcels." The first summers, the visitors lived in the rosin-gatherers' cabins; now every luxury is

Indian Family in Canoes on Miami River

afforded the 200,000 tourists who come there every year. In the Landes a man could buy a farm for a few francs, but it required over two acres to support one sheep. In less than a century the population sextupled, while that of a large part of the rest of the country either remained stationary or decreased. The fecundity of the French in places where there is plenty of room and opportunity is proverbial, as in Canada; it is even so in the Landes, which, on being reclaimed, was equivalent to a new province or colony.

All along the east coast of Florida there are dunes of snow-white sand covered with scrub pines and palmettoes. This fine, white, silicious sand, although naturally sterile, is excellent for the growth of pineapples in regions where there is sufficient warmth. Mile after mile of this sand along the line of the railroad between the Everglades and the sea is used in the cultivation of pineapples, which are fed a balanced ration of fertilizer, just as cows are fed a balanced ration of feed for the production of high-grade milk.

This great Everglades basin, extending from Lake Okeechobee to Miami and westward to the Gulf of Mexico, contains 3,000,000 acres, more or less. The whole cultivated area of the state of Florida is estimated at only about a million acres. The Everglades are larger than Porto Rico or Jamaica and as big as Rhode Island and Delaware combined. This great area is mainly confined by dunes of sand and ridges of limestone rock. These ridges, like fingers, project into the Everglades and are usually covered with pine. Between these ridges are small glades on the edge of the main or "big glade." The accepted definition of a glade is a narrow strip of grassy land between forests. Glade refers to a grassy area. The big glade is all or "ever" glade. In this way, no doubt, the term Everglade originated. Here and there in the Everglades are islands covered with rich jungle or hammock hardwood growth. On these islands the Seminoles cleared small areas, where they raise their crops.

We visited the Everglades from Fort Lauderdale. It was after a long period of heavy rains, and the mosquitoes

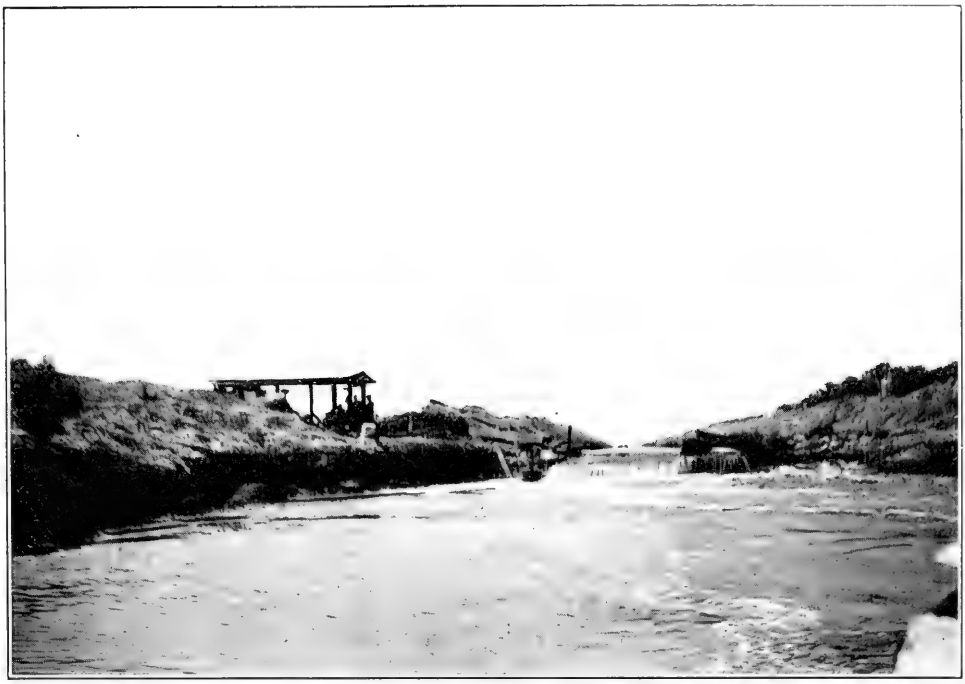
Camp on Caloosahatchee River

were bad in the pine woods. We ascended the New River, a beautiful, winding stream, generally deep, but very deep in places, one spot having a depth of eighty-five feet. The banks were quite low and sandy and lined with moss-draped cypress, oak, maple, magnolia, cocoa plum, pond apple, etc. After a short ride we reached the beginning of the drainage work—one long canal ran northwestward, with the dredge Everglade at its head, hard at work; another due westward, with the dredge Okechobee at its end at work. These canals will run about twenty miles out into the glade and will be met by a canal running north and south from Lake Okechobee to a point about twenty miles west of Miami. The dredge Miami is now at work at the head of the Miami River; another dredge is at work on the west coast, opening the old Disston Canal into Lake Okechobee.

As these canals are finished, dams are made to hold back the water to facilitate dredging, showing rather a surprising amount of fall and how effective these canals will prove in discharging the floods of water from this big area. I understand that the Government will permit the level of Lake Okechobee to be lowered only four feet, since a Federal appropriation has been made to dredge the Kissimee River, which empties into the northern part of the lake.

There were no mosquitoes in the Everglades during our visit, and crops already growing on the land, owned by eager settlers, show what can be done on land only partially drained.

Western capitalists mainly have bought this land; the money from the sales is doing the work, and the further it progresses the more the land will bring and the more eager people will be to get hold of it. The Board of Internal Improvement is wisely holding back much of the land from sale, knowing full well that as time goes on it will increase in value and thus yield ample funds for the continuation of this important work. In many cases the state has sold only the alternate sections.



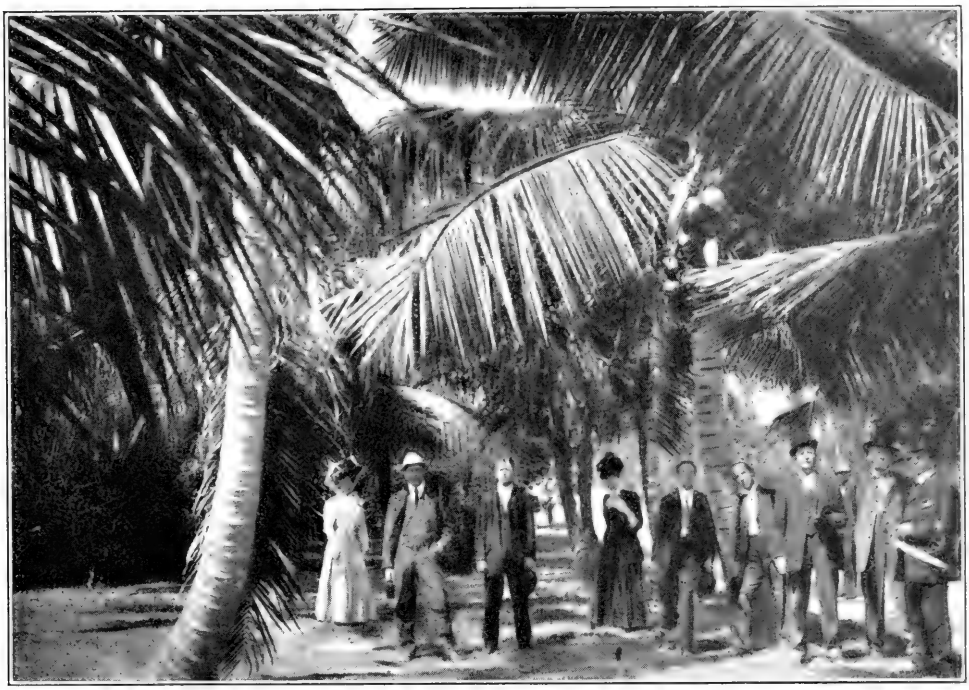
Canal with Dam to Raise Water to Float Dredge

An Everglade Canal below the Dam, Showing the Amount of Fall

PHOTO BY KAUFMAN

Everglades Lands after Drainage

A Home in the Everglades after Reclamation



A Miami Palm Garden

There are agents at work selling this land in every state in the Union. Men of wealth and influence are behind this project. If any one doubts its feasibility, he should come to Florida and see with his own eyes. Much praise is due ex-Governor Broward for his work in this line, and in the years to come he will shine forth as the governor who really did something to add to the productivity and worth of his state. The man who makes two blades of grass grow where only one grew before is the proverbial public benefactor; but the man who, by his energy and foresight, inaugurates a movement to render 3,000,000 acres of waste land highly productive deserves endless commendation in this day, when we talk so much about the conservation of nature's resources. Mr. Broward is a masterful promoter; the keynote of his campaign was drainage; he worked at it incessantly while in office, and he has been working at it ever since, and has made good.

We must not forget that this reclamation is in a land of perpetual summer in the only part of the mainland of the United States which is truly tropical, and where the productive capacity of the land is many times greater than in northern climes; where not only a greater quantity, but a much greater variety of crops can be produced than elsewhere in this country.

This may be far-fetched, but I can picture in my mind's eye long avenues of Eucalyptus, Australian pine, and Royal palms along these canals; great masses of Hibiscus, Allamanda, Oleander, Bouganvillea, Poinciana, and countless other resplendent ornamentals around thousands of neat homes surrounded by fields of peppers, tomatoes, eggplants, celery, onions, okra, arrowroot, tobacco, etc.; also, no doubt, orange and grapefruit groves, as well as choice mangoes, avocados, and other tropical fruits. The canals filled with boats will lead to Miami and Biscayne Bay, the Arcachon and Biscay of Florida.

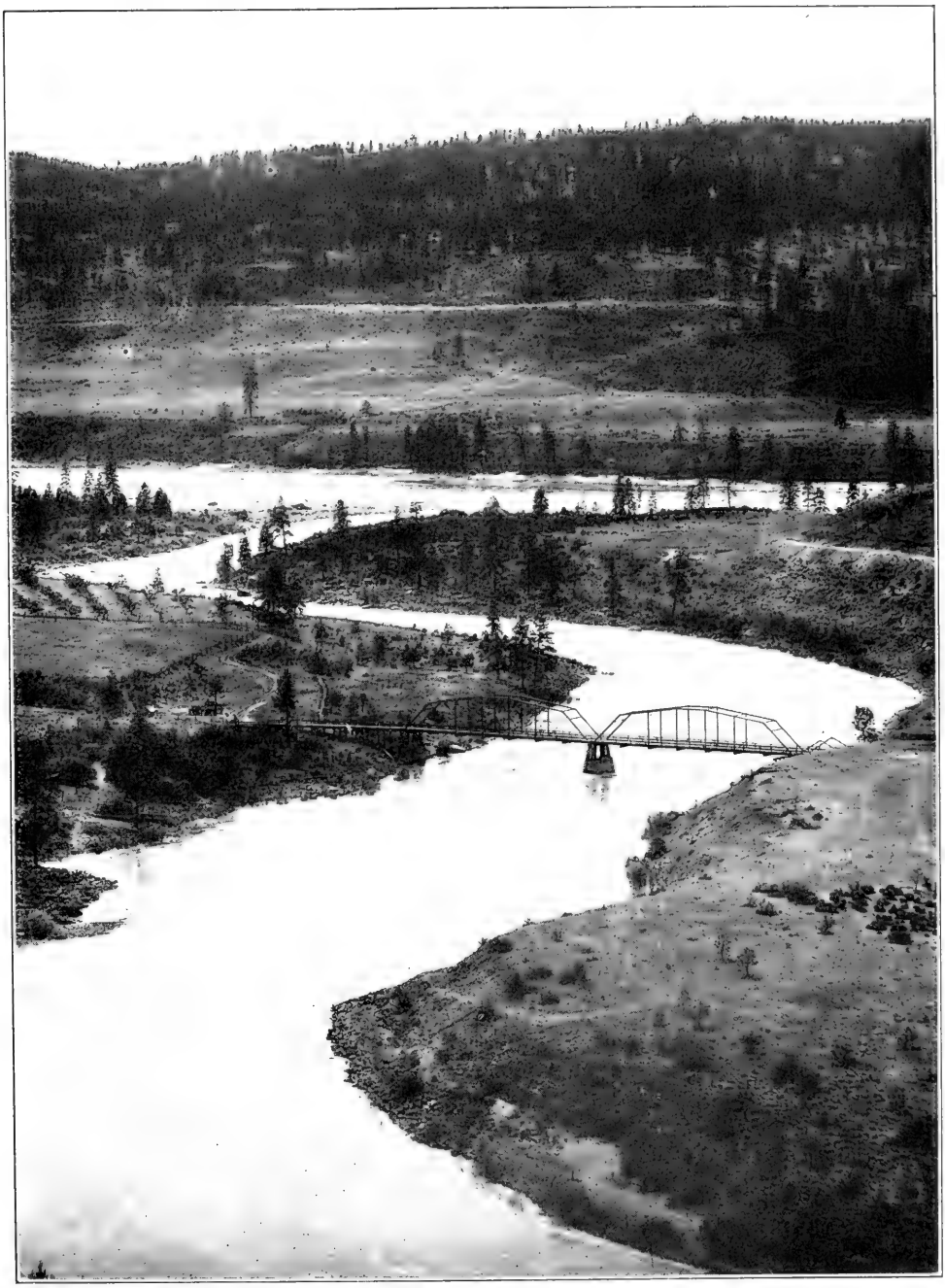
The land of the moccasin, alligator and Seminole will see a great transformation in a very short time—it does not take long in a tropical country, especially on land where there is no forest to clear.

It is more than a drainage scheme, since by means of dams and locks the water table may be kept at all times just where it is needed for irrigation purposes. The land is level, fertile, and free from alkali and other injurious minerals. The canals serve the triple purpose of drainage, irrigation, and transportation.

The soil is usually a black muck, in places several feet in thickness; under this is usually a layer of marl; under the marl, sand, and under the sand, limestone rock. There is considerable mineral matter mixed with this muck, and, although it will shrink some, I doubt if the shrinkage will ever prove a serious drawback. By the application of lime, the cultivation of legumes, etc., this soil can be kept at a maximum state of fertility, so that five acres would be ample for the support of an ordinary family.

Throughout the Everglades there are large springs, fed, no doubt, by a watershed far up the state. This water is usually heavily charged with lime, which is deposited on the surface of everything in a fine, flocculent state during the period of overflow. This deposit, added to the muck, no doubt, contributes much to the quality of the soil. There are deposited also the shells of many fresh-water mollusks. In short, with the fertile, easily-worked soil, an bundance of water for irrigation, a tropical, healthful climate, canals for transportation purposes, and all within easy access, by both water and land, to our great northern markets, there is a combination of favorable conditions which probably cannot be equaled elsewhere in the whole world.

And lo! the poor Seminole; what of him? At best, he is merely a renegade; and the time will soon come when he will have to put on pants and go to work on the land, join his relatives in Oklahoma, or die from the effects of too much bad whisky.



Where the Waters of the Columbia and the Spokane Meet in the Spokane Indian Reservation

South End of Coeur d'Alene

OPENING OF THE COEUR D'ALENE RESERVATION

THE Coeur d'Alene Indian reservation in northern Idaho, 200,000 of whose 400,000 acres of agricultural, grazing and timbered lands will be distributed among homesteaders by the Government lottery plan at Coeur d'Alene, beginning on the morning of August 9, is one of the three reserves in the Inland Empire to be opened this year. The other two are the Spokane, in eastern Washington, 6,000 acres of agricultural lands, and the Flathead, in western Montana, with 450,000 acres of agricultural and grazing lands. Those eligible to settle on this land must register at either Kalispell or Missoula, Mont. Registration will begin on July 15 and continue until August 5. All applications for registration must be mailed in a plain envelope, three and one-half by six inches, to James W. Witten, superintendent of opening, Coeur d'Alene, Idaho.

The passing of the reserve from the hands of the historic tribe of white settlers marks an epoch in the annals of the Northwest; its settlement next April means homes for from 7,000 to

ervation of the Same Name

10,000 persons, probably many of them from crowded cities in the East, and the development of the lands will add several millions of dollars annually to the wealth production of the Inland Empire.

The reservation has an interesting history, dating from the early '30s, when French-Canadian employes of the Hudson Bay Company stirred up among the untutored reds a desire for the coming of "Black Robes," as the missionaries were known in those days. Fathers De Smet, Gregory, Mengarini, and Nicholas Point, accompanied by Brothers Specht, Huet, and Claessens, came from St. Louis in 1841 and lived among the Indians. They founded their first mission in the Bitter Root Valley in Montana near the site of the present town of Stevensville, where they afterward erected a church and parish house, and cultivated the land. Several years later Father Joset joined the band of workers, and the Coeur d'Alene mission was established.

Father Joset became superior of the Rocky Mountains mission, which, in 1907, was united with the California mission. It is headed by Rev. Father George de la Motte, of Spokane, whose jurisdiction now embraces the states of California, Oregon, Washington, Idaho, Montana, Wyoming, the Dakotas and southern Alaska, an area of 900,000 square miles.

In the early days some of the Indians, then in their prime, were looked upon as "medicine men," endowed with supernatural power, and, consequently, of great influence among their fellows. When the priests began their work they condemned that superstition, and the medicine men gradually lost their power and influence. Old and young to-day

Harvesting on the Flathead Reservation near Kalispell, Mont.

are devout adherents of the Roman Catholic religion. The men devote themselves to athletic sports and games between the ceremonies, being especially fond of baseball and horse-racing. Indian officers maintain a vigilant police system, and offenders are punished by imprisonment in the jail at De Smet. Drunkenness is not tolerated.

The reservation is situated wholly in Kootenai County, Idaho, and contains approximately 625 square miles, or 400,000 acres of land, of which two-thirds is cultivated and capable of high development. The rest is heavily timbered with white and yellow pine, cedar, fir, and tamarack, and is subject to entry under the homestead laws at its appraised value. The cost of these lands has not yet been determined. While the principal crops produced are wheat, oats and hay, the soil has proved itself to be admirably adapted to the cultivation of potatoes, sugar beets, and other root crops, also tree and vine fruits.

The Indian population of the reservation is 500 Coeur d'Alenes, of whom 255 are males. There are also ninety-seven Spokane Indians. A census taken early this year shows the sexes are nearly evenly divided. These people each own 160 acres of land, and have 2,500 head of horses, 1,200 cows, 600 hogs, and 175 sheep. The reserve is traversed by the Chicago, Milwaukee and Puget Sound Railroad and the Tekoa-Burke branch of the Oregon Railroad and Navigation Company, the latter carrying all members of the Coeur d'Alene tribe free of charge between Tekoa, Wash., and Cataldo, Idaho, fifty-seven miles, as the result of a contract made when the Harriman people secured a right-of-way across the reserve in 1889.

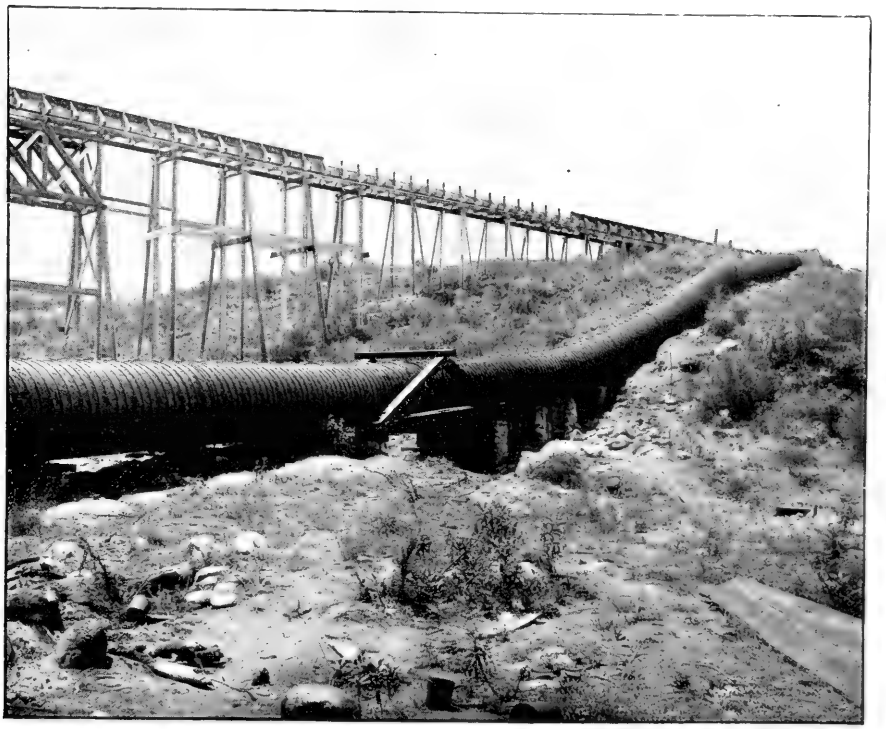
Pierre Wildshoe, chief of the tribe, and successor of Andrew Seltice, who died in 1902, while not the wealthiest, is one of the most respected and influential men on the reservation. Pierre Moctielma is sub-chief, and John Davenport, who was raised by a white merchant of the same name at Colfax, Wash., is head of the Indian police.

They are respected by all who know them.

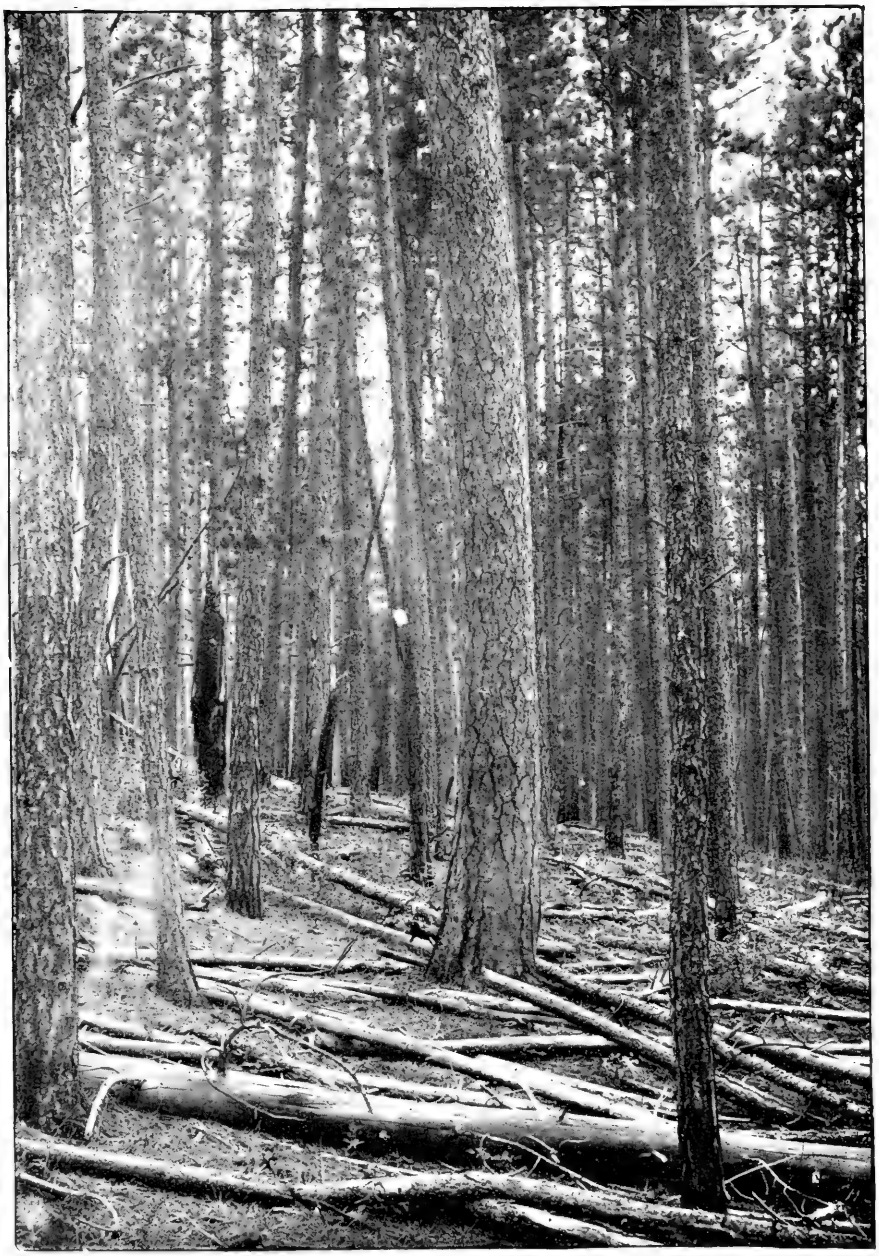
Louis Mitchata is, probably, the wealthiest of the Coeur d'Alene Indians. He is reputed to be worth at least $15,000, of which $8,000 is in money at interest. He lives in a house which would be no discredit to any farmer in the country, and has a good barn for stock, and convenient outbuildings. A grove of trees surrounding a large fish-pond is a pretty feature of the premises. Lo-lo, who lives near the Government sawmill, a few miles east of the mission, has possessions in live stock and cash to the amount of $10,000. Chief Wildshoe is worth $6,000, and others have from $1,500 to $5,000.

The great age reached by a number of these people is a matter of interest. Father Caruana, of De Smet mission, says that Charles, who died there a few years ago, was not less than 120 years old. He was totally blind years before his death, and was waited on by his daughter, who died later, deaf and blind, at the age of ninety years. Coo-Na-Cha, a Coeur d'Alene squaw, died recently at the age of ninety-six years, and Victoria, of the same tribe, is supposed to be in her ninetieth year. Scam-tal-am-to, a Spokane squaw, who lives on the reservation, is ninety-one years old. There are several others past the four-score period.

It is announced by James W. Witten, superintendent of the opening, who will arrive at Coeur d'Alene on July 5, that no charge will be made for registration, but at the time of making entry in April, 1910, persons who take lands in the Flathead reservation must pay one-third of the appraised value, and those who apply for either Coeur d'Alene or Spokane lands must pay one-fifth of the value. The remainder may be paid in five equal annual instalments.



Conveyance of Water for Irrigation in Stave Pipes. Old Flume and New Redwood Stave Pipe Replacing It, Redlands Canal, California



View in the Black Hills Forest Reserve, Showing Average Stand of Timber

INFLUENCE OF TAXATION ON FOREST DISTRIBUTION

By E. M. HOOVER, Boise, Idaho, Delegate from Idaho to the White House Conference, May 13, 14 and 15, 1908

THE importance of the conservation of the forests of private individuals and of holdings outside of the National Forests, is greater than that of the conservative management of the National Forests. The reasons are that the private holdings are more accessible for cutting and are in an altitude below the permanent snow line; they are, therefore, located where the forest covering delays the melting snow and retards the runoff of rainfall.

The lumberman does not, from any influence of greed, willingly destroy his own property or endanger the welfare of the future. He acquires large tracts of timber land in order to be assured of a timber supply that will justify the construction of mills, roads and river improvements and the expenses of logging, thus taking only a reasonable business precaution.

The lumberman would prefer to make his timber supply permanent. He is absolutely prohibited from so doing by the present methods of taxation of timbered lands. The taxes are assessed on both the land and the growing tim-

A Southern Pine Forest, Showing Path of a Destructive Fire after Lumbering

ber; and, in many cases which I could cite, on a valuation exceeding the cost or the present actual value. To avoid disastrous business results, his only alternative is to cut the timber off clean, and as fast as he can; otherwise, the increasing taxes, added to the expense of caring for the property, the destruction of timber by fire, storms and insect depredations, place an absolute prohibition on any system of reforestation or conservative lumbering.

To fair-minded men there is a reason, as well as an obvious necessity, for the immediate adoption of measures that will conserve the timber resources of the Nation and render them permanent for the general good; but the timberland owner who can reap but one crop in a lifetime should not be called upon to bear a disproportionate share of the resulting burden.

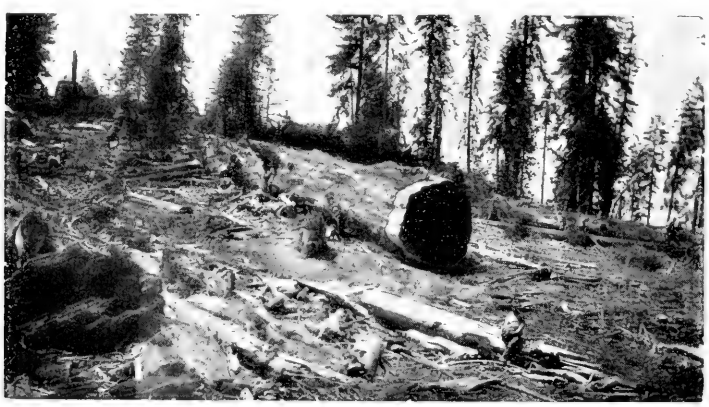
In an instance with which I am familiar the timbermen in a county, actually owning five per cent. of the area of the county, are assessed on forty-nine and one-half per cent. of all the lands on the assessment rolls, and they pay seventy per cent. of the tax revenue from the item of "lands" and thirty-eight per cent. of the entire county revenue from all sources.

There is a National Forest in that county comprising about twenty-five per cent. of the area of the county. The timbermen's tax amounted to over 150 times as much per acre as the county received from the National Forest. The Forest Service could not hope to continue its present invaluable work if it were obliged to carry such an item of fixed charges.

For the counties and state it would be a far wiser business policy to collect a low, permanent tax rather than a heavy one for a few years only.

The reserve of mineral in a mine bears no burden of taxation; no other growing crop than timber pays any tax until harvested.

The remedy for the destruction of forests by individuals is in the proper adjustment of taxes. Timber land should be taxed on the value of the land only; the growing trees should be on the basis of any other crop, and taxable as personal property when they are cut; or, in other words, when the crop is harvested. Under such a system the timber owner would be obliged and could afford to adopt a scientific and conservative management of the forest, and would be a willing demonstrator of forest preservation and its far-reaching, desirable results.



An Example of Wasteful and Destructive Lumbering in the Sierra Nevada

Topeka, Kans. Flood. Building Pontoon Bridge from Fock Island Depot

STATE FOREST POLICY

By HERMAN HAUPT CHAPMAN
Assistant Professor of Forestry, Yale University

As the virgin timber supplies in the different states near the point of exhaustion, the question of growing timber to meet the many urgent needs of our industries and arts is brought squarely before the public. The National Government has been able by timely legislation and the courageous action of several of our Presidents to retain title to an immense area of public timber lands lying west of the Mississippi River. But constitutional limitations will probably confine the operations of the Government to public lands, or to tracts situated at the headwaters of navigable waterways. In the Eastern states, especially, state governments have duties and responsibilities in forestry which can never be assumed successfully by the National Government.

The first of these duties is the encouragement of private forestry. No matter how much land the state may finally acquire, much the larger and more valuable portion of the timberlands capable of producing the most rapid growth of timber will remain the property of private owners as woodlots or of large land owners or corporations as cutover lands. Upon these lands, the production of new crops of timber must depend upon private effort.

But left to themselves, private owners will be slow to undertake forestry on a large scale. The extensive growing of timber can be carried on by individuals only as an investment which must give them a return on their money. Under present conditions the danger of destruction or severe damage to timber by forest fires is so great that such investments are not safe, and the comparatively long period which the investor has to wait, with his property exposed all the time to fires, before he can realize any returns will discourage many who otherwise would grow timber. A second, equally serious drawback is the heavy taxes which in many localities are assessed against standing timber and which threaten to absorb whatever profit might otherwise be made by the owner. It is clearly the duty of state governments to remove these two great obstacles to private forestry by passing and enforcing suitable laws.

Most states have already passed fire laws making it an offense to set fire to woodlands either purposely or accidentally. Such laws have always remained a dead letter until the office of fire warden was created for the proper enforcement of the law. The most primitive form of a fire warden system is that which imposes the duties of fire warden for a town upon the town supervisors. Experience has shown that such officials are indifferent to these added duties. The best results have been obtained in states which have created the office of state fire warden and made the local or town wardens appointive. The town board may retain the power of appointing a fire warden, or he may be appointed by the state warden, who should in any case approve the appointments and have the power to remove an inefficient warden. By this plan a warden may be secured who is willing to devote the proper time to his duties and who can be retained in office by reappointment as long as he is willing to serve. With an active and efficient state fire warden

Large Poplar Tree Growing in Mountain Ravine on West Slope of Great Smoky Mountain,
Eastern Tennessee

Result of Fire Protection Commenced in 1890, and Seed Felling Made in 1894. Five to Ten Pine Seed Trees Are Left on Each Acre

to supervise the work of the town wardens, instruct them in their duties and weed out incompetent wardens a sound basis is laid for fire protection of woodlands.

But no force of fire wardens, however good, can prevent fires if neither the owners of forest lands nor the residents of the locality desire protection. If fires are constantly being set, and the wardens' duty is merely to extinguish them, the expense would be prohibitive. Prevention of fire is the cheapest method, and this can be accomplished by education of the public to the damage done by small as well as large fires, by punishment of offenders, and, when possible, by providing for patrol during the dry times by the wardens or deputies.

Large owners can supplement the work of town wardens by using their employees as a fire patrol, and state laws should provide for the appointment of such persons as fire wardens.

The progress already made in some states under proper laws is such as to encourage the belief that complete fire protection may, in time, be secured wherever an honest effort is made along the right lines.

In the matter of tax reform for the encouragement of private forestry, little progress has been made. Many laws have been passed providing for some form of bounty, rebate or exemption on plantations of timber trees. Some have been declared unconstitutional, while others have not been taken advantage of. A more general reform is needed. As long as timber is looked upon as real estate it will be overtaxed. Virgin timber which has cost the owner no effort to produce it may with some reason be assessed on the basis of realty, but where woods are grown as

Forest Land in Minnesota Devastated by Fire. This View Will Explain to Some Extent the Diminution in the Cut of White Pine

a result of definite outlay of time or money, they are in all respects a crop, and represent income on the land. The effect of the present system of taxation is to force the owners of valuable timber to cut it to escape extortionate taxes and to discourage the growing of new crops of timber trees. It is not possible to cut and market timber until it reaches certain sizes, and the longer it is allowed to grow, the more valuable the product becomes to the community.

Standing timber should be released from taxation wherever it can be shown that the property is being managed for the continuous production of wood crops. The best method of accomplishing this is to limit the assessed valuation of such lands to the value of similar wild or unimproved lands not timbered, and provide that the lands shall be managed under plans approved by the state forestry officials. Should this discrimination in favor of forest lands cause too great a loss of revenue, a tax should be laid on the timber when it is cut rather than to revert to taxation of standing timber. Tax reform for woodlands may be expected soonest in states whose supply of virgin timber is nearest to exhaustion.

The forest policy of any state would be incomplete if confined to such general legislation to encourage private forestry. There is much to be learned in this country regarding methods of handling woods to get the best growth of most valuable timber. Mistakes are costly, for they do not become fully apparent for many years. The state should provide against such mistakes and waste effort on the part of its citizens, first, by employing a forester with a thorough professional education and considerable experience to give information to those in need of it; and second, by acquiring land as forest reserves for the purpose of experimenting and demonstrating the best methods of forest management. Such a policy is illustrated by the work of the agricultural experiment stations. There is no state so small or with so little waste land that it would not be justified in establishing small forest reserves for educational purposes.

Stone Mountain, near Atlanta, Ga. The Ax and Fire Have Removed the Forest; and the Heavy Rains Have Removed the Soil Which Once Covered the Larger Part of This Rocky Knob

But most states cannot stop here. In nearly every large state there are bodies of land not suitable for agriculture which, for many reasons, the state should own and manage as forest reserves.

The best use to which land can be put is the production of farm crops. But lands too mountainous or rocky to be cultivated will grow valuable crops of timber, and if used for this purpose, contribute to the resources of the state. Only when every acre of productive land is put to its best use, is the highest prosperity attained.

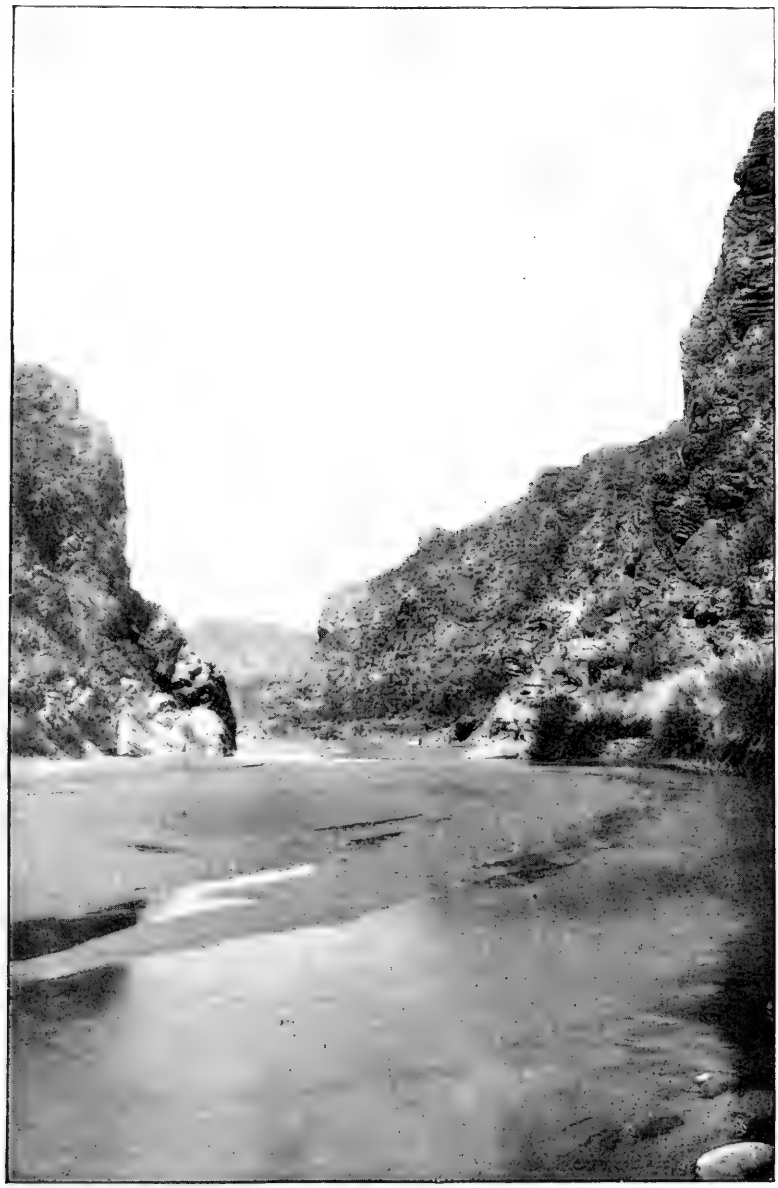
But aside from producing crops of wood for use, the growing of timber on mountainous land is desirable for two other purposes. The first of these is the preservation of the soil on steep slopes by preventing erosion, and the consequent regulation in the flow of streams and reduction of danger from floods. This is one of the most striking and most easily demonstrated effects of forests, and in certain mountain regions is the chief argument for forest preservation.

The second motive for devoting mountain lands to timber growth is to furnish parks and pleasure grounds for the public. This last incentive is the simplest and most widely understood of the three, and will meet with the most ready support. But it has often been unduly emphasized. A state forest policy which is unable to harmonize these three essential objects of forest reserves, namely, timber production and use, protection of soil and water, and public parks, will remain a continual source of dissension in the state and is economically false. Timber should not be cut indiscriminately where the other two objects must be secured. But it is an inexcusable waste to prohibit cutting of timber upon large areas of forest land that they may be used exclusively as parks. The great majority of persons visiting such forests will travel along certain definite routes, either streams, trails or roads. The old timber can be left intact in all such places. For landscape effects from the tops of mountains, young timber looks as well as older growth, and it is only necessary to keep out fire and protect the soil by the prevention of too heavy cuttings. Thus the management of large state holdings as parks is not opposed to their use for the production of crops of timber.

Where erosion is rapid and its effects on the flow of streams disastrous, state ownership of such lands and control of cutting is the only means to end the trouble, short of National intervention for the same purpose. Laws are sometimes proposed to prohibit timber owners from cutting trees below a certain size. Such legislation would only be justified in these mountainous localities, and under conditions where it could be clearly shown that destruction of property belonging to others would be caused by the removal of such timber. And such a method of attempted regulation of private property is far more drastic and difficult to enforce than a policy of acquiring such lands for the state. Public ownership makes possible any form of management best suited to the general good.

So great has been the pressure for state ownership of such mountainous areas that in the states of New York and Pennsylvania a total of considerably over 2,000,000 acres has been acquired, largely by purchase, for forest reserves.

But some states have a much more difficult problem to decide. There are many areas of level land which can easily be cultivated but have not been successfully farmed. The commonest type is a coarse, deep sand with no subsoil found in many pine regions. Much of this sandy land in older states has been taken up and abandoned several times. It is in dealing with soils of this character that our state policy needs strengthening. Conditions in America are still unsettled, and the pressure for land is very strong. The doctrine that lands too poor for agriculture should be used for the production of wood crops is not yet accepted, for no land which can be plowed



San Carlos Dam Site, Gila River, Arizona

will be relinquished to forest reserves without a struggle. In every state which has attempted to create forest reserves on sandy land a bitter fight has been waged against the withdrawal of such lands from agriculture.

This opposition springs naturally from both the settlers in such districts and the speculators in farm lands. The interests of the settler are promoted by more rapid settlement, since a denser population not only reduces the taxes for roads and other improvements, but creates better markets for produce. A suggestion that a portion of any region is unfit for agriculture is

End of a Log Slide

a blow at the development of the district. This should be recognized, and extreme statements and radical measures avoided by forestry advocates.

But final judgment cannot be formed without considering the other side as represented by the land speculator. In many districts the test of experience has shown the difficulty of profitable farming, and the original settlers have abandoned the attempt. Land speculators find in these lands a fruitful source of profit, and induce inexperienced or over-confident investors to buy them for homes.

There seems to be but one way to meet this situation honestly, and that is by acquiring such lands for state forest reserves. We need these lands for growing timber. In such thickly settled countries as Prussia sandy lands are being purchased every year by the Government and planted to pine. We must learn in this country to put land to its best use, and be willing to admit that in some cases this best use is forest production. The ability to distinguish between agricultural and forest soils, and the power to open the first class to settlers and prevent the improper use of the true forest soils for agriculture can only be developed in a state under a progressive policy of state forest reserves.

There are thus strong reasons for state ownership of forest lands in all instances in addition to the need of producing timber. Should the argument be based solely on the necessity for the state to grow timber, it might be held that a state must not compete with individuals in the production of crops. This is true where individuals can supply the demand for the product and where state competition would in any way hamper private effort. But in the production of timber, experience in this country as well as abroad is rapidly proving that the individual or corporation is seldom willing to invest the money or make the sacrifices necessary to secure a second crop of timber, while under state control the proper steps may be taken with little difficulty. It is certain that all the timber that can be raised by the united efforts of states

Every Forest-lined Breathing Place Is a Powerful Influence in the Uplifting of Future Citizens

and private parties will not supply the demand, hence it is equally certain that the growing of timber by the state will not injure the individual. It will aid such private efforts by improving conditions of public sentiment, securing better fire protection and developing markets for home grown timber. The larger and more valuable sizes of timber needed for special purposes, and the clear lumber which comes only from older trees can only be produced in the future by the state, since no other owner can afford to wait so long before cutting his crop.

A progressive forest policy for a state calls for absolute freedom from political connections, and for direction by men of proper training and knowledge of forestry. A policy of land acquisition may be managed successfully by men without a forester's training, and such public-spirited men have been responsible for nearly all the progress that has been made so far in securing state forest reserves. But as soon as the foundations are laid and the work of management for the purpose of timber production begins, it should be in the hands of trained foresters.

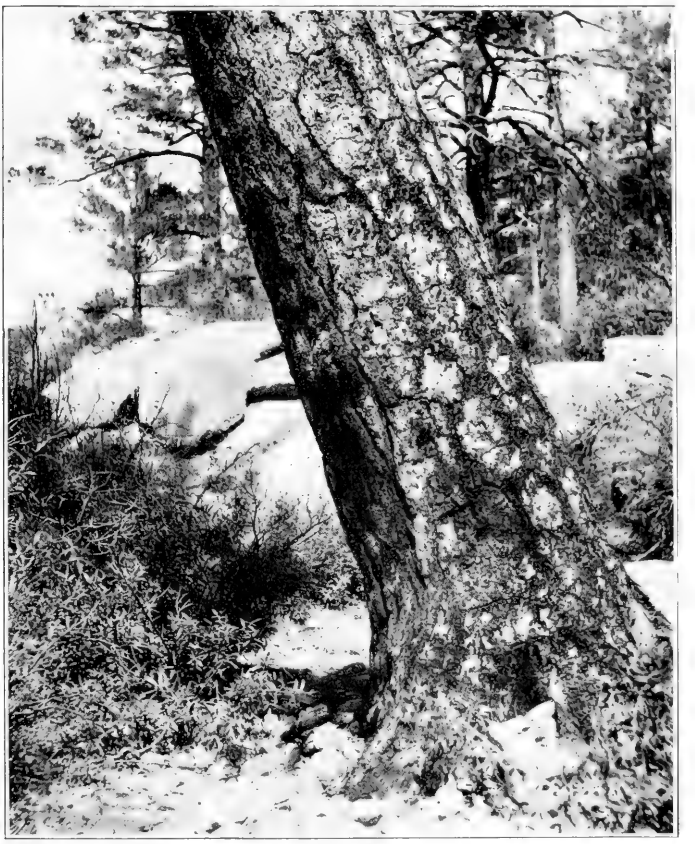
The experience of some states has indicated the best method of securing an efficient and non-political management of forest reserves. A forestry board should have control of the policy of the state and should decide matters dealing with state lands and the expenditure of money. This board should be composed of men occupying positions of responsibility in the state, in educational or technical lines; and, when feasible, the commission should be named specifically; as, for instance, President of State University, Director of State Geological Survey, Professor of Forestry in some well-known institution. Five members should make a large enough board.

The executive officer of the board should be a state forester appointed by the board. By this arrangement, the forester is responsible to the board, whose members, in turn, will be able to

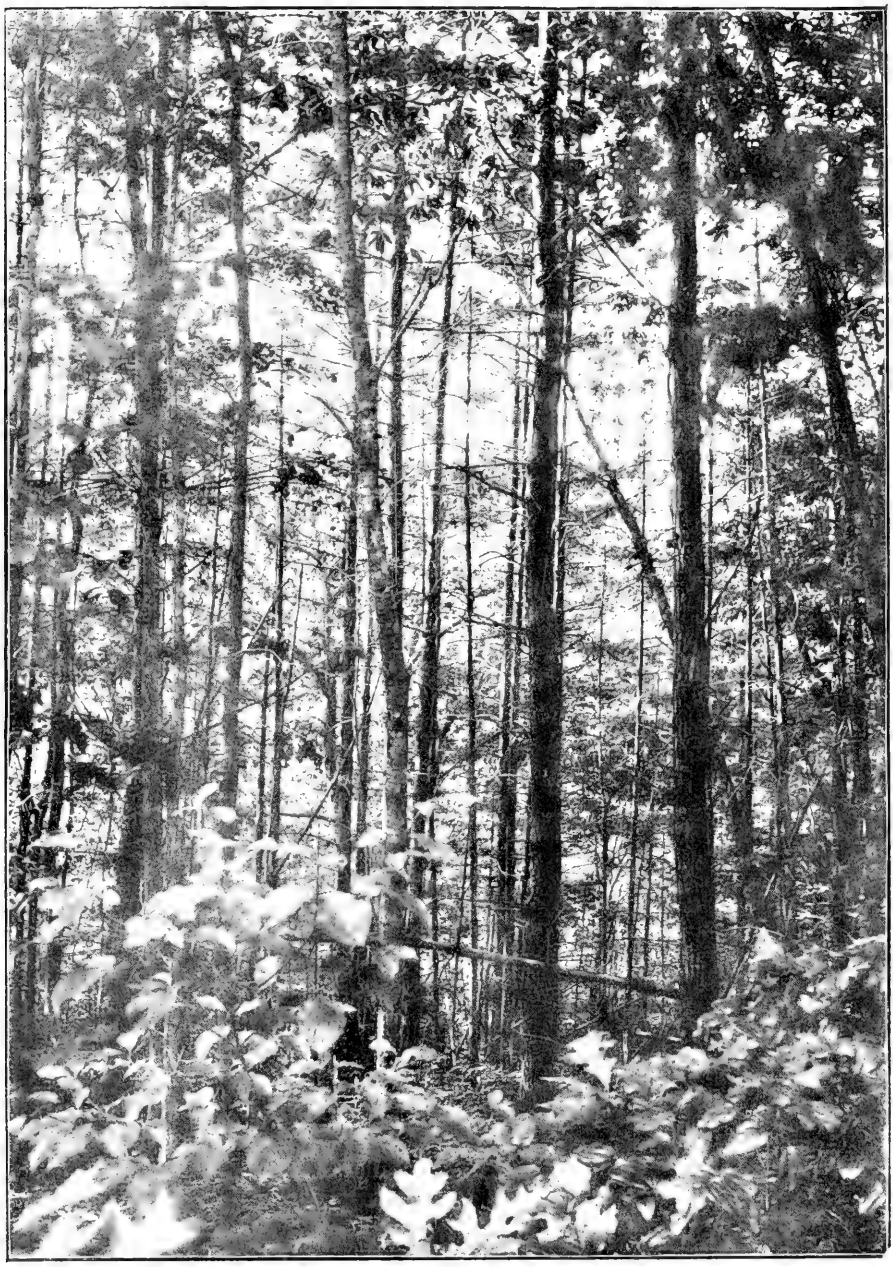
give the proper time to the work, since their other duties will be confined to meetings, held at stated intervals.

Unless forestry work in a state is organized along some such lines, the chances are that sooner or later the organization will prove inadequate, and the work stagnate and fall into disrepute, or even become the prey of politicians.

State forestry is in its infancy and the need is urgent. Mistakes are costly and often unnecessary. A clear cut policy, persevered in, will succeed, while radical differences of opinion may mean wasted effort. An understanding of the true goal of state forestry is needed to direct and unite such efforts. A constant interest on the part of the public in the forestry work of the state is the surest guarantee of ultimate success.



Specimen of Arizona Pine in Santa Catalina Mountains; Altitude, 6,000 Feet



White Pine Forest in the Region of the Proposed Southern Appalachian Forest Reserve, Showing Reproduction on Cut-over Lands, Graham County, North Carolina

THEODORE ROOSEVELT

Dynamic Geographer*

By FRANK BUFFINGTON VROOMAN, F. R. G. S.

INTRODUCTORY

NO INTELLIGENT geographer or economist will be satisfied with mere catalogues or classifications of facts, that so many trees have been planted, so many dams have been built, so many canals have been digged, or that so many cornfields have allowed so much bacon to be added to the world's common store of good. It is imperative that we connect a continental rearrangement with the fundamental principles underlying the progress made. In other words, the economic geography of the United States cannot be intelligently studied apart from the political geography of the United States.

In reviewing the Roosevelt administration, one is startled by the array of practical results achieved for the common good, and no less by the impetus and universality of the movement among the people toward the idea of a new democracy. There is a chance that American destiny may be fulfilled on rational instead of fortuitous lines. Mr. Roosevelt's work has been laid on geographical foundations, carried on in an ethical spirit, and conservatively within constitutional limits.

The future historian will date a new era in American history from him. American politics can never again be the arid waste it was before it was watered by Mr. Roosevelt's irrigation ditches. Facing problems no less than continental, he made a political issue of a national economy. Over and above the administration of the affairs of nearly ninety millions of people whom he essayed to give a "square deal," were the great geographical problems to be solved for generations unborn. Here was unavoidable confusion and waste. Here was possible unlimited power and use. Here was a great people bereft of certain utilities in raw materials and natural resources, some of which were going to natural waste, and some of which, with criminal recklessness, were being stripped and appropriated by the land-skinner. In the scientific divisions of the departments of government were thousands of experts and scientific men collecting information more or less valuable, but haphazard, concerning land and water and forest supplies, but nowhere appeared the universal mind to synthesize and utilize all for one constructive national purpose.

The first American President who was practical statesman, ethical philosopher, and scientific geographer, elected to office at the close of a period (which he closed) of arid mediocrity, when few public men were aware of an issue other than the tariff or graft—this man has blazed new trails for American destiny. This is a great work to have achieved—to have cut a hemisphere in two and joined two oceans into one; to have begun the habilitation of what Mr. Walter Page would call an "unkempt continent;" to have laid scientific foundations for quintupling the commercial and economic capacity of the million and a half square miles of the fertilest land on earth, lying in the basin of the Missis-

*Based on a lecture delivered to the School of Geography, Oxford University, March 8, 1909, and published by Henry Froude, Oxford University Press, London.

sippi and the Great Lakes; to have snatched an area the size of New York State from the sage brush and rattlesnake, and an area four times as large from the land-skinner, and presented them to the American people without the eventual cost of a brass farthing; to have widened the sphere of the State, changed the definition of the word "politics," laid democracy on ethical foundations, and made it possible to speak of politics and ethics in the same breath without an apology. This, I say, was a great work, and but a part of the actual achievement during three-quarters of the first decade of the new century, due to the intelligence and initiative and determination of one man.

Mr. Roosevelt was able to accomplish this work because he knew it was the kind of thing which would never get done of itself; because he applied the scientific knowledge and political resources of the Nation to the task; because he had intelligence enough to know that progress is rational and not fortuitous. Here was one political geographer who happened to have the political resources of a nation behind him, and what is more to the point, who happened to have the intelligence to synthesize those resources and organize them into a national program and purpose. In these acts he expressed a faith in the people more potent than that of any exponent of individualism from Jefferson to Bryan. Here is a pledge of faith in national self-government. Here is a scientific outline for constructive and ethical democracy on the basis that the whole people can govern, and does govern, itself. He has done more than any other American to bring the public to self-consciousness, and perhaps to self-sufficiency.

No man in the Western Hemisphere ever dealt so deadly a blow to a political fetish as when Mr. Roosevelt laid his big stick on the doctrine of *laissez-faire*.

It is a very interesting fact that almost every great policy Mr. Roosevelt has ever advocated has had both an ethical and a geographical-economic character. The combination gave it also a political character. I say geographical because these policies were intimately connected with the national resources of the earth, either in their production or transportation; and ethical because he constantly refused to consider them except with reference to the common good. It will be seen, when his account is made up, that Mr. Roosevelt is one of the few "applied geographers," to use a phrase Doctor Keltie has made his own, who has taken geography seriously, scientifically and politically, and has put the resources of a great nation behind it to further the interests of mankind.

He was the first President who dared to attempt the solution of the vital geographical problems presented by the territory occupied by the United States in their largest and completest bearings by the wisest and most conservative political methods. He saw that these problems would never solve themselves. The gospel of individualism carried no message of salvation. And if any voice came crying from the wilderness, it was that the problems of the wilderness must be solved by a national policy grounded on the certainties of scientific foundations, with no guesswork, no haphazard, no *laissez-faire,* but by a far-sighted and constructive statecraft.

There are long periods of American history in which successive presidential administrations have been fruitless, and in which the country has made no advances, except such as it was impossible for such a country to keep from making. Until now, the twentieth century, the man had not appeared capable of scientifically and intelligently investigating his data, and so able to state his problems, and then offering such wise solutions, as he has done, in so masterly a fashion, for those very problems which everybody else before him seemed to have overlooked.

It is, of course, hardly necessary to say here that I am keeping in mind other kinds and sets of problems which have been bravely met and wisely mastered in their day. But this does not keep me from saying also that the work

of President Roosevelt, which has made the vast continental domain a more fruitful habitat for a happier people, now and hereafter, has already become one of the most fascinating achievements of modern times.

Theodore Roosevelt is a new kind of geographer. There are static geographers and dynamic geographers. Mr. Roosevelt is a dynamic geographer. One studies and describes that geography which man helps to make; the other helps to make that geography which other men describe. They are necessary complements in the great scheme of geography, and they bear something like the relation to each other (if I may say it reverently) that the Bible bears to the encyclopedia. The dynamic geographer is the efficient geographer, the constructive geographer, the busy geographer; the man who gets geographical things done; the man who studies the land and water with an ethical purpose in the back of his mind, with reference to getting from them, for mankind, the highest possible amount of use. The dynamic geographer is the strenuous geographer, and this one has made himself a practical incarnation of the principle of making two blades of grass grow where one grew before, without letting any grow under his feet.

Just now he is to try a new geographical role. He is becoming an explorer in South Africa before he is to become your distinguished guest at this university, and, I hope, of this school of geography. It is also said that he is going lion-hunting. So far his special animosity has been the bear. He has hitherto shown no special grudge against the lion, especially of the British variety. But if he does not make some new and striking contributions to geographical dynamics in Africa before he returns this way, those who know him will miss their guess.

SITUATION

The first decade of the twentieth century, or, roughly speaking, the administration of President Roosevelt, found the economic situation in the United States a most extraordinary and interesting one. This situation discloses some of the problems which his administration has had to face boldly, and for which it had to offer solutions. Perhaps one of the first things that strikes the observer, if he gets far enough away to take a bird's-eye view, is the chaos both in the economic and political conditions of the entire country; the anarchy which prevailed among certain people and over certain areas; the mad and unintelligent scramble to get possession of the raw materials and natural resources of the Nation; the prodigious waste which attended the scramble for these resources, and their concentration and final centralization and congestion in a few pairs of hands; finally culminating in the stock gamblers' panic of last year, whose evil effects have been felt by every man in the civilized world.

This panic was brought on by the stock-gambling régime in the midst of a material prosperity unknown in the history of the world, in a year when the production of American farms was greater than the entire national wealth fifty-eight years before. It occurred at the close of a generation in which the material increase of wealth measured in tons of gold coin more than all Great Britain had laid up for 500 years; at a time when the United States owned one-fourth of the world's wealth and put out one-third of all the world's manufactured product.

A very interesting statement was made a few months before the advent of this panic by James J. Hill, the railway promoter. (I might as well say that there is a vast difference between the railway promoter and the railway smasher.) Mr. Hill made the statement (1906) after an era of railroad building, which in twenty years had built enough railroad in the United States to reach three times round the globe and leave a branch line from here to Vladivostock, that there was neither money enough nor rails enough in the world to build track enough to carry the traffic offered.

The first decade of this century, however, found 100 men controlling the

bulk of all this wealth, and nearly 90,000,000 people controlling the rest. It has been stated that one per cent of the population actually owns or controls ninety per cent of all this wealth, and the 100 men known, for want of a better name (or worse), as Wall Street, who control the larger part of these vast assets, constitute from one eight-thousandth to one nine-thousandth part of one per cent of the population of the United States. This is why they are able to produce a world panic, felt to the uttermost reaches of civilization, in the midst of an unparalleled and unexampled prosperity.

This first decade, also, among this coterie of dollar-getters, found one man (and we are by no means certain that he was the richest man in the country) whose annual income is greater than the combined wealth, in total capital, of every millionaire in the United States before the Civil War.

This is the economical paradox presented by the first decade of the twentieth century.

A few people began to ask some questions as to why there was no money in circulation during this unexampled prosperity; why in the midst of it it was possible for a stock gamblers' panic to be perpetrated; why nobody for months could borrow money on any security whatever to conduct legitimate business; and why men could not draw their own money out of the banks in larger sums than £10 at a time.

The New York financiers chose an inconvenient time for the panic. In forcing this panic the stock-gamblers made their first fatal blunder. They got the American people to wondering whether, after all, their prosperity were not a good deal like that of the fly described by Josh Billings, which had acquired a half-barrel of molasses. A few of the more disinterested and far-sighted saw in this stock-gamblers' régime an immediate and overshadowing menace to the very existence of the American Republic. This menace is financialism. It is not commercialism, not even the materialism which constitutes, unfortunately, the basis of the American idea of life. It is an insolent and irresponsible gambling and wrecking game, beside which the Louisiana lottery was a Sunday-school—a game run by creatures whose only distinction, and apparently whose only aim lies in the heaping up of what others need, and they cannot use—a game destitute of soul or spirit, unless it were the spirit of Demylus at the Greek banquet, who, wishing all the fish for himself, spat in the dish.

When, by a series of revelations in the business world, or, more accurately speaking, in the financial world, it became evident, through these revelations appearing in instalments, with appalling punctuality, that these vast and grewsome hoards had been heaped up by methods which could not compare favorably with those of the late Captain Kidd (inasmuch as he was willing to take some chances, and invested himself with certain shreds of romance) the American people began to sit up and rub their eyes. It began to be apparent to them that American institutions were being developed rapidly, and almost solely, for the benefit of the financial classes. Those without the financial instinct, however able in other walks or realms of life, suddenly found themselves in danger of slavery or extinction. One eight-thousandth of one per cent now ruled this blessed democracy. Life on the financial or acquisitive plane, under individualism, means that the strong win and the weak perish. This, being interpreted, means that the financial strong win and the financial weak perish, and the inevitable issue is a financial despotism. Free competition had broken its backbone carrying its own fat, and had crawled into the sarcophagus of billionaireism to die and rot. That which De Tocqueville had feared had come to pass in America—democracy had issued in despotism. The dream of the Jeffersonians and the eighteenth-century revolutionists had not been fulfilled. The *laissez-faire* millenium had not arrived. We found we had been developing the wrong kind of democracy—the democracy of individualism. For

individualism means unlimited and uncontrolled competition and the apotheosis of the selfish instinct. It makes no allowances for the principle of handicap. Uncontrolled competition means the fattening of the big upon the little. It is the law of the fish-pond, the dog-kennel and the wolf's den. Free competition in its larger sense issues in the supremacy of the strong and the cunning. The supremacy of the strong issues in the aggrandizement of the strong at the expense of the weak, until there is no more competition or possibility of competition. If a dozen wolves are put in a fold with a hundred sheep, on the principle of free competition, there is only one question involved, and that is *how long* before the wolves are to acquire all the mutton.

Mr. Roosevelt decided that the time had come to put a stop to the stock-gamblers' régime. He knew that if he did not do it, the American people would do it in another way. If it were to be done conservatively, it must be done at once. It was for this reason that he stepped out into the arena to do battle, with the spirit of the old gladiators upon him. Indeed, he is not at his worst in this role, this man of peace! He demanded a "square deal" for the people. He demanded the organization, conservation and use of the national resources. He demanded constitutional solidarity in place of the whimsical rule of state rights and *laissez-faire*. He demanded a sovereign for the areas of anarchy between the states, a scourge for the cave-dwellers of lawless wealth and impecunious envy alike, prison bars for the unlawful exploiters of unrequited toil and unprotected property, Nemesis for the insolent throttlers of competition, gyves for the pirates on the high seas of finance.

Mr. Roosevelt holds that political responsibilities are immanent; that political relations, as they are objectively expressed in a rational state, are the fulfillment of certain capacities in man, without which he would not be man at all, and that such capacities are ethical. To him politics reveal a body of duties as well as rights, which themselves imply a common life and a common good.

Every measure he has ever proposed, and lost or won, has had its distinctive ethical value. Every law he has enforced and every act he has carried through Congress, every measure which through his initiative and support has been written on the statute books of state and Nation, without a single exception, has been in restriction of the field of anarchy in the interest of law and order and equity, and toward the enlargement of the ethical sphere of the State—toward the centralization and rationalization and moralization of its power.

ETHICAL SPIRIT

Mr. Roosevelt's contribution is not only that he has given the Nation a new rational and scientific idea, but he has awakened a new ethical spirit. The Hon. William Rodenburg said in Congress, last April: "If Theodore Roosevelt had accomplished nothing more than the awakening of the public conscience to a realization of the dangers of corporate encroachment, he would still lead all the men of his day and generation in the great work of practical and permanent reform." The American people are no worse than others, and I will not say that they are very much superior, but for some reason or other, until recently, the word "politics" in America always carried with it a reproach. For three-quarters of a century, since the Jacksonian Democracy crystallized into practise, the slogan was, "To the victor belong the spoils." The very mention of American politics had been but a signal, from sheer force of habit, for one hand to fly to one's pocket and the other to one's olfactories, in instinctive self-defense. In the proper sense, we may hardly be said to have had a politics at all. We had a kind of political scrap-book; we had policies; we had a political economy (imported and antiquated); but we have had no political philosophy. Consequently we have had no political ethics. We have developed in many respects political morals, but for a long time we hid these under a bushel,

and could have gotten them under a peck. But no one has yet formulated the theory of our institutions, nor had they, before the beginning of this century, worked out a theory or practise of political ethics. But a revolution has been accomplished by the incomparable work of the United States Civil Service Commission, of which Theodore Roosevelt was one of the earliest and most effective commissioners.

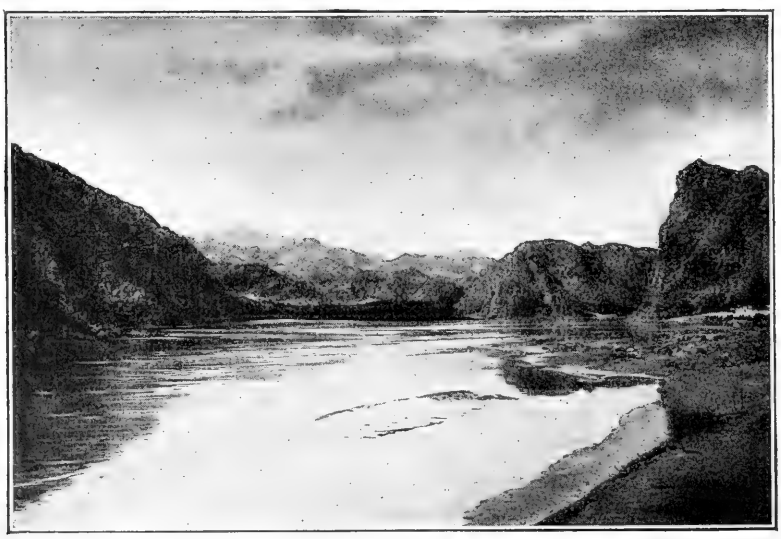
This is what Mr. Roosevelt has laid foundations for doing. His ethical contributions are much more far-reaching and important than his restrictions on unlawful financial power. He has worked out a new constructive ethical idea on scientific foundations. He has realized that idea, not only in stemming the tide of individualism rampant, but he has shown the path which will avoid the evils of socialism. He has been the first man in position of peculiar power or influence since Hamilton to see clearly and draw distinctly the natural line of cleavage which separates the two great principles in natural antagonism in America. He has precipitated the political issue of the twentieth century, not merely in the United States, *but the world issue of the twentieth century,* that between the democracy of individualism, which threatens the very existence of democracy upon the earth, and the democracy of nationalism, which offers the only rational and ethical alternative for socialism or individualism.

"The chief aim of De Tocqueville," says Professor Flint, "was to demonstrate that democracy was in imminent peril of issuing in despotism." Farther on, he says: "There is nowhere visible on earth to-day any power capable of resisting or crushing democracy. If there be none such, it does not follow that it will not be arrested in its progress, but it follows that it will only be arrested by itself."

The distinguishing characteristic of Mr. Roosevelt's statesmanship is that, if he has marked the outlines for the future of the only kind of democracy in which politics and ethics can ever coincide, he has saved democracy from itself.

Therefore, I say distinctly, knowing that the judgment of history will back me up, and that the magazines and publishing houses owned in Wall Street will not, that Theodore Roosevelt is one of the few universal political geniuses of the world, and that a new era in world politics and a new day for rational, ethical and constructive democracy dawned upon the world the day Theodore Roosevelt was sworn in as President of the United States.

(To be continued)



Ball's Head Reservoir, Colorado River, California and Arizona

The Equalizing Influence of Forests on the Flow of Streams and Their Value as a Means of Improving Navigation*

By GEORGE F. SWAIN, LL.D., Professor of Civil Engineering
in the Massachusetts Institute of Technology

IT IS the opinion of probably the great majority of engineers conversant with the subject, that forests act as equalizers of the flow of streams by diminishing, in general, the frequency and violence of freshets, and increasing the low-water flow, and by preventing the erosion of the soil and the consequent silting up of watercourses.

Based on these premises, it is believed to be of much importance to the interests of navigation, as well as to other interests, that the United States Government should establish forest reserves in the Southern Appalachian and White Mountains, the object of such reserves being:

First, to aid in the protection of certain given watersheds.

Second, to enable the Government to give an object-lesson to private owners in the vicinity as to what may be accomplished by proper forest management, and to cooperate directly with such private owners in encouraging them to use the best methods.

Third, to aid in preventing forest fires and the consequent deterioration of the soil and destruction of timber on both Government and private lands.

Fourth, to aid in and encourage reforesting, and, by this means, and by proper management, to augment and prolong the timber supply.

In September, 1908, a paper, the title of which has been quoted below, was published in the Proceedings of the American Society of Civil Engineers, by Col. H. M. Chittenden, of the Corps of Engineers, U. S. A., in which arguments were advanced which in a measure seem to controvert the generally accepted opinions. The present paper is a brief rejoinder to that article, prepared with special reference to its bearing upon the Appalachian and White Mountain forest-reserve bill.

The paper of Colonel Chittenden is exceedingly well written and upon first reading might seem to contain strong arguments against the regulative action of forests. Upon analyzing its statements, however, it will be perceived that Colonel Chittenden practically acknowledges most of the claims made for forests, that the paper contains many contradictory assertions and illogical deductions, and that his arguments are largely conjectural and unaccompanied by proof.

The paper states that the commonly accepted opinion is that forests have a beneficial influence on stream flow:

"(1) By storing the waters from rain and melting snow in the bed of humus that develops under forest cover, * * * preventing their rapid rush to the streams and paying them out gradually

*Being mainly a rejoinder to the paper of Col. H. M. Chittenden, U. S. A., entitled "Forests and Reservoirs in Their Relation to Stream Flow, With Particular Reference to Navigable Rivers," presented before the American Society of Civil Engineers.

Prepared at the request of His Excellency Curtis Guild, Jr., Governor of the State of Massachusetts.

afterward, thus acting as true reservoirs in equalizing the run-off.

"(2) By retarding the snow-melting in the spring and prolonging the run-off from that source.

"(3) By increasing precipitation.

"(4) By preventing erosion of the soil on steep slopes and thereby protecting water-courses, canals, reservoirs and similar works from accumulations of silt."

This will probably be admitted to be a fair statement of what the believers in the benefits of forests consider to be true, except that some do not consider that there is yet sufficient demonstration that they increase the rainfall, and also except that the water is not stored simply in the bed of humus, but also in the ground beneath.

With reference to the first of these points, the author states that it is "strictly true of average conditions." He says: "It is true, therefore, as popularly understood, that, in periods of ordinary rainfall, with sufficient intervals for the forest bed to dry out somewhat, forests do exert a regulative effect upon run-off. They modify freshets and torrents and prolong the run-off after storms have passed, and therefore realize in more or less perfection the commonly accepted theory." He believes, however, that this beneficial effect is not exerted under extreme conditions, *i. e.*, great floods and excessive low waters, and he states that these extreme conditions "determine the character and cost of river control."

Even if it be admitted that the presence of forests does not affect "extreme conditions," this is no argument against the value of forests, for it is certainly not true that only extreme conditions affect the navigability of streams or "determine the character and cost of river control." Extreme conditions determine certain elements, such, for instance, as the height of levees. Colonel Chittenden certainly cannot mean to state that ordinary, every-day floods do not carve away banks and cause shoaling of channels, rendering dredging necessary for navigation. A few high but not extreme floods may do much more damage than one extreme flood, and may necessitate more expenditure for dredging and other purposes. Extreme conditions are in the nature of freaks. They occur only at intervals of many years. It would seem to be more nearly correct to state that the interests of navigation are governed more by the usual conditions, and that it is possible for extreme conditions at rare intervals to interrupt traffic for a short time without causing much loss. It may as well be argued that it is not wise to attempt improvements on railroads because an earthquake or a tornado or an extreme flood in a river may destroy a portion of the track and interrupt traffic for a while. It matters little in the navigability of a stream if at intervals of twenty, thirty, or fifty years an extreme drought occurs for a few days or weeks, making the depth of the channel insufficient for the largest vessels.

If it be true, therefore, that extreme conditions do not govern the question, Colonel Chittenden has admitted all that the advocates of forests desire. Let us consider, however, the arguments with reference to such extreme conditions:

The argument with reference to extreme floods appears to be that floods are always the result of combinations from various tributaries, the highest flood from one stream coming at the same time as the highest flood from other streams, occurring after periods of long-continued and widespread precipitation. In such cases the forest bed becomes completely saturated, the storage capacity exhausted, and when this point is reached "the forest has no more power to restrain floods than the open country itself."

It is, of course, evident that the rainfall may be so great and long continued that the forest bed becomes saturated and that the water flows over the surface, but it does not seem correct to say that in this case the forest has no more power to restrain floods than the open country tiself. The discharge will be hindered in the forest by the physical conditions, and because the soil will not

be washed away and the water will not be gathered into torrents flowing down through eroded channels. Moreover, it seems a strange argument to maintain that because the retentive power of the forest is not unlimited it is not therefore useful. Even if it be admitted, however, that under a torrential rainfall the water flows away from the forest without hindrance, it is under just such a condition that the forest is most valuable *in preventing erosion*, for the water is distributed over the forest floor and does not carry with it the earth beneath. With reference to this point, however, Colonel Chittenden maintains that there is no more erosion from cut-over lands than from forested lands. There are certain reasons for believing that he is not correct. In the first place, the forest cover is always more or less disturbed or injured by the cutting, and after cutting is done it is more exposed to the sun and becomes dryer in summer and more liable to take fire. It is believed to be a fact that fire very frequently follows the lumberman and originates on cut-over land. This still further destroys the forest cover, and heavy rain falling on deforested ground is not broken in its fall by the leaves and branches of the trees. In many places, of course, a new growth springs up after the forest is cut, if it is not prevented by fire, and this new growth will in the course of time become a new forest, and the old conditions will be restored, but in the meantime there is a deterioration of the soil covering, and a greater liability to erosion, as well as a smaller power of retention, and consequently more rapid discharge of the rain waters. In some parts of the White Mountains, tracts once cut clean and burned over do not grow up again.

Colonel Chittenden suggests that under extreme flood conditions such as have been referred to, the presence of a forest may actually produce a worse condition than if the country were cleared, and asserts positively, but without proof, "that the forest does promote tributary combinations * * * and that it may therefore aggravate flood conditions." He continues "that forests never diminish great floods, and they probably do increase them somewhat." As this statement is not proved, it can only be regarded as Colonel Chittenden's personal opinion. There is certainly no more reason for believing that forests promote the combination of floods from different tributaries than that they have the opposite effect. It may be admitted, however, that it is possible to conceive of circumstances in which, under extreme conditions, the presence of a particular forest may increase a particular flood at a particular point. It is equally possible to imagine many more conditions under which the reverse would be true, and it is clear that if the forest has a restraining influence on the discharge of water from the surface, increasing the amount of percolation into the ground, to reach the surface later at lower levels by springs and seepage, it must in the vast majority of cases reduce the frequency and violence of floods.

It is true, as stated by Colonel Chittenden, that the records of high water in most streams do not show that the waters now rise under extreme conditions higher than extreme floods which have occurred in the past. The highest recorded flood on the Connecticut River occurred in 1854, long before the present rapid rate of cutting on its upper headwaters had begun. Similar facts are no doubt true of other streams. Exceptional conditions are always likely to occur, but, as mentioned above, it is not exceptional conditions which should govern in this question. To represent them as doing so is like arguing against the benefit of food for the reason that a man's food may choke him, or against the benefits of the sun's heat, for the reason that people occasionally get sunstruck.

Colonel Chittenden illustrates the action of a forest by considering an inclined plane surface "practically impervious to water" with a layer of sand covering some small portion of it, and to which a spray of water is applied. This comparison, however, is not a correct one, for the forest cover does

not rest upon an impervious surface. The forest and its cover prevent the earth beneath from being baked by the sun and compacted by the rain. It is kept in a porous condition ready to absorb water which filters down to it through the forest cover. Any conclusion, therefore, drawn from Colonel Chittenden's simile must be inaccurate.

The author's summary of this part of the discussion is perhaps contained in the following sentence: "That the forest does promote tributary combinations, there would seem to be no question, and that it may therefore aggravate flood conditions necessarily follows. It is not contended that this increase is ever very great, but it is contended *that forests never diminish great floods and that they probably do increase them somewhat.*"

It would seem to be much nearer the truth to say that forests generally diminish floods, although it is conceivable that a forest may slightly increase a given flood at some points.

The author further states that "the forests are virtually automatic reservoirs, not subject to intelligent control, and act just as the system of reservoirs once proposed by the French government for the control of the floods of the River Rhone would have acted if built. These reservoirs were to have open outlets, not capable of being closed, which were intended to restrain only a portion of the flow. A careful study of their operation in certain recorded floods showed that they would actually have produced conditions more dangerous than would have occurred without them."

The last sentence of this quotations is rather conjectural and its meaning is not quite clear, but it will be surprising to most people to be told that a reservoir not subject to intelligent control does not regulate, and they will hardly accept the statement. Of course, a lake is a more efficient regulator than a forest, because, if its level is rising, the discharge from its lower end is always less than the flow into its upper end, while in case of the forest, when its storage is exceeded, its level cannot rise, and it can simply hinder the discharge of later rain-water by physically obstructing its flow.

The general aspect of this part of the subject seems, after all, quite simple. The forest floor absorbs a large amount of water, prevents it from flowing off rapidly, and allows it to gradually percolate into the porous ground beneath. If the land were clear of vegetation, or if it were cultivated, and especially if the slopes were steep, the erosion would be greater, and might sooner or later leave no soil upon the rocks to serve as a reservoir in future storms. The author's argument, therefore, leaves unassailed the beneficial effects of forests in regulating flow.

The fact must be emphasized that those who believe in the beneficial effect of forests upon flow do not urge the preservation of the forests on lands needed for agriculture. The beneficial effects of the forests on flat lands in modifying the violence of freshets and increasing the low-water flow is much less clear than in the case of forests in steep mountain regions. It is the preservation of these last—forests upon land not suited to agriculture—that is believed to be especially important from every point of view.

The statement of Colonel Chittenden that the flood of 1908 in the Western States would have been much greater if the region had been forested, is a mere statement of his own opinion, entirely without proof, and undoubtedly incapable of proof; and, further, if the gauge records given by him show that it is impossible to find evidence in them to support the current theory of forest influence, it may also be stated that there is nothing in them to support his own contention.

The question will, of course, have occurred to the reader of these remarks: Why it is not possible by long-continued observations of the height of floods on our rivers to settle this question absolutely? With reference to this some explanation is necessary. The flow of a stream is the resultant of a number of elements, chief among which are rainfall, its distribution throughout

the year and over the area considered, the slope of the ground, the area of forest, cultivated land, etc.; the number of lakes and reservoirs, the temperature, and other elements. The chief of all of these is undoubtedly the rainfall and its distribution. A great fall of rain, long continued, will probably cause a great flood whether there are forests or not, although, as before explained, there is abundant evidence for the contention that the action of the forest is to diminish the flood. Meteorological phenomena are admittedly variable and uncertain, and, of course, they are entirely incapable of control. The rainfall varies from year to year in long cycles, the extent of the variation being such that in the United States it has generally proved impossible to determine with certainty whether the rainfall over a given territory which has remained in essentially the same physical condition is increasing or not. The rainfall at a given place may vary from thirty inches in one year to fifty or sixty inches in the following year, and its distribution is subject to similar variations. These variable elements, therefore, may mask the influence of forests or of reservoirs, but the important point is that these two *are the only elements subject to man's control.* It is admittedly physically possible, by reforesting and by the construction of storage reservoirs, to make the flow of a given stream practically uniform throughout the year, although to do so would in most cases involve a prohibitive cost; and, moreover, it would be physically impossible to regulate a reservoir and allow the water to flow out of it in such a way as to produce this effect, because the future cannot be foreseen. Observations of gauge readings on rivers, therefore, are inconclusive in themselves. Fortunately, however, we are not without valuable evidence on this point. Mr. M. O. Leighton, Chief Hydrographer of the United States Geological Survey, has, during the past summer, made an elaborate study of the floods of the Tennessee River, in which he has endeavored to eliminate the effect of the rainfall and its distribution by comparing the number of days of flood with the number of individual rainstorms of sufficient magnitude to produce floods. The record shows that during the last half of the period studied the number of days of flood was actually less than in the earlier part of the period, notwithstanding the deforestation which has recently taken place. The rainfall, however, has also been less in the latter period, and the results of Mr. Leighton's study are that the diminution of the rainfall has been much more than sufficient to account for the diminution of the floods, so that the *actual result is that the floods have been increasing, the percentage of increase being* 18.75 *in the last seventeen years, as compared with the seventeen years previous.* This study is the best contribution to the subject which has come to the writer's knowledge, and it seems conclusive. The experience in France also furnishes valuable evidence in this matter. In 1857, M. F. Valles, a French government engineer, published a work in which, and in some subsequent papers, he gave almost the identical arguments advanced by Colonel Chittenden, maintaining that forests diminished the rainfall, increased the floods, and diminished the supply of grain by withdrawing lands from cultivation. He also maintained that floods were beneficial, by bringing silt from the mountain sides to the plains. His work, however, seems to have been entirely without influence, for immediately after its publication the French government entered upon a policy of forest protection and reforestation, particularly in the mountain regions, which has been continued up to the present time. Up to January 1, 1900, the state had acquired over 400,000 acres, or 629 square miles, for the purpose of controlling torrents. Of this area, 440 square miles are in the Alps, 145 square miles in the central plateau and the Cevennes, and forty-

four square miles in the Pyrenees. The expenditure has been as follows:

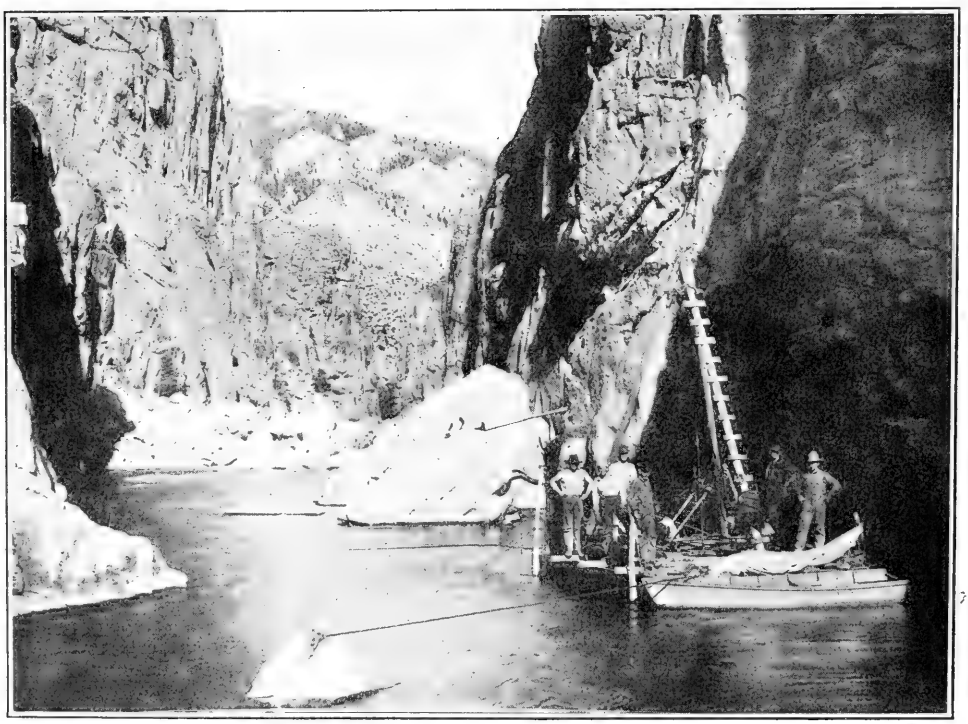
For acquisition of land....	$5,200,000
For work of reforesting....	4,000,000
For work of regulating....	2,600,000
Miscellaneous	1,600,000
Total.....	13,400,000

And there is still to be expended under the plan contemplated about $23,000,000 more.

Referring to this work, one of the most recent writers on the subject (G. Huffel, *Economic Forestiere*, 1904) states: "The role of the forest as a regulator of the flow of streams may be considered as evident, and it is today universally admitted." Under the able direction of Prosper Demontzey, chief of the service of reforestation in France from 1882 until retired in 1893, and of his predecessors, much has been accomplished, and some formerly very destructive torrents have been reduced to inoffensive streams, by reforestation and regulation, as above shown. Perhaps it will now be argued that the good results that have followed have been due entirely to the regulation, and not to the reforestation, but that is not the view of the French engineers.

At first, there was great oposition to the French governmental policy, on the part of the inhabitants of the mountain districts, and in 1864 there were riots in some places. This opposition, however, has entirely subsided, the inhabitants now cooperate heartily with the government, even petitioning to have it extend its work, and in some cases even giving portions of their lands on the mountain sides without compensation.

(To be concluded)



Diamond Drill on Barge in Shoshone River at Dam Site, Shoshone Project, Wyoming

A CHAPTER OF CONSERVATION HISTORY

By THOMAS ELMER WILL

THERE are subjects upon which it is necessary to "write with a quiet pen;" one of these is the brief history of the conservation movement in the United States. The facts in this history should be before the readers of CONSERVATION; in stating them the writer prefers to confine himself, where possible, to records and official utterances.

Among the resolutions adopted by the White House Conference is the following:

> We agree that further action is advisable to ascertain the present condition of our natural resources and to promote the conservation of the same; and to that end we recommend the appointment by each state of a commission on the conservation of natural resources, to cooperate with each other and with any similar commission of the Federal Government.—*Proceedings of the Conference of Governors*, page 194.

On June 8, 1908, the National Conservation Commission was created by President Roosevelt.

On December 8, 9, and 10, there met in Washington the Joint Conservation Conference composed of the governors of the various states, their advisers, members of the National Conservation Commission, representatives of state and national organization, and others.

Among the resolutions adopted by the Conference was the following:

> We also especially urge on the Congress of the United States the high desirability of maintaining a national commission on the conservation of the resources of the country, empowered to cooperate with state commissions to the end that every sovereign commonwealth and every section of the country may attain the high degree of prosperity and the sureness of perpetuity naturally arising in the abundant resources and the vigor, intelligence, and patriotism of our people.—CONSERVATION, February, 1909, page 97.

In his special message of January 22, 1909, to Congress, transmitting the report of the National Conservation Commission, President Roosevelt quotes the above resolution and says:

> In this recommendation I most heartily concur, and I urge that an appropriation of at least $50,000 be made to cover the expenses of the National Conservation Commission for necessary rent, assistance, and traveling expenses. This is a very small sum. I know of no other way in which the appropriation of so small a sum would result in so large a benefit to the whole Nation.

No action was taken by Congress toward placing the National Conservation Commission on a permanent basis, nor was a dollar of money appropriated for its work. Instead, however, there was attached to the Sundry Civil Bill, which became a law on March 4, 1909, the following amendment:

> Section 9—That hereafter no part of the public moneys, or any appropriation heretofore or hereafter made by Congress, shall be used for the payment of compensation or expense of any commission, council, board or other similar body, or any members thereof, or for expenses in connection with any work or the results of any work or action of any commission, council, board or other similar body, unless the creation of the same shall be or shall have been authorized by law; nor shall there be employed by detail, hereafter or heretofore made, or otherwise personal services from any Executive Department or other Government establishment in connection with any such commission, council, board or other similar body.

This amendment is known as the "Tawney amendment." Of it the Joint Committee on Conservation says:

> This amendment prohibts the National Conservation Commission from going on

with this work under the Government, although the commission itself continues in existence.—*Bulletin No. 4, National Conservation Commission,* page 1.

In discussing the work of President Roosevelt in promoting the conservation movement, Charles Richard Van Hise, President of the University of Wisconsin and member of the National Conservation Commission, says:

In amazing contrast with these great, statesmanlike acts of the President is the position of Congress. The House embodied a section in the Sundry Civil Bill, which prohibits the scientific corps of any of the departments at Washington from doing work for any commission, council or other similar body appointed by the President. Since, notwithstanding the strong favorable recommendation of President Roosevelt, Congress made no appropriation for the Conservation Commission, this clause of the Sundry Civil Bill, coupled with the refusal to furnish funds for the Commission, makes without avail, so far as lay in the power of Congress, the conservation movement. * * *

Under the system in vogue in Congress, by which it is difficult to fix responsibility, with the exception of one man, we cannot certainly designate the individuals who are most guilty of halting the conservation movement. This exception is Mr. Tawney, of Minnesota, who introduced the objectionable section, and advocated its adoption. We should hold him responsible to the people for doing all possible to render ineffective the conservation movement. All good citizens who know the facts should spread the truth abroad as widely as possible in order that he may receive the profound public condemnation which is his just due.—*World's Work,* June, 1909, pages 11718-9.

This is the economic paradox pre-

sion prepared its report, a three-volume work, certainly one of the first in importance of all documents ever published by the Government of the United States. Naturally, the demand for this report was great. Of the work of the House of Representatives in meeting this demand, President Van Hise says:

In this connection, there should also be mentioned the Committee on Printing of the House, consisting of Mr. Charles B. Landis of Indiana, chairman; Mr. James Breck Perkins of New York, and Mr. David E. Finley of South Carolina. This committee refused to report favorably to the House a resolution passed by the Senate providing for printing 25,000 copies of the report of the Conservation Commission, the President's message concerning the same, the summaries of the secretaries of the four sections, and the proceedings of the joint conservation conference held in December, and thus prevented the people from gaining information which the Conservation Commission had already obtained. These men should be held responsible to the public for doing all that lay in their power to block the conservation movement, of such vital importance to the Nation.—*World's Work,* June, 1909, page 11719.

The Joint Committee on Conservation in the bulletin above quoted says:

The publication of the report for general distribution has not been authorized by Congress. A limited edition is to be printed as a Senate document.—*Bulletin No. 4,* page 2.

The report has at last appeared as a Senate document. The number of copies for distribution to the 90,000,000 people of the United States is 2,400!

The facts in the above history seem to be clear and conspicuous. The President created the Commission, Congress having failed to do so. Congress furthermore failed to appropriate any sum whatever for the maintenance of the work of the Commision. The House did nothing toward making available the results of the labors of the Commission, embodied in its notable report. The Senate published the report, but in an edition so small as to be hopelessly inadequate for public needs. Further, by means of the "Tawney resolution," Congress did what it could to make the prosecution of the conservation movement impossible in the United States. Of this action, taken at the very end of his term, President Roosevelt said:

The chief object of this provision, however, is to prevent the Executive repeating what it has done within the last year in connection with the Conservation Commission and the Country Life Commission. It is for the people of this country to decide whether or not they believe in the work done by the Conservation Commission and by the Country Life Commission. If the people of this country do not believe in the conservation of our natural resources; if they do not believe in developing our waterways and protecting our forests; if they do not believe in the betterment of life on the farm, and in upholding the interests of the farmers; if they are willing to go on in the old course of squandering the effects of our children's children; then they will uphold the action of those in Congress who are responsible for this provision. If they believe in improving our waterways, in pre-

venting the waste of soil, in preserving the forests, in thrifty use of the mineral resources of the country for the Nation as a whole rather than merely for private monopolies; in working for the betterment of the condition of the men and women who live on the farms, then they will unstintedly condemn the action of every man who is in any way responsible for inserting this provision, and will support those members of the legislative branch who opposed its adoption. * * *

The Republican platform last year said:

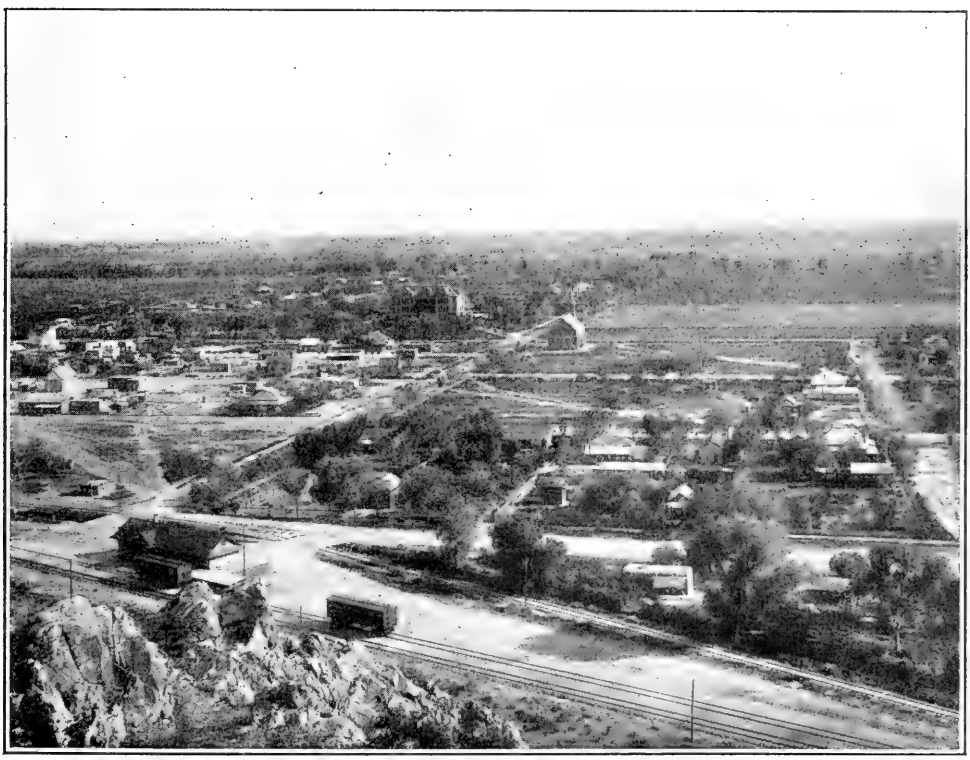
"We endorse the movement inaugurated by the administration for the conservation of natural resources * * * the obligation of the future is more insistent and none will result in greater blessings to posterity." The Democratic platform said: "We repeat the demand for internal development and for the conservation of our natural resources, the enforcement of which Mr. Roosevelt has * * * sought."

My successor, the President-elect, in a letter to the Senate Committee on Appropriations, asked for the continuance and support of the Conservation Commission. This Conservation Commission was appointed at the request of the governors of over forty states, and almost all of these states have since appointed commissions to cooperate with the National Commission. Nearly all the great national organizations concerned with natural resources have been heartily cooperating with the Commission.

With all these facts before it, the Congress has refused to pass a law to continue and provide for the Commission; and it now passes a law with the purpose of preventing the Executive from continuing the Commission at all. * * *

But I call the attention of those who are responsible for putting in this provision to a fundamental fact which is often ignored in discussing and comparing the action of the Executive and the action of the legislative branches of the Government: Neither one is responsible to the other. Each must act as its wisdom dictates. But each is responsible to the people as a whole. It is for the people to decide whether they are represented aright by any given servant; and one element in enabling them to reach a decision must be that public servant's record in such a case as this.

The reader may supply his own comments.



Tempe, Ariz., Showing How Irrigation Transforms the Desert

EDITORIAL

The Mill Tax for Forestry

THE legislature of Minnesota at its last session passed a bill submitting to the people an amendment to the constitution providing that one-fifteenth of a mill upon the assessed valuation of property in the state should be applied to the support of forestry. It is greatly to be hoped that such legislation will become common. The "mill tax" has become widely used for the support of educational institutions, and has much to commend it. It is a fixed source of income practically independent of legislative caprice, and constantly increasing with the increased valuation of the state and the increased needs of growing educational institutions. Similar legislation would provide a practically permanent support for a state forestry policy.

Legislative Support for Student Labor

THE legislature of Minnesota also voted $5,000 per year for student labor on the forest reserves. This appropriation is peculiarly grateful to those responsible for the Forest School, inasmuch as material difficulty has been encountered in finding opportunity for students to obtain practical knowledge of forestry work. The provision of wages for student workers by the state has much to commend it. Many capable students have not the means with which to pay their way through college. They are willing to earn their way if opportunity can be afforded. In an agricultural college, upon an experiment station, or in the forest connected with a forest school, there should be large opportunity for student labor, educative in itself and providing at the same time maintenance for needy and industrious students. Among the first state legislatures to provide for student labor was that of Kansas, which, in 1899, voted $10,000 for 1900, and $10,000 for 1901, applicable, in part, to student wages. Other legislatures might well follow the example of those of Kansas and Minnesota.

The Washington Forest Fire Association

THAT portion of Washington State lying west of the Cascade Mountains leads the world as a lumber manufacturing area. Nowhere else can be found such forests in close proximity to accessible ocean harbors and transcontinental railways.

Yet the fire peril follows hards upon the trail of the lumber industry. Especially is this true of lumbering in the area in question. During the summer months there is practically no rain, and the forests frequently become like a vast tinder-box. More timber has been destroyed in Washington by fire than has been manufactured into lumber. In 1902 a single fire destroyed more timber in twenty-four hours in Clarke and Cowlitz counties than was that year manufactured into lumber in that state. "On September 10, 1902, there was destroyed a forest which, if spared, would have ultimately yielded good profits to the owners and $25,000,000 besides to labor and for supplies in western Washington."

Last year was notably the fire year for the United States, yet western Washington suffered far less than usual from fires.

The explanation is to be found in the existence of the Washington Forest Fire Association, composed of corporations, firms and individuals owning timberlands.

This association began by dividing up the state into seven districts, and effecting a working organization. Patrolmen were appointed, and each was made

forest-ranger-at-large and furnished with a badge of authority empowering him to arrest without warrant parties violating the fire laws, and to stop all dangerous burnings of slashings. Each patrolman was furnished with a working equipment, was required to report weekly to his chief, and was sent from time to time letters of instruction from his chief. The patrolmen first posted some 9,000 notices. Under the supervision of patrolmen, many slashings and logging works were burned without damage to green timber. Spark arresters were placed on many locomotives and donkey engines. Close cooperation was maintained between the association and the state fire wardens proper and representatives of the Forest Service.

Eleven hundred two fires occurred in the season (July and August), but only 102 of these were large, requiring extra help and expense. The total number of acres burned over was 18,773, consisting chiefly of slashings and old logging works. Seven hundred forty acres of green timber were burned over, about one-half of which was damaged. Between 600 and 650 extra men were employed in fighting the fires.

The association's work was done at its own expense. To increase its efficiency, it desires a liberal state appropriation for forest fire protection. "The state owns outright timberlands easily worth $20,000,000;" its annual appropriations heretofore, however, have barely sufficed to pay the salaries and expenses of maintaining a fire-warden in each county. If it would lock its stable door before all its horses are stolen, it should so increase its own fire-preventing and fire-fighting facilities, in connection with those provided by individuals, as to reduce the fire danger on its forests to a level with that existing in well-managed cities.

The Destruction of Fish

IN A news note in this issue will be found an editorial from the *Washington Post* on "Vanishing Food Fish." The point to note is the rapidity with which our fish supply is being destroyed. This work is being done in part by dynamiting, in part by the pollution of streams with city refuse, in part by the pouring out of fish upon irrigated fields to perish, and even more largely by the destruction of the forests which protect the streams in which the fish might otherwise flourish. And here, again, as in countless other cases, the need must be met by public activity, state or national. Every day's experience emphasizes the necessity for governmental administrative activity. As Herbert Spencer and other philosophic anarchists have foreseen, government as an agent of repression may, with the progress of civilization, enlightenment, and self-control, progressively wane, but government as an administrative agent working in the interest of the whole people must indefinitely wax if the needs of the nation and the race are to be met.

Conservation of Soil Resources

THE United States Department of Agriculture has prepared a farmers' bulletin (No. 342), discussing, among other things, the conservation of soil resources, which it characterizes as "one of the elemental problems of modern scientific agriculture." The bulletin notes that agricultural operations in the United States have taken little heed of "the soil inheritance of future generations." Forests have been destroyed, flood waters from torrential rains and melting snows have swept away the soil, leaving bare rocks behind or soil robbed of plant food. Poor cultivation has rivaled deforestation as a soil destroyer. Not only has the soil suffered from erosion by rain, but from drifting by winds, "so that at the present time the problem of conserving what is left of the natural resources of the soil is of great economic significance."

The agricultural experiment stations have given attention to soil building, and also to scientific conservation of the natural resources of the soil.

The bulletin considers methods of preventing soil washing, such as em-

banking, tile drainage, deep culture, subsoiling, sodding, and planting to crops. The reclamation of washed soils is considered. Terracing is highly commended for hillside farming.

Methods are also discussed for the prevention of the drifting of soil under the influence of winds. Among the methods advised are frequent rotation in long, narrow lands, increasing the water-holding power of the soil, leaving the ground uneven after seeding, the preservation of wooded belts in north and south strips, and the planting of windbreaks. Says the bulletin:

> Considered in its general aspects, the work which the agricultural experiment stations have done along the lines of preventing the washing and drifting of soils is of great economic significance. Means for preventing the further waste of the natural resources of the soil have been discovered. If these principles are put into practise, large tracts of land now useless can be brought under cultivation, and if these lands are worked in accordance with methods of restoring and maintaining soil fertility, which the stations and this department have discovered and published, the extent of the wealth-producing power thus conserved to the farmers of the United States will be enormous.

Dry-land Farming

TWO practicable methods for reclaiming semi-arid lands have been found; the first is irrigation, the second is dry-land farming.

Dry farming has been defined as "farm operations under limited rainfall in districts where irrigation water cannot be obtained or where the supply of irrigation water is inadequate to meet the requirements of the acreage."

Under irrigation the water is stored in reservoirs and turned upon the land when needed; under dry farming the water is stored in the soil itself.

Dry farming demands the establishment of a natural reservoir in the soil by the conservation of the limited rainfall or other form of moisture through methods by which waste and evaporation are prevented.

A dry farmer is a man who, in a region of rainfall under twenty-five inches annually, cultivates the land that has, in the past, been deemed worthless, and conserves the moisture so that it is sufficient for his crop.

The dry farmer recognizes that land commonly regarded worthless for agriculture, frequently receives sufficient rainfall per year to meet the needs of farm life, much of which rainwater, however, is permitted to disappear through evaporation. The dry farmer devises plans, some of which were explained in CONSERVATION for March (page 173), whereby this evaporation may be reduced to the minimum. In addition, drought-resisting plants are sought the dry world over, and introduced.

The success of dry farming means the bringing into use of millions of acres of now almost worthless land in the semi-arid West, not to mention similar lands in other places. In fact, the Dry Farming Congress announces that there are 200,000,000 acres of arable lands awaiting development by the dry-farming method.

Though dry farming is in its infancy, the results already reported are most encouraging. Land once sold for taxes is even now producing every variety of cereal, vegetable and fruit. From a drug on the market, at 50 cents an acre, to active market value, at $25 an acre, is by no means an unusual advance. Among these results, may be mentioned the following:

One farmer exhibited at the Dry Farming Congress a sample of rye raised without irrigation. It stands three feet six inches high and is fully headed out, although plucked before it had matured. The same farmer has forty acres of dry-farm wheat which, he says, promises to yield a banner harvest. Another farmer claims to have raised a wheat crop last year, all on dry land, yielding him $35,000. He now has 3,836 acres, and a comfortable fortune drawing interest. Another farmer raised fifty-one melons on one square rod of dry land. Still another dry-land farmer quoted has 1,320 acres, representing the investment of part of his profits from dry-farm wheat and oats. In addition he is reported to have nearly $100,000 in cash and other possessions.

Three dry-farming congresses have already been held, and the fourth will be held at Billings, Mont., October 26-28 next. Much interest is manifested in the meeting. The Chicago and Northwestern Railroad will gather samples of farm products in western Nebraska and Wyoming, and, with several dry-farming experts, will run a special train, advertised in advance to make a trip, and give instruction at points along the line. Chambers of commerce are actively encouraging preparations for the congress, and interest is being developed by means of street meetings. Hundreds of Montana settlers, as well as established farmers, are joining the congress in order to avail themselves of the practical instruction in dry-land agricultural methods. The congress has a membership of more than 4,000, and expects its membership to exceed 10,000 before the Billings meeting.

Mr. L. Baeta-Neves, an eminent civil and mining engineer, and chief engineer of the technical department of public works and industries in Brazil, has been appointed foreign vice-president and corresponding secretary of the congress. His letter in response indicates the deep interest of Brazil in dry farming, which country is taking steps to reclaim its own arid lands.

One of the triumphs of dry farming is durum wheat. This wheat has been tested by the United States Department of Agriculture, and found superior even to the celebrated Minnesota spring wheat. The wheat growers of the dry-farming regions have announced a "durum bread day," on which the whole country is asked to join in eating durum bread.

Dry-farming experts now believe that the results of their experiments prove that farming in its broadest sense is decidedly in its infancy, and that dry-farming methods are among the most important factors in its development.

The Riot of the Rivers

AGAIN appear the familiar reports of floods, with their terrible damage. Once they were regarded as the inevitable visitations of an inscrutable Providence. To-day the world knows better. The plague is not inevitable. Modern medical science, hygiene, the destruction of insects disseminating germs, and the like, are banishing plagues and rendering pestilences wholly needless. Men shivered with cold until fire was discovered. They blistered with heat till they learned how to avail themselves of ice in summer. They trudged on foot till they devised means of transportation now culminating in the airship. They went naked until they invented clothing. They cowered before the lightning until they conquered it and made of it a willing servant.

There must be refuge! Men
Perished in winter winds till one smote fire
From flint-stones coldly hiding what they held,
The red spark treasured from the kindling sun;
They gorged on flesh like wolves, till one sowed corn,
Which grew a weed, yet makes the life of man;
They mowed and babbled till some tongue struck speech,
And patient fingers framed the lettered sound.
What good gift have my brothers, but it came
From search and strife and loving sacrifice?
—*Edwin Arnold*

Man no more needs to surrender to the flood than to the other forces and agencies named. Like them, he may transform it from a bane into a blessing; from a merciless master into a supple slave. What he needs to do is to hold back the surplus water and release it in his time of need. By means of two agencies he may hold back this surplus —the one is the forest, the other is the reservoir.

Does he want facts regarding the forest? Then let him apply to the United States Forest Service. Would he know of the reservoir? Let him ask the United States Geological Survey.

The world is not in ignorance on these matters. It simply remains for the statesman to apply the knowledge already possessed by men of science and engineers. When will he do it?

Building a Nation

In our news columns appears the proposal of Mr. Arthur Hooker, secretary of the board of control of the National Irrigation Congress, to memorialize Congress to borrow $5,000,000,000 for drainage, irrigation, deep waterways, good roads and forests.

The press swarms with comments on this proposal, few apparently hostile.

It must be admitted that the proposal looks big; yet we must become accustomed to big things.

Some years ago we had our first "billion-dollar Congress." An economical member exclaimed against the unheard of extravagance. Another member, however, in replying, reminded the first that ours is "a billion dollar country."

Oceans cannot be crossed with rowboats nor stellar places penetrated with spectacles. Great ends demand appropriate means.

The American people face the task of Nation building—the greatest task which ever confronted a people. Already we are looking forward to the time, not far hence, when our population will number 150 and 200 millions, and it has been demonstrated that our resources are going at a rate which, unless checked, would in a few generations embarrass even such a population as we have now.

We cannot awake too soon to the situation.

The work suggested by Mr. Hooker must be done if our people would avoid hardship, even calamity. Now, who is to do it?

Obviously, individuals cannot, and corporations and trusts will not. At the best, all these agencies can but help.

Tasks of such magnitude, if performed at all, must be performed by government—municipal, state and especially national.

Further, they cannot be performed without money.

And whence shall come the money?

A moment's reflection must convince any thoughtful mind that no Congress will vote an adequate sum out of current revenue; neither are the American people prepared for the establishment of any system of taxation which would raise the funds in time.

There is but one other way in which the money can be obtained; namely, by borrowing.

Many of our people have developed a constitutional dread of debt; they look upon bonds as marks of bondage.

The burnt child cannot be blamed for fearing the fire.

Still, the American bonded debt has largely ceased to be a burden. The interest on our national debt, $1.09 per capita in 1882, had shrunken in 1908 to 24 cents per capita.

Nevertheless, if it were proposed to borrow any considerable sum on the same basis as our war loans, we might still rightly hesitate. But Mr. Hooker's proposal is quite different. "Congress," he says, "will not be asked to appropriate a penny. The returns from the improvements would pay off the bonds." The Government would simply act as a banker, as it does now for the various irrigation projects. The proceeds from sale of reclaimed lands alone, he estimates, would justify the expenditure of $2,500,000,000.

From facts at hand proving conclusively the profitableness of drainage, reclamation, deep waterways, good roads and forestry, it should be evident that the payment even of $5,000,000,000 for a utility so vast and on a hundred years' time, would be a trivial investment for the American people to make.

There is one question, however, that should be carefully considered. How are the American people, as a people, to obtain the chief benefit from a series of enterprises so gigantic?

Selling the lands after they have been reclaimed will undoubtedly repay the entire cost, including interest. Even so, the people as a people may receive but a small percentage of the actual value created through their initiative and based upon their credit. If they would receive a larger percentage, they may reflect upon the lesson taught by the sixteenth section of land in the heart of Chicago, which belongs, not to private

individuals or to corporations, but to the school board of that city.

So long as the people as a people retain these lands, every stroke of labor bestowed, every dollar of capital invested, every unit of increase in the population upon these lands adds to their value, and consequently to the wealth of the American people as such; but when once the people have parted with the lands the value goes to others.

The Conservation of Human Resources

OF ALL our resources the most important are our people. Rome is said to have fallen because of "a failure in the crop of men." Whatever fate might befall our material resources, such a crop failure would inevitably end our own career as certainly as it ended that of the World Empire.

We place a cash value upon the horse, the ox, the swine. At an earlier day we placed it upon the black slave. How many, however, recognize in the citizen a national asset, and realize that premature death or impaired vitality of men and women is a loss to the Nation in precisely as real and valid a sense as is the loss from the burning of buildings or the swallowing up of territory by an earthquake?

A clearer view was had by the National Conservation Commission. In its report of December 7 may be found a section entitled, "National Efficiency." The report recognizes that the length of human life may be materially extended and the death rate materially diminished. Our annual mortality from tuberculosis is placed at 150,000. "Stopping three-fourths of the loss of life from this cause and from typhoid and other prevalent and preventable diseases, would increase our average length of life over fifteen years." More than half the illness in the United States the Commission holds to be preventable. Following this, they say:

"If we count the value of each life lost at only $1,700, and reckon the average earning lost by illness as $700 per year for grown men, we find that the economic gain from mitigation of preventable disease in the United States would exceed $1,500,000,000 a year."

In closing, the Commission wisely suggests the concentration of the several governmental agencies now exercising health functions into "a greater health service worthy of the Nation;" in other words, into a bureau of public health.

Our common failure to appreciate the public significance of health, longevity and physical vigor on the part of our people is but another of the dead sea fruits of the rampant individualism which, until yesterday, characterized us as a people. If an individual died, we might sympathize with his family, but we experienced no sense of public loss. If thousands of our population rotted in slums, we saw in this fact merely a disgusting condition, which we attributed primarily to the shiftlessness and unthrift of the slum dwellers; possibly we tossed a coin in the name of charity and dismissed the matter from our minds. If tens of thousands of children toiled in factories when they should have been improving minds, morals and physiques in school, we thought of the condition primarily as a business necessity unfortunate only for those immediately involved, if even for them.

One of the few redeeming features of the calamity known as war is that it compels a nation and its leaders to take a social rather than a purely individual view of human life. A great war is largely a test of resources; among these, human beings rank foremost in importance. In numbers, vitality, energy and spirit, they are vital factors of military success. The nation which, with a military future before it, permits whole sections of its population to waste away through disease, poverty and dispiriting conditions, ranks in folly with the nation which deliberately throws its powder and ball into the sea.

But a point which all have not yet grasped is that international competition need not be exclusively military; that there are battles of bourses, struggles for markets, and contests for supremacy or leadership in a thousand different

ways; and that, in every such contest, the people themselves, in the long run, constitute a significant, if not the determining factor. For example, it is generally understood that Germany's system of popular education has weighed mightily in her favor in her long competition with France. Again, the long-continued and fatuous persecution by French monarchs of the Huguenots, culminating in 1685 in the revocation, by Louis XIV, of the Edict of Nantes, in consequence of which France lost more than a million of her most intelligent, enterprising and industrious citizens, is recognized as a chief cause of national weakness long enduring.

In the light of such historical evidence, which might be multiplied at will, it should seem superfluous to argue that the conservation of human resources is a national duty of the first magnitude. Nevertheless, from the standpoint of the *laissez faire* statesman, no such duty exists. Unemployment, unskill, poverty, misery, disease, are matters of individual concern with which lawmakers wrestling with the mighty problems of tariff and currency have little concern.

Fortunate it is that President Roosevelt, shortly before retiring from office, established here, as in so many other regards, a new precedent. On January 25-6 last there assembled in Washington, on the invitation of the President, a conference on the care of dependent children. In this the President took the most lively interest, following its adjournment with a special message to Congress declaring that "the interests of the Nation are involved in the welfare of this army of children no less than in our great material affairs," urging the establishment of a Federal children's bureau, "which shall investigate and report upon all matters pertaining to the welfare of children and child life, and shall especially investigate the questions of infant mortality, the birth rate, physical degeneracy, orphanage, juvenile delinquency and juvenile courts, desertion and illegitimacy, dangerous occupations, accidents, and diseases of children of the working classes, employment, legislation affecting children in the several states and territories, and such other facts as have a bearing upon the health, efficiency, character and training of children," pointing to the fact that "the state has always jealously guarded the interests of children whose parents have been able to leave them property by requiring the appointment of a guardian," and pointing out that "the interests of the child who is not only an orphan, but penniless, ought to be no less sacred than those of the more fortunate orphan who inherits property."

In the same spirit is the more recent utterance of Prof. Graham Taylor:

"The child is coming to be as much of a civic problem as it ever has been a family problem. Upon the normality of its children the strength and perpetuity of the state depend, as surely as the dependency and delinquency of its children undermine the prowess and menace the life of the state. The education and discipline, the labor and recreation of the child figure larger all the while in our legislation and taxes, our thinking and literature."

For all of such utterances we may be profoundly grateful as evidences of a growing recognition of the importance, from the public standpoint, of the life, health, well-being and normal development of the citizen, and of the propriety and necessity of legislation and administration, municipal, state and national, to promote the highest well-being of every man, woman and child in the Republic.

Where Is Conservation to Stop

THE conservation idea grows by what it feeds upon. We began in this country by conserving forests, then we took up irrigation, waterways and the like until the movement was launched a year ago for conserving all natural resources.

Attention thus far seems to have been given chiefly to material, subhuman resources. Yet at the White House Conference Mr. MacFarland urged the conservation of beauty, quoting Mayor McClellan that, "It is the country beau-

tiful that retains the love of its citizens," and William Morris, who urged humanitarian efforts, "until the contrast is less disgraceful between the fields where the beasts live and the streets where men live."

Such suggestions lead directly to the thought of conserving human resources, including physical health. The *New Haven* (Conn.) *Journal-Courier* says editorially:

> It is now generally recognized that bodily health is quite as much to be enumerated among the resouces of the human race as are the forests, the mines, or the streams. * * * But, like many good institutions, the resources movement has kept on developing. Its latest department of activity is in the realm of safety. It is not difficult to see that bodily safety is quite as important as bodily health. Both diseases which can be prevented and dangers which can be averted have in the past made great inroads among the numbers of our skilled workmen and our most useful citizens.

Mention is made of the efforts of Germany to make industrial conditions of life in factories safer. The Director of the Imperial German Bureau of Statistics is quoted as saying:

> One million marks, in wage-earning efficiency annually, we save Germany through our museums of safety, sanatoria, and other forms of social insurance.

The *Journal-Courier* continues:

> Much more will certainly be heard in the immediate future as to possible means of safeguarding the lives and limbs of American workmen in their shops and factories. It is a great problem which concerns the employers, who are held strictly to account in these days under the employers' liability laws, quite as much as it does the employees.

At the White House Conference, Mr. John Mitchell, speaking of the wasteful production and consumption of coal, said:

> Our extravagant wastefulness in the use of our fuel supply, both in production and consumption, is equaled only by our criminal disregard of the personal safety and the lives of the men who toil in the mines. For every 190,000 tons of coal produced, a mine worker is killed and several are seriously injured; for each 1,000 men employed 3.40 are killed annually. Last year nearly 2,500 men were killed and more than 6,000 were seriously injured in the mining industry of our country. No other country in the world shows so large a percentage of fatalities. Indeed, in those foreign countries in which mining is most hazardous, the proportion of men killed to the number employed is from fifty per cent to seventy-five per cent less than in our country. It is a sad commentary on our vaunted civilization that more men are killed or crippled in mining in the United States than in any other nation on earth.

As a matter of fact, there seems to be no logical stopping place for the conservation movement short of the conservation of all those materials, forces, agencies and conditions which make for the highest, completest well-being of every human soul, and of the race itself.

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Governor Fernald's Proposal

Gov. Bert. M. Fernald, of Maine, in his inaugural address, said:

> Under state direction, the time is at hand when we must replant forests carelessly destroyed. The state can produce pine and spruce trees for a very small sum per thousand. A state water-supply commission naturally would cooperate with the forest and game commission to establish nurseries of forest trees.

This is an up-to-date proposal. Following it, *Collier's Weekly* presents a plan to afforest over 800,000 acres of abandoned, forestless land in New Hampshire, meeting the expense by a long-term bond issue. It is estimated that the investment would prove profitable financially thirty or forty years hence, in addition to which the timber resources of the state would be greatly increased, and waste land utilized.

With these two proposals may be placed that of Great Britain's budget appropriating $1,000,000 to reforest waste lands in England, Scotland and Ireland. These are examples of the types of government which the present age demands —a government which, instead of merely playing policeman, strips off its coat, rolls up its sleeves, and aggressively attacks the problem of making state or nation more habitable, and life better worth the living for every citizen, present and to come.

NEWS AND NOTES

Canadian Forestry Association Meeting

The executive committee of the Canadian Forestry Association extends a cordial invitation to the officers and members of the American Forestry Association to attend and take part in a special meeting of this association to be held at Regina, Sask, Canada, on September 3 and 4 next. The British Association meets in Winnipeg just prior to this, so that cheap railway rates will prevail. Those attending the Seattle Exhibition may return east through Canada, in which event they will be able to stop off for a day at Regina without added cost. For further information they may write to James Lawler, Esq., Secretary, 11 Queen's Park, Toronto, Ont.

To Protect New Hampshire Forests from Fires

State Forester and State Fire Warden E. C. Hirst has sent the following circular letter to the selectmen of the state calling attention to the law for the preservation and protection of forests, and asking their cooperation in the selection of fire wardens.

"In the act of the New Hampshire legislature of May 1, 1909, entitled, 'An Act to Improve the State System of Forest Protection,' it is provided that the selectmen of all towns and the mayors of all cities, and other citizens, shall recommend to the state forester the names of such persons as may in their estimation be fit to fill the offices of forest fire wardens in the respective towns and cities. The state forester may then choose from the names recommended one competent person in any town or city, or group of towns, at which time the term of office of forest fire warden previously appointed for that town or city, or for any group of towns shall cease, and the new appointee shall serve, the state forester having the power at any time to remove the forest fire warden from office.

"The duties of the forest fire warden under the new law are as follows: He shall, when directed by the state forester, patrol the woods, warning campers, hunters, etc., about extinguishing fires. He shall post fire notices along roads, streams, camp sites and other public places. He shall extinguish all brush and forest fires occurring in his town, and may call such assistance as is necessary. He shall have the power of arrest without warrant, and will be required to make a report at regular intervals to the state forester.

"The expenses incurred in fire fighting, etc., are to be shared between the town or city and the state. The fire wardens' bill will be audited by the selectmen or mayor, paid by the town or city, after which the state reimburses the town or city for one-half the amount. The remuneration is to be fixed by the forestry commission and the state forester, and I shall be pleased to have you quote me the wages paid for ordinary labor in your community; also what, in your judgment, would be a fair amount per day to pay the local fire warden for his work and for fire fighters.

"In complance with this law, will you kindly name several persons whom you think well qualified and willing to assume the duties of forest fire warden in your town.—*Manchester* (N. H.) *Mirror.*

A State Forester

Vermont has set an example which most the other states in the Union would do well to follow. After some years devoted to a discussion of the problem in connection with the ravages of the lumber companies and pulp mills, after seeing her streams diminish to mere rivulets or disappear altogether, the Green Mountain state has engaged a trained forester to devote his attention to the forest areas and to the task of arousing the farmers to the necessity or advantage of the conservation of natural resources. The man engaged for this purpose is a graduate of the Yale Forestry School, and he has had experience in the Government service as state forester of Connecticut. One of his doctrines is that instead of selling the growth of his wood or timber lot just once, the farmer ought to be able to market a lumber crop once in every thirty years, if he takes care that it is properly planted and protected. There has been a state nursery in which young trees are grown, and whose products are offered to prospective purchasers at cost. About 100,000 young trees, principally white pine, have already been sold out of this nursery for planting by farmers and lumbermen. If an official like this state forester can do something toward restoring the streams to their former volume, or even maintain them as at present, he will earn his salary and more.—*Biddeford* (Me.) *Journal.*

England's Progressive Policy

That policies known in America as Rooseveltian are finding favor in England is evident by the recent speech by the chancellor of the exchequer, Mr. Lloyd George. In addressing the Commons on his budget proposals, he said in part:

"A state can and ought to take a larger and wider view of its investments than individuals. The resettlement of deserted and impoverished parts of its own territories might not bring to its coffers a direct return which would reimburse it fully for its expenditure, but the indirect enrichment of its resources would more than compensate for any apparent or immediate loss. Any man who has crossed and recrossed England from north to south and from east to west, must have been perplexed at finding there was so much waste and wilderness possible in such a crowded little island.

"This brings me straight," Mr. Lloyd George continued, "to the question of afforestation. There is a very general agreement that some steps should be taken in the direction, and I will not say of afforestation, but of re-afforestation of the waste land of this country. Here, again, we are far behind every civilized country in the world. In Germany, for instance, out of a total area of 133,000,000 acres, 34,000,000, or nearly twenty-five per cent, are wooded. In France, out of 130,000,000 acres, seventeen per cent are wooded. In the United Kingdom, out of 7,000,000 acres, only 3,000,000, or four per cent, are under wood. The number of people directly employed in forest work in this country is only 16,000, and yet the climate and soil of this country are just as well adapted for the growth of marketable trees as those of the estates of Germany.

"Recently we have been favored with a striking report of a royal commission, which outlines a very comprehensive and far-reaching scheme for planting the wastes of this country. The systematic operation which the commissioner recommends is a gigantic one, and before the government can be committed to it in all its details it will require very careful consideration by a body of experts skilled in forestry. I am informed that there is a good deal of preliminary work which ought to be undertaken before the government can safely begin planting on the large scale indicated in that report.

"I will tell the house what we propose to do: There is a certain amount of money, not very much, spent in this country in a spasmodic kind of way, on what I may call the work of national development—in light railways, in harbors, in indirect but very meager assistance to agriculture. I propose to gather all these grants together into one national development grant, and to put in this year an additional sum of £200,000 for these purposes. Legislation will have to be introduced, and I will then explain the objects in greater detail, but the grant will be used in the promotion of schemes which have for their purpose the development of the resources of the country.

"It will include such objects as the institution of schools of forestry, the purchase and preparation of land for afforestation, the setting up of a number of experimental forests upon a large scale, expenditure upon scientific research in the interests of agriculture, experimental farms, the improvement of stock, the equipment of agencies for disseminating agricultural instruction, the encouragement and the promotion of cooperation, the improvement of rural transport so as to make markets more accessible, the facilitation of all well-considered schemes for attracting labor back to the land by small holdings or reclamations of wastes. Every acre of land brought into a higher state of cultivation means more labor of a healthy and productive character; it means more abundant, cheaper and better food for the people."

Women Saving the Big Trees

There is joy in the heart of the western tourist this summer, as well as in the hearts of Californians, because the famous Big Trees are to be saved from the wanton hand of the destroyer.

For years the destruction of the Big Trees has been going on. In 1906 the lumber cut of the Big Trees amounted to 8,500,000 feet. The oldest living things in the world were destroyed for cheap lumber. And while the trees were being cut—for a period of years—a band of California women, headed by Mrs. Lovell White, was making a valiant fight to interest the Government in their salvation.

After repeatedly failing to pass the House, a bill was introduced and favorably voted upon at the last session. By the bill, which was signed by President Roosevelt, the Calaveras National Forest is created, and the Big Trees saved for all time. The 500 and more California women are justly proud of their victory, and Mrs. White, radiant that the loved trees will be protected, has won their salvation by one of the most unique campaigns of lobbying in the history of the country.—*Ex.*

Fall River to Acquire Woodlands

State Forester Rane, of Massachusetts, is a stanch advocate of the plan advocated by the American Civic Association for the establishment of municipal forests. Through proper forestation of drainage basins and sources of water supply, it is urged by State Forester Rane, citizens not only will be educated in the advantages of forestry, but a source of municipal income will be developed. Forester Rane recently drafted a plan for Fall River which eventually will mean 3,000 acres of woodland.

New Forest Assistants and Their Work

Forty-seven young graduates of nine American forest schools have just received appointments as forest assistants in the United States Forest Service. These men have secured their appointments as a result of passing the regular civil service examination.

Forest assistants are men who have completed their preliminary training for the profession of forestry, as the graduates of law or medicine have completed theirs, and are ready to enter upon practical work.

There is a growing interest in the profession of forestry now, and many young men are asking how to get into it, and what it promises. Gifford Pinchot, United States Forester, in an address to the graduating class in forestry at Harvard University this year, said:

"The Government and the country need more men trained in the knowledge of forestry, and it offers opportunity to make a man's life loom large and to count for much among the many phases of human endeavor. To be a good forester a man should combine something of the naturalist with a good deal of the business man. To know how to use the forest he must be able to study it. He must have, therefore, the power of observation, a fondness for nature, and the ability to penetrate her secrets. He must be resourceful, able to stand by himself, willing to undergo the privations of rough life, and capable of commanding the respect of rough men, who quickly recognize virility and genuineness of character, but will not tolerate pretense or the assumption of superiority. A forester should be sound in mind and body, and should make the fullest college preparation for the service. This service means a free, vigorous life in the open air, and a clear, straight, fine, wholesome, manly condition of life."

Heliographs to Be Used on National Forests

Experiments will be made during the summer with the standard heliographs which are now used in the War Department, for signaling on the National Forests. One of these experiments will be on the Kaniksu National Forest, in Idaho, and the other on the Stanislaus Forest in California.

It is intended to discover whether these instruments will be of use on National Forests to report fires or transmit other messages in areas where there is no quick method of communication. Easy and quick communication to all parts of a forest must be had if fire is to be kept down.

For the administration and protection of the 148 National Forests in nineteen states and territories and Alaska, the Government spent $2,526,098.02, or about one and one-half cents an acre for the calendar year 1903. Of this amount $592,169.19 was spent for permanent improvements, including the construction of 3,400 miles of trails, 100 miles of wagon roads, 3,200 miles of telephone lines, and forty miles of fire lines.

Berlin Spends $10,000,000 to Buy a Forest

Taking the lead of all cities, American and European, Berlin is spending vast amounts of money in the municipalization of its outskirts, the latest proposal being to acquire for $10,000,000 a great forest in the so-called Spree district. This is to be developed as a park and municipal water-works. Lying near the city was a sandy tract of little or no use. It was utilized for the disposal of sewage and actually transformed into a healthful and productive spot.

The Biltmore School to Germany

The report that the Biltmore Forestry School will be discontinued with the retirement of Dr. C. A. Schenck from the forestry department of the Biltmore estate is practically confirmed by the news that Doctor Schenck will establish the headquarters of his new school in Germany. * * *

The plans of Doctor Schenck for his school are international in their scope. * * *

Doctor Schenck proposes to continue his forestry school, but instead of having a single fixed location, his students will have the range of the world's forests. It is his intention to locate the principal headquarters of the school in Germany, near the Black Forest, which is one of the most healthful and attractive parts of the empire. The school will be located there for six months of each year, and for the rest of the year will do practical work in the forests of Maine, Wisconsin and eastern Tennessee.

Doctor Schenck has been superintendent of the School of Forestry for a period of about fifteen years, and the school has become noted through his work, as students have come from all parts of the country and several foreign countries as well, for courses in practical instruction in the splendid Biltmore forests. * * *

About twenty-five of his students have signified their intention of continuing the work under his direction, so he conceived the idea of a course of practical study and research in forestry work in the Black Forest, with which he is thoroughly familiar.

The Biltmore school closes on the 1st of November, when Doctor Schenck's relations with the Biltmore estate terminate. About the 15th of the month Doctor Schenck will leave for Germany with his students.

The scheme has found great favor with the students, who see in it not only a chance

to learn forestry on a broader scale than they can do even in such a field as Biltmore estate offers, but also an opportunity for interesting travel while they are studying. It is understood that Doctor Schenck will retain the name of the Biltmore School of Forestry for his new school.—*Asheville* (N. C.) *Citizen.*

Forestry in Antioch College

Prof. J. J. Crumley, of Antioch College, Yellow Springs, Ohio, will give his time entirely to forestry in the future, largely with the Ohio State Experiment Station. He reports the growing interest in forestry in his part of the country as very manifest, a half dozen now thinking of the subject where but one did five years ago. Good work is being done among teachers, who prove good listeners, thinkers and workers. Professor Crumley lectured to several hundred teachers at Wooster, Ohio, in July.

Forestry Department of University of New Brunswick

Last fall witnessed the establishment of a department of forestry in the University of New Brunswick, at Fredericton.

The course covers four years, the first two paralleling closely the engineering course, with the addition of work in Botany, Forest Botany, and Histology. In the junior year courses are given in Dendrology, Silviculture, and Forest Mensuration, besides Economics, Road Construction, English, etc., and Zoology. In the fall term there is field work in Surveying, Forest Mensuration, and Silviculture. A tract of six square miles near the university serves for practical work, while plenty of room on the college farm is afforded for nursery and seed-bed work in the spring. In the senior year, courses in Lumbering, Technology, etc., will be given. The location of the university on the St. John River affords admirable facilities for studying mills and various lumbering operations, driving, rafting, etc. The city of Fredericton offers a gold medal for the best essay or treatise on "Lumbering and Milling Operations on the St. John River System."

Hon. Chas. E. Oak, manager of the Miramichi Lumber Company, offers to take four seniors this year into his lumber camps from December to March, paying them wages while there, in order that they may learn the woods end of the business, and the forestry department will give them this practical work even at the sacrifice of theoretical instruction. Four seniors and probably eight or ten juniors will take the work this year.

The prospects for building up a forestry department in the university are good, and the interest in forest preservation throughout the province is encouraging. The students have organized a forestry club, and are very enthusiastic over their work. Nova Scotia will make a forest survey of crown lands, and New Brunswick will carry out the provisions of the public domain act, which provides for a survey of their 10,000 square miles of crown lands.

Utilizing Zurich's Experience

There are in New Hampshire 800,000 acres of land once cultivated, but now abandoned to brush, and the state forestry commission is trying to devise some means to get control of these wastes. If this can be done, the land will be planted in trees, the expense of "taking up" and forestation to be met by a long-term bond issue. It is argued that the investment would prove very profitable thirty or forty years hence. In support of the proposition the example of Zurich, Switzerland, is cited. The people of Zurich some years back, finding themselves without the timber necessary for building and other purposes, took over certain abandoned and denuded lands and planted them with trees. The former barrens are now among the most valuable assets of the city, yielding as they do a net profit of $15 per acre a year. The *Springfield* (Mass.) *Republican,* in discussing the New Hampshire movement, says New Hampshire is not the only state that should consider the question involved. And so say we. The question of making denuded forest areas and barrens yield a revenue is a practical one in Virginia to which it is to be hoped the next general assembly will give earnest attention. —*Richmond* (Va.) *Leader.*

Legislation in Minnesota

Prof. Samuel B. Green has written CONSERVATION as follows:

Our legislature passed a new forest-fire law, which is very much superior to our old law. It requires, among other things, the burning of slashings, gives us a patrol system in dry seasons, and requires county attorneys to prosecute violators of the law, making it a misdemeanor not to do so; it increases the appropriation from $11,000 to $19,000 per year. It passed a bill submitting to the people an amendment to the constitution whereby one-fifteenth of a mill tax should be used for the support of forestry. This would, under present valuations, bring in about $80,000 per year; but, as the valuation is increasing all the time, it will not be long before it will be doubled. A permanent appropriation of this kind would be a great thing for forestry, as it would permit of our planning ahead for a long series of years. It established a new reserve of 2,700 acres for the University of Minnesota, about two miles from Cloquet, which is one of the most important lumber milling centers of this section. By cooperation with the United

States Government and the lumber companies this land can be obtained for about $10,000. It also appropriated $2,500 per year to care for the same. It provided an appropriation of $4,000 per year for the support of the forest school, $5,000 per year for student labor on the forest reserves, and $1,500 per year for creosoting wood and similar experiments. For Itasca Park, which is the large reserve connected with the forest school of the University of Minnesota, it appropriated $10,000 for a new road, and $14,500 for maintenance and repairs, making the total appropriation for the support of the School of Forestry and the reserves connected with it $55,500. It also passed a bill authorizing the Forestry Board to accept a donation of 3,200 acres of land from the Pine Tree Lumber Co., together with all the hardwoods, and all the pine, spruce, cedar and balsam under eight inches in diameter, in consideration for which all their timber over eight inches in diameter shall be free from taxes for a period not exceeding ten years. An amendment to the constitution was also passed, and as a result will be submitted to the people, exempting timber lands from taxation.

Minnesota Out of Conservation Plans

None will find fault with Governor Johnson for his refusal to appoint a conservation commission for Minnesota at the present time. The legislature failed to make provision for any such commission, and, while there are men who would serve gladly without personal compensation, the preliminary work would entail a considerable expense, for which no appropriation is available.

The situation is most unfortunate. Practically all of the states of the Nation have joined in the general conservation movement, admittedly one of the most important that has been advanced in this country. Each state is making a study and survey of its timber, mineral and coal lands, considering its waterways and water-power possibilities, and preparing to cooperate with the Federal Government in the work of conserving and developing these resources for the benefit of the people of the individual states and of the whole Nation. When the time comes for active work on the part of the Federal Government in placing its conservation program into effect, the states that have done most in the preliminary work will be the largest sharers in the distribution of Federal funds in aid of the general movement. Minnesota need not expect the Federal Government to do anything for the state until the state does something for itself. The question of conservation of state resources will be one of the live issues for consideration by the next legislature.—*St. Paul* (Minn.) *Dispatch.*

Railroads for Conservation

A plan by which the railroads are to take part in the conservation movement is announced as the outgrowth of conferences and correspondence between representatives of the carriers and the joint committee on conservation. Preliminary negotiations on the part of the railroads have been conducted by representatives of the American Railway Engineering and Maintenance of Way Association. Attention was also given to the subject of conservation at the recent meeting of the American Railway Master Mechanics' Association, at Atlantic City, N. J. The great quantities of timber, iron and coal used by the transportation lines are the bond of interest between them and the conservationists.

The plan as outlined provides for a systematic arrangement by which the committee on conservation is to give the railroads suggestions as to the most practical method of putting conservation policies into effect. The railway men agree to carry out these suggestions. The conservation authorities have submitted a plan, which is now in the hands of A. S. Baldwin, chief engineer of the Illinois Central Railroad, who in a letter to the conservation committee says:

"On account of the wide areas traversed by the railroads and the great consumption by them of timber and fuel, with their enormous use of iron and steel products, it is believed that the most effectual assistance of the American Railway Engineering and Maintenance of Way Association can be in directing the attention of railroad officials to the excessive wastefulness in the present methods of production of timber and fuel, and the great importance of introducing economies in their use and consumption; also to the importance of economizing in the use of iron and steel products and the possibilities of preservation by protective coatings and otherwise."

With this end in view, the railroad conservation committee has asked for specific suggestions as to the best methods that should be used by railroads in the prevention and control of forest fires. The conservation committee has presented an outline for this work, and with it a statement showing the enormous loss of lumber through forest fires every year.—*Norwich* (Conn.) *Record*

The railroads also ask information regarding possible economies through use of treated ties, the desirability of by-product ovens in coal territory, the species of trees railroads might profitably plant, the gain through substitution of sawed for hewed ties, and the prolongation of life of steel and iron in bridges. The railroads will also investigate and report to the joint committee on the possibility of substituting other materials for ties and timber.

High Water in the Missouri Valley

For ten days and more following July 4, residents in the Missouri River valley experienced floods. The following are comparative river stages and high-water records:

THE RIVER STAGES

	Feet
Missouri River, 8 a. m., July 13.....	27.0
Kaw River, 9 a. m., July 13.....	23.9

PAST HIGH WATER RECORDS AT KANSAS CITY

	Missouri *Feet*	Kaw *Feet*
In 1903, May 31 and June 1..	35.0	37.6
In 1904, July 8.....	27.5	27.5
In 1908, June 15.....	29.5	29.5

The floods are attributed to snow melting in the mountains, followed by rains.

Following are dispatches published by the *Kansas City Star* of July 14:

One thousand persons were driven from their homes, and many thousands of dollars' damage done Saturday morning by a flood in Perry Creek, a small stream which separates the east and west sides of Sioux City, Iowa. A cloudburst north of Sioux City is believed to have been the cause.

Five years ago Ottawa, Kans., had its greatest flood, and confidently set the mark high above any possibility of future flood conditions. At noon last Thursday the town gazed upon a flood more than a foot beyond the previous record. The Marais des Cygnes River stood at thirty-seven feet at the Main Street gauge. Of the bridge itself, only the upper framework was visible.

Communication between North and South Ottawa was cut off by a channel half a mile wide, through which sweeps a millrace which even a skilled boatman could scarcely cross.

Estimates on the number of homeless families were necessarily guesswork. Sections never before reached by floods were tenantless now, swept by wastes of muddy water. Schoolhouses and churches were filled with refugees. A swift current four feet in depth sweeps through the Santa Fe Union Station. The Missouri Pacific Station is in the center of a sea. Railroad traffic is abandoned, and only extensive repairs to tracks and yards can reestablish it. Freight and baggage have been removed to high ground.

Thirty persons, including guests, were in the upper floors of the Marsh Hotel, through which a deep current flowed. Food supplies reached them by boat service.

Osawatomie, the scene of John Brown's exploits, was almost an island.

Rescued by boats across more than a mile wide expanse of swift flood waters of the Marais des Cygnes River, 300 passengers on the Santa Fe train No. 5, westbound from Kansas City, experienced late Wednesday afternoon all the thrills of a rescue from a wreck at sea.

Water was running three feet deep in the center of Marion, Kans., Tuesday afternoon, due to a four-inch rain above the town on the Cottonwood River.

At Pattonsburg, Mo., Big Creek and Grand River came together. Heavy rains caused the two streams to become lakes without banks or channel. Tuesday night, July 6, the water rose so rapidly that almost before the people were aware water was coming through the doors of their homes. Few persons thought of the possibility of a flood and few made preparations in the way of food supplies.

Wednesday morning found Pattonsburg surrounded by three miles of water, which rose steadily until it reached the second floors of stores and dwellings, driving many people to the roofs. Rain added to the sufferings of the people exposed. Three hundred men, women and children found shelter on the second floor and in the attic of the school building.

At its height the water was from five to eight feet deep in the streets of Pattonsburg.

George Palmer, a harness maker, who had set out on foot to visit neighboring towns, was drowned. His body has been recovered.

Several hundred persons rendered homeless and property loss estimated at three-fourths of a million dollars are the result of a flood which swept through the heart of Springfield late Wednesday night, July 7.

The Missouri River Valley was a vast lake, and the loss to crops was great.

The Chicago and Alton, the Missouri, Kansas and Texas, and the river route of the Missouri Pacific to Jefferson City were entirely out of commission. The Chicago and Alton and Katy tracks were under fourteen inches to five feet of water in the valley to Jefferson City.

At Rich Hill, Mo., the river Marais de Cygnes was five miles wide.

The Grand River at Chillicothe, Mo., was more than twelve miles wide on July 8.

Trenton, Mo., on July 7, was on an island and entirely cut off from all railroad or other communication. Early Wednesday morning there came down Grand River and tributaries the greatest flood in the history of that stream, covering all the lowlands and doing property damage estimated at half a million dollars. A water-spout sent the rise down the stream like a tidal wave, and few of those in lowlands were able to escape. Men were busy with boats all day, rescuing refugees from treetops. No lives were lost.

America's Greatness

Ambassador Jusserand, of France, said recently:

"The farther west I travel the more astonishment I have over the greatness of the United States. If the people of France had such rivers as are in the West they would dam them all and allow none of the water to go to waste. Irrigation is a great thing, especially for the western part of America."

With this may be coupled M. Jusserand's famous declaration, "It is an absolute principle: No forests, no waterways * * * If the Mississippi is the 'Father of Waters,' the forest is the father of the Mississippi."

Conservation of Water-power and Public Land

It will be recalled that Taft recently called down Secretary of the Interior Ballinger for revoking orders of Roosevelt withdrawing lands from speculative land-grabbers. There is no doubt that a water-power trust in the West is working hard to get possession of the water-power of the upper Missouri River. Taft will protect the consumer rather than the man who consumes the country's resources. It is understood that Pinchot, with the assistance of other experts, has drawn up a plan for a general control of water-power including the proper royalty companies shall pay the Nation for use of water-power. In Europe governments have invoked the Roosevelt safeguards. Taft will stand for the consumer.—*Lewiston* (Me.) *Journal.*

Irrigation Desired for Eastern States

On June 23 the American Seed Growers' Association met at Niagara Falls, N. Y. The special committee appointed to inquire into the irrigation situation presented a report recommending irrigation in the Eastern States. So successful has the scheme proven in the West that the seed men are desirous of testing it extensively along the Atlantic coast.

* * * * *

Burnett Landreth, of Bristol, Pa., advanced a novel idea in his paper on "Irrigation of Old Eastern Farms." He pointed out that the Government had spent some $14,000,000 for developing irrigation systems in California, Nevada and Arizona, changing their former arid wastes to flowering gardens. It was high time, Mr. Landreth thought, that some attention was given to the farms of the Eastern States. In times of drought, he said, the eastern farmer suffered to such an extent as to make his fruitful years hardly balance the loss of dry years. A system of irrigation reservoirs from Maine to Florida would insure the farmers against loss from droughts. As a beginning, he suggested that the Government appropriate $70,000, with which to buy a farm of about 100 acres near Washington, in charge of the Department of Agriculture, as an "irrigation kindergarten."

The expense of establishing such a system along the Atlantic coast, he said, would be great, but it would pay tenfold on the investment. In the West the water for the irrigation ditches is had from the mountains, gravity being the power. In the East it would be necessary to establish pumping plants at great cost. But only some such plan would make farming in the East profitable to-day.—*New York Commercial.*

Progress in Reclamation Work

The big dam on the Belle Fourche irrigation project, South Dakota, contains approximately 1,000,000 cubic yards of material. When completed this dam will be one of the largest earth embankments in the world, and will contain about 1,700,000 cubic yards of material.

The project presents a most imposing scene. Eleven trains of ten cars each loaded with dirt are constantly in view. As the earth is dumped on top of the embankment it is sprinkled and rolled with heavy rollers. The dam is now seventy feet high and 6,200 feet long. A great change has taken place in the valley since the initiation of Government work. From a region given over almost wholly to stock raising, with individual holdings as high as 1,000 acres, the valley is being transformed to a thickly-settled community. New settlers, principally from the Mississippi Valley, are coming in steadily. This is one of the best opportunities in the Northwest to secure a farm at a reasonable price. Land can be bought at from $15 to $35 per acre. A new creamery has just been opened, and all lines of business in the town of Belle Fourche are increasing in volume.

The progress of settlement on the Sun River and Huntley projects, Montana, is most satisfactory. Many of the new entrymen have been induced to go to these sections by former neighbors who settled there. Thousands of shade and fruit trees have been set out at the demonstration farms, and the good example is being followed by the farmers, who are planting sufficient numbers to insure plenty of shade.

The schools throughout the Huntley project are well attended. Consequent upon the heavy settlement around Simms on the Sun River project, a large number of children of school age have come to that vicinity, and active steps are being taken toward the establishment of a school at that point. A two-room building will soon be erected, and arrangements will also be made for a school at Fort Shaw. The grading of the streets is adding much to the general appearance of the towns. Stores and other business houses are being erected. At Huntley a skimming plant, which is to be operated in connection with the Billings creamery, is ready for operation.

One hundred eighty men were employed during May at Laguna Dam, Yuma irrigation project, California-Arizona, Sixty of these men were at work on the Arizona side of the river excavating for the canal and protecting the bank below the mouth of the sluiceway. The walls and bottom of the canal heading were also concreted. On the California side the crew was engaged in canal excavation with the steam shovel, the

product being used to blanket the reservation levee and to protect the banks below the sluiceway. The dam has since been completed.

In July a flood of 150,000 second-feet passed over it. Both the dam and the levees which for miles protect the bottom lands held their own. This fact confirms the judgment of the officials that the Colorado River could be controlled and the bottom lands protected from floods, and irrigated.

The Laguna dam is patterned after weirs which have been successfully operated on erratic rivers of the Old World for half a century, and the levees are of the type which experience on the Mississippi River during the past sixty years has proved to be the best.

During June the contractors laid 14,000 cubic yards of masonry on the Roosevelt dam, Salt River irrigation project, Arizona. The masonry was all laid on the south side of the gap through which the water is still flowing from the reservoir. The south end of this part of the dam is at an elevation of 169 feet. Near the gap the elevation is 135 feet. The water in the reservoir is 110 feet deep. The Government cement mill was operated twenty-five days, burning 11,500 barrels and grinding 12,000 barrels of cement. The south canal is completed and work is being pushed on the eastern canal. Work is progressing favorably in concreting the sluicing tunnel.

The Gunnison Tunnel, Uncompahgre Valley irrigation project, Colorado, was advanced 510 feet during June, and but sixty feet then remained to be excavated between headings. There was a great scarcity of labor and the heavy ground in the tunnel required timbering in both headings. The daily flow of water remained practically constant, amounting to 1,126,000 gallons in the east portal and 3,400,000 gallons at west portal. Sixty-five feet of concrete lining were placed in the tunnel and the concrete portal at the west end was built and 200 feet of concrete lining placed in the portal cut. The flow of water in both the Uncompahgre and Gunnison rivers during the month attained the greatest volume of which record has been made.

The tunnel has since been cut through; the workmen met and shook hands.

A contract has been entered into by the project engineer of the North Platte project, Nebraska-Wyoming, on behalf of the Government and the Platte Valley Telephone Company for telephone service in connection with the North Platte project for a period of six years, from July 1, 1909, to July 1, 1915, in continuation of an existing contract which expired July 1, 1909. Twenty-five telephones are provided for in the contract, besides two exchanges and other services.

The Secretary of the Interior has approved a contract entered into by F. E. Weymouth on behalf of the United States with the Nampa-Meridian Irrigation District and the Payette-Boise Water Users' Association, which provides for the use by the Government of the canals and laterals of the Nampa-Meridian Irrigation District in the reclamation of certain lands belonging to the Payette-Boise project, Idaho, and for the adjustment of expenses of operation and maintenance of the canals and laterals between the respective parties.

The United States is given the right to enlarge or extend the existing canals or laterals of the Nampa-Meridian Irrigation District, the title to all enlargements or extensions to vest in the United States.

The lands involved consist of about 50,000 acres lying within the boundaries of the above-named irrigation district and below their canal.

Five Billions for Development

Mr. Arthur Hooker, secretary of the board of control of the National Irrigation Congress, will present a resolution for the approval by that organization at its seventeenth session in Spokane, August 9 to 14, memorializing Congress to issue three per cent gold bonds running 100 years, to the amount of $5,000,000,000, or as much thereof as may be necessary, for the following specific purposes:

One billion dollars for drainage of overflowed and swamp lands, thus reclaiming an area equal to 100,000 square miles.

One billion dollars for the reclamation by irrigation of 40,000,000 acres of arid and semi-arid lands, now partly or wholly waste.

One billion dollars to construct and improve deep waterways, to develop thousands of miles of territory now without adequate transportation facilities.

One billion dollars for good roads and national highways, for the lack of which the loss to the farm area of the United States is approximately $500,000,000 annually.

One billion dollars for forest protection, reforestation and conservation of the forest resources, thus assuring timber and lumber supplies for centuries to come.

Says Mr. Hooker, in explaining the plan: "Congress will not be asked to appropriate a penny. The returns from the improvements would pay off the bonds. The Government would simply act as a banker, as it does now for the various irrigation projects. The bond issue would provide ample funds as required to carry out the work in the several divisions, at the same time giving the best possible collateral to those investing in these securities. Government figures bear out the statement that there is enough good land overflowed in Minnesota, Wisconsin, Kansas, Nebraska, Louisiana, Kentucky, Tennessee, Mississippi and Maine to make an area as large as the state of Missouri, or more than 44,000,000 acres, while in the eastern, central and western states there is more than as much more, or about 100,000,000 acres in all. At a conservative estimate of $25 an acre, the sale of this reclaimed land would justify the expenditure of $2,500,000,000, or

150 per cent more than is required to drain it. This land would support from 2,000,000 to 3,000,000 population. Approximately 40,000,000 acres of lands in western and southwestern states are adapted to irrigation, which, if reclaimed at an average cost of $25 an acre, would be worth not less than $200 an acre, or a total of $8,000,000,000, and provide homes for more than 8,000,000 persons. The economic value of irrigation cannot be measured in dollars and cents, but crops of from $500 to $1,000 an acre are not rare in the irrigated districts. There are already 14,000,000 acres under irrigation, and the Reclamation Service estimates it will have reclaimed 2,000,000 acres, at a cost not exceeding $70,000,000, before the close of 1911. The construction and improvement of the deep waterways required to provide better and cheaper transportation facilities is, I believe, a 100 per cent investment, from the fact that two-thirds of the bulky freight could be shipped by water routes, at a cost to the shipper of not more than one-sixth the present rail rates. The importance of this becomes apparent when it is remembered that the food question is becoming a world problem. It is estimated that the average annual loss from poor roads is 76 cents an acre, while the average increase resulting from improving all public roads is $9.

"The value of our forests was never better appreciated than to-day. Within the arid and semi-arid portions of the Western States nearly 124,000,000 acres are covered with woodland, of value for fuel, fence posts and other purposes essential to the success of the farmer. There also 97,000,000 acres covered with heavy forests having commercial value for timber and logs. Reforestation and conservation of these vast resources are necessary to provide future generations with timber and lumber supplies."

Five Billions for Irrigation

Somebody is shocked because the advocates of irrigation by the National Government suggest spending five billions within a few years, putting water on dry, desert land. One brilliant paragraph writer says: "Only five billions! The national irrigators are too shy. Make it a hundred!"

Yes, make it a hundred billions, by all means, if that amount is required for irrigation, and if the country in the centuries ahead can spare it—which it can.

No money can be spent more wisely than the money spent to supply water, fertility and crops to soil dry and useless without the water.

Five billions seems like a good deal of money, but it isn't very much if it is well spent. The nation that can talk glibly about piling up battle-ships, instruments of death, at ten millions apiece; the nation that can give that fortune of a thousand millions to an individual; the nation, that can spend millions for whisky that ruins the brain and the body—can well afford to spend billions on irrigation, which is the improvement of the earth.

The greatest source of wealth that we know is water. The water is drawn up from the salt ocean, scattered over the land by the clouds. The rain pours into the Great Lakes. And this water, worth many times five billions, rushes out into the ocean, where it is lost, taking with it through the mouth of the Mississippi and other great rivers the valuable soil worth many millions more.

Before the waters of our lakes and rivers run back to the ocean human ingenuity should take all that is needed to scatter over the dry fields. Even the fields that we call fertile need more water, and ought to have it.

Farmers impoverish themselves paying thirty and forty dollars a ton for fertilizer. But the fertilizer without the water is useless, and with irrigation the water would not cost half a cent a ton.

When the Government spends its millions and billions on irrigation it will be doing the real work of the human race on this earth. Our work here is to develop the earth, make it into a beautiful park, fertile, every inch irrigated and cultivated—a park in which human beings may live together in peace and plenty, in harmony and friendship.

This work is going to be done, and the advocates of irrigation help it along. The day will come when not a dollar will be spent for a rifle, a bullet, a battle-ship or a lawyer. Emulation will replace competition everywhere. Contests between men will be contests of the mind, each struggling, not to help himself, but to help the whole of humanity by adding to the wealth and knowledge of the race.

This rich country, with its great lakes, its enormous fortunes, its vast tracts of land that need irrigation, and that will repay irrigation with ten dollars for one, ought to lead in the task of beautifying this earth.

The people of France, after the war with Germany, were condemned to pay a fine of five thousand millions of francs to Prussia. The sum was raised by the French people, not only once, but fourteen times over.

France, a small nation, at the end of a disastrous war, was ready with fourteen billions of dollars to pay a war debt.

Would it be such a horrible thing for this country to raise five billions of dollars to pay part of man's debt to this earth that supports us?—*Boston American.*

Bond Issues for River Improvements

"One of the most vital questions of the hour, and in some particulars the most vital, eliminating tariff revision from consideration, is the question, 'How will Congress meet the demands for improving and maintaining the waterways of the United States?' "

This statement was made by Representative Richard Bartholdt, of Missouri. Continuing, Mr. Bartholdt said:

"I have seen the movement for a waterway bond issue grow from a tiny thing to an almost national demand." It has been and is the practise of Congress to first provide for all the legitimate needs of the Government, and then, if anything is left, to set it aside for waterways, public buildings and so forth. If all the revenues are needed for the regular expenses of the national household, it is the doubtful privilege of the friends of internal improvements to hold the bag. I venture to say that if the Government is to enter upon a policy of favoring systematic internal improvements, a regular annual budget should be provided for that purpose, the same as for the army and navy and all other departments.

"An issue of two or three per cent bonds to the amount of $500,000,000, to be distributed over a period of, say, ten years, will suffice to complete all great waterway projects whose improvement has received the official recommendation of the United States engineer corps, and will forever solve the problem of the permanent improvement of our great waterways.

"I am well aware of the existing prejudice in some sections against an issue of bonds in time of peace, but that prejudice does not exist in the district which I have the honor to represent. This prejudice would be justified if the Government proposed to mortgage the future in order to meet its running expenses. But in the contemplated waterway-bond issue an extraordinary expenditure would be made, with a return for every dollar, and with all the guaranties of a permanent investment for the lasting benefit of the present as well as future generations."

The River as a Carrier

John Callan O'Laughlin gives an interesting summary of the report of the board of engineers appointed to investigate the matter of a fourteen-foot channel between the Lakes and the Gulf.

This report, be it remembered, finds that the plan is feasible, but recommends against it. The report stated, as we remember, that $150,000,000 would be required to put fourteen feet from New Orleans to Chicago, and $5,000,000 a year would be needed to maintain it. In these days of rapid development the commission felt that these figures would show the plan to be futile.

It we were to get fourteen feet from Chicago to New Orleans it would be equal to all the freight a six-track railway could haul. And a six-track railway between Chicago and New Orleans would cost ,probably, $400,000,000. The $5,000,000 for upkeep is a bagatelle. The Illinois Central spends more than that amount for the upkeep of its lines from Cairo to New Orleans.

In order to secure the benefits of cheap transportation by water, more is necessary than merely a channel. The railroads of this country, like the railroads of Germany, France, and England, will eventually come to that condition where certain heavy material cannot be hauled by them at a profit. In these countries coal, rock, lime, salt, wood, cement, and brick are hauled by barges through canals or on rivers.

Heavy structural iron is hauled on the rivers for the reason that cars in England are not made for the transportation of this heavy material.

There is established in these countries, as it were, a community of interest between railroads and river transporting companies. Switch-yards are established on every water-front. The unloading of boats is done by electrical machinery, and the transferring to cars is done in the same way.

There is a public warehouse at every water-front in these countries, and goods are carried by machinery into these warehouses and are distributed.

The time will come in this country when the conditions will force traffic into the water, and this is the main reason why the continued work of the improvement of the rivers should be pushed.—*Memphis Commercial-Appeal.*

The Lesson of the "Soo"

That the loss in a single year from the discontinuance of the operation of the canals at Sault Ste. Marie, Michigan and Ontario, would amount to between $300,000,000 and $400,000,000 in added freights alone, is a fact developed since the recent temporary loss of control of the waters of the Canadian canal at that point. The engineers of the War Department furnish the figures which make it possible to reckon this loss and, incidentally, to throw a strong light on the value to the country of such aids to commerce as these canals.

St. Mary's River connects lakes Superior and Huron and around its falls are built the canals. That on the Canadian side has one lock, while the American canal has two locks, side by side. A vessel jammed its way through the Canadian lock on June 9 and the torrents followed it and became uncontrollable. For two weeks the engineers of two nations were puzzled as to the manner of shutting off that flow; but the feat was finally accomplished.

But before this had been done the question was raised as to what would be the result if the onrush could not be stopped and a similar accident happened on the American side. The answer as to freight advances was given in exact figures by Government engineers who for years have kept tab on the freight that passes through these canals, but the damage to business generally is beyond computation. The freight accustomed to these water-rates would have had to go by rail and would have cost, on the basis of the figures for 1907, $364,000,000, whereas by water the cost would be but $38,000,000. These actual figures compiled by the Government engineers show that freight hauled by

rail that year cost nine and one-half times as much as that handled by boat on the Lakes. The prosperity of all that region tributary to the Lakes has been developed because of these rates and depends upon them for its continuance.

There is before Congress the proposal to adopt a policy for the improvement of all the waterways of the country that offers unquestioned possibilities, and a consequent carrying of the favorable freight rates of the Great Lakes to many sections of the country. A joint commission has been appointed by Congress and instructed to report how this may be done. The report will be submitted to the next Congress and action on the part of that body is expected to follow.

The question that most worries the legislative body is the matter of financing so monstrous an undertaking. In an attempt to solve this riddle the advocates of waterways have come to the conclusion that there is but one answer—the issuance of bonds. They cite the fact that the Panama Canal is being actually built upon this basis and that all private enterprise, such as railroad building, is always accomplished in this way. In fact, there is no other way of accomplishing so great a task, and further, the benefit is chiefly to posterity, and posterity should help pay for it. These men are enthusiasts, and hold that if the cheap rates offered by water transportation are ever to be extended to the people the work should be done now. Among the people none are found who are not willing to accept these low rates.

Mount Pocono Meeting of the Pennsylvania Forestry Association

The summer meeting of the Pennsylvania Forestry Association was held as advertised at the Pocono Manor, near Mt. Pocono, Monroe Co., Pa., July 7-9. Among the features was an address by Dr. J. T. Rothrock on "Desolate Pennsylvania."

Forest Conference in the White Mountains

A forest conference will be held in the White Mountains under the auspices of the Society for the Protection of New Hampshire Forests, at Mt. Pleasant House, Bretton Woods, N. H., Tuesday evening, August 3, and Wednesday, August 4.

The following bodies will meet in connection with the conference: The directors of the American Forestry Association, the state foresters of the Northeastern States, and the New Hampshire State Forestry Commission.

The Society for the Protection of New Hampshire Forests will hold its eighth annual meeting at this time.

Following is the program:

First Session, Tuesday Evening, August 3

Hon. Frank W. Rollins, *Presiding*

8:15. Sonate Pathetique, No. 8...*Beethoven*
Miss Selma L. Stahl.

8:30. "Forest Conditions in the Adirondack and Catskill Reserves, with Special Reference to Reforestation" (illustrated by lantern photographs), Mr. James S. Whipple, State Forest Commissioner, New York.

Second Session, Wednesday Morning

9:30. The eighth annual meeting of the Society for the Protection of New Hampshire Forests. Report of the forester; report of the treasurer; election of officers.

"The Forestry Work of the Women's Clubs," Mrs. Joseph Stenifeld, Forestry Chairman State Federation.

10:30. Conference with the Directors of the American Forestry Association, opened by a discussion of "The Timber and Stone Act, and the Appalachian Bill," Mr. George H. Maxwell, of Chicago, Executive Chairman of the National Irrigation Association. (Of Mr. Maxwell's work in connection with the irrigation bill, Mr. Joseph Cannon said: "We had to get out of the way of the steam engine.")

11:40. "The Grover Cleveland Memorial Road in Tamworth, N. H.," Dr. John H. Finley, President of the University of the City of New York. (President Cleveland established the first National Forests.)

Third Session, Wednesday Afternoon

2:30. Conference with the State Foresters, opened by a discussion of the New Forestry Law in New Hampshire, by Mr. Robert P. Bass, President of the State Forestry Commission.

Other topics: "Forest Fire Patrol and the Mountain-top Observatories in Maine;" "The Proper Scope of a State Forest Service," the Forest Commissioner of Maine, Mr. Edgar E. Ring; the State Forester of Vermont, Mr. Austin F. Hawes; the Secretary of the Massachusetts Forestry Association, Mr. Edwin A. Start, and others, will take part.

Fourth Session, Wednesday Evening

"Forest Conditions in the White Mountains," illustrated by lantern photographs; Mr. Philip W. Ayres.

Forestry Legislation in Pennsylvania

Forest Leaves for June contains a two-page resume of Pennsylvania's new forestry legislation.

H. R., 13, authorizes the department of forestry to grow young trees and distribute them to those who will plant and care for them.

H. R., 147, is designed to create a system of fire wardens, these to suppress and prevent forest fires on woodlots and wild lands; $50,000 appropriated.

H. R., 159, provides that, within certain limitations, all forest reserves shall be subject to an annual charge of 2 cents per acre for school purposes.

H. R., 175, is designed to protect trees growing by roadsides and within road limits, and provides penalties for injuring or destroying trees.

H. R., 253, permits the acquisition of forest or other suitable lands by municipalities for the purpose of establishing municipal forests.

H. R., 542, appropriates $374,500 for the department of forestry.

H. R., 553, appropriates $20,000 for salaries of instructors, stationery, maintenance, etc., and $1,000 to equip laboratory.

H. R., 557, sets aside $100,000 for the purchase of lands for forest reserves, and $100,000 for a similar purpose for the fiscal year beginning June 1, 1909, and an equal amount for the fiscal year following.

The following measures were defeated:

H. R., 226, to regulate the management of timberlands in Pennsylvania for the purpose of preventing floods and droughts, conserving water supply, and securing favorable conditions of water-flow.

H. R., 228, for purchase and distribution of tree seeds.

H. R., 244, to protect privately-owned woodlands from fire, theft, and other damage.

H. R., 257, providing for the protection of the state forest reserves.

H. R., 286, transferring to the department of forestry the control and management of all public highways not improved state highways bordering on or lying within state forest reserves.

H. R., 383, designed to establish auxiliary forest reserves, and punish violations.

H. R., 386, to provide for taxation of auxiliary forest reserves.

H. R., 469, to increase privileges of forestry reservation commission in leasing rights of way, lands for water-power plants, employing forest rangers, etc.

H. R., 813, appropriating $3,500 for the purchase of herbarium and library belonging to Dr. Joseph T. Rothrock.

H. R., 826, appropriating $15,000 to establish recreation camps in forest reserves.

Progress in New Hampshire

Mr. Philip W. Ayres, forester for the Society for the Protection of New Hampshire Forests, writes:

"We have just passed a new law which brings us into the line of the progressive states in having a state forester who works in connection with the state forestry commission of three unpaid members. We have revised our forest-fire laws so that they are excellent, as nearly complete as those in the other progressive states. Our new state forestry commission is made up as follows: Robert P. Bass, Peterborough, president; J. H. Tolles, Nashua, treasurer; W. Robinson Brown, Berlin, secretary. The commission has appointed a new state forester, E. G. Hirst, a graduate of the Yale Forest School. He previously completed his course at the Ohio State University.

"You will be interested that the plans for the Conference at Bretton Woods are making good progress."

What a State Might Do

The latest statistics in the report of the New Hampshire Forestry Commission state that over 800,000 acres of land, once cleared, have since 1880 been abandoned to grow up in brush, says *Collier's*. If New Hampshire had been the municipality of Zurich, Switzerland, this would have been taken under some form of the doctrine of eminent domain, planted with trees, and in the later generation have become an asset for its people. The people of Zurich once found themselves without the timber needed for its maintenance, for the building of its homes, and took this wise step. To-day, when the expense of operation is paid, the property yields to the government of the city something over $15 an acre.

What would be the opinion of the generation of New Hampshire citizens thirty years from now of the work of their forebears if they should find themselves possessed of several hundred thousand acres of white pine, planted and managed by a competent state forester, properly accountable to the people, in place of nearly 1,000,000 acres now shorn of forest and abandoned by the plow?

It is within the constitutional power of the legislative branch of the state government of New Hampshire to seize this land, plant it with trees—with white pine for the advancing generation, and with spruce for the remoter descendants.

An issue of bonds, to pay the expenditure necessary for the condemnation, reforestation and guardianship of the growing forests, and redeemable at stated intervals by the sale of the lands back to to the people, under definite restrictions to insure the preservation of the forests, would probably reimburse the state for its work. It could then be provided that only a certain portion of the growth should be cut in any year, that the trees of small girth should be spared, and that all the danger of fire caused by allowing the waste to remain within the forest should be prevented by compelling the timber harvesters to remove and burn it.

Doctor Hale, during the recent winter, in one of his addresses, offered the suggestion that towns become the owners of forests just beyond the village limits, as has been done in Zurich. This would act as a supplementary reforestation to that of the state—which would obviously apply only to

the larger areas. It might be wiser to begin the work by degrees, testing its success gradually. But three things are certain—the state of New Hampshire has the power to do this service for the next century; it will return the forests to all but the mountain tops; the desolated lands will become an asset, while now they are unproductive. —*Pueblo* (Colo.) *Chieftain.*

America's Awful Fire Losses

Fire is one of the wasteful extravagances of the American people.

We have been extravagantly wasteful in the past in building without much regard to the destruction by fire, and in this respect we have nearly bankrupted insurance companies and expended in rebuilding nearly as much as originally invested. Indeed, in some years we burn up more than we actually build. This was notoriously the case in the year of the great San Francisco fire and in the first half of the panic year of 1908. In a normal year, such as 1907, we lost through fire buildings valued at $215,000,000. Some years we run as high as half a billion dollars in fire losses, and again we get along with a loss of only $300,000,000.

We have grown so used to fire losses in this country that little attention is paid to one that causes a loss of half a million dollars. Such a fire gets no more than a few lines in the national press unless there are harrowing accounts of lives jeopardized. Even the newspapers are not roused from their apathy regarding fires unless there is something spectacular about them, and it takes a catastrophe that wipes out half a city to induce them to give big scarehead lines. In New York City we suffer an annual fire loss of between $6,000,000 and $8,000,000, but only a few of these attract any special attention. It is estimated that it costs the city over $50,000,000 a year to protect itself from fires, including the private and public protection and equipment and maintenance of the fire department. — George Ethelbert Walsh in *Moody's Magazine.*

The Death of Colonel Fox

All friends of forestry will learn with sincere regret of the unexpected death of Col. William Freeman Fox, of New York State. In its *Field Program* for July, the United States Forest Service publishes the following:

"With profound regret, announcement is made of the death, on June 16, of Col. William Freeman Fox, a collaborator of the Forest Service, and, until June 1, 1909, superintendent of state forests, New York Forest, Fish and Game Commission. Colonel Fox was born on January 11, 1840, at Ballston Spa, N. Y., and served with great credit through the civil war. Later he traveled extensively in Europe, studying forest conditions and the different systems of forest management, and in 1886 entered the service of the state of New York. To Colonel Fox's aggressiveness and foresight is due in large measure the present forest policy of the state. As a collaborator of the Forest Service, he rendered important aid to the Government. Colonel Fox was an associate member of the Society of American Foresters and the author of a number of books on the forests of New York."

The Society of American Foresters, Washington, D. C., has passed resolutions expressing its appreciation of the work of Colonel Fox, of his genial disposition, and of the assistance which he has always been glad to extend to young foresters.

Austin Cary Succeeds Colonel Fox

Austin Cary, assistant professor of forestry in Harvard University, succeeds Colonel Fox as superintendent of state forests, New York Forest, Fish and Game Commission. Professor Carey was for six years forester for the Berlin Mills. He is author of "Six Years of Practical Forestry in a Spruce Tract in Maine," published as a Forest Service bulletin, and also of "A Manual for Northern Woodsmen," published by Harvard University, 1909.

The National Irrigation Congress

Continent-wide interest has been aroused in the seventeenth session of the National Irrigation Congress, which will meet in Spokane, August 9 to 14. Speakers of national reputation will discuss problems of reclamation of arid and swamp lands, deep waterways, forestry, conservation of the Nation's resources, good roads, and home-building. Railroad presidents, financiers, scientists, statesmen, Government officials, engineers, and practical men in other lines of industrial activity have accepted places on the program, and, with from 4,500 to 5,000 delegates, including farmers, orchardists, and truck gardeners; representatives of all parts of the country, and visitors from the East, West, North, and South, there is every indication that the gathering will be the best attended and most important in the history of the organization.

BACK NUMBERS WANTED

The office of CONSERVATION desires a few copies of the issue for November, 1908, for which it will pay twenty cents each.

Any having available copies will oblige by advising this office.

The American Forestry Association

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Application for Membership

To OTTO LUEBKERT
Secretary American Forestry Association
1417 G Street N. W., Washington, D. C.

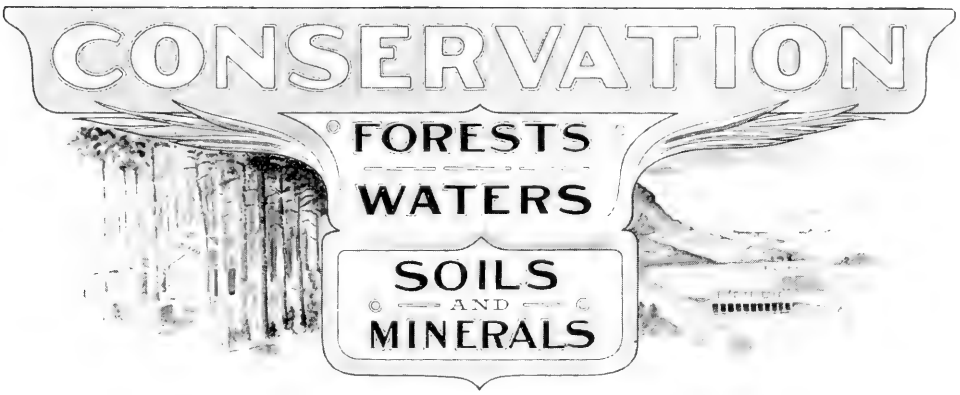
Dear Sir: I hereby signify my desire to become a member of the American Forestry Association. Two Dollars ($2.00) for annual dues are enclosed herewith.

Very truly yours,

Name_____

P. O. Address_____

Theodore Roosevelt, Author of the Conservation Policy



Vol. XV SEPTEMBER, 1909 No. 9

HOME-BUILDING FOR THE NATION

By GIFFORD PINCHOT, United States Forester, and Chairman National Conservation Commission*

THE most valuable citizen of this or any other country is the man who owns the land from which he makes his living. No other man has such a stake in the country. No other man lends such steadiness and stability to our national life. Therefore, no other question concerns us more intimately than the question of homes. Permanent homes for ourselves, our children, and our Nation—this is the central problem. The policy of national irrigation is of value to the United States in very many ways, but the greatest of all is this, that national irrigation multiplies the men who own the land from which they make their living. The old saying, "Who ever heard of a man shouldering his gun to fight for his boarding-house?" reflects this great truth, that no man is so ready to defend his country, not only with arms, but with his vote, and his contribution to public opinion, as the man with a permanent stake in it—as the man who owns the land from which he makes his living.

Our country began as a nation of farmers. During the periods that gave it its character, when our independence was won and when our Union was preserved, we were preeminently a nation of farmers. We cannot, and we ought not, to continue exclusively, or even chiefly, an agricultural country, because one man can raise food enough for many. But the farmer who owns his land is still the backbone of this Nation; and one of the things we want most is more of him.

The man on the farm is valuable to the Nation, like any other citizen, just in proportion to his intelligence, character, ability, and patriotism; but, unlike the other citizens, also in proportion to his attachment to the soil. That is the principal spring of his steadiness, his sanity, his simplicity and directness, and many of his other desir-

*Delivered before the National Irrigation Congress at Spokane, Wash., on August 10, 1909.

Undeveloped Water-power in Stevens County, Washington

able qualities. He is the first of home-makers.

The nation that will lead the world will be a nation of homes. The object of the great conservation movement is just this, to make our country a permanent and prosperous home for ourselves and for our children, and for our children's children, and it is a task that is worth the best thought and effort of any and all of us.

To achieve this or any other great result, straight thinking and strong action are necessary, and the straight thinking comes first. To make this country what we need to have it, we must think clearly and directly about our problems, and, above all, we must

understand what the real problems are. The great things are few and simple, but they are too often hidden by false issues, and conventional, unreal thinking. The easiest way to hide a real issue always has been, and always will be, to replace it with a false one.

The first thing we need in this country, as President Roosevelt so well set forth in that great message which told what he had been trying to do for the American people, is equality of opportunity for every citizen. No man should have less, and no man ought to ask for any more. Equality of opportunity is the real object of our laws and institutions. Our institutions and our laws are not valuable in themselves. They are valuable only because they secure equality of opportunity for happiness and welfare for our citizens. An institution or a law is a means, not an end—a means to be used for the public good; to be modified for the public good, and to be interpreted for the public good. One of the great reasons why President Roosevelt's administration was of such enormous value to the plain American was that he understood what St. Paul meant when he said: "The letter killeth, but the spirit giveth life." To follow blindly the letter of the law, or the form of an institution, without intelligent regard both for its spirit and for the public welfare, is very nearly as dangerous as to disregard the law altogether. What we need is the use of the law for the public good, and the construction of it for the public welfare.

It goes without saying that the law is supreme and must be obeyed. Our civilization rests on obedience to law. But the law is not absolute. It requires to be construed. Rigid construction of the law works, and must work, in the vast majority of cases, for the benefit of the men who can hire the best lawyers and who have the sources of influence in lawmaking at their command. Strict construction necessarily favors the great interests as against the people, and in the long run cannot do otherwise. Wise execution of the law must consider what the law ought to accomplish for the general good. The great oppressive trusts exist because of subservient lawmakers and adroit legal constructions. Here is the central stronghold of the money power in the everlasting conflict of the few to grab, and the many to keep or win the rights they were born with. Legal technicalities seldom help the people. The people, not the law, should have the benefit of every doubt.

Equality of opportunity, a square deal for every man, the protection of the citizen against the great concentrations of capital, the intelligent use of laws and institutions for the public good, and the conservation of our natural resources, not for the trusts, but for the people; these are real issues and real problems. Upon such things as these the perpetuity of this country as a nation of homes really depends. We are coming to see that the simple things are the things to work for. More than that, we are coming to see that the plain American citizen is the man to work for. The imagination is staggered by the magnitude of the prize for which we work. If we succeed, there will exist upon this continent a sane, strong people, living through the centuries in a land subdued and controlled for the service of the people, its rightful masters; owned by the many and not by the few. If we fail, the great interests, increasing their control of our natural resources, will thereby control the country more and more, and the rights of the people will fade into the privileges of concentrated wealth.

There could be no better illustration of the eager, rapid, unwearied absorption by capital of the rights which belong to all the people than the water-power trust, not yet formed, but in rapid process of formation. This statement is true, but not unchallenged. We are met at every turn by the indignant denial of the water-power interests. They tell us that there is no community of interest among them, and yet they appear year after year at these congresses by their paid attorneys, asking for your influence to help them remove the few remaining obstacles to their perpetual and complete absorption of the remaining water-powers. They tell

Irrigation Results: An Eight-year-old Jonathan Apple Tree Bearing Ten Boxes of Fruit

us it has no significance that the General Electric interests are acquiring great groups of water-powers in various parts of the United States, and dominating the power market in the region of each group. And whoever dominates power, dominates all industry. Have you ever seen a few drops of oil scattered on the water spreading until they formed a continuous film, which put an end at once to all agitation on the surface? The time for us to agitate this question is now, before the separate circles of centralized control spread into the uniform, unbroken, nation-wide covering of a single gigantic trust. There will be little chance for mere agitation after that. No man at all familiar with the situation can doubt that the time for effective protest is very short. If we do not use it to protect ourselves now, we may be very sure that the trust will give hereafter small consideration to the welfare of the average citizen when in conflict with its own.

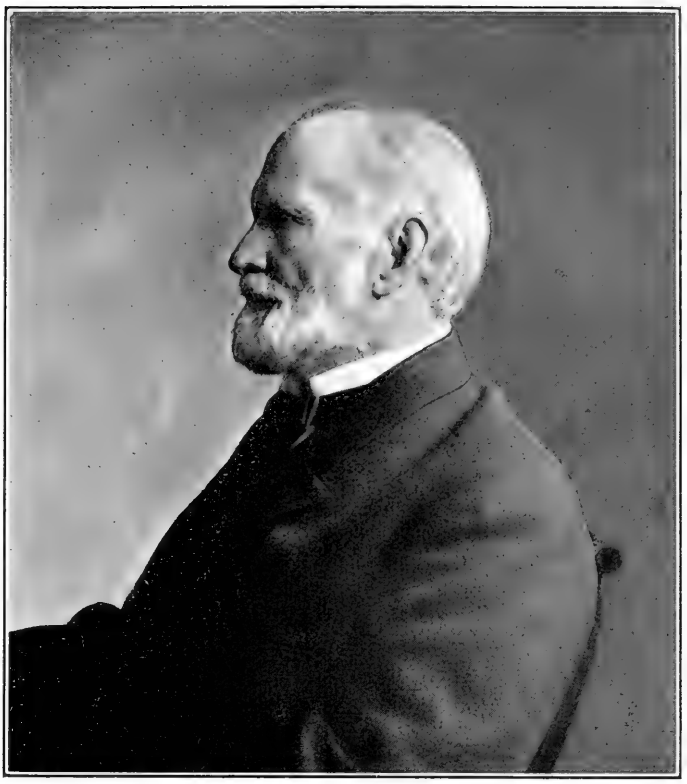
The man who really counts is the plain American citizen. This is the man for whom the Roosevelt policies were created, and his welfare is the end to which the Roosevelt policies lead. As a nation, we are fortunate at this time in this fact above all others, that the great man who gave his name to these policies has for his successor another great President whose administration is most solemnly pledged to the support of them.

I stand for the Roosevelt policies because they set the common good of all of us above the private gain of some of us; because they recognize the livelihood of the small man as more important to the Nation than the profit of the big man; because they oppose all useless waste at present at the cost of robbing the future; because they demand the complete, sane, and orderly development of all our natural resources, not forgetting our rivers; because they insist upon equality of opportunity and denounce monopoly and special privileges; because, discarding false issues, they deal directly with the vital questions that really make a difference with the welfare of us all—and most of all, because in them the plain American always and everywhere holds the first place. And I propose to stand for them while I have the strength to stand for anything.

President Roosevelt's Acknowledgments to Mr. Gifford Pinchot

"We have been doing everything in our power to prevent fraud upon the public land. . . . So much for what we are trying to do in utilizing our public lands for the public; in securing the use of the water, the forage, the coal, and the timber for the public. In all four movements my chief adviser, and the man first to suggest to me the courses which have actually proved so beneficial, was Mr. Gifford Pinchot, the Chief of the National Forest Service. Mr. Pinchot also suggested to me a movement supplementary to all of these movements; one which will itself lead the way in the general movement which he represents and with which he is actively identified, for the conservation of all our natural resources. This was the appointment of the Inland Waterways Commission."—Address of President Roosevelt before the National Editorial Association at Jamestown, Va., June 10, 1907, at 2 p. m.

"All these various uses of our natural resources are so closely connected that they should be coordinated, and should be treated as part of one coherent plan and not in haphazard and piecemeal fashion. It is largely because of this that I appointed the Waterways Commission last year. . . . The reason this meeting takes place is because we had that Waterways Commission last year. . . . Especial credit is due to the initiative, the energy, the devotion to duty, and the farsightedness of Gifford Pinchot (Great Applause), to whom we owe so much of the progress we have already made in handling this matter of the coordination and conservation of natural resources. If it had not been for him, this Convention neither would nor could have been called."—President Roosevelt in his opening address to the Conference of the Governors of the United States, White House, May 13, 1908.



James Wilson, Secretary of Agriculture

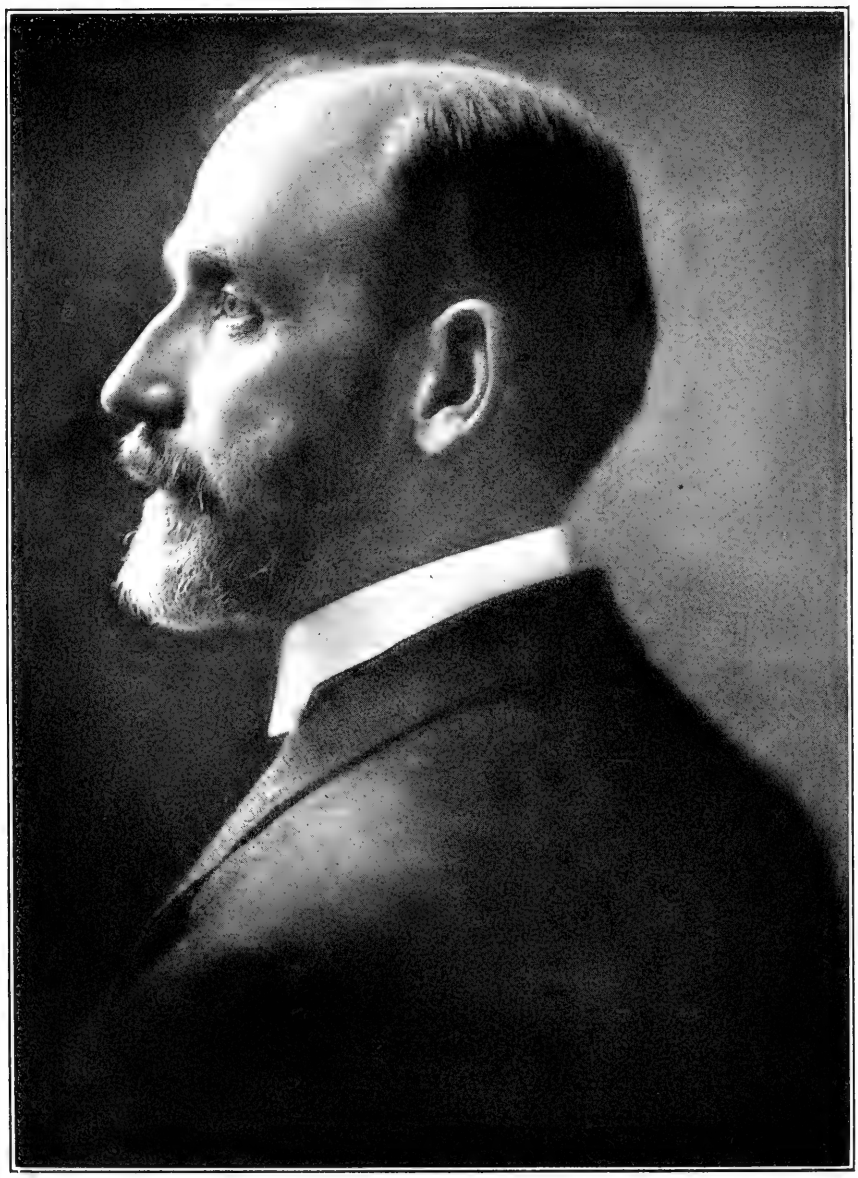
THE NATIONAL IRRIGATION SITUATION

By FREDERICK HAYNES NEWELL, Director of the United States Reclamation Service*

THE present situation in national irrigation is that homes are being provided for thousands of self-supporting citizens at no cost to the taxpayer. Seven years have elapsed since the passage of the Reclamation Act. Under its operation irrigation works have been built in thirteen western states and two territories by which waters are conserved and distributed and nearly 700,000 acres already brought under irrigation, with returns to the fund amounting already to over $1,000,000. The success obtained may be said to justify the hopes of the most enthusiastic of the early advocates of the Reclamation Act.

The law signed by President Roosevelt on June 17, 1902, known as the Reclamation Act, is, perhaps, the most prominent of the statutes dealing directly with the conservation of natural resources and with the utilization of these in creating opportunities for a a large body of citizens to own land in small quantities sufficient for the sup-

*Delivered before the National Irrigation Congress at Spokane, Wash., on August 9, 1909.



Frederick Haynes Newell Director U. S. Reclamation Service

port of a family. To quote a well-worn phrase, its object is to put "the landless man on the manless land," and to enable his family to prosper by the use of waters which otherwise flow to waste or are destructive of human life and property. The land which otherwise is valueless becomes highly productive through the intelligent application of the water thus conserved, and through the labor of the man who otherwise might be unable to employ his energies for the best good of his family and of the commonwealth.

The Nation is concerned in this work, not only because of the resulting internal development, but also because of the improvement in citizenship and in stability of American institutions. The nomadic herdsman, the restless miner and the wandering laborer add little to the strength or safety of the community, but let one of these men become attached to the soil; let him own a small farm which is sufficiently productive to furnish his family with needed subsistence and comforts, and he becomes a citizen who can be depended upon, in season and out of season, to preserve those institutions which we most highly prize.

This result of adding to the productive area of the country and the building up of the highest type of citizenship is brought by the expenditure of a fund not created by direct taxation nor taken from the pockets of other farmers. The fund is derived from the proceeds of the disposal of public lands acquired a century or less ago and which have been considered almost valueless. These funds are expended in the construction of reservoirs and canals, the water from which is not given away, but is sold at a rate sufficient to repay the cost and to maintain the fund undiminished. * * *

While the Government has utilized this fund in making homes in localities where otherwise this would not have been done, private capital has also made great advances, and possibly at present five or ten times as large an investment in the aggregate is being made by corporations in building irrigation works as is being invested by the Government. Much of this investment, however, has been made possible, or at least has been stimulated by the Government work. The fact that the National Government has deemed it wise to take up the matter has been one of the strongest arguments appealing to capitalists to do likewise.

There is no competition as between national and private funds, but rather an attempt at all times on the part of the Government to stimulate legitimate enterprise through obtaining facts upon which investments might be safely made, and to avoid taking up such work as could be handled successfully by others. Looking back, it now seems probable that if the Government had not begun work in each of the western states, many of the enterprises now successful under private auspices would not have been taken up; but, on the other hand, some of the enterprises on which the Government is now engaged, if left dormant for several years, would have been entered upon by private capital.

The reclamation fund has been larger than was expected, upward of $52,000,000 being available to December, 1909, this being twice as much as was foreseen. There have been laid out systems which involve the ultimate reclamation of several million acres. Large works, whose magnitude is such that they have been passed over by private and corporate enterprise, have been built. In all, it may be stated that in round numbers there were ready for irrigation at the beginning of the irrigation season of the present year over 5,000 farms, with an aggregate acreage of 700,000 acres.

Storage of flood waters had been created and in actual use to the extent of 1,000,000 acre-feet. Canals and ditches were ready for use of an aggregate length of more than 3,000 miles. Fifty-eight tunnels had been built of a length of 85,000 feet. Many thousands of smaller structures, such as headgates, flumes, bridges, and turnouts, were completed; a thousand miles of telephone in operation, and yardages of earth moved comparable to that handled in the same time at Panama.

Minidoka Dam, Nearly Closing the Snake River, Idaho

Field of Irrigated Lettuce, Sanford, Fla.

More than all this showing of material progress are the excellent results accomplished in carrying out the purpose of the act, namely, the making of opportunities for homes. The wise provision of the law restricting acreage has been enforced, and there is a well marked beneficial result in the subdivision of large areas of irrigable land and the placing of this in the hands of men competent to successfully cultivate the soil and make permanent homes. The speculative element has been largely absent.

The works now in hand will require all of the reclamation fund for several years. Each large work is completed to a point where it has made possible hundreds of homes, and where returns are coming to the fund, but it has numerous ramifications or divisions, each of which requires considerable more money for completion. There is no lack of work when these are finished. The opportunities for further conservation of the waste waters are almost unlimited. * * *

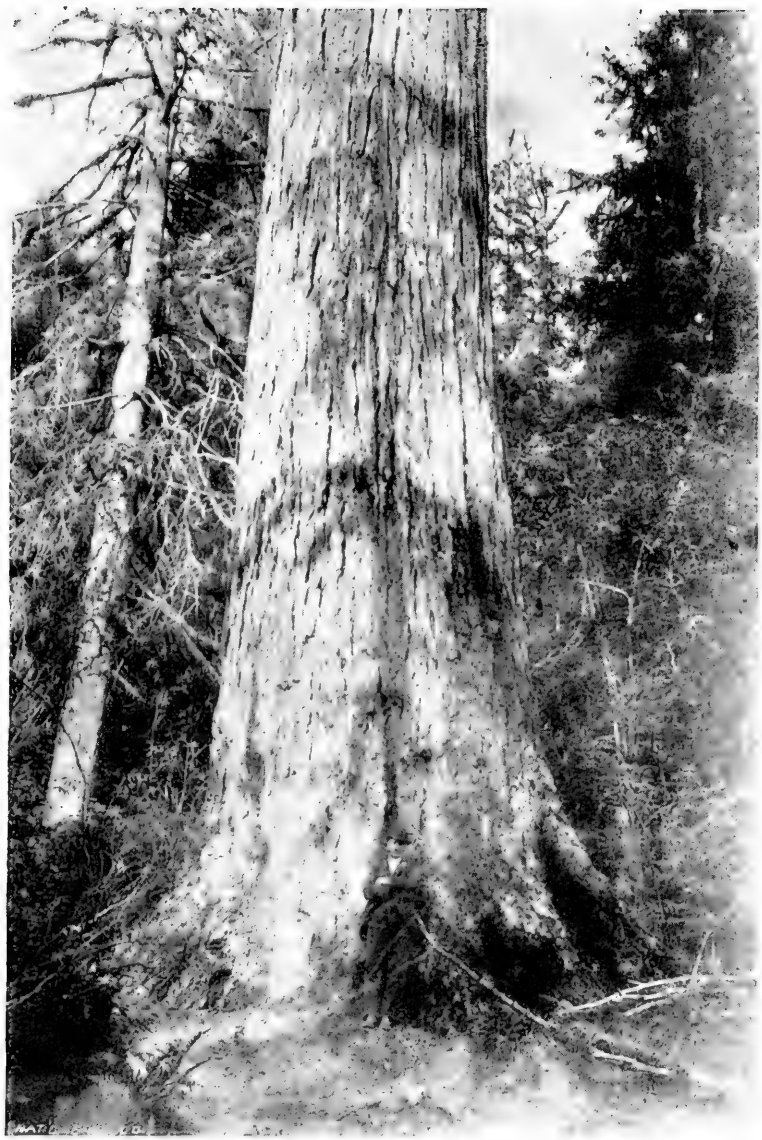
The main intent of the Reclamation Act in bringing about beneficial results to the multitude frequently puts the individual to annoyance and expense. The requirements of residence on the land, or in the neighborhood is freely criticized as involving unnecessary hardship, and yet this is one of the requirements which the majority of Congress considered as being an essential condition for the advancement of Federal funds.

The slowness of the work is also criticised and it has come to be a matter of general remark that the Government is always slow. This, like many truisms, is a statement which does not stand close analysis. There are few corporations which have accomplished with the funds available as much as has been carried on by the Reclamation Service. * * * The people are impatient for all the improvements to be carried on at once, forgetting that revenues are not sufficient. * * *

The successful handling of the reclamation fund probably requires as much, if not more, skill and patience than in any industrial enterprise. On the one hand are the settlers clamoring for immediate results; on the other hand are engineering problems and complications of vested rights to water and difficult rights of way, with defective land titles, all of which must be patiently worked out under very exacting regulations.

The Federal employee is regarded by all as a proper target; when joined with this is the fact that the man in control of the ditch is, as a matter of course, regarded by every one as responsible for every evil in the community, you have a combination which requires almost unlimited skill, tact, and self-control.

The Reclamation Act is not a perfect document, but, like most acts of Congress, is the result of compromise of many conflicting ideas. It is purposely broad and leaves as many details as possible to executive discretion. Wherever it may be defective these defects can only be remedied in one way, namely, by Congress, and not by any official. It is worse than useless, therefore, to attempt to remedy these defects, if they exist, through criticism of the methods adopted by the officials in direct charge. Any needed improvements should be brought to the attention of the law-making body and particularly to the Committees on Irrigation of the Senate and House, each of which is seeking for suggestions and intelligent advice from practical men.



Douglas Spruce Near Astoria, Oreg., Diameter Thirteen Feet, Estimated Height Three Hundred Feet

NOTES ON SOME FOREIGN FORESTS

By CHARLES E. BESSEY

Professor of Botany in University of Nebraska

I HAVE never traveled strictly as a forester, any more than I have as a botanist only, or as a simple sight-seer or a mere "globe-trotter." When I travel I like to be on the lookout for everything that comes along, whether it be botanical, zoological, geological, agricultural, anthropological, economical, or comical. Yes; I enjoy the latter, and must confess to keeping my eyes constantly on the lookout for the comicalities of travel, and I am sure that much of my continued enjoyment of travel is due to this relaxation. So I manage to see a good deal of my surroundings when I take a run through a new country, and it is in this way that I have picked up some things about the forests of the Old World.

Many years ago I made the acquaintance of an English chemist, who much later invited me to visit his country place in the edge of Epping Forest, a few miles northeastward from London. Of course, I went and had the pleasure of driving out into the famous old forest. Originally, this was a tract of about 60,000 acres of a notable forest growth, covering an area from eight to ten miles in length (north and south) and from less than a mile in width to near two miles. Here were formerly some gigantic trees, one oak (*Q. robur*) having a diameter of nearly nine feet. But, alas, Englishmen were formerly as careless of their forests as Americans have been, and this great, public tract was despoiled of many of its finest trees, and even the land was stolen, until public sentiment demanded that the remnant at last should be saved. Yet it was not until 1871 that these ravages were stopped by an act of parliament, which has saved for posterity a tithe of the great tract, no longer a stately forest, but an open glade with here and there a tree, or a group of trees, and more rarely a denser forest mass. And yet I enjoyed my visit to this old forest, for although mostly despoiled of its trees, and with its area reduced through the rapacity of unauthorized land-seekers, it is still a witness to the fact that the people will not allow unlimited destruction of the public domain. It took the English public a long time to wake up to the fact that this great forest was being destroyed, just as it has taken a long time for the American public to realize that their forests were being ruthlessly destroyed.

West of London, at Kew, is another old forest worthy of a long journey to see. A long time ago the kings and lords used to delight to rest, or hunt, or carouse in the forests at Kew and near-by Richmond. With the fear of the royal displeasure before them, despoilers were kept from destroying the trees or stealing the ground, and so one may find here in the edge of the great city dense forests that seem never to have suffered from vandal axmen. It seemed strange, indeed, to be able to stroll, as I did, out among the old trees until I reached a solitude as absolute as that one finds in the Selkirk forests of the great Northwest. I sat under an enormous beech, and could scarcely realize that I was so near the greatest city in the world, with its century-old buildings, its treeless streets, and its noisy, restless throngs of tired, anxious people. A part, now, of the Royal Botanical Gardens at Kew, this forest may well stand as long as the world endures. Here oak trees, now a century or two old, may live on until old age claims them. Here young trees, now mere whips, may grow to be giants, and in their turn they, too, will pass into the decline of old age and drop their limbs

Green Lake Reservoir Site, Washington

and go down to death. And yet the Kew forest will live on to show the denizen of the great city what trees, and shade, and cooling rest are. I shall not soon forget the pleasant hours I passed in the old Kew forest.

As one runs through rural England he sees many bodies of forests; in fact, one is impressed with the abundance of trees in the ordinary English landscape. It shows that at bottom John Bull loves the forest, and loves trees—for in the fields and along fence rows everywhere one sees trees. Maybe his love of hunting had something to do with it, but even this reason for preserving the patches of forests is far better than that greed which sees nothing but so much money-bringing lumber in every tree and every acre of forest. Let us honor the Englishman for his love of trees, and let us learn from him that a beautiful landscape dotted with trees has a value for our lives that cannot be estimated in terms of money—that the rest and shade of a piece of woodland are of more value than rubies, and that all the gold of Ophir cannot buy them.

On the Continent one is impressed with a feeling that centuries ago the people cleared away the forests, and laid waste the whole land. As a rule, the only natural forests are those on the steep hills and mountains where man could not make cultivated fields. Here the feeling that prevailed was like that which still dominates in America, namely, that a forest-covered tract has only two possible uses: (1) to be cut for its wood, as fuel or lumber; and (2) to be turned into fields to be plowed. And too often where the axman did not care to cut the trees for his use, the plowman demanded the removal of the trees in order that he might have fields to plow. So, as the centuries went on, the country was mostly cleared of trees, and then came the awakening. And to-day one sees artificial forests that have become a necessity because of the reckless lack of forethought of the people many years

The Pulp-wood Industry. Cutting Spruce in the Adirondacks

Scene on Menominee River at Marinette, Wis. Formerly for a Number of Years 700,000,000 Feet of Pine Was Driven Down This Stream Each Spring

ago. Europe is paying now for her wastefulness centuries ago, just as we are soon to begin to pay for our similar wastefulness.

Much as we may admire the Germans for the many artificial forests which they have planted, we must not overlook the fact that this is a very expensive way of securing forests. It is far easier and less costly in money and labor to *keep* a forest than to make one. Fortunate it is, indeed, that when we have lost our forests we can make new ones; but let us not delude ourselves with the thought that it is, after all, quite as easy as to bother with the preservation of the natural forests. As one looks at the planted forests of Germany the thought comes forcibly that man is, after all, a puny creature. Compare the little patches of artificial forests, composed of "sapling" trees, with the endless stretches of forests of gigantic trees that once covered the region from the prairies to the Atlantic Ocean. In my boyhood I was fortunate enough to live where there were yet large tracts of untouched forests of oak, beech, maple, ash, elm, hickory, walnut, and chestnut, and I have wandered for hours among the giants that had held their ground for centuries. And later, I lived for a time in the pine woods of Michigan, where one might walk for days without leaving the primeval forest. Do you wonder that I advocate the conservation of forests rather than the planting of forests? Not that I would discourage planting; do that by all means; but where nature has already established a forest, let us keep it—let us preserve it. Let us stop the reckless destruction of trees by the axman; let us say to the plowman that the public good forbids him to kill the forest merely that he may plow the ground for his crops. Let us not do as was done in western Europe—kill the natural forests, and then be compelled to depend upon planted ones alone.

Between Halle, in south Germany, and Berlin, there are numberless little blocks of planted forests. And indeed they looked very pretty, and are very interesting to study, with their carefully planned successions of plantings, looking like so many green steps on the landscape. And yet I could not help thinking of the big sawmills I have seen in the Michigan woods, and later on Puget Sound, and I wondered how many days these little forests would last before one of them. And when I have heard about the great mills that make paper pulp I have wondered again how many hours it would take one of them to grind up these pretty patches of planted trees.

Between Berlin and Moscow the artificial forests are mainly planted upon the sandy areas that stretch across the country, here and there, and as one goes farther eastward these finally merge into natural timber belts that have been conserved, and somewhat improved by additional plantings, and these, in turn, are followed by unmodified natural forests.

But none of these forests impresses one as of great value as compared with the original forests of eastern North America, since the trees are small, and of species that have low value as timber producers. Southward from Moscow to the Caucasus Mountains are the great, treeless steppes, exactly like the region of the prairies and plains between the Mississippi River and the Rocky Mountains. Here is a black soil which is covered with grassy vegetation, but upon which trees will grow if planted. Here and there one finds thrifty trees or groves, planted by the landholders, showing that the conditions there and here are alike.

Farther south lie the Caucasus Mountains, with a sparse forest growth on the north slopes. I was told that these mountains were once forest-covered on their northerly sides, and I can well believe the statement, for here and there are forest areas that appear to be the remnants of a former general forest growth. Here, however, the destruction of the forests was the voluntary act of an invading army seeking to dislodge the fierce tribesmen. The result, alas, is that the great mountains are now bare of trees, and the rivers

The Top of a Dune on the Jersey Coast Held by a Patch of Bayberry

have become dangerous and destructive mountain torrents. On the southerly slopes the forests still persist, and give one some idea of what they probably were once throughout this mountain region. I have scarcely seen their equal anywhere, and here they stand as they have stood for ages, and the streams that come from them are living streams which flow peacefully and harmlessly in their channels, in sharp contrast to those on the northerly slope. If any one is in doubt as to the effect of the removal of the forests upon stream-flow, he has but to contrast the two sides of the Caucasus Mountains. On the treeless side, the rivers are uncontrollable torrents that rush down suddenly, rend and tear the valleys, and carry sand and gravel out upon the level farm lands below the mountain sides; on the other, the streams flow steadily, and the little fields in the lower valleys are not molested. On the one hand, the forests retain and restrain the waters; on the other, the deforested, naked mountain sides allow the waters to run off at once with destructive rapidity.

A River Scene

THE ABANDONED FARM

By J. OLIVER SMITH

A FEW years ago the so-called abandoned farm was in reality forsaken, left to the mercy of the elements; and though mother nature tried to cover up the slow decay by luxuriant growths of vine and creeper, by banks of wild roses and the persistent bloom of daisy, larkspur, and caraway, which some loving hand had planted near the doorway, still the tangle of bush and brier told its own story of neglect and also of longing. At the present time the longing and loneliness which even nature might be supposed to feel

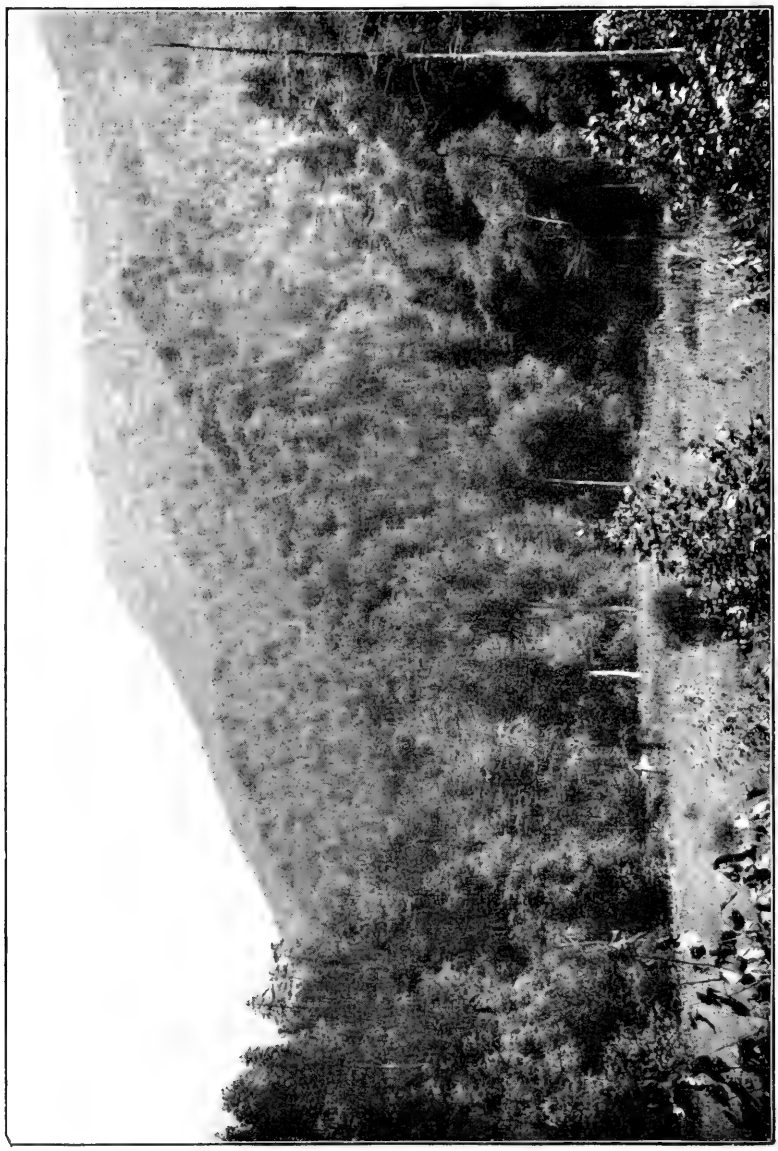
> For the touch of a vanished hand
> And the sound of a voice that is still,

have been in some measure relieved by the extent to which these places have been taken by summer residents, and the tenderness of home given back to the locality by the bestowal of more care than that given by their original owners and occupants. What new delight the summer resident feels over every changing panoramic view, in sunshine or in storm, beautiful beyond description, and soul-satisfying after the limitations of the city.

Several years ago it was the good fortune of a little family who had been living in one of our smaller cities to find such a home for the summer in a section of the western Adirondacks. The father being a professional man with but little leisure for summer outings, and belonging to that school of "reservists" who think that home is the best place for the family—and with reason—that there is altogether too much hotel life for the good of the rising generation, seldom in his busy practise found an opportunity for a vacation and seldom admitted the necessity for it as a nerve tonic, a rest cure, or an inspiration. The family had without much rebellion accepted his opinions. But as the daughters grew toward womanhood and the mother noted a delicacy of coloring in the cheek of one of them, and a growing languor in her appearance, some plan was in process of evolution to give them the tonic of the woods and fields without the nerve-exhausting distraction of crowds nor the wearing effect of coming in close contact with different personalities.

Just at this time the mother heard, through a friend, of a place in one of our northern counties which was for sale at a low figure. She wrote to the friend and found that there was such a place. He gave a glowing account of it in its natural scenery, not far from the junction of two rivers and only a few miles from some of the famous Adirondack lakes. "The house itself," he said, "was merely an unfinished farm house, and might disappoint a purchaser who had not seen the small houses in that section of country; but there was a fine old barn, weather-beaten outside, but with beams and rafters that might last a century. There were sixteen acres of farm and woodland, and a clear title could be given. But there was an "if" in the way. It had other prospective purchasers, and would be held only one day more!

As it happened, the father was, for the time being, on the other side of the continent, having been sent as a delegate to an important convention held in a city near the Pacific coast. It was an important step to take without consultation; and the mother, dreading the responsibility of it, might have lost the opportunity, had it not been that one



Typical Forest-covered Mountain-side

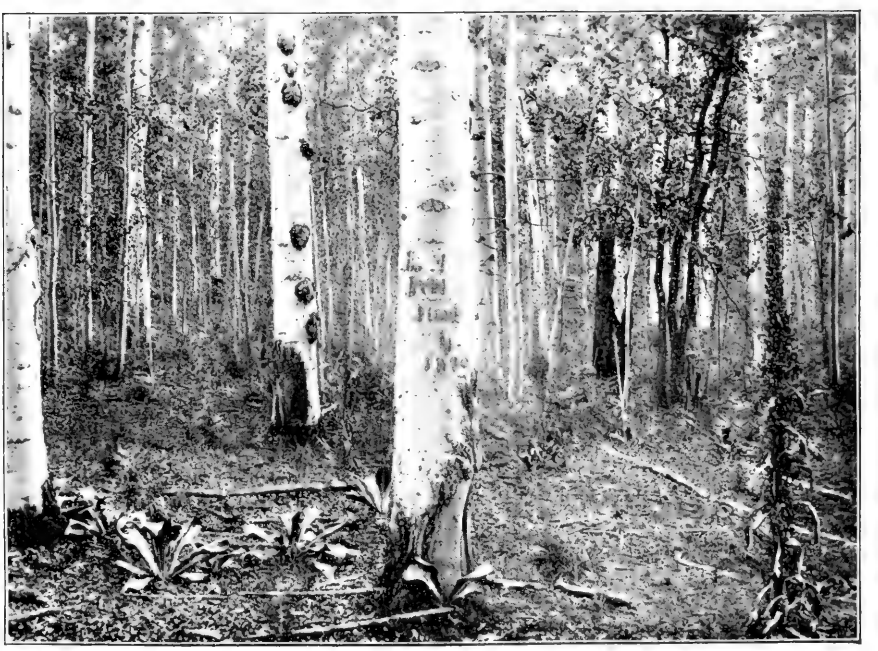
of the little womanly daughters took matters into her own hands and decided the question.

She reminded the mother that out of their own pocket money, which they had saved, they could pay the first instalment on the little place and with a slight advance from the mother's purse might pay the whole if they were satisfied on seeing it.

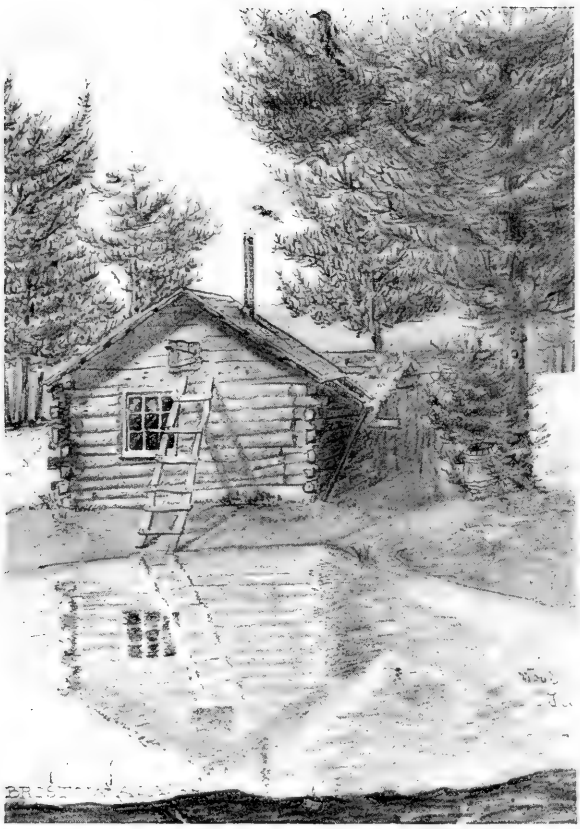
"As sister is the one who needs the change most," said the little promoter, "you and she start off this very afternoon on a prospecting tour, and I'll stay and keep house; and if you get it, telegraph me, and I'll break the news to papa just as soon as he gets home."

It was with eager anticipation that the two travelers set out on their journey, and to the mother's delight she saw the flush of pleasure and interest steal into her daughter's face as they

A Woodlot Consisting of White Oak, *Populus Tremuloides*, and *P. Grandidenta*
Situated in Vernon County, Wisconsin



Grove of Aspen in the Black Mesa Forest Reserve



A Hut in the Woods

went into the unknown. By car and stage they journeyed until late afternoon, when at length, from the rose-embowered steps of the little chateau, they had the pleasure of seeing one of the finest sunsets they had ever beheld, and the aroma of that divine, balsam-laden air seemed the elixir of life.

Although the first sight of the little house was disappointing, they soon saw the possibilities of the place, and finding that there was a spring of ice-cold water under the hill, soft and clear as crystal, and that there were also many kinds of trees on the place, with a border of real forest in the background, and also that it was not too far from other human habitations, the purchase was made before the end of the following day.

The telegram was sent to the sister at home, and, later, a letter, to come as soon as she could get the father's consent, and to ship from the real home all the surplus odds and ends which might be spared.

The result was, after a few days, a letter of commendation from the absent father, praise for their decision of character, reimbursement for their outlay, a quick conversion on his part to the vacation idea, and a promise of a visit to their little chateau on his return.

Busy hands and loving hearts now planned the adornment of the little summer home, to be in readiness for the father's coming. The unplastered walls were soon covered with cream-colored unbleached muslin, bought by the piece at the nearest country store. This was tacked on with care, while the great beams overhead were left bare in the colonial style of our great grandmothers. Branches of balsam hemlock and garlands of running pine graced

A Perennial Southern Slope of Mt. Mitchell Fed by Water Stored in the Forest-covered Slope Above

these white, upholstered walls, and before the father appeared on the scene a very habitable little home had arisen like magic from out of its bower of June roses with their mass of bloom and brightness. Hammocks were swung under the tall maple, and a rustic seat placed under the "climbing trees"—a name given by a little child of the circle to the grove of aspen trees a few rods away from the house.

The sequel has proved the wisdom of the purchase, for both health and happiness have been the order of the hour in every summer day spent in that quiet retreat. The cost of living has been slight; plenty of fresh eggs, spring chickens, and milk have been available from the neighboring farmers; no servants were required, for the living was simplicity itself.

After the first year the nearer fields were placed under cultivation, the soil enriched by phosphates, and the family soon had the deep, satisfying pleasure of watching the growing grains and vegetables. It was found that the soil, which is a sandy loam with a substratum of clay, yielded plentifully, and that in the autumn the home cellar in the city was regularly stocked with these rich returns, and that when the stay in the country could be late enough, the deliciously toothsome delicacy of sweet corn and other succulent vegetables, such as no city hotel could boast, were there in great abundance.

Attitude of the Administration Toward the Reclamation of the Arid Lands of the West*

By Hon. RICHARD A. BALLINGER, Secretary of the Interior

I BELIEVE nothing has done so much to stimulate and bring about the development of the West and its settlement as the policy of the Government in connection with free homesteads for landless settlers and the encouragement of exploration in the mineral regions. It is true the great land grants were productive of railroad construction, linking the Atlantic with the Pacific, and the construction of these railroads was an almost indispensable element in the progress of settlement west of the Mississippi River. Since the adoption of the homestead and mineral laws, the public lands have been considered less of a direct national asset than as a means for the advancement of our people and the encouragement of agricultural, industrial, and commercial growth.

Up to the last decade it was not fully apparent that the vast resources of the Government in the public domain were rapidly disappearing, and that for settlement nothing but arid and semi-arid lands would be left; that the forests and streams and coal deposits were beginning to be the prey of speculators and the Government's title therein divested by fraud and criminal devices. The necessity for the conservation of public utilities had not ripened into a conviction that the Government owed any responsibility either to the present or to future generations.

In reference to the forests, particularly, tremendous loss existed, not only from fires, but from the wasteful methods of logging and of manufacturing. Under pioneer conditions wastefulness on account of the necessity for existence may have its excuses. The pioneer could not eat the timber, and what may now appear to have been reckless prodigality may have been, at the time, abject necessity; nevertheless, waste is always to be deplored, and true conservation of all our natural resources means the elimination of waste so far as possible, and the production of the greatest utility for the greatest number. The protection of the great water-sheds of the mountain ranges from being denuded of their forests so that the streams may flow through their courses and carry water to the arid lands of the plains is of vital necessity in the reclamation of these lands.

The Nation is, therefore, to be congratulated that, even if not seasonably undertaken, we have now entered upon a period of rational protection and of saving of its resources in the public domain. You may be assured, my fellow citizens, that all the energies of the Government will be put forward to make effective the means necessary to accomplish this result.

Appreciating the necessity of further development in encouraging the settlement of the West upon lands which without irrigation were uninhabitable and fit only for grazing (and that to a very limited extent), Congress in 1902 adopted the method of appropriating the receipts from the sale and disposal of public lands in certain states and territories to the construction of irrigation works for the reclamation of arid and semi-arid lands. The wisdom of this measure could hardly have been fully recognized by those who were responsible for its enactment. It not only

*Delivered before National Irrigation Congress at Spokane, Wash., on August 11, 1909.

committed the Government to the great work of irrigating the arid lands, but it furnished an example and stimulant to private capital and enterprise to enter upon this development wherever capital could be secured.

While the Government has invested over $50,000,000 in irrigation works, many times that amount has been invested since the passage of the Reclamation Act by private enterprise, and it is safe to say that a large portion of these private investments have resulted from governmental example and encouragement; and let me say here that it has not been and is not the policy of the National Government in the administration of this act to hinder or interfere with the investment of private capital in the construction of irrigation works, but rather to lend it encouragement. This is particularly true in reference to irrigation under the Carey act in the various states. I am not a believer in the Government entering into competition with legitimate private enterprise. Its functions under the Reclamation Act are not of this character, and I am sure that when private enterprise has done what it can there will still be thousands upon thousands of acres of public lands reclaimable only by Government aid. The western states should, therefore, be very jealous of the perpetuity of the reclamation fund and of its constant increase.

The purpose of the Reclamation Act is to undertake the irrigation of arid and semi-arid lands where a considerable portion thereof belongs to the public domain, and by the installation of the storage and diversion of available waters to irrigate the largest possible area within a given territory at the least cost to the entrymen and landowners for construction, maintenance, and operation, always keeping in view the matter of the settlement of these lands and rendering them capable of supporting the greatest number of families. While it is a reclamation act, it is also a settlement act, and the public lands which are proposed to be irrigated by means of the contemplated works have been rendered subject to entry only under the homestead laws in small tracts capable of supporting a family. It is is declared by the act that only the cost of construction and maintenance shall be repaid to the Government. No consideration of profit or direct advantage to the Government is intended, and in this the statute does not trench upon the rights of private enterprise, particularly so long as the reclamation of public land is the main object of the Government. The law is a beneficent one; it is another evidence of the broad and liberal policy which has ever actuated our National Government in the disposition of its public lands. It differs, however, from the simple homestead law in that it holds out inducements only to men of sufficient industry and capacity to carry the added burdens of construction, maintenance, and operation, which is the cost of the lands. While it is possible that persons of limited means may successfully enter and acquire irrigated lands, it will generally be found that it is not a poor man's proposition, unless coupled with intelligent industry in agriculture.

The whole scheme of the act is based upon the appropriation of the proceeds of the sales of public lands in certain states and territories for the construction of irrigation works for the reclamation of arid and semi-arid lands therein. No further appropriation by the Government is intended, or can be inferred from the act, and the responsibility for the disbursement of the funds and the construction of the works is placed upon the Secretary of the Interior. It must be recognized that the Government is acting in the nature of a trustee for the people in the disbursement of this fund; that it must construct the works for the settlers and turn them over at cost, and has no right to recklessly or improvidently waste the fund; that cost means the cost which is incurred in the exercise of common business prudence, and this is likewise true of the expense of maintenance and operation.

It is also the declared purpose of this law that the Secretary of the Interior in carrying out its provisions shall proceed in conformity with the laws of the

states and territories wherein the irrigation works are situated and is bound by these laws in respect to the appropriation and use of the waters therein.

The Government, as I have said, has invested $50,000,000 in reclamation works, and by such investment has succeeded in irrigating over a million acres of arid lands; and it may be likewise stated with fairness that more than $50,000,000 have been added to the value of these lands. With the additions which are contemplated in the completion of irrigation works now under construction and those contemplated, the increase of values will more than proportionately continue, and the consummation of the revolving fund brought about by the return of the cost of construction of present works will enable the Government in the course of years, where feasible projects exist, to increase beyond calculation the wealth of the irrigable regions and the continual expansion of opportunities for settlement and for homes; the end to be reached only when irrigable lands cease to be available. Lands that may be considered under present methods non-irrigable, in the development of mechanical and electrical capacity for raising water onto higher levels may be economically irrigable in years to come, so that no one can to-day define the limits of possibility, as they are not the limits of conceivability.

This fact has been well illustrated in the history of the public domain, as it has not been many years since the arid and semi-arid lands of the West were considered worthless and denominated "desert lands." Thousands of acres of these lands, considered non-irrigable, and valuable only for grazing, are now being entered and utilized for dry farming as authorized by the act of Congress known as the "enlarged homestead act."

Any one who has visited one or more of the reclamation projects now in operation and sees, on the one hand, the desert covered with sage brush and barrenness, and, on the other, the water flowing over the fertile soil, producing heavy crops of grain, or orchards in fruit, appreciates to the fullest extent the benefits of irrigation.

The people of the West, therefore, who are familiar with these wonderful results in irrigation, are highly appreciative of the importance of the Reclamation Service, but the great difficulty which that service encounters is in finishing the projects now undertaken as against the clamor for a diversion of the funds to new fields. In this respect the service has suffered in not carrying to completion a less number of projects than it is now engaged in constructing.

I cannot conceive of anything which will contribute more to the permanent wealth and prosperity of the reclamation states and territories than the continued construction on the broadest possible scale of irrigation works.

The danger, which the Government is undertaking to overcome, is the establishment of small irrigation projects in localities where by such establishment the larger opportunities are destroyed, thus preventing enormous areas of lands from ever acquiring the use of water. It is quite true that many small projects capable of being financed by men of limited means can be carved out of larger possibilities, but to encourage them means the loss of the large possibilities. For lack of funds the Government is at present often required to surrender possibilities in water appropriation which means an enormous loss in future development of irrigation works, and I fear this is not fully appreciated. It is for this reason that at times private enterprises are disposed to contend that the Government is obstructing their interests, while from the larger view their interests are obstructing greater possibilities for larger areas of irrigable land. I may mention here what has frequently occurred to me as a source of advantage both to the states and the Federal Government, and that is the securing from the various states of uniform legislation in the matter of the appropriation of water and its beneficial use, and also legislation looking to the control and conservation of all available water-power.

This Congress could accomplish no greater work beyond the stimulation of interest in the development of irrigation than to secure uniform water regula-

tions in the states and also uniform legislation affecting interstate waters.

Ours is a nation of busy people, a nation of great resources and possibilities, and most favorably situated for trade and commerce. Its wealth is greater than that of any single country, even of France and Germany combined, and this wealth is increasing at a fabulous rate. Much of it has been accumulated by the destruction, by the sacrifice and waste of nature's gifts, and it is a fortuitous circumstance that the country has been brought to understand the importance of utilizing and saving our natural wealth and making it possible for the Nation to continue to prosper, and for the generations that are to come to have some share in that prosperity, especially since no element of the Nation's wealth is greater than that contained in the soil. For this reason, if for no other, the work of reclamation of the arid and semi-arid lands of the West is worthy of first importance in the development of the Nation's resources. Every acre of irrigable land will be needed in the Nation's economy.

In a century, we have passed from a purely agricultural country to an industrial and commercial country, but we have not outgrown the necessity for agriculture. We have, of necessity, maintained agriculture and have added to our national activities industrial and commercial progress to a wonderful degree. The wealth of the Nation embraces every product of labor which contributes to the needs of man. The dormant wealth in national resources means only resources available to create wealth by intelligent effort, and I trust our people will never be called upon to look with fear upon the couplet of Goldsmith:

> Ill fares the land, to hastening ills a prey,
> Where wealth accumulates, and men decay.

A Typical Headgate on the North Platte. There are 9 Gates, as Shown by Uprights

ADMINISTRATION FOR THE PEOPLE*

By Former Governor GEORGE C. PARDEE, of California

I COME here to-day with the thought of an appeal to Caesar, as it were—an appeal to the members and delegates of this Congress—as to whether they are satisfied entirely with the way that things have been carried on in the government of the country. I do not make this appeal as one who is opposed to the Government of this country.

I make this appeal to people who are vitally interested in the present and the future of this country—the people who have children and whose children's children will have an interest in the advancement and the prosperity and the varied perpetuity of the country. I am one of those rather, perhaps, old-fashioned people who believe that there is something outside of the cold features and words of the law.

I am one of those people who believe, with Roosevelt, that the time to do things is now, and let us talk about them afterward. I believe, with him, that to withdraw, for instance, from entry those lands which take with them power sites and to hold them for the benefit of the people is the thing for the government of this country to do.

And, therefore, I thoroughly agree with the actions and the work of the predecessor of the present Secretary of the Interior. You will remember, perhaps, that Mr. Secretary Garfield, perhaps at the instigation of our very good friend, Mr. Gifford Pinchot, certainly with the advice and consent of the then President of the United States, Col. Theodore Roosevelt, did withdraw from public entry certain parcels of the public lands aggregating about 1,000,000 acres, in each of which parcels of public land there was a power site.

Much to the surprise of the people who were interested in those things in this country, almost immediately after his induction into office as Secretary of the Interior, Mr. Ballinger, the present Secretary of the Interior, put back into public entry these various parcels of land which embraced a water-power site; and within eight days, or within a very few days after the order had been made, most, if not all, of these power-site plants had been grabbed. By whom? By the people who will use them for the future benefit of the people of the United States?

They talk to us and we have been talked to from this platform of the great advantages of "individualism." Countless graves have been filled; countless children orphaned, and countless widows made by individualism since the history of the world began. Caesar was an individualist. Napoleon was an individualist, and the people who have done great things in this country for the benefit of the people of the country have been individualists; but is the time not ripe when individual rapacity shall be checked and kept in order and regulated so it will not further oppress the people and take away from future generations, the people of this country, the things that ought to be of right the property of all the people of the country?

Now, I am informed that the Secretary put back into public entry these various parcels of the public land, each embracing a power site, and which had been withdrawn from entry by his predecessor, Mr. Garfield. I am informed that he did this because there was no specific law by which the Secretary of the Interior could do these things; but Garfield did them. The then President

*Delivered *ex tempore* before the National Irrigation Congress at Spokane, Wash., on August 11, 1909.

of the United States patted Garfield on the back for having done that, and the present President of the United States, unfortunately after the damage had been done, ordered the Secretary of the Interior, Mr. Ballinger, to withdraw again from public entry those lands which were left and had not been grabbed because they did not contain power sites; and let me say that Mr. Taft, before he became President of the United States, had a reputation among the common, every-day, ordinary people of the country as being quite a lawyer.

At any rate, the Secretary of the Interior first restores land to public entry because there is no specific law, I am informed, authorizing him to keep them from public entry, and then, at the order of the President of the United States, he again withdraws those lands from public entry. But law or no law, specific or unspecific, is it not about time that the plain, ordinary, every-day, God-fearing, law-abiding, patriotic people of this country should receive some little attention in the disposal of these things? And is it not time that if, by any possibility, there can be any doubt, that doubt should be resolved once in a while to the benefit of the people of the country?

Ladies and gentleman, the future prosperity and very perpetuity of this country depend upon keeping a due proportion between the rural and the urban population. England found, to her cost, when she fought the Boer war, that because London and the great cities had swallowed up those country people of hers which had made her armies invincible, she had not the men to whip the Boers, and that had it not been for her colonial troops, England would never have whipped the Boers. The reason for that was that England's country population had been decreasing while her urban population had been increasing.

To every large city in this country there is a stream of young men and young women marching from the country. The time was when there was land enough for every man who wanted a quarter-section to go and take it and raise upon it a family of American boys and American girls. Where can it be be done now, except in the arid West and Southwest? And this land is available and can only be so used when water is put upon it; and it is, in my humble judgment, the patriotic duty of every citizen in office or out of it to see to it that everything possible is done so that this irrigation, this conservation, this preservation of the public lands for the people, may be so conducted that it may be as cheaply, as quickly as possible put into the hands of the people who are hungry for it. The Flathead reservation, the Nez Perce reservation, the departure of so many of our farmers for Alberta, show that there are people still hungry for public lands.

I am sorry that the Secretary of the Interior is not present here at this time. I am sorry he has not heard what I have to say; but, of course, his public duties require his presence elsewhere.

One ruling of the Secretary was that those people who are unable to pay cash for their land under a reclamation project could receive from the Reclamation Service scrip. That ruling was made by Secretary Garfield. Secretary Ballinger has reversed that upon a statement of fact believed to be incorrect and upon an opinion rendered upon that incorrect statement of facts by the Attorney General of the United States. The result is that those people who are unable to produce the cash, who have a horse or two and a spade or a harrow or a shovel and want to go upon that land and put in their work instead of the money, and receive in lieu thereof scrip which will be received as pay for the land, are now unable to do it. Singular, is it not, why everything that is done is to the detriment of the man who, by his brawn and his sinew and sweat of his brow, wants to go upon the land and earn him a living, and raise a family of American boys and girls to bear the future burdens of the country? And yet these things are done—done, perhaps, because the strict construction of the law might say that these things should be done. But Roosevelt never hesitated under those circumstances; his motto was, "Go, do it, and talk about it afterward."

THEODORE ROOSEVELT

Dynamic Geographer

By FRANK BUFFINGTON VROOMAN, F. R. G. S.

(Continued)

(The length of Mr. Vrooman's paper requires that it be condensed. Following the August section, the author next discusses the career of Theodore Roosevelt, his work in the Navy, especially in bringing "the efficiency of the American gunner from that of about the lowest to a place as high as that of any in the world," and his part in the Spanish war.

In speaking of Mr. Roosevelt's administration, the author says: "The administration of Mr. Roosevelt is as noteworthy for what he has tried to do as for what he has done. One can say of those policies and measures in which he has been thwarted by members of his own party that they are not lost. They have lodged in the moral consciousness of the American people, and must be reckoned with hereafter."

Mention is made of his settlement of the coal strike, his promotion of meat inspection and pure-food laws "to keep the American people from being poisoned at so much profit per head," and his part in making of the War Department not a mere fighting machine, but an effective agency for constructive work.

Under the head of "The Big Stick," Mr. Vrooman says:

"It became evident to the President that it was only a question of a short time when the people must settle once for all the question as to whether the people or the corporations should rule the Nation. * * * He also set to work the vast national scientific machinery to build up what rampant individualism had torn down. * * * The Department of Commerce and Labor was created within two years after Mr. Roosevelt became President. Its work was inaugurated 'to do for labor everything that the law permits the department to do, and to give the manufacturer all the knowledge the department can secure.'" The President is quoted as saying, "There is grave danger in our free institutions in the corrupting influence exercised by great wealth suddenly concentrated in the hands of a few. We should in some manner try to remedy this danger in spite of the sullen opposition of those very few powerful men, and with the full purpose to protect them in all their rights at the very time we require them to deal rightfully with others."

The Interstate Commerce Commission and the Hepburn act are discussed. The writer closes the section by saying: "The old saying which passed muster so long, that the law is a web which catches the little flies but which the big flies break through, has begun to have a certain remoteness, for the principle has been not only asserted but enforced that big and rich corporations are not better than the law. The billionaire anarchist has felt the big stick." EDITOR.)

CONSERVATION

THE last days of his administration presented the last public policy and one of the largest ideas which President Roosevelt has ever offered to the world. The Canadian and Mexican Commissioners of the North American Conservation Congress, in session at the State Department with the American representatives and the President, gave their approval to the President's plan and requested him to take the initiative in calling an International Congress of Conservation to be held at The Hague. The fact that such a World's Congress should be called to meet at The Hague, instead of Washington or London or some other great capital, shows at once some of the ideas in the President's mind, beyond the mere principle of utilizing the resources of the earth, or for making and comparing inventories of the natural wealth of the world. The man who is responsible for calling the second Peace Tribunal at The Hague, and who was awarded the £8,000 Nobel Peace Prize, and who immediately devoted the money to the further interests of peace in the establishment of better

relations, and the peaceful settlement of disputes between labor and capital, no doubt saw very clearly when he chose The Hague for a meeting-place all the possibilities which were involved in such a Conservation Congress, especially when surrounded by the peaceful traditions of The Hague. It is proposed to make this Conference conserve the interests of peace between nations, as well as to conserve the natural resources of those nations. This World's Congress would, therefore, be a Conservation Congress in more senses than one. It would conserve and develop all the unwonted possibilities involved in nations getting together, and through their representatives conferring with each other as to what they have in common; as to what one nation has and the other nation has not; as to making it possible for the people of the one continent, one zone, or one race to benefit by the surpluses of another continent, or another zone, or another race. It would hasten the removal of the unnecessary barriers which might prevent an easy exchange, at the same time protecting the interests of these nations, by getting their representatives around a common council board, and making of them a new type of Knights of the Round Table. Under a new cosmopolitan chivalry, perhaps, they might look for the things they have in common instead of those they have at difference; look toward cooperating with each other in the vast interests of the world's common good, instead of antagonizing each other upon the plane of individualism and selfish instinct. It offers a field of work so brilliant and fascinating in the conception on a universal scale, and the realization and launching of President Roosevelt's overruling and constructive conservation idea, that one cannot but feel that here, after all, is the central idea and aim of this world's statesman, a fitting climax for his Presidential administration and a fit beginning for such new developments of his career as the world may still have in store for him.

The Canadian and Mexican delegates of the North American Conservation Congress, while they were enthusiastic in their expressions of approval of the proposed conference at The Hague, made it known clearly that in no sense was this International Congress to take the place of the North American Commission. It was their purpose to work together and to see what the three countries occupying the North American Continent could do for themselves. * * *[1]

This remarkable program was adopted by the representatives of the three nations of the North American Continent.

It is reported in the dispatches that the Dominion Government intends to adopt, practically in their entirety, the recommendations arrived at by this International Conference at Washington with regard to the proper and adequate conservation of the natural resources of Canada and the United States. New standing committees have been appointed by the house of commons, with instructions to take under their especial charge all questions relating to fisheries, forests, mines, and waterways, and are now preparing to take up all the important questions broached at the Washington Congress with a view to the adoption of a united general policy, to prevent any further waste or extravagance in dealing with the rich natural heritage of the people.

The famous White House Conference of Governors was called by the President last May, not only to formulate into a better organized system the conservation policies, but to state their principles and to secure the cooperation of the governors of the different states and territories in enlarging the field of work. After discussing principles for three days, which discussion included papers by both scientific and economic experts, they drew up and adopted a "Declaration of Principles. * * *[2]

One of the striking results of the White House Conference of Governors is that, since its meeting last May, thirty-six different states have ap-

[1]Here follows a discussion of the "Declaration of Principles" found in CONSERVATION for March, 1909, at page 164.

[2]See CONSERVATION for June, 1908, pages 343-4.

pointed conservation committees. In a private way, fifty of the organizations representing the great industries of the country have also appointed their own committees to foster scientific work in the way of investigation and application of improved economic principles to their interests, and these movements, which have been crystallized within ten months, are only an indication of an enormous popular educational and propagandist movement which is being carried on throughout the entire country.

THE SCOPE

The American hemisphere covers an area of about 14,950,000 square miles, of which about 8,000,000 square miles belong to North America. That Eurasia was probably never known to the aborigines of North America, in any real sense, does not seem so strange as that civilizations could have arisen and flourished and fallen and decayed before the discovery by the European races of this fecund hemisphere, capable of such vast economic power and utility.

A glance at the world map will show the larger portion of this hemisphere in its equatorial and sub-tropical regions encroached on by the sea, and the greater portion of its areas not only lying in the temperate zone, but mostly free from such vast deserts as in Asia and Africa destroy economic utility and furnish insuperable obstacles to communication. Again, both the northern and southern continents have been furnished means of sea communication in its rivers, incomparably superior to those of either Europe, Asia, or Africa. The Mississippi-Missouri River, for example, furnishes one continuous navigable waterway for forty-three hundred miles, with a system of navigable waterways of about 16,000 miles, capable, under proper treatment, of carrying ocean-going steamships.

The St. Lawrence River and the Great Lakes offer a continuous waterway, with short canals, of twenty-two hundred miles, and has a drainage basin of 600,000 square miles. One can float in a canoe without meeting a rapid or cataract on the Amazon, 2,000 miles from the foot of the Andes to the Atlantic Ocean, and then hoist the sail and sail back again, for practically all the winds blow up-stream.

The Mississippi has more navigable water than all the streams which drain Europe, and the Amazon discharges more water than the eight rivers of Asia —the Yenesi, Indus, Ganges, Ob, Lena, Hwangho, and the Yang-tse of China.

Productive power depends upon heat and moisture, and these are present, roughly speaking, in the whole Western Hemisphere, except in a narrow margin of British North America of arid or mountainous waste and frozen land.

The Mississippi basin, of 1,280,000 square miles, may be made the site of a material civilization so rich as the world has never dreamed of before—a basin economically the most important in the world, and capable easily of supporting one-half the present population of the globe. For the Mississippi basin is economically probably twice or three times as productive (if not more than that) as all the rest of the United States. An interesting sidelight on this subject might be found in referring to the first volume of the *Encyclopedia Britannica* of the edition of 1875. It states that while the American world is half the size of the old, it contains equally as much useful soil, and more productive power than Europe, Asia, and Africa combined, and is capable of sustaining a population of 600,000,000—more than twice the present population of the globe. This was written, however, before the resources of west and northwest Canada, and certain parts of Africa, were ever even considered.

There are about 3,000,000 square miles of land surface in the United States proper, a little over one-fifth of which is under cultivation, about a quarter being covered with forests or stumps, and some smaller proportion covered with woods, undergrowth, and other bushland. With the exception of a small amount of mineral lands and, of course, waste lands, the rest is grazing land. While there are sections,

principally in the South, where the farmers have been paying no attention to the matters of fertilization or rotation of crops, it has actually been demonstrated that the soil of the United States, as a whole, is gaining in fertility. The outside limit of lands capable of cultivation in the United States is twice the present area under cultivation. There is nothing to limit the population of the United States to twice, or even ten times, its present number, and as the farm crops are increasing much more slowly than population, and as there is an immediate limitation to the acreage available, and practically no limit to the possible population, and inasmuch as all the best lands are taken, and those now available are more or less uncertain in their value, the increase in the yield per acre becomes a problem which the Nation must solve, and that at once. Over and above the lands possible for home-making, there are other areas containing mineral, water, and timber supply, which the Nation must hold in its own possession and maintain in efficient condition owing to the intimate relations they sustain to the other lands of the United States. But all these lands, old and new, made and unmade, are capable, under the new science of agriculture, and under the new idea of national conservation, of being increased in their productive capacity manyfold.

When Mr. Roosevelt looked out over the broad domain of the United States, he also looked ahead to the needs of the future population of the United States. If the founders of the country built for the future, and for those generations then unborn, one of which is ourselves, and thereby earned our everlasting gratitude, why should not present-day statemanship lay scientific foundations for making a greater people in the future with a happier lot in life? Several things were obvious to his intensely practical mind. That they had not occurred to any former President or any former Congress, or, we may say, to any former American statesman, was no deterrent to his audacious dream. He saw the vast possibilities in the land and its running water. He doubtless said to himself: "Why not take the trouble to get ready for their highest use the incomparable waterways of the North American Continent, into the very heart of which it is possible to extend the coast-line and ocean shipping? How much better that certain billions of tons of fresh water, instead of destroying farms, should make farms; instead of carrying away soil should deposit soil; instead of blocking navigation should extend navigation; instead of destroying life should support life!"

This was his secret.

THE WATERWAY IDEA

The Roosevelt waterways idea involves a project no less imposing than the fundamental rearrangement of the New World.

The cutting of the Isthmian Canal is a geographical event of the first magnitude and of first importance; while the more useful, if less attractive, scheme for the artificialization, the control and use of the Mississippi River and its tributaries, and the coordination of all the problems related thereto, presents a scheme in scientific government as brilliant as anything of the kind ever before presented to the human mind.

The conception involves a project for the artificialization, the control and use under one great engineering scheme, of not only the whole Mississippi River system, with its 16,000 miles of navigable deep waterways and countless unnavigable tributaries; but, connected with the problems of this continental artery called the Mississippi River, is that of its own canalization and the canalization of one of its own tributaries, namely, the Illinois River, and the deepening of the Chicago Drainage Canal through to Lake Michigan.

There are a few geological points of some interest in connection with the past and future of this scheme. Probably before the waters of the upper Mississippi River found their way into Hudson's Bay, the waters of the Great Lakes, when the great glacier lay across

their present outlet, ran across to the headwaters of the Illinois, across the country where Chicago now stands, and down the Mississippi to the Gulf of Mexico. Through this very old channel of ancient overflow lies the Chicago Drainage Canal, and here will be built the deeper and larger waterway which will connect the Lakes and Gulf. It is interesting to note, also, the fact that the land supporting the eastern outlet is rising nearly six inches per hundred miles per hundred years, thus throwing the waters back gradually to the lower part of Lake Michigan; and it is more than likely that in two or three thousand years the geologic process of the ages will come appropriately to the support of the Roosevelt plan.

It is idle to say that the Isthmian Canal would have been done sooner or later. The Western Hemisphere had been discovered and had been developed for 400 years, and we seemed no nearer to it than when Gomara, in 1551, urged Philip II to cut it through. Since that time much effort and much treasure and many lives and many words have been wasted, and the world was tired of waiting. The work waited for the man who would wait no longer. Mr. Roosevelt seized the opportunity which passed his way, and posterity would have forgiven him had he made the opportunity, and he set to work. He made terms at once righteous and fair with France for what had been done. He organized a preparatory sanitary work of unparalleled efficiency, which made out of a plague-hole a healthy place. He transplanted schools, churches, Christian associations for men and women, appointed a commission with assistants who have been models of civic virtue and administrative efficiency, and got the work going which will have ships moving through from the Atlantic to the Pacific in a few hours, now, in less than six years from to-day. The Panama Canal will save 10,000 miles for every ship plying between New York and San Francisco. As an example of its economic value, it will save £2,000 for every 2,000-ton barque plying between these two points. It will add 8 shillings per thousand feet to the values of the vast forests of the Pacific coast from California, Oregon, and Washington, to British Columbia and Alaska, adding, perhaps, a hundred million pounds to the present value of those timber areas alone—twice the cost of the canal. Not only will the commerce between Occident and Orient pass through it; the Andean countries will be opened, with the Mississippi and the Hudson, and the Orinoco and Amazon will make a new Mediterranean of the Caribbean Sea.

In a message to Congress, December 3, 1907, the President recommended the development of the deep waterway and of the great river system as national water highways, and urged that this development should be considered as a *Government undertaking*. He called for a deep waterway from the Great Lakes to the Gulf of Mexico, and for deep-water highways leading from it to the East and West. "Such a waterway," he said, "would practically mean the extension of our coast-line into the very heart of our country." He also urged the development of those natural inland waterways connected largely by canal, which lie just back of the whole eastern and southern coast. To this end he appointed an Inland Waterways Commission, which went immediately to work to make the most exhaustive investigation and report, while much subsidiary work was being done by the bureaus of different departments.

The unqualified good nature and complacency of the American people of the Mississippi basin, which constitutes one-half of the states in the Union, holding half its population, began to be disturbed a few years ago because the product of farm and factory was increasing so much faster than transportation facilities that it became impossible to carry the increased product of their industry to market. The transportation problem, both in its economic and political phases, has been growing more acute year by year, until President Roosevelt's active campaign began in the interests of the people. Even the railroad managers themselves com-

plained of their lack of equipment to do the country's business, as is shown by the single remark before quoted from James J. Hill, that there was not money enough in the world to lay the track to take the traffic the country offered. It is no wonder that the farmers of the wheat belt and those dependent upon them complained if their wheat was rotting in the bins for want of cars to carry it to market; if the maize of the corn belt was rotting in the cribs, or being burned for fuel in the stoves of the farm houses; and that the cotton of the cotton belt was heaped away unsold, because the railroads, taking advantage of the situation, charged all the stuff was worth to haul it. No wonder they complained when there was a fuel famine over a dozen western states, and farmers were burning their furniture and farm products, and some of them were freezing to death, because there were no cars to haul them coal; and if, at the same time, the railroads were being centralized through blind pools and other inventions of new and devious methods of modern finance to put more railroads into fewer hands, with more irresponsible power of watering stock and inflating tariffs to pay dividends on them. No wonder that there was a movement in the whole Mississippi basin, in which, through "river and harbor congresses," "trans-Mississippi congresses," "Lakes to Gulf associations," "deep waterways conventions," etc., this population of forty millions made their protest, and said to the Government at Washington: "We must have transportation, and we must have a rate which will let us live. If you don't want to undertake the job we will do it ourselves, only we must have transportation and living tariffs." Out of the tremendous activity and discussion on the platform and in the press which attended this movement and followed it arose the growing revolt against the prodigious waste of the *laissez-faire* policy. And out of this discussion, too, could be marked the progress of the increasing determination to organize the national assets and conserve and utilize the natural resources, especially those so obviously available as the navigable deep waterways of the Mississippi basin, whose channels nature has digged so conveniently in their ramifications for the uses of this great area.

As the public education on this subject grew out of the matter of transportation and the intolerable situation which it presented, so, again, one of the most important results of the whole movement will be a question of transportation. For the perfection of this scheme, which includes as one of its subsidiary measures the main idea of national and international waterways, is the Panama Canal. The perfecting of the Panama Canal and the Lake Michigan Canal, the canalization of the Illinois River, the perfecting of the channel of the Mississippi itself, and the deepening and otherwise perfecting of the channels of its larger tributaries, will finish the backkbone of the great conservation scheme. So that, as far as transportation is concerned, steamers from Honolulu and Yokohama can load their freight at Duluth and Fort William, Toronto or Buffalo, and freight may be carried direct from the wharves of Minneapolis or Chicago, Pittsburg or Omaha, to Bombay, Liverpool, or Hong-Kong.

Back of this great transportation idea are also the problems toward the headwaters of the rivers where the products for transportation are grown or made. For example, it is very interesting to study the relation of the mere conservation of waters to the building of dams or reservoirs among the thousand sources of headwaters, which shall, of themselves, serve a score of uses. For instance, one of the most obvious things to any one who will take trouble to think about it, is the dynamic value of water. And if every pennyworth of coal saved is a pennyworth digged, it will readily be seen what a saving of the coal-beds will follow the scientific use and development of the wasting water power of the country. Whenever a rainstorm, for example, has left a million tons of surplus water over a given area and over and above that which soaks

into the soil at, say, an altitude of 2,000 feet, it is plain that this body of water will expend as much energy in getting back to the sea as the sun has expended in lifting it to this height, or as the mechanical devices of men might expend in lifting a million tons 2,000 feet high. But the energy of the sun has already lifted this water, and there it lies of so much potential dynamic value. The question is: How shall we utilize the particular energy which the sun has stored in this particular way, so that we may relieve the too wasteful use of that other particular form of energy which the sun has stored in coal?

Mr. Roosevelt's solution is simple and laconic: *Drive wheels.* This is good nation housekeeping; it is, therefore, good politics.

Herein, I think, lies the greatness of Mr. Roosevelt—that he has all the qualifications of a great politician. Of course, when I am speaking of a great politician to an Oxford audience, it will be taken for granted it is in the Aristotelian and not the American sense. The first qualification is creative imagination. This bridges the gap between science and philosophy. Add to this, ethical insight, sanity of judgment, and a daring which knows no bounds save those of righteousness and the common good, and you have the ideal politician, if he also happens to be a scientific geographer.

(To be continued)

A Forested Watershed on the Island of Maui

The Equalizing Influence of Forests on the Flow of Streams and Their Value as a Means of Improving Navigation

By GEORGE F. SWAIN, LL.D., Late Professor of Civil Engineering in the Massachusetts Institute of Technology; Now Professor of Civil Engineering in the Graduate School of Applied Science of Harvard University

(*Concluded*)

WHEN it comes to the question of extreme droughts, Colonel Chittenden takes a curiously contradictory position to the one which he takes in considering the matter of floods. Regarding the latter, it will be remembered, he considers that the forests may cause a combination of the highest floods arising simultaneously from different tributaries; with reference to droughts, however, he assumes just the reverse, namely, that the extreme low water on different tributaries will not occur simultaneously. It seems clear that the extreme combination is as likely to occur in one case as in the other.

He admits "that, as a general rule, springs and little streams dry up more completely than when forests covered the country," but he argues that, since each spring is small, their drying up will have little effect upon the main stream, the flow of which will be kept up, if the region is deforested, by the rapid discharge, over the surface, of the water from summer showers, which will occur, first on one tributary and then on another, in such a way as to furnish to the main stream always a low-water flow greater than if the springs could all be kept up. If his argument be carried to the very common case where no rain falls upon a given drainage basin for weeks, or for a much longer time than it takes for a drop of water to flow from the extreme source to the mouth, it would seem to lead to the conclusion that there would be no flow at all in the stream. In other words, the author would have the mills at Lawrence and Lowell depend for their summer flow, not upon keeping up the "springs and little streams" so far as possible by increasing through the effect of forests the percolation into the ground, but would have these mills trust to luck that the summer showers would be so distributed over the different tributary basins that when one was low others might be high, and he maintains that in this way the low water would be greater than if all the little springs were kept up. This would, of course, require most intelligent planning on the part of Jupiter Pluvius, for it would not do to have these summer showers, which are supposed to flow rapidly from the surface, inaccurately timed or distributed over the basin. It does not seem necessary to pursue this suggestion further.

Even a large drainage area, say 10,000 square miles, may well have its main stream possess a length from extremest source to mouth, measured on the stream of considerably less than 300 miles. If the average velocity of the stream is one mile per hour, which is low, it would take less than two weeks for a drop of water to pass from the extremest source to the mouth. Now, even in districts which have a summer rainfall, it frequently happens that even an area as large as that mentioned is without rain in part of it for months

at a time, under which condition, if the writer understands Colonel Chittenden's theory and his admission, even such a large stream would practically dry up. It would seem to be much more reasonable to depend upon some means of keeping up the springs and small streams rather than upon the equal distribution of surface waters of the summer showers from deforested areas.

Moreover, it is not evident why, even in a small stream, a uniform flow is any less desirable than an intermittent flow. Of course, as is well known, the larger the stream, the greater the low-water flow per square mile, other things being equal, for the very reason that the low-water flow on all tributaries will not occur at the same time, no doubt partly owing to local rains. A precisely similar remark applies to the flood discharge, which is less per square mile on large watersheds than on small ones, because the maximum discharge from different tributaries will not occur at the same time. Colonel Chittenden, therefore, seems here inconsistent. In discussing floods, he considers an extreme condition in which the floods from various tributaries arrive simultaneously at a given point and from this he argues that forests increase the violence of floods. In the case of extreme droughts, however, he considers the case—not where the low-water flow from various tributaries arrive simultaneously at a given point—but, on the contrary, where comparatively high water from one arrives at the same time as the low water from another.

With reference to the effect of forests upon snow melting, Colonel Chittenden states that "it can be demonstrated that the effect of forests upon the run-off from snow is inevitably to increase its intensity."

He argues that the snow does not drift at all in the forests, but that great drifts form on open ground; that the snow begins to melt over open ground earlier than in the forests, and that the drifts on open ground serve as reservoirs to feed the streams, lasting much longer than the snow in the forests; that the snow melting in the forests does not sink into the ground, but into the snow itself, which becomes saturated, until a warm rain carries off the whole mass of snow in a freshet. He says, referring to the snow in the forest: "The water from the first melting from the snow blanket does not sink into the ground, but into the snow itself. Snow is like a sponge; a panful will shrink to one-fourth of its volume or less before any free water appears."

This argument contains a number of errors and inconsistencies. In the first place, the snow does drift in the forest, although not to the same extent as in the open. Colonel Chittenden admits that the snow blanket lasts longer in the forests than in the open, except for the drifts. It is the present writer's experience, however, that the snow in the forests lasts considerably longer than even the drifts in the open, although this may not be true in the case of very high altitudes. The snow in the drifts on or near the summit of Mount Blanc, of course, lasts longer than the snow in the forests below, because the top is in a region of perpetual snow. Obviously, this is not the condition to be considered in the present instance. But Colonel Chittenden ignores the fact that under the snow the ground in the forest is warmer than the ground in the open, and that the snow blanket melts at the bottom rather than at the top. Frequently the ground in the forest does not freeze at all and, therefore, it is in a better condition to absorb the melted snow than the ground in the open. But even if the snow blanket in the woods absorbs, as he thinks, the water from its own melting under the sun's rays, preventing it from percolating into the ground, why do not the large drifts in the open, which he says form the main reservoirs of the streams, also absorb their own water and prevent it from running off?

The fallacy of Colonel Chittenden's arguments in this respect is obvious. It is, of course, true that if a warm rain comes upon the snow blanket in the woods, carrying it off in a short time, the resulting flood may be greater than if the forest had not been there to retain the snow; but it is equally clear that in the latter case the *earlier spring*

floods would have been increased. If a given amount of snow has to be carried off into the streams, it is obvious that the flow of the streams will be more regular if the period of melting is extended, and this is the effect of the forests.

A further instance of illogical reasoning is found in Colonel Chittenden's reference to the great floods which occurred in the state of Washington. He says: "The great flood of 1906 in this section was a perfect demonstration not only of the vast intensifying effects of forests upon floods due to snow melting, but of the utter helplessness of the forest bed, when saturated with long rains, to restrain floods. It will be clear, however, upon reflection, that this flood is no demonstration of any "intensifying effect." It simply demonstrates that there may be heavy floods from forested areas. If those forests were cut down, that same flood might, and probably would, have been much more violent. Colonel Chittenden here apparently forgets the difficulties in studying this problem which arise from the fact that the effect of the forests cannot be separated from the other elements entering into the problem.

Similarly inconclusive is the statement about the flood of the American River compared with Puta Creek in California. Watersheds differ not alone as regards forests, but in other respects. The facts stated simply seem to show that in this case the forests did not regulate its flow to an extent sufficient to counterbalance other factors. For instance, if the writer is correctly informed, the slopes of the Sierras are steeper than those of the coast range. Again, the shape of the drainage area is a matter of considerable importance with reference to the maximum rise of water at a given point.

The writer has not had the opportunity to study to any extent the conditions in the Rocky Mountains, but he observes that Prof. L. G. Carpenter, of the Colorado State Agricultural College, than whom there is no more competent authority, in his paper on "Forests and Snow," comes to the conclusion that:

(*a*) * * * the greater the amount of forest cover the less violent the daily fluctuation, the more uniform the flow throughout the day and throughout the season, and the later the stream maintains its flow.

(*b*) The loss of the forest cover means more violent fluctuation during the day, greater difficulty in regulating the headgates and keeping a uniform flow in ditches, and hence an additional difficulty in the economic distribution of water. Also the water runs off sooner, hence the streams drop earlier in the summer; and, on account of the lessening of the springs, the smaller is the winter flow.

(*c*) The preservation of the forest is an absolute necessity for the interest of irrigated agriculture.

Colonel Chittenden, however, after devoting so much space to considering the effects of forests upon extremes of flow, does not on the whole take his own arguments seriously, for, later on, he says: "In the records of precipitation, wherever they exist, will be found a full and complete explanation of every one of the floods that have seemed unusually frequent and severe in recent years." After citing the conditions, he goes on to say: "Similar conditions prevail in every great flood and the *true explanation is found in them, and not at all in the presence or absence of forests on the watersheds.*"

Reference has already been made to the fact that the amount and distribution of rainfall are the most important factors affecting the flow of streams, yet it is quite unreasonable to conclude that on that account the forests have no effect at all.

These quotations are cited, however, to show the apparent contradictions in Colonel Chittenden's arguments.

It would take too long to analyze in detail the remainder of Colonel Chittenden's paper and to criticize his many statements. If his views, however, have weight, attention should be called to one statement which he makes with reference to erosion. He states (page 955 *et seq.*) that the sediment carried into the Gulf of Mexico by the Mississippi "all comes from the uplands far and near, but particularly from the more remote and hilly regions. This load is in the nature of through traffic. The local freight picked up from a cav-

ing bank is mainly discharged at the next station. It follows, therefore, that if the banks of the stream were revetted from the Gulf to Pittsburg, the falls of St. Anthony and the mouth of the Yellowstone, the quantity of sediment passing into the Gulf would not be diminished a particle."

As the quantity of sediment carried into the Gulf each year is exceedingly large, Colonel Chittenden admits the great erosion from the mountain slopes. We do not agree with him, however, in the statement quoted. A river picks up sediment where the velocity of the water and the size of the grains of sediment admit, and a reduction of velocity causes the deposition of sediment, beginning with the heaviest particles. The river cuts away a bank here and deposits a bar there, and much of its load is, as Colonel Chittenden states, in the nature of local freight. The important point, however, is that all this freight is moving down stream, and it would seem scarcely reasonable to suppose that under this continual movement down stream the only silt to find its way into the Gulf is that which comes from the extreme sources.

In contradiction to the above statements, Colonel Chittenden says: "It is incontestably true that whatever restraining effect forests have upon runoff is greater upon the lowlands than upon steep mountain sides." This is a good illustration of the character of statement with which this paper abounds—positive statements given entirely without proof and in contradiction to all experience and to the best authorities. It would seem to be reasonably clear that since on steep slopes there is more tendency for the water to run off than on moderate slopes and flat land, whatever restraining effect the forest exerts would be greater on steep slopes than elsewhere. Seeing that if the land were absolutely level there would be no tendency at all for the water to run off, so that it would all either percolate or be absorbed, or evaporate, and seeing that flat lands upon which forests will grow are generally suitable and must sooner or later be used for cultivation, and seeing, also, that Colonel Chittenden has asserted that newly plowed land has probably a retentive capacity greater than the forest ground, the difficulty of reconciling some of these statements will be seen.

In the recent work of Huffel, *Economie Forestiere,* for example, a detailed discussion of many of these points will be found, and the fallacy of Colonel Chittenden's last remark above quoted is there abundantly shown.

Colonel Chittenden refers to some foreign publications, particularly to the reports of the Tenth International Navigation Congress, held at Milan in 1905. With reference to these, he says: *"While all the writers heartily favored forest culture,* the opinion was practically unanimous that forests exert no appreciable influence on the extremes of flow in rivers." The important part of this quotation is the first clause, and not the last. It is true, and it is a very significant fact, that *all the writers urged the preservation of the forests on the mountain sides,* or precisely what is contemplated by the White Mountain-Southern Appalachian bill. As foreign testimony may be of value in this connection, as showing the dependence of the interests of navigation upon the preservation of the forests, it may be worth while to give extracts from some of these reports.*

Mr. Lafosse, the French delegate, says:

> If the destruction of forests is to be deplored, *it is most of all on the mountain that the cutting away of timber is to be feared. It is not alone the supply of the springs and the discharge of the streams which are in danger. It is the very existence of the rivers themselves.* The stream which can be utilized disappears to give place to the devastating torrent.
>
> The soil swept bare of its forests, exhausted by the abuses of grazing, loses quickly its vegetable stratum. Washed periodically, and carried away by melting snow and summer storms, it is soon disaggregated. The waters run toward the low points, rolling before them gravel and boulders, and even tearing out loose sections of rock. A thousand rivulets cut out beds, the torrent is formed. Scours begin, the banks

*The translations were made abroad, and the quotations are given just as printed.

are broken down, and a mass of mud, stones, and rocks invades the valley, destroying everything as it passes.

Mr. Wolfshütz, a delegate from Austria, while admitting that excessive floods are not appreciably checked by forests, writes as follows:

For economical reasons reafforestations will have to be confined to the steeper mountain slopes which are of little use for other cultivation. Here the forest will have a beneficial influence by making the soil firmer and more compact and by preventing erosion and washing down, and thus any excessive alteration and the formation of detritus which would shoal and silt up the water-courses. Such forests further retard the melting of the snows in spring and lessen the violence of spring high water. *It is thus advisable in the interests of navigation to spare and to attend to the forest.* There is no simpler, cheaper, nor more effective means for securing the mountain slopes and for keeping the pebble shoals down. In this respect, forests have incontestably had a beneficial influence upon the floods of the large rivers. Beyond this, however, no further measurable influence upon the high waters of rivers can be credited to them.

As regards the occurrence of high floods in the large rivers, the forests cannot have any noteworthy influence. As regards the increase in the ground-water level and in the replenishment of springs the forests have, in the plains, no more influence than the open ground, and it is only in the mountains that this action can be rated at any higher figure. *In the mountains, however, the main office of the woods will be to prevent the denudation and erosion of the surface, the formation of detritus, and the silting up of the river-beds with mud, sand, and pebbles.*

Mr. Riedel, of Vienna, is very emphatic as to the benefits of forests. He shows the terrible results which have been brought about by their destruction in various parts of Europe, and, with reference to Germany, states that * * *

In Germany, also, reasonable bounds were not everywhere kept to, and the effects of the progressing deforestation made themselves apparent, on the one hand, in scarcity of timber, and on the other *in the impoverishment of perennial springs and the alarming lowering of the mean water-level of German rivers,* and not less so in a gradual increase in the dryness of the ground, caused by the fall of the level of the underground waters.

The unquestioned circumstance, that a large number of rivers now carry down more loose material than formerly, is a consequence of the extensive denudation and careless clearing of the plantations. The slopes of the hills lose a large part of their fruitful soil, and in many cases earth-slides, and even extensive subsidences of whole slopes take place, while considerable areas of ground in the valleys are smothered up and rendered useless.

The loose material which the tributary brooks carry into the main streams ceases to be carried onward as the declivity becomes less steep, and in consequence fills up their beds. The streams are then obliged to seek out new courses, by which the most fruitful ground is devastated and the whole bed of the valley is gradually transformed into a barren layer of loose stones. This drawback affects not only the mountain dwellers, but, in so far as the waters are not able to deposit their loose suspended material in large basins on the way, the population of the lower-lying fertile and well-tilled valleys also. Here the damages further include the circumstance that, by reason of the often elevated position of the river-bed, overflow-waters are very difficult to get rid of.

Proofs of the foregoing, and especially of the last-mentioned circumstance, are afforded by a large number of river valleys. This condition of things is of importance in the cases of those river or stream channels which, by the formation of weirs, are to be made serviceable for purposes of inland navigation. Thus on the canalized Oder, between Cosel and Breslau, properties which, though at a distance from the channel, lie at a lower level than the latter, are swamped to the most damaging extent.

The foregoing is not intended to convey the idea that previous to deforestation, earth slides, damages to river banks, and inundations did not take place, but it is intended to show that *since the decrease of the forests all these disadvantages have increased to a serious and disquieting degree.*

Mr. Lauda, of Vienna, compares two similar watersheds of about the same area in Austria, one being much more heavily wooded than the other. He thinks the forests may not exert much influence in high floods, but concludes as follows:

If, now, the final judgment on the subject of the influence of forests on the regimen of streams be unfavorable to the forest to this extent, that there are denied to it certain of the properties attributed to it generally, it does not follow from this that it is necessary to oppose the rewooding of arid surfaces, the replanting of the basins of streams or the maintenance of plantations of trees. *The general utility of the forest is so well settled, the extraordinary appreciation in which it is held, as a means of protecting the soil against landslides, is so firmly established, its great advantageousness, especially for the spring district, in holding back*

earth thrusts and reducing the amount of sediment carried by rivers so important, that these reasons alone justify fully the greatest possible promotion of forest culture.

Mr. Ponti, of Italy, seems to have no doubt that forests on steep slopes are useful in the interests of navigation. He says:

In Sicily, the consequence of cutting away the forests on a vast scale in the province of Messina has been also to raise sensibly the bed of the streams, and many of these beds are now above the adjoining fields.

Mr. Keller, of Austria, thinks that forests affect the regimen and discharge of rivers only to a slight extent, except in mountainous regions, regarding which he says:

However, there is no doubt that in many cases deforestation has contributed to the erosion of the mountains and to the deposit of the soil at their foot, as also to an unfavorable change in the conditions of flow and drainage of the waters. This remark applies equally to the regions of high mountain ranges as to the Mediterranean basin. There, also, the formation of a cohesive soil takes too long to make good the loss caused by a sudden shower.

Mr. Lokhtine, of Prussia, does not discuss particularly the effect of mountain forests, but among his conclusions is the following:

(1) Forests form a beneficent factor, acting favorably on the general abundance of water in a country, and particularly on the supply of streams and rivers. That is why the destruction of forests should be considered as hurtful and dangerous.

These extracts show that foreign authorities are unanimous as to the benefits of forests on the mountains upon the flow of streams and the interests of navigation.

It will not be attempted to discuss Colonel Chittenden's remarks with reference to reservoirs, as these are not here under consideration.

Finally, it must be remembered that the acquirement by the Government of forest reserves in the Appalachian and White Mountains will be of benefit to the navigation of the streams not simply in proportion to the area of these reserves. By acquiring a foothold, the Forest Service will be able to demonstrate to owners of adjoining tracts the benefits of wise forest management, and will be able to cooperate with them on the ground in using similar methods in their own forests. The Government, also, for the same reason will be able to restrict forest fires, not only on the Government reserves, but on private lands. The effect of the Government reserves, therefore, will be much larger than in proportion to their area, and by wise management and by cooperation with private owners, not only will erosion of the ground be prevented and the flow of the streams favorably affected, but the timber supply will be conserved.

THE INTERESTS VERSUS THE PEOPLE

By THOMAS ELMER WILL

I. AN ORGANIZED FIGHT

THE issue is joined and the war is on.

For years, the readers of this magazine have been familiar with the fight on the National Forest policy. At regular intervals certain United States Senators have made the welkin ring with their onslaughts upon "Baron" Pinchot and his "Western empire."

Again and again sentiment and evidence sufficient to pass a dozen ordinary bills have been concentrated upon Congress to secure the enactment of the Appalachian bill, only to see it fail in one house or the other.

But the fight is not confined to the forest policy. In CONSERVATION for August, the present writer pointed out the hostility to the conservation policy in general.

Congress, though urged by the President, will not establish a national conservation commission. The President appoints such a commission and asks for it a paltry appropriation of $50,000, but receives no response.

Instead, Congressman James A. Tawney, of Minnesota, appears with his amendment to the Sundry Civil bill, rushes it like lightning through both houses, and behold, the Conservation Commission, with numerous other similar and valuable bodies, is outlawed.

All of which proves again that Congress *can* enact legislation when it so desires, but that it is discriminating as to the character of legislation.

Next, the Conservation Commission comes forward with its epoch-making report, but the House Committee on Printing, Charles B. Landis, of Indiana, chairman, refuses to report favorably the Senate resolution providing for printing it. Finally, the Senate prints a paltry 2,400 copies, chiefly for members of the two houses, and a congressional mailing list, and the report is thereby virtually suppressed.

What does it all mean?

As Mr. Pinchot so well said at Spokane, "The easiest way to hide a real issue always has been, and always will be, to replace it with a false one."

But the real issue in this case shall not be hidden. Let the facts testify.

For years, the hostility to the forest policy centered in Denver. It was there that the Public Lands Convention of June 18-20, 1907, was held. In Denver a year later came another outburst of hostility to governmental "great feudal estates," "paternalism," "bureaucracy" and landlordism."

In Denver there now exists "The National Public Domain League," with constitution and by-laws, membership fee, office, press bureau and the other paraphernalia of present-day propaganda.

The literature of this body is sufficiently abundant to make plain its viewpoint. That there may be no mistake about this, typical extracts are here given.

On one occasion Mr. Pinchot seems to have used the following very proper language:

"These reserves will be the remnant of the vast empire that lay beyond the Mississippi which can still be handed down as a national heritage after all the rest of the public lands worth having have become private property."

To the National Public Domain League this expression operates as a red rag flaunted in the face of an angry bull. The sentence is quoted over and

over again as a complete betrayal of the sinister motives of the Federal "feudal baron," and as carrying with it its own refutation and the final and utter condemnation of its author.

Again, the Forester is reported to have said:

"In my judgment it is a perfectly fair and right thing for any man who comes and takes property belonging to all the people, which because he has it, somebody else cannot have, that he should make a return of some kind to the people. The time of free land, free timber, free everything, has gone by."

This declaration also, repeatedly quoted, fires the blood and rouses the ire of the Public Domain League.

What the National Public Domain League wants is shown by such declarations as follow:

It is declared to be "the duty of every citizen to urge the fullest possible liberality on the part of the Government in passing the lands and their resources into the hands of *bona fide* citizens."

"Exactly the same principle is involved relative to *every natural resource pertaining to the public domain,* in that *they shall pass,* in an equitable manner, *into the ownership of the individual,* in order that that tremendous resource, ever incident to the West, viz., 'opportunity,' may continue as an incentive to bring into our citizenship the best people of the land, and our prosperity be accelerated through the full sway of our national characteristic, viz., *'individualism.'* "

"The League is *opposed to the principle that the public domain and all its resources 'belong to all the people,'* in the sense that those words were used by President Buchanan in 1860, in his message vetoing the Homestead Bill; but the League adheres to the national principle immediately thereafter established, in adopting that Homestead law —that the public domain and all its resources belong to all of the people to *come, take and use.*"

The meaning of such expressions as these is unmistakable. Between the position taken by Mr. Pinchot in the language first quoted, and that taken by the League, there is a great gulf fixed. They are polar opposites. They no more agree than do plus and minus, or fire and water. Mr. Pinchot proposes that "these reserves" shall be "handed down as a national heritage." The Public Domain League propose that "every resource pertaining to the public domain * * * shall pass * * * into the ownership of the individual."

The advocates of forest reserves believe that "the public domain and all its resources," in so far as it may be deemed wise to set these aside in the form of National Forests, "belong to all of the people," *collectively.* The League, instead, "adheres to the * * * principle * * * that the public domain and all of its resources belong to all of the people to *come, take* and *use," individually.* The conservationists believe in maintaining a public property in certain selected portions, at least, of the public domain. The Public Domain League believes in turning the whole of this public domain into private property as quickly as may be. The conservationists believe in limited collectivism; the League, in unlimited individualism.

The irrepressible conflict between the viewpoint of the conservationists and that of the Public Domain League is further shown by the proposal, above quoted, that "our prosperity" shall "be accelerated through the full sway of our national characteristic, namely, *'individualism.'* "

In his *Outlook* editorial of March 20 last (page 619) Theodore Roosevelt points out that "absolute individualism" would not "be compatible with civilization at all * * * That every step toward civilization is marked by a check on individualism." He continues, "The ages that have passed have fettered the individualism which found expression in physical violence, and we are now endeavoring to put shackles on that kind of individualism which finds expression in craft and greed."

In seeking to ensure "the full sway of our national characteristic, namely, *"individualism,"* the Public Domain

League is harking back to a past as dead as that of chattel slavery.

If the writers of the League but knew the alphabet of history, if only they were in faintest touch with the great movements of the modern age, led by far-off New Zealand but represented in every progressive country of the world, notably in England, France and Germany, and more feebly, yet certainly, expressed by the great awakening in Russia, Turkey and Persia, they would know that the race has outgrown unrestricted individualism as certainly as, in the fullness of time, it outgrew feudalism.

Governor Pardee, at Spokane, well said:

"Countless graves have been filled, countless children orphaned and countless widows made by individualism since the history of the world began. Caesar was an individualist. Napoleon was an individualist * * * But is the time not ripe when individual rapacity shall be checked and kept in order and regulated so it will not further oppress the people and take away from future generations * * * the things that ought to be of right the property of all the people of the country?"

Yet the program whereby "every natural resource pertaining to the public domain * * * shall pass * * * into the ownership of the individual" is exactly what unrestricted "individualism" implies and demands.

In its individualistic frenzy, why does not the League go the limit, and embrace the doctrines of Herbert Spencer and the other anarchists, "philosophical" or what not?

Spencer was an individualist and, being such, he dared to be, for the most part, logical. He demanded not only that government should cease interfering with the operations of individuals so long as they maintained his "equal rights" principle—specious, but unworkable under his scheme—but that the schools, post-offices and even the mints should be turned over to individuals for their private operation.

Yet despite his prodigious intellect, Spencer, as a political teacher, was recognized in his own country, years before his death, as "a voice crying in the wilderness." Mr. Roosevelt, on the other hand, has all history behind his declaration that "every step toward civilization is marked by a check on individualism."

But does the National Public Domain League represent anybody? Let it speak for itself.

In its Bulletin No. 2, it says:

"All but one of the Colorado congressional delegation, the chairman of the public lands committee of Congress, three Colorado state senators, and many of our most prominent near-by citizens," are members.

The solitary exception is that of Senator Guggenheim. From all the other members of the Colorado delegation in Congress the League publishes strongly commendatory correspondence.

Congressman John A. Martin writes a letter so full and carefully prepared that the League has published it as a special bulletin.

Senator Hughes wires: "I wish to say that I heartily endorse the objects of the National Public Domain League."

Congressman Taylor writes: "I am in hearty accord with the League and with your object, and shall be more than pleased to aid in every way possible toward carrying out its purposes."

Congressman Rucker writes: "You can safely trust me with doing all in my power to push the results outlined by your declaration of purposes."

Congressman Mondell, of Wyoming, telegraphs: "I am in hearty sympathy with the aims and purposes of the League as set forth in the Articles of Association."

And there are others.

II. WHY THE SPOKANE CONTROVERSY?

As to the inwardness of the Spokane controversy, let no one be deceived. Personal feeling may exist, but the real issue is not personal. "Graft" there may be, but the question strikes deeper than graft. Differences may, and do exist, in interpretations of law; but as an issue, law is not in this case primary.

The real issue is the age-long issue of "mine" and "thine." It is this ancient question in its most modern aspect: that, namely, of *the interests against the people.*

The public domain belongs to the people. The interests want it and are resolved to have it.

In this domain are lands, forests, mineral deposits and water-powers of priceless worth.

By accident, in an age of rampant yet discredited "individualism," a president came into power who cared for the interests of the common people.

For once, furthermore, in our national history, the country had a president who knew the great West.

Again, a case too rare among administrators and rulers, this president listened to a wise counsellor.

He recognized that, with a population such as ours is and is to become, the people would need, and need soon, every foot of this public domain and every dollar's worth of the value represented thereby.

He was brought to see, however, that, by fair means and foul, and with rapidity inconceivable, this vast estate was passing into the hands of the few.

He realized that the time had come to act, and he acted.

He launched the "Roosevelt policies," including the vast enlargement of the National Forest area, the passage of the Reclamation law, the appointment of the Inland Waterways Commission, followed by the National Conservation Commission, the calling of the White House Conference of Governors, and of the North American Conservation Conference, at which meeting was promulgated the never-to-be-forgotten call for the World's Conservation Congress at The Hague.

Men say, "But these things everybody believes in." Hold, not so fast.

Plenty of people are willing that natural resources shall be conserved provided this process does not interfere with their own private interests. But can conservation be carried far without clashing with the private interests of somebody?

Look, for example, at coal. Till yesterday coal lands, according to their distance from a railroad, sold at $10 or $20 per acre. Now the Geological Survey is placing upon them a value approximating their market value.

These values range up to $100, $300, even $500 per acre.

A single unbroken coal vein eighty-four feet in thickness, the lands over which, until Secretary Garfield's time, were held at $20 per acre, now represents millions to the Government.

A single township which, under the old practise, would have sold at less than half a million dollars, is now held at $8,000,000.

Here we have the modern revised version of "the ratio of 16 to 1." Will the business man, intent on bargains in coal lands, approve this kind of conservation?

In like manner, immensely valuable forest lands in Government possession have been frittered away. The National Forest policy checks this process. How many timber-land speculators may be expected to approve such conservation?

But national irrigation, it may be argued, will interfere with no man's private gains. Be careful. Here again we may jump at conclusions.

In his address of welcome at the Spokane meeting, Mayor Nelson S. Pratt said:

"And yet, I am not unmindful of the fact that an effort to enlist the aid of the General Government to the extent that the reclamation proposition shall be undertaken by the United States government generally, will be met by the most strenuous opposition from some of our money centers, by men who in the past have been able, as it appears, to wield a powerful influence in national legislation."

On August 14 *The Wall Street Journal* said editorially:

"There are vast areas of public land whose value the Government has not had time to determine. * * * Many of these tracts are known to private interests to contain enormously valuable deposits of minerals. Other areas will afford splendid opportunity for irrigation

enterprises, as to which the Government has a policy of its own and counter to which private interests occasionally run."

Speaking of the attack on Director Newell, the *Spokesman-Review* of Spokane for August 10, said:

"These attacks are directed chiefly by large and powerful interests that have failed in their efforts to manipulate Mr. Newell and persuade him to sacrifice the public welfare wherever it came in conflict with their desires."

Consider again the matter of water-powers. Note the statements made by Mr. Pinchot at Spokane, and the remarks by Mr. John L. Mathews, a specialist in this field; both found in this issue of CONSERVATION.

Read the following utterance by Mr. Mathews, deemed of sufficient importance to be quoted in the *Wall Street Journal* of July 31:

> Every group of capitalists in the United States is interested in water-power. The Standard Oil and the Amalgamated Copper people are grabbing powers in the Northwest. The Duke-Ryan tobacco trust is interested in southern powers. The Moffat group, with Myron Herrick, is busy in Colorado. Harriman, through Pacific-coast power companies and through alliance with Oakleigh Thorne and Marsden Perry, makes his influence felt and contributes to the good understanding. The harvester trust, the Widener group—all these and others are getting their share of our water-powers. What are you going to do about it?
>
> Of course, if you are one of the capitalists represented in any of the present water-power corporations, you are going to promptly and enthusiastically condemn "muck-raking magazines," and give instructions to your press agents, your newspapers, and your lawyers to discredit these statements in every possible manner. But if you are one of the other 99,999 out of every 100,000 of the population—if you are just a plain business man, or professional man, or workingman, or farmer—what are you going to do? You can sit idly by, and can be sure that the grabbers are busy every minute. Or you can demand intelligent, honest action from your members of the state legislature and your member of Congress and your United States Senator.—JOHN L. MATHEWS in *Hampton's Magazine.*

With interests like these antagonized shall we wonder that the heads of men like Pinchot and Newell are demanded as a sacrifice?

That the interests were in evidence at Spokane is also clear from the dispatches.

Former Senator George Turner severely criticized Governor Pardee's speech; in addition, he bitterly fought the indorsement of Messrs. Pinchot and Newell.

The *Spokane Chronicle* for August 12 quotes him as saying: "I am under a retainer from the Washington Water-power Company, and have been so for a number of years."

The same paper also declared that "Judge Turner is counsel for the Yuma Land and Irrigation Company, which is engaged in litigation with the United States Government."

The Spokesman-Review, of Spokane, for August 30, says:

"Judge Turner is attorney for this company (The Irrigation Land and Improvement Company) in a suit that not only seeks to stop one of the national irrigation projects, but attacks the constitutionality of the whole reclamation work."

The Denver Times, of August 14, speaks of "former Senator Turner and Attorney Frank H. Post, both of whom are attorneys of record for the Washington Water-power Company, a branch of the General Electric Co."

The Washington Times, of August 14, tells of the work of "Former Senator Turner and Attorney Frank H. Post, both of whom were attorneys of record for the Washington Water-power Co., a branch of the General Electric Co.," and adds: "At former Congresses the attorneys for the Water-power Co. and private irrigation concerns have always been aligned against the then Secretary of the Interior, James A. Garfield. Both Turner and Post have fought the policies of Pinchot and the Reclamation Service and both were opponents of Secretary Garfield."

III. THE BALLINGER-PINCHOT CASE

And now for the Ballinger-Pinchot case. What are the facts?

Not all of these, unfortunately, are verifiable. On some of the most important "deponent," the Interior Department, "saith not."

The resources, nevertheless, of the Capitol, the Departments, where available, and the press, including a clipping bureau, have been exploited. Following is the story:

In recent years there has been forming a water-power trust. When complete, it will dominate the power market, and with it all industry. Beside it, Standard Oil will be petty.

The seat of power for the trust is water-power sites. In *Forestry and Irrigation* for April, 1908, the present writer editorially exposed numerous attempts on the part of the power interests to secure Congressional legislation.

In the closing days of his administration, President Roosevelt learned of wholesale seizures of water-powers by the trust.

It had been supposed that Secretary Garfield would continue in charge of the Interior Department; on February 15 he learned that he must go on March 4.

"Not knowing who the new secretary would be, President Roosevelt and Secretary Garfield decided to lock all doors so that the new administration would find everything snug."

At midnight, preceding March 4, President Roosevelt withdrew from entry, and hence from the reach of the land grabbers, 186,000,000 acres of land containing power sites. Three-quarters of this was in Montana, the remainder in Wyoming.

Secretary Garfield was followed by Richard Achilles Ballinger, of Seattle. Following the Binger Hermann-Mitchell scandals, Ballinger had come to the Land Office, where, for a year, beginning February, 1907, he was Commissioner. Friction, however, existed and he resigned.

Hardly had Secretary Ballinger assumed office before he began throwing open to entry lands which his predecessor had withdrawn for the protection of the public's interests.

How much? Application to the Department of the Interior for figures has brought no response. A table published on May 8 shows land totaling 5,012,729 acres to have been thus released in twenty-one states and territories.

Press reports at hand indicate the throwing open to entry of more than a half-million additional acres in July.

The reason given by Secretary Ballinger for these acts was the lack of specific law for the withdrawal of the land originally.

Presently the country began to be heard from. Not only so, but Mr. Gifford Pinchot, Forester, went direct to President Taft and voiced an indignant protest.

President Taft promptly instructed the re-withdrawal of the lands in question. But a fraction, however, of the lands thrown open were re-withdrawn.

Furthermore, it is charged, lands in Montana, ordered to be withdrawn, were not withdrawn for nearly two months; during which time representatives of the power trust grabbed immensely valuable water-power sites.

The protest of Mr. Pinchot, however, bore fruit of still a different character. A bit of side history must here be introduced.

The Indian reservations are in control of the Indian Office of the Interior Department. On the Indian reservations are valuable forests. The Indian Office, however, does not maintain a scientific, technical forest force. It is and has been, therefore, incompetent to handle forests.

Realizing this, the Secretaries of Agriculture and the Interior on January 22, 1908, agreed upon a plan of co-operation between their departments. Under this plan, the Indian forests were administered by the Forest Service of the Agricultural Department, the Indian Office paying the bills.

Mr. Pinchot's letter of July 23 last, to Secretary Wilson, shows that this plan bore admirable fruit, a fact which the Interior Office concedes.

When Mr. Ballinger became Secretary, the question of continuing this co-operation was repeatedly discussed with him. He agreed that the cooperation should continue.

However, when ordered by the President to re-withdraw the lands as above mentioned, he changed his mind on this point.

Press dispatches from the West quo-

ted him as saying that "a subordinate of the Agricultural Department should not run the Interior Department."

On July 17 and 20 his representative, the Acting Secretary of the Interior, through letters to the Secretary of Agriculture, terminated the cooperation on the ground that it was "in contravention of law and of well settled principles."

Meanwhile, trouble was brewing in the Reclamation Service. The Secretary of the Interior was reported to be hostile toward the Director, Mr. Frederick Haynes Newell.

The Secretary started on a tour of the reclamation projects. A press story from Oregon announced that "scores and perhaps hundreds of bitter complaints would be poured into his ear," and it was predicted that there would be "a great shake-up in reclamation circles" after Mr. Ballinger had completed his inspection.

The source of these complaints was conceded in the following language: "These reports are circulated, as a rule, by representatives of companies whose private projects conflict with those of the Government."

In the same story it was declared that "the projects should be confined to Government lands and kept clear of enterprises which private capital is ready to finance."

Again, Director Newell was criticized for going outside the law in promoting his work.

For the convenience of settlers of limited means, and to enlarge at the same time the scope of the reclamation work by the Government, a cooperative plan had been agreed upon.

By this, the settler might pay in part for his water rights by his work; the Service at the same time could avail itself of his labor without paying therefor in cash. Each party to the contract was benefited, and the plan proved exceedingly popular.

Furthermore, before its adoption this plan had been carefully considered by the Secretary of the Interior, the Director of the Reclamation Service, and the Senate Committee on Irrigation and Reclamation of Arid Lands.

Secretary Ballinger, however, forbade its use as not specifically provided for by law.

His hostility to this plan was, perhaps, reflected in his remarks at Spokane where he said:

"The whole scheme of the act is based upon the appropriation of the proceeds of the sale of public lands in certain states and territories for the construction of irrigation works for the reclamation of arid and semi-arid lands therein. No further appropriation by the Government is intended, or can be inferred from the act."

Naturally the enlargement of the field of the Reclamation Service, as by this cooperative plan, pointed toward competition with "enterprises which private capital is ready to finance." The Secretary, in his Spokane speech, declared that it was "not the policy of the National Government * * * to hinder or interfere with the investment of private capital in the construction of irrigation works," and declared himself to be "not a believer in the Government entering into competition with private enterprise."

At the Spokane meeting, these questions came to a focus. Mr. Newell spoke on the 9th, Mr. Pinchot on the 10th, and Secretary Ballinger on the 11th. The latter was immediately followed by Former Governor Pardee. All these speeches are reported in this issue of CONSERVATION.

Mr. Newell's speech was mollifying. He showed what the Reclamation Service is doing, gave credit to the work of private capital, suggested the immensity of the task undertaken by the Service, hinted that it was under fire, and pointed out how "offenses must needs come."

Mr. Pinchot emphasized the importance of the home in the Nation, and the need of saving and extending it. He voiced the need for maintaining equality of opportunity among citizens; showed how this equality is menaced, among other things, by the water-power trust;

how President Roosevelt had sought, by grasping the spirit of our fundamental law, to protect the plain American citizen, but how, through a Pharisaical emphasis upon the letter of the law, it is possible wholly to miss its spirit. Finally he made clear that "this strict construction necessarily favors the great interests as against the people, and in the long run cannot do otherwise."

He declared that "the great, oppressive trusts exist because of subservient law-makers and adroit legal constructions. Here is the central stronghold of the money power in the everlasting conflict of the few to grab, and the many to keep or win the rights they were born with. Legal technicalities seldom help the people. The people, not the law, should have the benefit of every doubt."

It is here that Mr. Pinchot "threw down the gauntlet;" for it is exactly this strict construction that has characterized Mr. Ballinger's administration.

Strict construction gave him his ground for restoring to entry the lands Secretary Garfield had withdrawn.

Strict construction enabled him to declare cooperation between the Indian Office and the Forest Service on Indian forest lands unlawful.

Strict construction, again, was killing the cooperative work on the reclamation projects.

Excitement rose high while Mr. Pinchot spoke, and the applause as he ended was loud and long.

On the following day, Secretary Ballinger came, read his paper, and, without waiting for questions or discussion, hastened from the room.

His apparent disposition to limit strictly the work of the Reclamation Service, his dread of Government competition with private enterprise, his belief that irrigation farming is not generally "a poor man's proposition," and especially his restoration of lands to entry, raised questions which many were eager to ask.

As the Secretary left the room, Former Governor Pardee was introduced. Laying his manuscript on the table, he launched into the *ex tempore* address published in this issue.

It is needless to say that the Pardee speech was a bomb shell. The excitement, high before, here rose to a white heat.

Former Senator Turner denounced the speech, and interpreted its closing statement to mean that "public officials" should "act first and then investigate the law afterwards."

The governor, however, would not have it so, and closed by rejoicing that he was "neither a lawyer nor the son of a lawyer."

The preceding day had brought the reports of the alleged Montana land scandal.

The story came from Helena and gave added point to the tale, already outlined, of the withdrawals of lands by Garfield and their reopening by Ballinger.

It told of a vanishing coal supply, of electricity generated by water-power as the coming successor of coal, and of the billions of wealth, potential and soon to be actual, represented by water-power.

It told of Montana's water-power sites as strategic in the plans of the power trust.

Finally it told how Secretary Garfield and President Roosevelt sought to save these lands, how Secretary Ballinger threw them open to entry, how President Taft warned him to re-withdraw them, but how, during his delay of weeks in so doing, the trust seized the power sites.

The Spokane Press demanded editorially of the Secretary that he meet these charges. How he met them we have seen.

Perhaps the Interior Office will yet make all this clear. The facts have been applied for, but, thus far, without success.

The office has said: "The public has all the information we care to give out at present."

IV. THE ALASKA COAL LANDS

Finally, as to the Alaska coal lands.

In Alaska is the Chugach National Forest. On its eastern edge is a coal field containing, it is said, the finest grade of steam coal. The field is valued at something less than a billion dollars.

Over half of this field is in the National Forest; President Roosevelt having, on his last day in office, so extended the boundaries of the forest reserve as to take in between 1,000 and 2,000 acres of this coal tract.

Now comes Mr. L. R. Glavis, chief of the Field Division of the Land Office, with a story buttressed by affidavits.

This story is placed directly in the hands of President Taft. In it are charges which, if sustained, mean a governmental earthquake.

One Clarence Cunningham, an Idaho prospector, discovered this field, bought out other prospectors who had filed claims on it, and, with thirty-two associates, himself filed claims to 5,280 acres under the coal land laws. These entries, it is claimed, were made by "dummies" picked up from docks and among unemployed miners.

Cunningham attempted to have his claims approved by the Department of the Interior; Secretary Garfield, however, refused; but Cunningham did not abandon hope.

Ballinger was, at this time, Commissioner of the General Land Office, and gave the Cunningham case his personal attention.

On resigning, he immediately became attorney for Cunningham. In this capacity, he filed a brief in the Interior Department urging Secretary Garfield to issue patents for the Cunningham lands.

On becoming secretary, Ballinger turned the handling of the Cunningham claims over to his assistant secretary, Mr. Pierce.

The Glavis story tends to show that the Interior Office, by an important ruling, sought to ensure the granting of the Cunningham claims, and by numerous telegrams to Glavis, to hasten proceedings.

Mr. Glavis believed the case to involve conspiracy, and wanted time; his superiors, instead, it appears, wanted "expedition."

Then follows the account of Mr. Glavis's appeals direct:

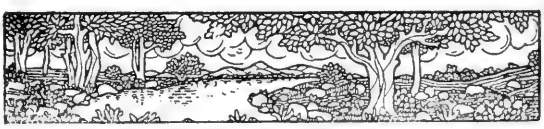
The first of these was to the Attorney General, who reversed the above ruling and decided that charges of conspiracy might lie in the Cunningham case.

The second was to the Forest Service, informing that office that the Cunningham claims, more than half in the Chugach National Forest, were about to proceed to hearing, and requesting the cooperation of that office in obtaining a postponement until the Government could complete its case. This, it is held, is the first official intimation received by the Forest Service that hearings in the Alaska coal case had been ordered.

And finally comes Mr. Glavis' appeal, in person and with papers, to the President himself.

The whole account is sensational to a degree. It seems clear either that the Interior Office is shamelessly maligned, or that it requires the immediate personal attention of the President and, perhaps, of a grand jury.

The latest word, as we go to press, is that the President has called upon the Department of the Interior for a complete statement of the Cunningham case.



EDITORIAL

Resolutions by the National Irrigation Congress

IN OUR news columns will be found the principal resolutions adopted by the National Irrigation Congress. Attention is herewith called to some of them:

BOND ISSUE ADVOCATED

The Irrigation Congress adopted the following resolution regarding a bond issue for conservation work:

Resolved, That the National Irrigation Congress co-operate with the several sections interested to bring about broad, comprehensive, yet conservative legislation whereby drainage, deep waterways, and forest conservation together with the pressing needs of irrigation may be provided during the coming session of Congress by bond issue; such bonds to be issued in small denominations, bearing a low rate of interest, in order that they may find their way into the hands of the people.

While the specific amount called for by the Hooker resolution was omitted, its principle is recognized.

Conservation, neglected, means national ruin; properly conducted, it costs nothing and yields a splendid net return. The principle, therefore, upon which the Hooker resolution rests is that it is needless to impoverish ourselves now that he may be wealthy in the future, when we may, in fact, pay the cost of great conservation and reclamation projects out of the profits of the enterprises. It should be noted that the bonds called for are of small denomination, thus putting them within reach of the everyday citizen. That people of moderate means will buy Government bonds when given the opportunity to do so was fully demonstrated in President Cleveland's second administration, and the proof may be repeated at any time.

INDORSEMENT OF THE FOREST AND RECLAMATION SERVICES

The congress approved the work of the Forest and Reclamation Services in the following resolution:

We approve of the honest, intelligent, and efficient manner in which the work of the Forest Service and Reclamation Service has been carried on, and we are convinced that the work of these bureaus has been to the interests of the small landowner and settler.

This resolution comes at a time when these two services are subjected to the fire of fierce criticism, and when it has been freely predicted that the heads of both would be driven from their positions. Further, it was adopted almost unanimously by a great and representative assembly, meeting in a far western state where the work of both bureaus is intimately known. The results, therefore, must be peculiarly grateful to every reader of CONSERVATION and to every friend of the conservation movement.

$10,000,000 ANNUALLY FOR IRRIGATION

The call for an additional $10,000,000 per annum to be appropriated by Congress for the period of five years, the same to be used under the provisions of the Reclamation Act and covered back into the national treasury in due time by the home-builders, is likewise eminently worthy the consideration of Congress.

Since the passage of the Reclamation Act, June 17, 1902, the utility of this service has been amply demonstrated. At the same time, there remains a vast area to irrigate and great projects, already begun, await completion, primarily, because of inadequate funds. Money thus expended costs the Government nothing, for it all comes back from the home-builders. From the standpoint of the settler and of public policy, there is everything to gain and nothing to lose by pushing such work. If objection there be, it must be looked for, primarily, from two classes of citizens: those, first, who would have Government do nothing but play the policeman; and those, second, who represent "the

rights of private enterprise" in irrigation, and who apparently harbor a morbid dread of "the Government entering into competition" with such enterprise.

Thus far, "legitimate private enterprise," especially that which has passed the infantile stage, has somehow managed, in this country, to worry along. It has discovered that "there is room at the top," and has headed that way. The Spokane debate, however, reminds one of the remark of old Ephraim in discussing the question of room. Said he, "What we most need, 'pears to me, am a little moah room at de bottom."

This room, it has been fondly hoped by irrigationists, the Reclamation Service would aid in providing. Since all it needs, apparently, is more money and no brakes, the appropriation should by all means be made, and the amount asked is small enough.

GOVERNMENT DRAINAGE

The resolution in favor of drainage, by Government, of the swamp and overflowed lands of the Union in the interest of public health and the creation of homes, is eminently wise. In view of work already in progress by states, notably Florida, the cooperation of the states and the Federal Government is very properly suggested.

The drainage question is one of far-reaching importance. We have in the United States 150,000,000 acres of waste lands, capable of reclamation. Such lands are among the most fertile, if not absolutely the most fertile, on the continent. The largest swamp area is in Florida, where the region covers 18,500,000 acres; Louisiana follows with 9,600,000 acres; Arkansas is third with 5,700,000. Thirty-nine states have swamp areas which may be figured in the tens of thousands of acres.

According to official estimates the cost of reclamation by drainage will not, in most instances, exceed five or six dollars per acre. Judging by the present value of drained lands, it is within limits to estimate that these lands will reach a value of from $50 to $200 per acre. If 60,000,000 acres are reclaimed and reach an average value of $100 per acre the total land value thus added to the Nation will amount to $6,000,000,000.

The Flint bill, which has been before the Senate for some time, provides for a revolving fund similar to that by which arid lands are reclaimed by irrigation. Here again is an enterprise which will cost the country nothing, for the lands reclaimed pay for themselves and more; in addition they will add vastly to the national wealth, and increase the opportunity of citizens to provide for themselves homes and earn honest livelihoods. The 60,000,000 acres above mentioned, if divided into forty-acre farms as contemplated by the Flint bill, would provide for from 7,000,000 to 8,000,000 additional farm population. Unless all "poor men's propositions" are to be turned down, and the Government is to be permanently committed to the policy of refraining from aiding the citizen, it would seem difficult to find good ground for criticizing the drainage resolution.

REGULATION OF TIMBER-CUTTING

The Congress favored "the enactment of laws by the states regulating cutting of timber on state and private lands."

This proposed restriction of the "right" of the individual "to do as he will with his own" is another blow at that rampant "individualism" which has gone so far to despoil the heritage of generations yet to come. In foreign countries, notably Germany, such regulation is accepted as a matter of course. At the White House Conference, President Roosevelt, in his opening address, called special attention to the need for such legislation in the United States. He said:

> Any right-thinking father earnestly desires and strives to leave his son both an untarnished name and a reasonable equipment for the struggle of life. So this Nation as a whole should earnestly desire and strive to leave to the next generation the national honor unstained and the national resources unexhausted. There are signs that both the Nation and the states are waking to a realization of this great truth. On March 10, 1908, the Supreme Court of Maine rendered an exceedingly important judicial decision. * * *

The opinion of the Maine Supreme Bench sets forth unequivocally the principle that the property rights of the individual are subordinate to the rights of the community, and especially that the waste of wild timber land derived originally from the state, involving as it would the impoverishment of the state and its people and thereby defeating a great purpose of government, may properly be prevented by state restrictions.

The Court says that there are two reasons why the right of the public to control and limit the use of private property is peculiarly applicable to property in land:

"First, such property is not the result of productive labor, but is derived solely from the state itself, the original owner; second, the amount of land being incapable of increase, if the owners of large tracts can waste them at will without state restriction, the state and its people may be helplessly impoverished and one great purpose of government defeated."

Commenting on this policy, the President said:

Such a policy will preserve soil, forests, water power as a heritage for the children and the children's children of the men and women of this generation; for any enactment that provides for the wise utilization of the forests, whether in public or private ownership, and for the conservation of the water resources of the country, must necessarily be legislation that will promote both private and public welfare; for flood prevention, water-power development, preservation of the soil, and improvement of navigable rivers are all promoted by such a policy of forest conservation.

This decision was also quoted in part and discussed at the same meeting by Mr. Edgar E. Ring, state forest commissioner of Maine.

STILL OTHER RESOLUTIONS

In view of the hardships suffered under the present law, it is desired that the homestead law should be amended so that the entryman upon public land under a Government project shall not be required to establish residence thereon before the Government is prepared to furnish him water.

The lands in question are, of couse, worthless without water. For the citizen to live upon them while the irrigation works are being constructed unquestionably involves, in cases, extreme hardship. A living cannot be made upon the land, and the entryman cannot go from it to make a living elsewhere without forfeiting his claim. Herein, doubtless, is found one chief reason why irrigation is "not a poor man's proposition." The problem, however, it would seem, might easily be solved.

The demand for deep waterways, notably the fourteen-foot waterway through the Illinois and Mississippi rivers from the Great Lakes to the Gulf, and the welcome declaration in favor of establishing national forests in the Southern Appalachian and White Mountains by Federal action, have also the genuine ring.

What Is the "Poor Man's Proposition?"

"While it is possible that persons of limited means may successfully enter and acquire irrigated lands, it will generally be found that it is not a poor man's proposition, unless coupled with intelligent industry in agriculture. The whole scheme of the act is based upon appropriation of the proceeds of the sales of public lands in certain states and territories for the construction of irrigation works for the reclamation of arid and semi-arid lands therein. No further appropriation by Government is intended, or can be inferred from the act."

Thus spake Secretary Ballinger at the National Irrigation Congress. Former Senator Wilson, in defending the power companies, is quoted as saying at the Congress: "It is the duty of the people to help the Government, and not the duty of the Government to aid the people in reclamation."

Statements like these at an irrigation congress are distinctly disappointing. It goes without saying that the desert is not to be reclaimed without "intelligent industry." The Secretary's remark, however, is supposed to carry with it a criticism of the cooperative policy of Director Newell and his advisers whereby water users were permitted to pay for their rights, in part, at least, by their labor. By this means, it is claimed and apparently not disputed, men who otherwise could not have done so have been enabled to secure homes upon irrigated lands, and the Government has been enabled, at the same time, to carry its reclamation

projects much further than would have been possible had it in all cases paid cash for labor employed on the projects.

The country has supposed hitherto that, with the rapid taking up of the public lands, one of the few opportunities still remaining to the poor man was afforded by the reclamation of the arid and semi-arid lands in the West. It has believed, in fact, that one of the chief advantages accompanying the reclamation work has been the possibility thus afforded for relief from the congested conditions existing in modern cities, and from the increasing pressure accompanying the struggle for existence. The statement by the secretary, however, especially when coupled with his overthrow of the cooperative plan above described, and reenforced by the statement above quoted from Former Senator Wilson, one of Secretary Ballinger's leading supporters in the Irrigation Congress, would indicate that these suppositions are incorrect, and that once again the poor man must look elsewhere for relief.

Not all have forgotten the speech made last fall by President, then candidate, Taft at Cooper Union. At its close, he was questioned as to the opportunities which exist in the United States for a man capable and willing, but unemployed. The speaker could extend to the inquirer no encouragement; his reply being simply, "God knows."

If the Omniscient alone knows what an unemployed man can do in America, if farming on irrigated land is "not a poor man's proposition," and if "it is the duty of the people to help the Government, and not the duty of the Government to aid the people," echoes will be heard from Governor Pardee's inquiry, "When are we ever going to give a chance to the common, working citizen?"

It will be recalled that Rome found it necessary to provide for its unemployed, although by means not generally to-day approved. Who will say that as against maintaining a body of placeless proletarians "in noisy idleness upon the price of their votes" and upon shiploads of grain from the provinces, freely distributed, it were not better for "the Government to aid the people," especially when, by providing opportunities for them to earn honest livings on reclaimed lands, it can do so without a penny of expense to itself or any one else?

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The Water-power Trust

NOTHING which occurred at the Spokane meeting has seemingly contributed more to the wide-spread press discussions of that gathering than Mr. Pinchot's reference to the "water-power trust." This concentration, he declared, is "not yet formed, but in rapid process of formation."

Among those who delight to denounce "Baron" Pinchot and all his works, this declaration is greeted with ridicule and scorn. One writer avers that "there seems to be no reason for Mr. Pinchot's exploiting this bugaboo of water-power monopoly, except to gain support in his effort to make power plants in national forests pay a charge for 'conservation' of water."

This question is one of fact. Fortunately, we have evidence at hand.

On January 15, 1909, President Roosevelt communicated to the House of Representatives a special message vetoing House Bill 17,707, authorizing the construction of a dam across James River in Stone County, Missouri.

Accompanying this message was a letter from the Commissioner of Corporations, under date of January 14, 1909, "setting forth the results of his investigations and the evidence of the far-reaching plans and operations of the General Electric Company, the Westinghouse Electric and Manufacturing Company, and other large concerns, for consolidation of the water-powers of the country under their control." This letter contains six pages of solid facts on the subject. It closes with a summary from which the following is taken:

> An estimate of the water-power, developed and potential, now controlled by the General Electric interests, admitted or sufficiently proven, is about 252,000 horse-power; by the

Westinghouse interests, similarly known, about 180,000 horse-power, and by other large power companies, 875,000 horse-power. This makes a total of 1,307,000 horse-power. Adding the horse-powers of the third class (c), those whose connection with these two great interests is at least probable, to-wit, 520,000 horse-power, we have a small group of thirteen selected companies or interests controlling a total of 1,827,000 horse-power.

Assuming that the water-power at present in use by water-power plants in the United States is 5,300,000 horse-power, as estimated by the United States Census and Geological Survey from figures of installation, it is seen that approximately a quantity of horse-power equal to more than thirty-three per cent of that amount is now probably controlled by this small group of interests. Furthermore, this percentage by no means tells the whole truth. The foregoing powers naturally represent a majority of the best power sites. These sites are strategic points for large power and market control. Poorer sites will not generally be developed until these strategic sites are developed to their full capacity. And should these strategic sites be "coupled up" they become still more strategic. There are powerful economic reasons for such coupling. The great problem of water-power companies is that of the "uneven load," and not only an uneven load but of an uneven source of power, because of the fluctuating flow of the stream. A coupling up utilizes not only the different storages in the same drainage basin, but, of still greater import, the different drainage flows of different basins. Also by coupling up, powers which have largely "day loads" can at night help out other powers which have largely "night loads," and *vice versa*. Coupling up is rapidly in progress in the United States. The Niagara Falls Power Company and the Canadian Niagara Power Company are coupled. The Southern Power Company, in North Carolina and South Carolina; the Commonwealth Power Company, in Michigan; the Pacific Gas and Electric Company, the Pacific Light and Power Company, and the Edison Electric Company, in California—each concern has its various developments coupled up into one unit.

The economic reasons urging water-power concentration are thus obvious. The facts set forth above show the very rapid and very recent concentration that has already occurred, practically all in the last five years. These economic reasons and business facts indicate clearly the further progress toward concentration that is likely to occur in the near future. It is obvious that the effect on the public of such present and future conditions is a matter for serious public consideration.

In his veto message the President refers to the facts stated in this letter, and says:

The total water-power now in use by power plants in the United States is estimated by the Bureau of the Census and the Geological Survey as 5,300,000 horse-power. Information collected by the Bureau of Corporations shows that thirteen large concerns, of which the General Electric Company and the Westinghouse Electric and Manufacturing Company are most important, now hold water-power installations and advantageous power sites aggregating about 1,046,000 horse-power, where the control by these concerns is practically admitted. This is a quantity equal to over nineteen per cent of the total now in use. Further evidence of a very strong nature as to additional intercorporate relations, furnished by the bureau, leads me to the conclusion that this total should be increased to twenty-four per cent; and still other evidence, though less conclusive, nevertheless affords reasonable ground for enlarging this estimate by nine per cent additional. In other words, it is probable that these thirteen concerns directly or indirectly control developed water-power and advantageous power sites equal to more than thirty-three per cent of the total water-power now in use. This astonishing consolidation has taken place practically within the last five years. The movement is still in its infancy, and unless it is controlled the history of the oil industry will be repeated in the hydro-electric power industry, with results far more oppressive and disastrous for the people. It is true that the great bulk of our potential water-power is as yet undeveloped, but the sites which are now controlled by combinations are those which offer the greatest advantages and therefore hold a strategic position. This is certain to be strengthened by the increasing demand for power and the extension of long-distance electrical transmission.

Facts like these, supplemented and emphasized by such papers as those of Mr. John L. Mathews in *Hampton's Magazine*, quoted elsewhere in part in this issue of CONSERVATION, throw light upon the question as to whether the existence of a "water-power trust" is to be dismissed with a sneer.

Yet over against the above should be placed the statement of Mr. Ormsby McHarg, who, he says, "in the late campaign was put in charge, by Mr. Hitchcock, of nine far western states," and is now Assistant Secretary of Commerce and Labor.

In a column-and-a-half interview published August 28 in a Washington paper attacking the Forest and Reclamation Services, he says: *"The talk of a gigantic water-power trust being formed to lay a heavy tribute on all posterity of the land is the veriest nonsense."*

Sacrificing the Indian Forests

PRESS dispatches of August 20 and 21 from Spokane, Wash., brings the following word:

> Fanned by high winds in the mountains, a fire with a five-mile front has been eating its way through the choicest white fir and tamarack forests on the Coeur d'Alene Indian reservation in Idaho for forty-eight hours unchecked by a thousand men, who are fighting the blaze.
>
> Blinding smoke from the green timber clouds the north and south ends of the region, hiding parties of fire fighters. * * * Farmers, homesteaders, and every available able-bodied man in Rockford, a town of 1,500 inhabitants; Plummer, a town of 500, and many settlements in the timber adjoining Lake Coeur d'Alene are fighting for their lives, homes and families.
>
> The total loss is estimated at $1,500,000. The Blackwell Lumber Company has holdings valued at $5,000,000 in this territory, and the 400 employees in lumber camps of this firm have turned from their work to battle with the blaze.

Here, it seems, we have one of the fruits of "strict construction." The forests on the Indian reservations are under the control of the Land Office of the Department of the Interior. This office does not maintain trained foresters, hence it is not prepared to handle forests or prevent fires.

Realizing this, Secretaries Wilson and Garfield, on January 22, 1908, agreed upon a plan of cooperation whereby the Forest Service should administer the forests on the Indian reservations, the salaries and expenses to be paid by the Indian Office.

As shown by a letter from Forester Pinchot to Secretary Wilson, dated July 23, 1909, the plan worked admirably and was saving untold millions to the Government and its wards. One fact out of many illustrates: At the very time the Forest Service established a force on the Coeur d'Alene reservation, a fire which "would not have gotten started had an efficient protective force been patroling the reservation, was burning with a front six miles wide."

Under the Forest Service management fires were prevented, timber was advantageously harvested and marketed, and the entire administration of the Indian forests underwent a beneficent revolution.

When Secretary Ballinger assumed charge of the Interior Office he agreed that the cooperative plan with the Forest Service should continue. Later, however, his representative called it off. The Indian forests are now being administered by the Indian Office.

A statement given out by the Department of the Interior on July 28, states that that department requested that it "be enabled to avail itself * * * of forest experts to advise and aid the employees of the Indian Office in the care or disposition of timber." Forester Pinchot in his letter to Secretary Wilson, above mentioned, states that "the Service will be prepared, so far as may be consistent with the performance of other duties entrusted to it, to advise regarding the care of forests within the Indian reservations." He states, however, that "the absence of men in the Indian Office technically qualified to carry out the advice given will necessarily deprive it of the greater part of its value." And the Forest Service states that the plan proposed by the Interior Office would involve little more than the return to an ineffective plan whereby that bureau cooperated in an advisory capacity with the Indian Office before the definite cooperation of January 22, 1908, was agreed upon.

This systematic cooperation between the two offices was discontinued by the Department of the Interior because "in contravention of law and of well settled principles."

It should be noted that the question of law was considered by Secretaries Wilson and Garfield before the plan was adopted, and that Secretary Ballinger accepted the plan. In addition, it should not be overlooked that the Wilson-Garfield cooperation was not unique. Cooperation substantially similar now exists between the Departments of Interior and War on the national parks, and almost identical between the Forest Service and the Geological Survey in the examination of mining claims.

But while discussing analogies we should not forget another. While Nero posed and acted, Rome burned; while the Interior Office strains over legal constructions the forests are burning. Does it pay?

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The Case of Congressman Tawney

IN CONSERVATION for August (page 496) Chancellor Van Hise's criticism of Congressman Tawney for paralyzing the work of the National Conservation Commission was quoted.

In the *Congressional Record* for July 27 may be found Mr. Tawney's reply. He criticizes the "enthusiasts" in the conservation movement "to whom so worthy an end seems to justify any means, whether lawful or otherwise," and refers to the Appalachian proposal as an example. "The member of Congress who differs with the theoretical conservationists * * * must expect to be singled out as the enemy of progress," or worse.

In Mr. Tawney's judgment, the conservation of "our dual system of government and our national credit," is involved in such schemes.

He would throw the responsibility for conservation work upon the states, instead of having it "foisted upon the Federal Government."

The reasons why this is not done, he thinks, are that the states may thus escape the burden of expense, and that "the advocates of conservation" may "concentrate public opinion upon Congress," which is easier than to concentrate it upon forty-six state legislatures.

Like Speaker Cannon, Mr. Tawney is appalled by "the ultimate cost" of "reforestation," which "would be so vast as almost to defy computation."

Mr. Tawney next points to increasing public expenditures, culminating in a "billion dollar session."

True, he concedes that 72 per cent of the expenses of the last fiscal year went for wars, past or prospective, and neglects to show wherein the conservationists are responsible for this. Still he advises them to preach economy in army and navy expenditures.

Mr. Tawney strikes at Mr. Roosevelt's "numerous commissions," stating that "they existed and carried on their work in violation of law," and as a result of "usurpation." He says, "We are not yet willing to return to the old idea that the Executive is the fountain of justice and can therefore do no wrong."

Further on he declares these commissions to have been appointed, "not only without authority of law, but in violation of law," and explains that "it was * * * to prevent the violation of the law by the executive branch of the Government that the provision of the Sundry Civil Appropriation Act for 1910 was adopted."

Mr. Tawney next devotes two columns to showing what the Federal Government has been and is doing for practical conservation, and again urges the conservationists to turn their attention to the state legislatures.

Conservationists recognize that the Government has done much in recent years and decades in contravention of the *laissez faire* policy; Mr. Vrooman's articles help to make this clear. They realize, however, that every step taken in this direction has been in the teeth of the advocates of a do-nothing government; they also realize that good work well done affords ground, not for desisting, but for doing more good work.

The theory that conservation is infinitely costly, they repudiate. The facts show that it yields vastly more than it costs. To sacrifice forests, soils, minerals, waterways and water-powers rather than undergo the expense of saving them, conservationists hold, is like letting one's house burn to save the labor of throwing water upon the flames. The pecuniary argument is altogether upon their side.

As to the states, conservationists are willing and glad to have them do their part, but they will not accept the new version of the old states' rights doctrine, as voiced by Speaker Cannon and his friends, and agree that Congress may abandon its proper field and throw its duties upon the states. Let Nation and state each do its part; there is no lack of work for either.

NEWS AND NOTES

Resolutions

Following are the principal resolutions adopted by the National Irrigation Congress:

Resolved, That the homestead law should be amended so that the entryman upon public land under a Government project shall not be required to established residence thereon before the Government is prepared to furnish him water; and that the honorable Secretary of the Interior be requested to recommend such an amendment in his forthcoming annual report.

WHEREAS, The amount of money now available or likely hereafter to become available under the Reclamation Act is inadequate to reclaim the arid lands of the Union;

Resolved, That the president of this Congress is authorized to memorialize the Congress and the President of the United States to augment the reclamation fund by an annual appropriation of ten million dollars ($10,000,000) for the period of five years, for use under the provisions of the Reclamation Act, to be covered back into the National Treasury in due time by the homebuilders.

We urge legislation to the end that mortgagees who in good faith have been compelled to foreclose their liens on lands within the limits of such irrigation projects may have a reasonable time after acquiring title to such lands under foreclosure proceedings to dispose of the same to qualified persons under the Reclamation Act.

Resolved, That we memorialize the Federal Government immediately to inaugurate drainage measures for the reclamation of the swamp-land and overflow lands of the Union in the interest of public health and the creation of homes, and we urge the cooperation of the states and Federal Government to this end.

Resolved, That the better utilization of our waters for water supply, irrigation, navigation, and power demands a unification of the various administrative agencies of the Government having charge of the Federal regulation and control of water and waterways into a single agency; therefore, we urge upon the Congress of the United States legislation looking to the early creation of such agency.

Resolved, That the Congress be requested to enact a law providing for the immediate survey and estimates of the cost of reclamation of submerged lands, where the work is international in character, or where part of the territory has been withdrawn from sale by the Federal Government, or lies along the banks of navigable lakes and streams.

Resolved, That the National Irrigation Congress cooperate with the several sections interested to bring about broad, comprehensive, yet conservative legislation whereby drainage, deep waterways, and forest conservation together with the pressing needs of irrigation may be provided during the coming session of Congress by bond issue; such bonds to be issued in small denominations bearing a low rate of interest, in order that they may find their way into the hands of the people.

We urge the Congress of the United States to extend the Reclamation Act to the territory of Hawaii.

We approve of the honest, intelligent, and efficient manner in which the work of the Forest Service and Reclamation Service has been carried on, and we are convinced that the work of these bureaus has been to the interest of the small landowner and settler.

We indorse the work of the irrigation investigations branch of the Department of Agriculture and urge that the states and the Federal Government contribute liberally to its support, in order that the water supplies that have been and are being provided for arid lands may be wisely used.

We favor the enactment of laws by the states to regulate the cutting of timber on state and private lands, and laws reforming taxation on timber lands, cut-over lands, and reforested lands, in order that the perpetuity of the forests may be assured and the flow of the streams be preserved.

We commend and strongly urge the continuation of the work of the United States Geological Survey, and recommend that more liberal appropriations be made by the Federal Congress for the prosecution of the work of the hydrographic and topographic branches.

Resolved, That there should be no political divisional lines with reference to the right to use water for irrigation or other beneficial purpose in the United States.

We approve the enactment of water laws by the states along the lines pursued in several western states during recent years. We adhere to the principle incorporated in these recent statutes that the waters belong to the people, and hold that this right of the people is inherent and indefeasible. Recognizing the necessity for administering this invaluable possession of the people by state and Federal agencies, we deny the right of state or Federal governments to alienate or convey water by granting franchises for the use thereof in perpetuity or without just compensation in the interests of the people.

We recognize the immeasurable importance of the development of navigation throughout the rivers and lakes of the United States

in accordance with the comprehensive plan beginning with the fourteen-foot waterway through the Illinois and Mississippi rivers from the Great Lakes to the Gulf as the main artery of our inland waterway system, and we urgently recommend to the Congress of the United States prompt action toward carrying out this and other great projects for the promotion of commerce.

We hold that there is no more important subject now before the American people than that of irrigation by private enterprise in the several states of the Union; that the industries connected therewith have risen to the first importance among the class of industries recognized by statisticians, statesmen, and the people generally; that definite information, at once comprehensive and detailed, is not now available in any state or branch of the Federal Government; and we urgently request that the Census Office be directed to take account of the industries connected with private irrigation, in order that the people may fully profit by our growing experience.

We reiterate the declaration of the Irrigation Congress of 1907 and 1908 in favor of establishing national forests in the southern Appalachian and White mountains, and urge legislation for that purpose, preferably through the Weeks bill in the amended form as it now stands before the Sixty-first Congress.

We recommend to the legislatures of the several states and to the Congress of the United States appropriate legislation to secure forest planting and the reforestation of lands denuded of timber.

We commend the work of the Audubon Society; and, recognizing the value and utility of birds and wild animals, we recommend their careful and adequate protection.

Roosevelt Policies Concerned

There has always been a small but very busy band of opponents to the Forest Service, headed by a man named Eddy, and—in the last year, since water-power on the public domain became an issue—encouraged by the big power companies, subsidary to the water-power trust. These forces have opposed Mr. Pinchot in every way possible but without success. Indeed, they apparently had no hope of success until a few months ago when Mr. Garfield was succeeded as Secretary of the Interior by Mr. Ballinger, whose ideas with regard to the administration of the public domain appear to differ widely from those of his predecessor.—*Colorado Springs* (Colo.) *Gazette,* August 15, 1909.

Roosevelt Policies at Stake

Until a decade or so ago, national resources that are now seen to be limited and rapidly disappearing were looked upon as unlimited and inexhaustible.

Under old conditions the Government's easy policy of disposing of the forests, the water-power, the coal and oil lands and irrigable areas had a merit that no longer exists. The Nation seemed to have these resources in riotous abundance, enough and more for the corporations and the individuals too, and could afford to encourage their conversion into wealth by giving them over to private enterprise.

But now the country is confronted by radically different conditions. These resources have dwindled to relatively small proportions, and the old free-handed policy becomes now a grievous wrong to the Government and the people, and if permitted to continue would soon be made a means of public oppression by corporate greed.

President Roosevelt, with admirable patriotism and courage, inaugurated his broad policy of conservation of these resources for the public benefit, and had the support among other zealous assistants of Director Newell of the Reclamation Service, and Gifford Pinchot, chief forester, over all the national reservations. President Roosevelt vigorously applied the policy of doing everything for the public benefit and the Government's welfare that was legal and not prohibited by law. That policy Mr. Newell and Mr. Pinchot are now attempting to perpetuate.

But Secretary Ballinger, of the Interior Department, has unfortunately manifested strong reactionary tendencies that were thought to be foreign to his character when he was pressed for appointment to the Taft cabinet. He appears not to have grasped the fact that the old easy-going policies, meritorious in their day, have now become positively vicious. He is twenty years or more behind the times.

Mr. Ballinger's reactionary inclination became so apparent that President Taft found it necessary to pull him up with a short rein, and since he cannot well direct his chagrin and anger against the President, it appears that he has turned upon Director Newell and Chief Forester Pinchot, evidently suspecting that they had entered a remonstrance against his course.

(*The Spokesman-Review* here recites that Secretary Ballinger made wholesale cancellations of ex-Secretary Garfield's withdrawals of public lands, and continues:)

Apparently he acted without consultation with President Taft, who declined to approve the act of his secretary and directed him to return to the policies of President Roosevelt and Secretary Garfield.

Smarting under this rebuke, Secretary Ballinger would like to take the scalps of Mr. Newell and Mr. Pinchot, but these officers are backed by public sentiment and apparently have the support of President Taft, and the outcome may be that Mr. Ballinger will lose his own official scalp.

East and west the public is awakening to the magnitude of this conflict and the nature of the principles at stake.—*The Spokesman-Review,* Spokane.

A National Issue Shaping

Unless President Taft takes decided action in the matter of the conservation of the public lands and their water-power, the issue now looming up in the Pinchot-Ballinger controversy will be taken up in Congress and will be enlarged into a great national issue. * * *

Formerly the people did not care, because they did not know. Our natural resources were so great that they seemed inexhaustible, and the people were told that private enterprise was necessary for their development. Enormous areas of the public domain were granted to railroads on that theory, and while grants were necessary and just, many millions of acres represented pure graft. The hunt for the Government's natural assets goes on; great conspiracies are formed and audacious acts are committed under the forms of law. The people look to the President to see that his administration does not aid or countenance this plunder of the Nation, and if his policy does not satisfy the popular sentiment a pressure will be brought upon Congress to compel adequate legislation or start a great national movement independent of party ties and questions.—*Newark* (N. J.) *Advertiser,* August 18, 1909.

The Lawyer and the Man of Science

The controversy between Gifford Pinchot and the administration presents a phase of the immemorial conflict between formal law and the facts of experience.

Pinchot, as a man of science habituated to an out-of-doors view of things, is bent upon the facts.

He sees the growth, under his eyes, of that gigantic water-power monopoly in the West which Mr. Roosevelt foresaw might come to overshadow the very Government itself.

Pinchot is determined to deal with this monopoly by any means that will keep the water-power in the possession of the people.

He is determined that the issue of the struggle between the Government and the privileged combination shall leave the Government on top.

Now the case looks altogether different to the higher powers of the administration.

The President and the Secretary of the Interior are in their mental make-up indoors men. They take the point of view traditionary with lawyers.

The practical facts of the economy of water-power have only a secondary interest to them. Their duty as they understand it is to administer a formal code of laws.

If a conscientious discharge of this obligation will keep the neck of the public clear of the heel of the Water-power Trust, that is well and good. If not—well, Mr. Taft and Mr. Ballinger will hold themselves blameless.

Now, which of these two mental attitudes, Mr. American Citizen, is more likely to save the Government of the United States from becoming the mere hallboy and typewriter of the Amalgamated Monopolies?

Which is the more competent at last for the vindication of law?

The administration seems to have scruples about its legal right to keep certain water-power sites exempt from private entry. But there is such a thing as being so nicely legal that the law gets trampled under foot.

Last week the Irrigation Congress, in session at Spokane, was thrown into a state of excitement at the reputed disclosures of facts showing that the Secretary of the Interior had shattered the Roosevelt conservation policy in Montana.

It was said that Mr. Ballinger had allowed millions of dollars of power-site lands to fall into the hands of the Water-power Trust.

The story is sensational, and should stir the country as it has stirred the Irrigation Congress.

It presents a great primary issue that must be met.

Shall the Government be a little rough-handed—in the Roosevelt fashion—when necessary to maintain its sovereignty over private powers, or shall it lay down its life for its enemies on the altar of legal scrupulosity?

Nobody can believe that Mr. Taft and Mr. Ballinger could possibly do what they seem to have done in this water-power matter from any but the most conscientious motives.

But the question arises, Are not their motives too high, too fine for any earthly use?—*Boston* (Mass.) *American,* August 19, 1909.

Director Newell and His Enemies

A public official who brings to an important task a zealous desire to advance the public welfare and courage to oppose selfish influences must expect to have his motives assailed and his achievements criticized.

Director Newell, of the Reclamation Service, is no exception to this deplorable rule. Persistent efforts have been made to discredit him with his superiors, to work up narrow local hostility in those communities that did not immediately receive portions of the reclamation fund, and to prejudice public sentiment generally against him. These attacks are directed chiefly by large and powerful interests that have failed in their efforts to manipulate Mr. Newell and persuade him to sacrifice the public welfare wherever it came in conflict with their desires.

Disinterested and well-informed government officials who have observed Mr. Newell's public work over a long range of years speak enthusiastically of his honesty, unflagging zeal in the public service and marked ability. Director Newell has had charge of this great reclamation work from the beginning, and under his eye and hand it has been made a gratifying success. Not a single undertaking has failed, vast desert areas have been reclaimed and passed over to

prompt and profitable settlement, and other undertakings are being driven to completion as rapidly as engineering ability and limitation of funds permit.

Mr. Newell has the faculty of drawing to his engineering staff able and disinterested assistants and of inspiring them with his zeal for the public welfare, and the splendid success of government reclamation is due to this faculty and his firmness in resisting local pressure for appropriation of the fund to projects that could not wisely be taken up at this time. * * *

It is not improbable that the interests that are fighting Director Newell have organized to attack him before the irrigation congress. If so, they will bring forward trumped-up objections and criticism and take great care that their real animus is kept in the background.—*The Spokesman-Review,* Spokane, August 10, 1909.

No Explanation

That Taft's Secretary of the Interior is actively working to undermine all the good work that had been done by his predecessor has been a common charge, based upon the reports of his own office showing the throwing open of these power sites to general settlement and purpose. The change in policy was not made after long and careful consideration and the reports of duly appointed inspectors. It was done with what looked like indecent haste, as a slurring reversal of policy. This is not based upon the irresponsible observations of some journalist. It is the expression of members of the administration itself and the situation which is arising is one that may seriously embarrass the national administration.

So, all these matters considered, it was supposed that Mr. Ballinger would seize upon the opportunity yesterday to address 1,200 of the most responsible people of the West, in convention assembled at Spokane, upon the meaning of the most consipcuous and important act of his department since he has assumed office. His speech was carefully prepared in advance and sent out by mail through the press associations in order that there might not be any mistakes in reporting or transmission. He read his speech, thus sent out before the congress, so that there might be no variations of a verbal nature.

And what does it contain? Some platitudinous truths regarding the need of farming development in the West, and the duty of the Government to carry on irrigation systems which are too large for private capital to handle, and winding up with a quotation from Oliver Goldsmith. Not a word about power sites. Not a word about the part his department is playing in the destruction or conservation of forests. Not a word as to the reversal of policies of his predecessor within four months of assuming office and without any more than a cursory examination of the situation by him in his official capacity.

It may be that Mr. Ballinger has good reason for all his official acts. It may be that if Secretary Garfield were still in office he would have thrown back these lands for public entry. Or it may be that Secretary Garfield was too hasty in his actions, and that a reversal of policy is right and proper at this time. But if so, Secretary Ballinger should so far emerge from the obscurity of his official dignity as to address some public gathering, or write a letter to some congressman, or contribute a paper to some magazine, or get himself interviewed in some way, so that the people of the country will know why he is doing things.

There is usually a suspicion that every man is reporting his acts to some one. It will be just as well for the Secretary of the Interior if that "some one," in his case, is the people of the United States.—*Fresno* (Cal.) *Republican,* August 12, 1909.

To Can Pinchot

The startling news comes from Washington that G. Pinchot, the National Forester, is about to lose his job * * * He is a great man who can't be canned with impunity. If he is, the people should rise up and make him President. Remember the name—Pinchot.—*Springfield* (Mo.) *Leader,* August 13, 1909.

Pinchot vs. Ballinger

Mr. Pinchot wants a continuation of the policy whereby President Roosevelt made large withdrawals of public lands from entry; Mr. Ballinger, who is a far westerner and holds the view of his neighbors that public lands should be turned over to the people on the spot, will only check the alleged water-power trust by reserving a few sites. * * * Since President Taft was well acquainted with Mr. Ballinger's views when giving him charge of the public lands—Mr. Ballinger, as Commissioner of the General Land Office under President Roosevelt, left no stone unturned to throw open every acre of land he could—it would seem a fair conjecture that the Ballinger forces will get their way.

With all due allowance for possible unwisdom on both sides, it looks to us as if Mr. Pinchot is taking the national view and Mr. Ballinger the sectional view. Certainly Mr. Pinchot has shown himself during years of faithful service a public servant whom the country could ill spare.—*Charlotte* (N. C.) *Observer,* August 15, 1909.

Pinchot and Newell Commended

With propriety and justice the National Irrigation Congress approved "the honest, intelligent and efficient manner in which the work of the Forest Service and the Reclamation Service has been carried on," and ex-

pressed a conviction "that the work of these bureaus has been to the interest of the small landowner and settler."

This resolution is equivalent to a personal indorsement of Chief Forester Gifford Pinchot and Director Newell, for they have long been at the head of the two bureaus under consideration, and the selfish and unworthy attacks that have been made upon the Forest Service and the reclamation work have taken on the form of personal reflections upon them.

The congress could, with propriety, approve the results of their efforts, because these have extended over many years, and the achievements are before the people for inspection.

The congress, on the other hand, with equal propriety, refrained from an indorsement of the record and policies of Secretary Ballinger of the Interior Department, for the reason that Mr. Ballinger has only entered upon his duties, and it is not at all clear what his policies are or what they will be. So far, they give evidence of a strong reactionary tendency and corresponding lack of sympathy with the conservation policies of Roosevelt and President Taft.

The Spokesman-Review hopes that Secretary Ballinger will fall in line and administer the Interior Department along the broad, general lines laid down by Secretary Garfield, his predecessor, but an expression of approval now of his acts or policies would be premature and unwarranted.—*Spokesman-Review*, Spokane, August 14, 1909.

Pinchotism and the Power Trust

Nobody in Congress discovered the encoachments of the power trust on the natural water-power rights of the country, but the discovery was made by Mr. Pinhcot, or in his bureau. Nobody in Congress raised a protest against the lavish gifts of public water rights to private corporations, unconditionally, perpetually and without compensation to the public for the wealth surrendered. Give, give, give has been the demand for a period of years, and Congress amiably gave. There seems to have been nobody of consequence or influence there to raise the point that this is the public property, that it is wealth, that its future value is immense. Congress simply followed its custom of yielding compliance to the representations of great capital that it was for the best interest of the public, of you and the rest of us, to give away wealth to enterprising financiers, who would proceed to administer the property so that everybody would be prosperous. In consequence of the dunderheadedness of Congress in pursuing its favorite theory that public prosperity can be brought about best by public exploitation, the people have been made to surrender an amount of wealth that is almost beyond calculation and a power trust has been built up, headed by J. P. Morgan, which exceeds in its ability to bleed the consumers any other trust that has ever been conceived by the thrifty promoting syndicates of Wall Street. Mr. Pinchot's speech, the Spokane dispatch says, was greeted with the "wildest applause" given any speaker of the Irrigation Congress, indicating that if Congress has been fast asleep, the country is awake.—*Topeka Capital.*

The "Water-power Trust"

The so-called power trust, which is credited with such great activities in the public domain section of the country, is reported to be a New Jersey corporation, with a capitalization of over $10,000,000.

If it should prove true that this corporation is operating illegally by means of "dummy" entries to get control of all valuable water-power sites situated upon public land opened for settlement, it would be the duty of New Jersey to take all legal steps to thwart these activities. Corporations which are organized under the laws of this state should not pass entirely from under its control. Corporations are creations of the state and owe their personality to articles of incorporation which are binding upon them. When they seek to violate the laws of the Federal Government they are exceeding the powers granted in their charters and are violating their pledges to this state. However desirable it is that New Jersey should be hospitable to corporations which operate chiefly in other states, the privilege should not be granted under conditions which should not leave ample control in the hands of this state.—*Elizabeth* (N. J.) *Journal*, August 16, 1909.

Mr. Pinchot's Fight

That is a game fight that Chief Forester Pinchot is making to protect the water-power of the country from being monopolized by a great trust. During the administration of President Roosevelt it became evident that certain powerful capitalistic interests were quietly planning to obtain control of the most eligible sites for water-power throughout the country, and in pursuance of that plan the public lands near the headwaters of important western rivers were being gradually passed into private hands.

For the purpose of thwarting that, the President withdrew large areas of the public lands from entry and placed them in the class of forest reservations, under the law authorizing the conservation of natural resources. Secretary Ballinger, of the Interior Department, has recently withdrawn a number of these lands so set aside, and it is given out that a powerful trust lobby will be on hand when Congress opens in December to put through a law ratifying the withdrawal of these lands and the opening of them to private ownership.

Against these things Mr. Pinchot has opposed strenuous objections, as a result of which the relations between the Chief Forester and the head of the Interior Department have been greatly strained. * * *

The question is a most important one, and a powerful fight will undoubtedly be made by the rich timber and public-land thieves of the country to discredit Mr. Pinchot and to show that the action of Mr. Ballinger is right and proper. The public lands of the United States have been the source of scandal and corruption from the beginning of the Republic until now; and as these lands grow scarcer the struggle to acquire them by means fair or foul—preferably foul, it seems—grows fiercer and more desperate.

It will be well for the country to keep a sharp lookout on the efforts now being made to monopolize the Nation's water-power.—*New Orleans* (La.) *States*, August 15, 1909.

Too Serious to Be Ignored

Mr. Pinchot's statement that a great water-power trust is being formed is too serious a matter to be dismissed lightly. Dismissing him from office would be like the Oriental custom of beheading the bearer of bad news and then refusing to believe there was any danger.—*The Wall Street Journal*, August 16, 1909.

Pinchot's Object Right

* * * It is certain that the policy which Theodore Roosevelt carried out with much success was inaugurated by Gifford Pinchot to the discomfort of public-land swindlers all over the West and with the approval of every honest citizen throughout the country.

* * * The burden of proof is upon the Secretary of the Interior to demonstrate that the established policy of the Government, as applied to the locality concerned, is wrong.

There are vast areas of public lands whose value the Government has not had time to determine. Of 774,000,000 acres in the public domain nearly seventy per cent is still unsurveyed. Many of the tracts are known to private interests to contain enormously valuable deposits of minerals. Other areas will afford splendid opportunity for irrigation enterprises, as to which the Government has a policy of its own and counter to which private interests occasionally run. Further than that, grazing and lumber interests in not a few parts of the Northwest have been deprived of pasturage and privileges that they formerly enjoyed with practically no compensation to the public treasury. Finally, it is true, as the Chief Forester claims, that the game of grab is being played in desperate earnestness on the part of syndicates bent on corralling water-power locations on public lands.

Against these forces Gifford Pinchot has fought the fight of the people for fully fifteen years. After such a service it ought to take a great quantity of proof to the contrary to change popular confidence in him as a faithful and fearless custodian of the national forests. * * * Secretary Ballinger by adhering to a narrow interpretation of the law seems in effect to speak for local interests and for private parties, in contrast with the national interest represented in a policy of conservation and careful valuation of resources before the people, through the Government, should part with this portion of their national heritage.

There is apparently no need of haste in alienating public property to private ownership under the circumstances. In the administration of its forest reservations the policy of the past has proved eminently satisfactory as a matter of public housekeeping. No amount of pressure or intimidation, no matter who its spokesman may be, should cause the Government custodians of the public forests to abate one jot or tittle from the strict spirit of the established policy to dispose of the public lands only so fast as the development of the communities in which they are located may really justify. If the law has really been strained to establish the policy, then the law should immediately be amended to give the proper authorities full power to protect the public interest. Mr. Pinchot, in his aims at least, should have unqualified support.—*The Wall Street Journal*, August 14, 1909.

Congress Should Investigate

It appears that to the water-power issue Secretary Ballinger has added another by his declaration of hostility to further irrigation schemes in the West, a fact that has greatly stirred the people of that section, because it is generally recognized that the development of the arid lands will result in enormous benefit to the whole country. Moreover, the present controversy has resulted in the airing of questionable if not scandalous coal-land transactions in Alaska, and it is quite certain that the enemies of Mr. Ballinger will cause all the facts in connection with these transactions to be uncovered by a congressional investigation.

It is alleged that these lands contain coal to the value of $250,000,000 and that the Morgan-Guggenheim interests are seeking to get their grip on the properties which are regarded as almost indispensable for the welfare of the Northwest. However, it is evident that the Ballinger-Pinchot dispute which started over the water-power sites has grown to larger and more serious proportions, involving the whole policy of conservation which the Roosevelt administration did so much to promote.

It is obvious that President Taft should at once inquire thoroughly into this matter.—*New Orleans* (La.) *States*, August 16, 1909.

The Law and the Spirit

Secretary Ballinger's declaration that he wants everything done according to law and not personal caprice sounds well enough,

but scarcely defines the situation. There is no charge that the law has been violated in the past. The real point at issue is whether the law shall be administered in a spirit of harmony with the principle of conservation of our resources and of retaining for the people as much as possible of the value of the public lands and their contents or in a spirit of getting into private hands all such lands and resources as speedily as possible, in the supposed interest of "business" and of "building up the country."

Pinchot represents the conservation principle and Ballinger the "use it all now" principle. The law is the same for both, but it makes a great deal of difference which spirit controls its administration. Secretary Ballinger is a western man, a man of the extreme West, where the people are obsessed with the idea of quick growth of cities and exploitation of resources. Anything that interferes with cutting down the forests, digging out the metals, bringing new lands under cultivation or the rapid growth of business, is anathema in the home of the Secretary of the Interior. Genuine conservation of the country's resources prevents them from falling into the hands of those who would exploit them for personal gain and, while incidentally making "business good," would make the people pay roundly for what had once belonged to them.

President Taft will be called to take a stand in this matter.—*St. Louis* (Mo.) *Star*, August 17, 1909.

Waterways Commission in Berlin

Berlin, Aug. 21.—The Congressional Waterways Commission arrived here last Tuesday and has had a busy week. The members include Senators Burton, Gallinger, and Simmons, and Representatives Wanger, Stevens, Alexander, and Sparkman. The commissioners have firmly declined all invitations to social festivities, and have been putting in most of their time visiting the waterways near Berlin and grappling with the statistical materials which the German authorities have been sending to their hotel by the bale.

Senator Burton has had conferences with the Prussian public works department. The commissioners left tonight for Dresden to take a boat down the Elbe.—*Washington Post*, August 22, 1909.

Conservation Congress in Seattle

The first National Conservation Congress of the United States, to be held in the auditorium of the Alaska-Yukon-Pacific Exposition on August 26, 27, 28, 1909, promises to be the largest and most enthusiastic gathering of prominent men ever held on the Pacific coast. * * * The indications are that many thousand people will congregate on the grounds of the Alaska-Yukon-Pacific Exposition to discuss the principles of conservation.

Sixty-four universities and other educational institutions will be represented. Four governors, the members of forty state conservation commissions, and the Governor of Hawaii and his commission are expected. The churches will be represented by twenty-two bishops and other prominent churchmen, and in consideration of that fact a special religious day will be observed for considering the subject of conservation. The commercial organizations from Maine to California have accepted the invitation and will send delegates of prominence. President Taft is expected to speak.

Other well-known men, some of whom have formally accepted the invitation to address the Congress, are: Prof. Ralph S. Hosmer, of the Hawaiian Conservation Commission; Gov. W. T. Freer, of Hawaii; Mr. Gifford Pinchot, United States Forester and Chairman of Joint Committee on Conservation; Gov. M. E. Hay, Washington; Mr. William L. Finley, of the National Audubon Societies; Prof. John Craig, of Cornell University; Rev. Henry Sloane Coffin, of the Union Theological Seminary of New York; Prof. L. R. Higgins, of Tacoma, representing Occidental College, of Los Angeles; Anson Smythe Burwell, of Seattle, representing Oberlin College; David R. Sanderson, of Vancouver, B. C., representing the Rose Polytechnic Institute, of Terre Haute, Ind.; Senator G. W. Chamberlain, of Oregon; J. N. Teal, of the Oregon state conservation commission; W. K. Kavanaugh and W. F. Saunders, of St. Louis; Senators Joseph H. Dixon and Paris Gibson, of Montana; ex-Gov. George C. Pardee, of California; Hon. James R. Garfield, and George H. Maxwell, of irrigation fame; Senator Reed Smoot, of Utah, and A. C. Shaw, of the Forest Service, Washington, D. C.

There will be nine sessions of the Congress and a special religious service, conducted by visiting churchmen on the Sunday following the Congress. At that meeting definite plans will be put in motion for the conservation of natural resources of land and water.

Special delegates will be appointed to attend the International Conservation Conference at The Hague, Holland, where an organization will be formed for the purpose of conserving the natural resources of the world.—*Spokane* (Wash.) *Chronicle*, August 13, 1909.

The Forest Conference

The Forest Conference under the direction of the Society for the Protection of New Hampshire Forests at Bretton Woods on Tuesday, Wednesday, and Thursday of last week brought together a distinguished company. Governor Rollins presided and Governor Jordan was there. The state foresters of Vermont, New York, New Jersey, and

Maryland took part, in addition to the new state forester in New Hampshire, Mr. E. G. Hirst.

Mr. Robert P. Bass, president of the state forestry commission, explained the new forestry law passed by the legislature last winter. He urged that citizens throughout the state take an interest in the selection of the proper person for town forest fire warden. * * *

The illustrated address on forest conditions in New York State and abroad given by Commissioner Whipple, of New York State, pointed out that, with the diminishing supply of timber in the country at large, and the rapidly increasing population, tree planting on a large scale is becoming a matter of the utmost importance.

Dr. John H. Finley, president of the College of the City of New York, and a close personal friend of the late Grover Cleveland, spoke of the Cleveland Memorial Road in Tamworth. Mrs. Grover Cleveland was present.

There were other equally interesting addresses. George H. Maxwell, of Chicago, spoke of forest conditions in the West and said that New Hampshire should not give up her struggle to secure a national forest in the White Mountains, because the principle of Federal control of forests at the head of interstate streams is essential to the well being of the country at large.

Mr. Allen Hollis, of Concord, stated the difficulties in passing a law to improve the taxation of forests, and said that the proper method, if it could be established by legislation, even though it required a change in the Constitution, is to tax the lands only annually and the forest crop once when it is felled.

The forester of the society, Mr. Philip W Ayres, presented a series of lantern pictures showing the beauty of the forests on the mountains and their complete destruction from lack of better state laws. He urged the acquisition of forest lands by the state and by the towns.—*Claremont* (N. H.) *Eagle*, August 14, 1909.

A Field Meeting of the Vermont Forestry Association

Following the New Hampshire meeting at Bretton Woods, officers of the Vermont Forestry Association conducted a delightful and profitable forestry excursion to the Billings estate at Woodstock, Vt., where forestry has been practised for twenty years. The party included the several state foresters and about forty members of the Vermont association. The Billings estate is one of the most beautiful in this country. Situated in one of the most charming parts of the Green Mountains, its management has shown a fidelity to nature and an adaptation of landscape effects to natural conditions not surpassed by the famous Smiley estate in California. The meeting was arranged by Mr. Austin F. Hawes, state forester of Vermont, and conducted by Mr. George Aiken, superintendent of the estate, who is also secretary of the state board of agriculture. To him the progress of the forest movement in Vermont is chiefly due.

There were visits to the plantations of white pine, in rows six feet apart each way, and of Norway spruce, thirty-two years old, the thinnings of which are now used to make paper pulp of a fine quality. Indeed, it is due to the success of this plantation of Norway spruce that the International Paper Company has established a nursery for the propagation of seedlings of this species, in order to secure a future supply of spruce for pulp at some of its great mills. This is practical forestry. The visitors were conveyed over the entire estate, through magnificent forests, properly thinned years ago; over roads kept in best condition. The plantations of European larch, sixteen years old, on a sandy, unprofitable hillside, attracted much attention, but it was Mr. Aiken's view that white pine on the same ground would have been more profitable.

After luncheon there were addresses by the state foresters, Mr. Besley, of Maryland; Mr. Gaskill, of New Jersey; Mr. Hirst, of New Hampshire, and Mr. Pettis, of New York. With cordial thanks to Mr. Aiken, the visitors departed. It is through such associations that the cause of forest protection gains its best headway.

Disastrous Fire in Maine Forest

Biddeford, Me., Aug. 13.—More than $100,000 damage has been done here in the last twenty-four hours in the most disastrous forest fire in this section of Maine in years. Already timber covering more than a mile square has been destroyed and though the fire is temporarily checked, it is feared that a shift in the wind will more than double the damage.

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The office of CONSERVATION desires a few copies of the following numbers: Vol. V, No. 5; Vol. VI, No. 6; Vol. VII. Nos. 6, 7, 8, 10 and 12; Vol. XI, No. 3. For these it will pay twenty cents each. Any having available copies will oblige by advising this office.

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Dear Sir: I hereby signify my desire to become a member of the American Forestry Association. Two Dollars ($2.00) for annual dues are enclosed herewith.

Very truly yours,

Name _____

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Opening of the Seventeenth National Irrigation Congress at Spokane, Wash., August 9, 1909

CONSERVATION
FORESTS
WATERS
SOILS
AND
MINERALS

Vol. XV OCTOBER, 1909 No. 10

SEVENTEENTH NATIONAL IRRIGATION CONGRESS

OF ALL the sessions of the National Irrigation Congress, the seventeenth, that, namely, at Spokane, Wash., was the most notable. The attendance outnumbered that of any previous session, and the entertainment provided for the delegates and visitors was in every way worthy of the hosts. The Congress maintained its interest throughout a period of five days, ending on the afternoon of August 13. But the feature of the Congress was the seriousness and scope of the addresses and of the resultant discussions. These were national in character; furthermore, they were given an international aspect by the presence of accredited representatives from fourteen foreign countries, most of whom read papers or participated in the debates.

The cardinal purposes of the National Irrigation Congress, which Theodore Roosevelt, while President of the United States, recognized as the most influential unofficial body in this country, are to save the forests, store the floods, reclaim the deserts, and make homes on the land for this and future generations. The chief object of the Spokane sessions, where more than 2,000 delegates were assembled, was to demonstrate to the West the wonderful development through reclamation of arid and swamp lands, forestry, deep waterways, good roads, and home building, and to show to the East the economic importance to the whole country of this work and of the marvelous achievements yet to be realized.

From beginning to end, the Convention was a success. Every word uttered in the propaganda for homes had a permanent value, and the speakers added substantially to the purpose and ideals, not only of the Northwest, yet in the making, but of the country as a whole.

Many of the ablest men in the country gave their best thoughts to their papers with two aims in view: First, to aid in unifying the development agencies of the Nation, and second, to add to the informative literature of this national, coordinated enterprise. The Congress represented in its ranks

On the Border; Forest on Idaho Side, Wheat Field in Washington. This Land Will Come under Irrigation With the Development of the Coeur d'Alene Indian Reservation

private projects which have already placed more than 10,000,000 acres of arid lands under the plow, and governmental plants covering not less than 3,000,000 acres, in addition to backing or supporting undertakings which will reclaim 50,000,000 acres of sage-brush and other waste lands, and 80,000,000 acres of swamps and submerged land, thus affording homes for from 40,000,000 to 50,000,000 men, women, and children under the most favorable conditions and addings billions of dollars annually to the wealth-production of the country.

The keynote of the Congress is contained in four letters—home. The uppermost thought was that the citizen of the greatest value in steadiness and stability to community, state and nation is the one who owns the land from which he makes his living; and, by the same token, it was clearly brought out that no man is so ready to defend his country, not only by taking up arms, but by his franchise and his contribution to public opinion, as the one with a permanent stake in it. Thus, the gathering reflected the great truth that the farmer who owns his land and conserves its resources in an intelligent manner is the real backbone of the Nation. As one of the speakers expressed it, "One of the things we need most is more of him."

Another speaker developed this thought in a paper which attracted wide attention because of its simplicity and directness:

"We have come to realize more today, probably, than ever before that the nation which leads the world will be a nation of homes. The object of this great conservation movement is to make our country a permanent and prosperous home for ourselves and for our children's children—a task that is worth the best thought and effort of any and all of us; and to bring this about the first thing we need in this country is equality of opportunity for every citizen. No man should have less and none ought to ask for any more."

The ultimate result of the stupendous work outlined by the Congress will be the migration of from 25,000,000 to 30,000,000 persons from the congested centers of population to the agricultural districts of the West, and the moving of 15,000,000 to 20,000,000 to the other reclaimed sections of the country. Here their efforts will add from $6,500,000,000 to $7,000,000,000 annually to the crop, now aggregating $8,000,000,000, and thus increase its value at least eighty per cent. The realization of this means a readjustment of production and consumption, and will eventually lead to greater individual happiness and national prosperity.

To the men and women gathered together from forty states and territories and foreign lands the Congress meant much. To them the word "irrigation," yet little understood by many east of the Missouri River, has come to be a general term for all kinds of problems connected with the relation of land and water in the profitable use of acreage for the support and comfort of mankind; and they discussed not only questions of getting water to lands on which the rainfall is insufficient to assure profitable crops, but also of draining the water off lands where the normal rainfall is more than enough.

The Congress also concerned itself with forests as regulators of streamflow, preservers of water supply, and protectors of the soil from waste and loss, and touched upon legislative readjustments made necessary by the growing perception that all property rights are not settled when land ownership is settled—that certainty and security in water use may be even more important than certainty and security in land use. The delegates, too, discussed the matter of good roads and national highways and other means of transportation.

"Questions of water rights and what should be the law governing them are really new problems to the English-speaking peoples," said R. Insinger, of Spokane, chairman of the board of governors and head of the executive committee of the eighteenth Congress, in discussing the significance of the meet-

Belleview Orchard near Colville, Stevens Co., Wash., North of Spokane

ing from a national viewpoint. He added:

"For uncounted generations they dwelt in lands where there was rarely a question of too little rain on each freeman's own land. Yet, in their overrunning of the earth, they have come to lands where water, instead of land, is the prime factor in the equation of prosperity and comfort.

"Taken in its broadest sense, what is called the 'irrigation' or 'reclamation' movement is a conscious recognition of two or three facts that we tended as a people to forget for a time. One is that the soil is the greatest source of wealth and of human comfort and happiness. We tended to forget this when, in the seventies, we had really completed the conquest of our continent, and for more than a decade youth fell, as never before, into the delusion that the farmer's business was one that might be left to the less intelligent.

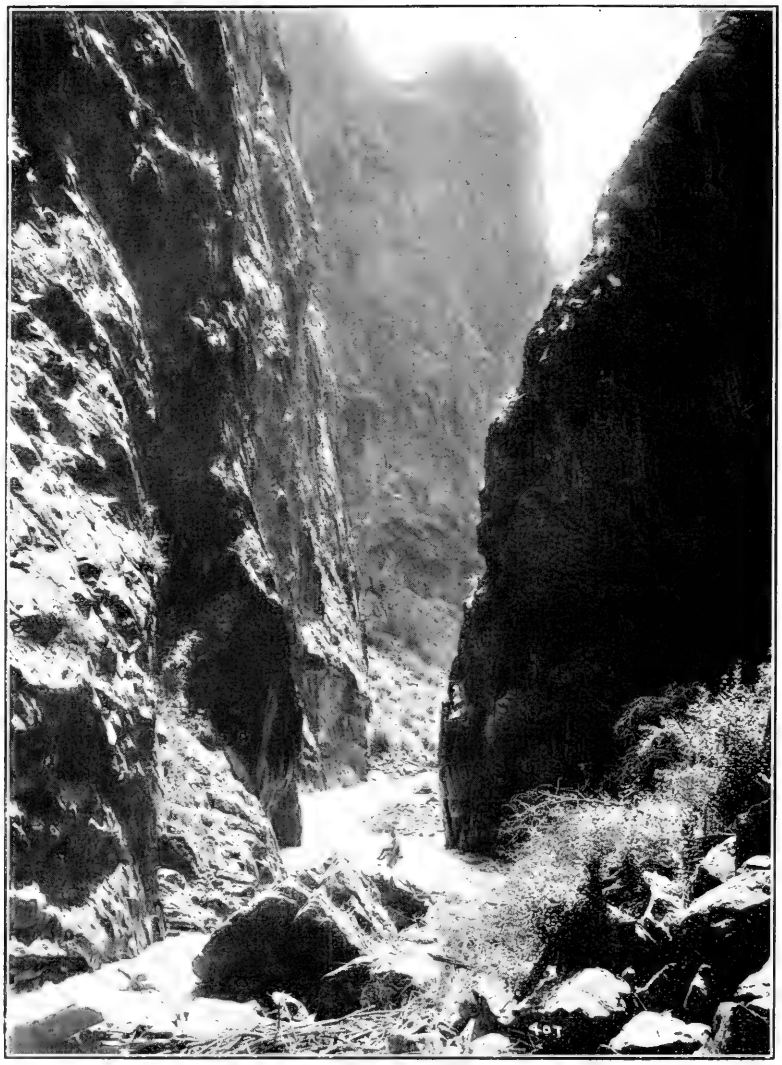
"In the present cost of living we are feeling the effects of that delusion. Too many of the nimblest brains left the soil and despised its tasks. With all our mechanical and industrial progress, we have not correspondingly increased the fertility of our soil and its productiveness.

"That the acre yield of our wheat lands, under plow, on the average, less than fifty years, should be less than that of European lands under plow for a thousand years, is a reflection upon our intelligence.

"We are getting out of this delusion. We are seeing what must be done to make our national development more symmetrical and to remedy a certain lopsidedness. We are seeing that the farmer's occupation gives the broadest scope for the keenest minds."

Of this awakening—of this more accurate and better-balanced perception of realities—the great gathering at Spokane was one of the striking visible signs.

Workers in Gunnison Tunnel



Uncompahgre Project, Colo. Old Dam Site Abandoned

THE GUNNISON TUNNEL

ON THE 23d of September the state of Colorado celebrated, in the presence of the President, the opening of the Gunnison Tunnel, one of the greatest projects ever undertaken by any government in the world.

In a little valley in western Colorado an engineering miracle has been performed. The Uncompahgre River flows through lands whose marvelous fertility has been concealed by the sage-brush desert. Beyond a formidable mountain range, the waters which might deliver it flowed between frowning canyon walls, but Uncle Sam's magician, the civil engineer, smote the rock, and lo! the desert is changing under our very eyes to a land flowing with milk and honey.

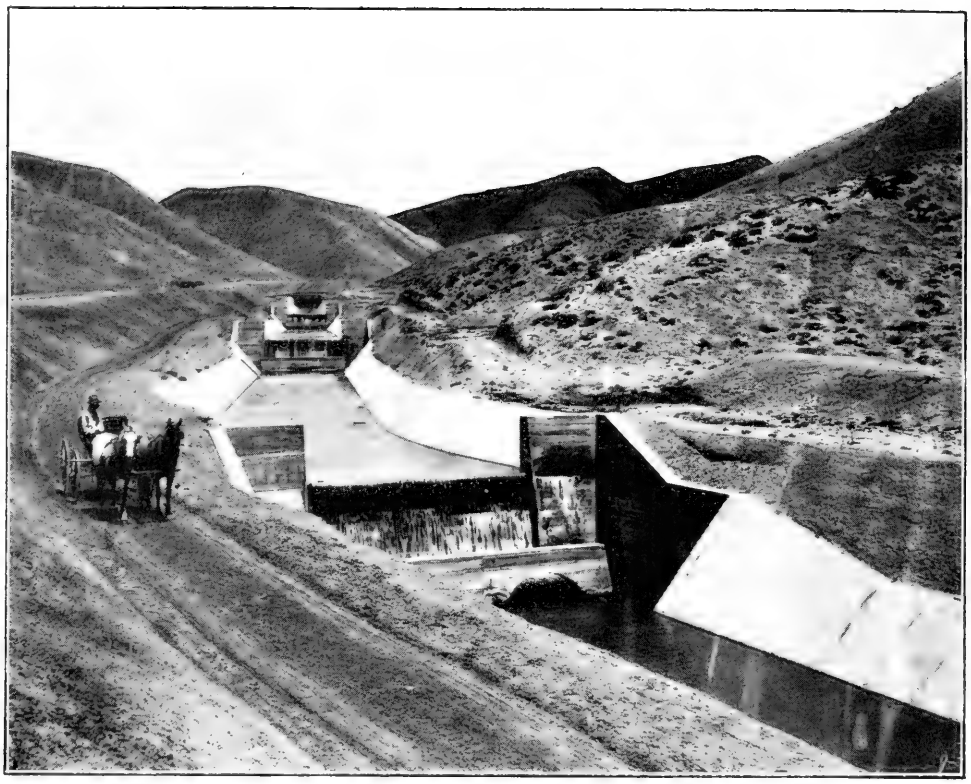
The story of the construction of Gunnison Tunnel is one of unequaled daring and devotion to duty. It is the fulfillment of a long-cherished dream to the residents of Colorado, for upon its completion depended the reclamation of one of the richest valleys in the whole West.

Years ago, when the Ute Indian reservation was thrown open to white settlement, thousands of homeseekers rushed in and took up farms, for the fame of the wonderful yields, even under the imperfect farming methods of the Indians, had gone abroad. It was only a short time, however, before they discovered that the Uncompahgre River did not carry water sufficient to irrigate more than a small portion of the lands. The only hope of relief lay in the Gunnison River, flowing uselessly in a canyon more than 2,000 feet below the surface of the earth. A wall of rock six miles thick intervened, and engineers who viewed it shook their heads and departed for more promising fields.

But among the farmers who had secured one of the first water-rights and whose land was yielding bountiful crops, there was a man who still had faith in the feasibility of the undertaking. So well did farming pay him that he finally found time to represent his district in the state legislature, and there he so imbued his colleagues with his spirit of optimism that they voted $25,000 toward building a tunnel through the mountains. This sum, however, was not sufficient for even the preliminary work, and when the Reclamation Act became a law the residents petitioned the Government to come out and help them.

So one day there came to the resident engineer of the Reclamation Service at Denver an order which read: "Advise me if it is feasible to construct a tunnel under Vernal Mesa to carry the waters of Gunnison River to Uncompahgre Valley." The order was signed by the chief engineer.

No man had ever lived to pass through the Black Canyon of the Gunnison, but without hesitation the engineer, A. L. Fellows, and assistant engineer, W. W. Torrence, prepared to make a reconnaissance. Straight down 2,500 feet over the jagged rock walls to where the river raced between the perpendicular cliffs they were lowered, carrying only a rubber mattress, a few surveying instruments, and a scant food supply. The story of the twelve days those men spent down in that inferno, whirling through rapids, clinging to slippery rocks, and making notes, shivering, drenched, and hungry, found no place in the report which came back to Washington; and when, at the end of the twelfth day, they emerged at the mouth of Devil's Slide, exhausted and nearly naked, but with their surveying notes safely encased in water-tight oilskin sacks, the first thing they did was to wire to the chief engineer: "The Gunnison Tunnel is feasible."



Uncompahgre Project, Colo. South Canal Division, Sixteen Series of Drops

Almost the next communication from Washington contained the order to proceed to dig. This was early in 1905, and they dug to such purpose that on July 6, 1909, the last round of shots was fired and the men who had been burrowing under the mountain of rock from either end shook hands through the opening. But between those two dates all sorts of discouraging delays were occasioned by unforeseen obstacles. Poisonous gases, hot and cold water, and cave-ins were encountered; but always the work was taken up again promptly and pushed forward. Following blasts on various occasions millions of gallons of water rushed in upon the workmen, who had to fight for their lives. At one point more than a mile from the west portal the bed of an old ocean was exposed. Deeply embedded in the rock were millions of sea shells of various sizes. The excavation here was easy, but the shells rendered the material exceedingly treacherous, and every foot of the way had to be timbered to protect the workmen from falling masses of rock.

In May, 1905, the bed of an old creek caused a cave-in which shut off a number of workmen from their companions and buried several others. The men who were on the outside immediately began sinking a shaft to rescue the imprisoned men. Down in the darkness of that living tomb the men who were uninjured threw up dikes to keep the rising tide of water from reaching their comrades who were pinned down, and many a tale is told of the brave stories they invented to keep heart in the injured men, although they themselves were almost hopeless. It was forty-eight hours before they were taken, exhausted, to the surface.

To the engineering world this tunnel is of interest as being the longest underground waterway in the world. It is six miles in length, has a finished cross-section of ten and one-half by

Apple Orchard in Uncompahgre Valley

eleven and one-half feet, and will carry a stream of 1,300 cubic feet of water a second. The headings met with so slight a variation that it took careful measurements to determine it. The tunnel is being rapidly lined with cement. It will connect at the west portal with a large ditch twelve miles long, having a carrying capacity greater than the Erie. This canal winds through the adobe hills, and is taken over a series of drops to the level of the distribution system in the Uncompahgre Valley.

To the average Easterner this story may not even bring a thrill of pride, but to the western man, or to the man who is seeking a home, and who has read of the marvels irrigation has wrought in the arid regions, the building of the Gunnison Tunnel means much. It means, among other things, that 150,000 acres of desolation will be turned into a garden spot, and that homes of comfort and plenty will be made for thousands of American citizens.

The old irrigation systems of the valley have been taken over by the Government, enlarged and extended. All of the public land has been filed upon except about 15,000 acres, which are not yet open to settlement. This land lies in small tracts on the outskirts of the irrigable area, and as the ditches are extended to cover it, it will be opened to entry.

The most valuable crop in the Uncompahgre Valley is fruit, the climate and soil possessing just the qualities which give fruit of all kinds superb color and the richest flavor, and which produce enormous yields year after year. One acre of pears, apples, or peaches will increase a man's bank roll by four figures, and there has never been a time when the supply of fruit has approached the demand.

Many settlers, however, prefer to engage in general farming, and alfalfa, grasses, vegetables of all kinds, vine crops, peas, beans, tomatoes, squash, and, in fact, practically every crop of the temperate zone, can be produced in the Uncompahgre Valley of a quality and in abundance surpassing the highest expectation of farmers from anywhere but the irrigated country.

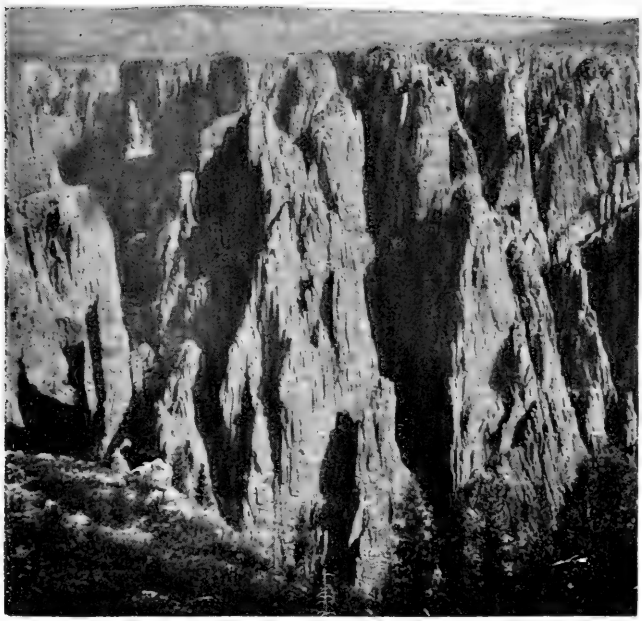
The near-by mining regions furnish an excellent market for everything that can be grown in the valley, but so great is the demand for fruit produced here that frequently Chicago buyers take the entire supply, making it impossible to get Uncompahgre fruit in Denver or other local cities.

This valley offers a golden opportunity to the man who desires to make his home on the soil. To be sure, but little Government land remains subject to homestead entry, but many of the early settlers took up farms containing more land than they can obtain water for under the Reclamation Act. These excess lands can be purchased at prices ranging from $25 to $100 per acre.

The valley contains 20,000 people, and has three good towns, Delta, Montrose, and Olathe. There is room for many enterprises, including a sugar-beet factory, flour mills, alfalfa-meal mills, brick factories, cold-storage plants, fruit-box factories, canning factories, evaporators, etc. Professional and business men will find good openings here, also. It is an ideal spot for the sportsman, as bear, elk, deer, and grouse are plentiful in the foothills and surrounding mountains, and the mountain lakes and streams afford excellent fishing.

In the elaborate preparations which are being made for the celebration the citizens of Colorado will proudly display the products of mountain and valley. There will be parades, speeches, much handshaking and cheering, and everybody will be happy; but somewhere in the throng, in dignified silence, Chipeta, the favorite squaw of old Chief Ouray, will walk alone, a vivid reminder of what has been accomplished in one generation, the turning of the hunting-ground of a nomad tribe to a highly developed region where flourishes the highest type of modern civilization.

Henniger Flats Nursery. San Gabriel Forest Reserve



Grand Canyon of the Gunnison from Above, Looking Down Toward the Head of the Tunnel

Destruction of the Northern Forests, and Its Effect on the Future of the Central States

By ALEXANDRE ERIXON

IT IS well known that the northern section of the Central States east of the Dakotas is the main source of the Mississippi and St. Lawrence rivers. It is also known that this section was originally covered by forests. With reference to similar co-relation, a writer on the subject says: "It is a mistake to suppose that the water is the cause of the groves being there. On the contrary, the groves are the cause of the water being there."

"In general the central parts of continents are likely to receive much less rainfall than their peripheral portions," says Shaler. The conditions, therefore, of the Central States are such, that the retention of existing moisture is essen-

A Pure Stand of Sapling Norway Pine on the "Ten Sections"

Virgin Forest of Oak and Hemlock in Western Maryland

tial to productiveness and life. This becomes fully plain when we consider the natural laws of the distribution of humidity, which place the coasts under direct control of the sea, while the interior is dependent on local conditions. An illustration may be had in the water discharged by the Mississippi River, which amounts to about one-fifth of the annual rainfall of its basin. It is evident, then, that only one-fifth is received each year from the sea, while the other four-fifths are retained in their cycle of activity as local moisture.

"It is not fanciful," says Shaler, "to say that the greatest misfortune which in a large way man has to meet in his agriculture arises from this peculiar stress which grain crops put on the soil. If these grains grew upon perennial plants, in the manner of our large fruits, the problem of man's relation to the soil would be much simpler than it is at present. He might then manage to till the earth without bringing upon it the inevitable destruction which he now inflicts. As it is, he should recognize that his needs imperil this ancient and precious element of the earth's structure, and he should endeavor in every possible way to minimize the damage which he brings about. * * * Where, as is often the case with farms in hilly countries, all the fields are steeply inclined, it is an excellent precaution to leave the upper part of the slope with a forest covering. In this condition not only is the excessive flow of surface water diminished, but the moisture which creeps down the slope from the wooded area tends to keep the lower-lying fields in a better state for tillage, and promotes the decay of the underlying rocks, and thus adds to the body and richness of the earth."

It is needless to ask whether or not the people of America have conformed their actions to this principle so essential to the future welfare of the land. And the result which ignorance or disregard has brought about is made known by the same author in his *Outlines of the Earth's History*. "Within the limits of the United States the degradation of the soil, owing to the peculiar conditions of the country, is in many districts going forward with a startling rapidity. It has been a habit of our people—a habit favored by the wide extent of fertile and easily acquired frontier ground—recklessly to till their farms until the fields were exhausted, and then to abandon them for new ground. By shallow plowing on steep hillsides, by the neglect in the beginning of those gulches which form in such places, it is easy in a hill country of the eastern United States to have soil washed away within twenty years after the protecting forests have been destroyed. The writer has estimated that in the states south of the Ohio and James rivers more than 8,000 square miles of originally fertile ground have by neglect been brought into a condition where it will no longer bear crops of any kind, and over 1,500 miles of the area have been so worn down to the subsoil or the bedrock that it may never be profitable to win it again to agricultural uses."

If Shaler had written of the northern section of the Central States, he would have found conditions there similar to those mentioned above.

But of even greater weight at the present time is the devastation resulting from a wasteful and unjustifiable system of lumbering. The great forests which once clothed the sandy tracts in the northern part of these states have disappeared. And to-day we have but little more than the charred remains of that which the ax has left.

The history of other countries points very clearly to the attendant effects of such a system of work. "The reckless and wanton destruction of forests has ruined some of the richest countries on earth. Syria and Asia Minor, Palestine and the north of Africa were once far more populous than they are at present. They were once lands 'flowing with milk and honey,' according to the picturesque language of the Bible; but are now in many places reduced to dust and ashes. Why is there this melancholy change? Why have deserts replaced cities? It is mainly owing to the ruthless destruction of trees, which

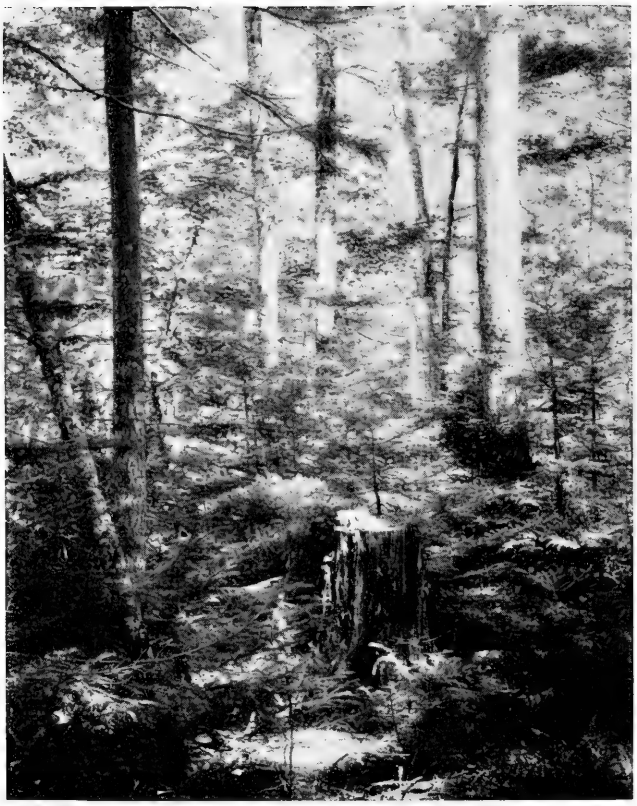
Tops Left Among the Trees in Logging. These Feed Forest Fires so Effectively That They Sometimes Destroy Everything in Their Path

View of a Deforested Hillside, Showing Effect of Erosion. Southern Appalachian Region

Hills Once Covered With Timber Down to the Banks of the Marsh. This Hill Has Been Badly Washed Away, Owing to the Denudation of Timber in the Valley Above

has involved that of nations." And to this adds Dana in his *Manual of Geology:* "Forest regions also keep the soil beneath them charged with moisture, and, like lakes, help to give rivers constancy of supply and uniformity of flow. And evil often comes when forests are cut away; for the rain-waters then speedily reach the river-channels and may occasion alternate periods of wasteful violence and worthless feebleness. The cutting away of the forests in the French Alps has led to uncontrollable erosion, despoiled fields, and impoverishment of the people; and, in America, to annual seasons of dry mill-ponds, an immense sacrifice of available water-power, and destruction of many a mill-site."

In this country, more than any other, has the wanton destruction of forests been permitted to proceed with the utmost rapidity, until but a swiftly diminishing fragment of its primal splendor still remains. The area of inland waters has greatly diminished. The power of retaining the local moisture in its cycle of continued service has decreased. With the removal of the forests, "the rain-water speedily reaches the river-channels," and is carried away to the sea. And as the moisture received from that source is, in the interior, insufficient for the sustenance of life, the nat-

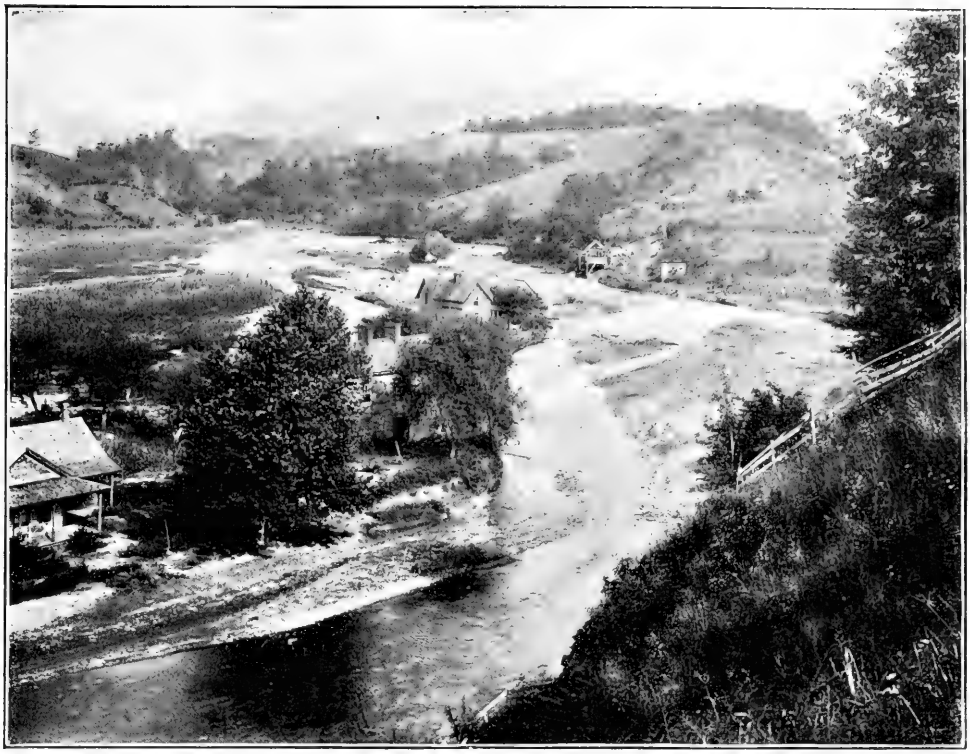


Forest Lumbered Twenty Years Ago to a Diameter of Fourteen Inches, Now Ready for Another Cutting

ural consequences will be an everlessened vegetation.

This all leads us to a perfect understanding of the words of Hinman when he says: "It is seen that all deserts correspond to regions of very light rainfall, and that the regions of heaviest forests are in regions of heaviest rainfall." With a lessened vegetation follows a decrease of the organic constituents of the soil; making it more permeable, and bringing it nearer to that state of which Winchell tells us in his *World-Life,* where the earth, during the latter stages of its history, will absorb all moisture from its face. With all this before us it is time to awaken to an understanding of the immutable laws of nature, and to change those systems which are hastening the progress onward to that ultimate state of barrenness.

This region of which we here write, the northern section of the Central States, is by nature adapted to the growth of pines, with which it was originally covered; though in parts it may produce other trees. To this we may add that it is almost worthless when considered from a standpoint of agricultural pursuits. As a forest it would preserve the local humidity in its cycle of useful service, thus giving productiveness to the regions around; and with conservative methods it would yield an almost unlimited supply of



Badly Washed Mountain Valley Lands, Bakersville, N. C. The Lower Slopes Bordering This Valley Are Largely Cleared

wood and lumber. From this point of view it is of inestimable local value—a value to which the Government and the people should awaken. And as the source of one of the most important rivers in the world, its history will go down on another page in the annals of time.

SONG OF THE OAK

O, sing of the oak, the brave old oak,
Who hath ruled in the greenwood long;
Here's health and renown to his broad green crown,
And his fifty arms so strong.
There is fear in his frown when the sun goes down,
And the fire in the West fades out;
And he showeth his might on a wild midnight,
When the storms through his branches shout.

—*H. F. Chorley*

Landslide Stopped by the Forest in the Southern Appalachians

A Virgin Forest of White Pine

Section of Oregon Fir Forest Taken Near Top of Black Butte Mountain, Oreg., about Two Thousand Six Hundred and Fifty Feet Above Sea Level

THE FOREST CONFERENCE IN THE WHITE MOUNTAINS

The Grover Cleveland Memorial, Forest Taxation, State Forest Policy, Federal Control of the Water-sheds of Interstate Streams

By PHILIP W. AYRES
Forester, Society Protection of New Hampshire Forests, and Dartmouth College Grant

A VARIETY of interesting topics was discussed at the Forest Conference held at Bretton Woods, N. H., August 3 to 6, under the auspices of the Society for Protection of New Hampshire Forests. These included forest taxation, the reforestation of denuded areas, the scope of a state forest policy, forestry in the public schools, the preservation of water-power, and Federal control of the headwaters of interstate streams. In connection with the Conference there occurred the eighth annual meeting of the New Hampshire Society, a meeting of the directors of the American Forestry Association, of the New Hampshire State Forestry Commission, and of the state foresters of the northeastern states, Maine to Maryland. A notable group of friends of the forest and experts in the care of forests was present, including Mr. George H. Maxwell, of Chicago, executive chairman of the National Irrigation Association; Mr. E. P. Whipple, of New York, state commissioner of Forests, Fish and Game; Otto Luebkert, treasurer of the American Forestry Association; Mr. James H. Cutler, of Washington; Austin F. Haines, state forester in Vermont; Alfred Gaskill, state forester in New Jersey; F. E. Besley, state forester in Maryland; E. C. Hirst, state forester in New Hampshire; C. E. Pettis, state forester in New York, and Asa F. Williams, forester of the Lidgewood Manufacturing Company.

Ex-Gov. F. W. Rollins, of New Hampshire, presided. Ex-Gov. Chester A. Jordan was in attendance, as were the forest commissioners of New Hampshire, Robert P. Bass and W. Robinson Brown.

Dr. John H. Finley, president of the College of the City of New York, presented a striking paper on the Grover Cleveland Memorial Road in Tamworth, N. H., a road laid out by Mr. Cleveland. Mrs. Grover Cleveland was present. Doctor Finley remarked that to establish this memorial—which goes straight up the hill, with every element of beauty—large contributions are not solicited, but a large number of small ones will be welcome as a tribute to the man whose work also went "straight up the hill." By resolution of the Conference, friends of the forest movement are invited to send contributions to Doctor Finley. Mr. Cleveland established the first National Forests.

The proper taxation of forests, said Mr. Allen Hollis, secretary of the New Hampshire Society, is an important element in forest preservation. If the law of taxing all property equally is enforced, and the owner must pay on this crop two per cent per annum taxes for fifty years, no one can afford to hold woodlands. Fortunately, in New Hampshire, this provision of equality is systematically violated by the assessors, which makes it possible for woodlands to be held until maturity; but there are as many systems as assessors.

with the greatest variation in practise. Mr. Hollis advocated, first, that the land be taxed annually, apart from the forest, and second, that as soon as it could be brought about without hardship to the towns now dependent upon taxes from woodlands, and as soon as constitutional difficulties can be solved, the forest should be taxed once only, viz, when felled. As a step in this direction, he urged exemption of woodlands properly planted, and those so cut as to leave adequate forest cover. This exemption could gradually be extended to the whole forest area.

Commissioner E. P. Whipple, of New York, urged the maintenance of our great water-powers through preservation of the forests on the mountains. In a series of rarely beautiful lantern pictures he showed the progress of moisture, the forests alone serving to prevent erosion and keep the soil on the mountains. The forest history of China, France, Germany, Italy, and Canada were traced to show examples of what is inevitably true in this country as in every other. The vitality and permanence of our entire civilization depend upon the preservation of the forest and the reforestation of denuded areas.

That the fundamental work of a forest service is educational, was the view of Robert P. Bass, president of the New Hampshire Forestry Commission, and of Austin P. Hawes, state forester in Vermont. This education should bear fruit in three main lines, the prevention of forest fires, the maintenance of the forest cover, and the acquisition of forest land by public authorities, Federal, state, or local, in order to guarantee that the forests are regulated in the interest of the whole people. Mr. Bass spoke particularly of the new forest-fire law in New Hampshire, which is progressive in that it provides for patrolling the woods in dry seasons to prevent fires, and provides for the arrest without warrant of persons found violating the law.

An admirable address on "Trees Along the Highway" was read by Dr. John D. Quackenbos, of New York and Lake Sunapee, N. H. Prof. B. S. Pickett, of the New Hampshire State College, urged that a well-equipped forestry department be established at that institution. Mrs. P. S. Peterson, of Chicago, chairman of the forestry committee of the National Federation of Women's Clubs, presented in a practical manner the need for educational work everywhere as to the meaning and importance of forestry to the country.

The most notable address in this notable series was that of Mr. George H. Maxwell. With faith in the future that cannot be shaken, he said that the principle of Federal control of the headwaters of interstate streams must be accepted by the country. He urged New Hampshire and the people who live in the East to take courage and push forward the Appalachian bill for national forests in the White Mountains and Southern Appalachians, because this is only the beginning of a necessary policy. He said it is more important to save the forests than to build battle-ships, for the safety of the people depends more upon them. To prevent the consequences of forest destruction it will prove of the utmost value to introduce forest instruction into the public schools.

The tall oak, towering to the skies,
The fury of the wind defies,
From age to age, in virtue strong,
Inured to stand, and suffer wrong.
—*Montgomery*

A BEGINNER IN FORESTRY

By ANNE WARNER

Paper Five

I BEGIN to wonder if, in the caring for trees so that they may produce railroad ties, houses, and other truly artificial necessaries, we haven't lost sight of the whole basic principle of forestry. The real need of trees is so that weary mortals may get out of houses and off of railroad ties, and back to one of the greatest pleasures of life,—the pleasure of just being alive,—the pleasure of becoming a child in heart,—the pleasure of being happy without knowing why.

The place where I am is small, not much frequented, totally ignored by Mr. Baedeker, and the most of the inhabitants of the village are the simplest peasant-folk, men and women who work in the fields and go home at night in long, uneven ranks, seven or eight together, each carrying his or her rake, hoe, or shovel. There is a domain, or large landed estate, and the woods belonging to the estate come as strictly under the forester's rule as if they were government property. The whole country-side is covered with beautiful forests, mainly "self-planted." The forester has explained to me that when there is a good growth of young trees after the cut they let them alone, only concerning themselves with the thin places, or the places where the soil is evidently not fitted for the young trees springing there. The soil in this vicinity is chalky, and the lay of the land makes me want to study geology—when I don't want to study mushrooms, botany, astronomy, or any other one of the new-old primitive sciences which press powerfully to the fore when one comes oneself under the forest's scepter.

The desire to know the answer to the riddle is that the riddle here is so big. The great plain of northern Germany lies straight outspread beyond me as I write. Wide and flat, dotted with villages, fertile with rich upper soil. The ocean once rolled to the foot of this hillside, and ages earlier all the rocks of which the hill and all those around are made was formed in its depths. Now this is the riddle: all the rocks are strata plainly defined, and without exception they are all tipped almost perpendicularly on end. The slant is invariable, and the ends of the stratum have a sharp little twist just beneath the soil. The soil on these rocks is only one or two feet deep and is first sand and then the rich black of vegetation. Such a big riddle to me.

The foresters interest me greatly. Men who care for the growth of 150 years and who cherish the life in that which will come to its end in 2050 or thereabouts, must have some traits which any American may well find interest in studying. The forester here tells me that he loves his vocation, and I can understand that no man would choose it who did not love it; because, of all professions, it would be the least possible to give a living to an indifferent follower. I went with him the other day to see his knife mark out the superfluous saplings, and I soon learned the two rules that saved or condemned: health at the root, and whether or not the young top formed part of the cover overhead. The cover overhead must be continuous or else grass grows beneath, and grass is not allowed in German forests. I mean, of course, as a

general thing—there are large open spaces every little way, places where the sun streams in and illuminates the whole scene with a radiant, heavenly glory that makes the legend of St Hubert most easily believed.

I spoke once of the exquisite "order" of the German woods, and I must speak of that again. As I said before, this is no frequented resort, no show-place; and yet the woods-paths, the little bridges, the tiny stone culverts, the wide, even macadamized roads for wood transport—everything is in what we might call "most beautiful order." The dead branches and twigs belong to the poor to gather for the first two days after storm or wind. We see them coming home—old men and women—their load bound on their shoulders, just as they have come for thousands of years. They go quietly by piles of neatly stacked cut wood to be taken to town and sold when the men shall have time, and the cut wood remains undisturbed until that time. The absolute, sturdy honor and honesty of the poor man in Europe is quite as much to each nation's credit as the care that they give to their trees. In my eyes, it links somehow to the spirit that leads the market woman to leave her full basket outside the church door and go in to pray. We shall come to that spirit in future centuries; we laugh at it now, because it is as easy to laugh as it is to give the California trees over to the executioner; but—a long way ahead—we shall not laugh. We shall pray, too, in that day—we shall give cast-off wood to the poor instead of heaping it together to burn; forthwith we shall have a reverence for what has grown old in service, and we shall be as willing to furnish schools for our trees as for our children. Some few out of each thousand know now how close is the unseen bond between the trees that we are trying to guard and those same children. It is closer yet between the trees and those children's children. And between our trees of to-day and the third generation hence it may well be vital.

One little word more, and then I shall have filled my space and must end. I want to tell of a curious way the like of which I never saw before.

For about a quarter of a mile along the highway there runs on one side a wide strip of land laid off in rows of parallel trees (parallel with the road), planted about ten feet apart, but with deep hollows running lengthwise between. The trees have had their tops cut in the old, French fashion until the new sprouts form a thick cover overhead, the whole too low to walk upright through. I was very curious about this way, and could not think by whom or for what purpose it could possibly have been made.

So I asked the forester, and he told me that the way used to stretch around the angle and down the hillside to the manor-house barns, and that it was planted centuries since and kept filled in as the old trees died, so as to provide a covered shelter for the herds and flocks which were driven daily through the wood and out to the pasture land on the other side. The herds and flocks are not so plenty now, and the way itself has been curtailed; but when it rains we go in under its close, green shelter, and—like many moderns who think the sun takes a year to go carefully and kindly around our little earth—thank the old lords of the manor for having thoughtfully saved us a wetting.

I hope next time to write something of the old forest-history of Germany—something of the days when the kaisers or königs gladly gave forests away if the receiver would just kindly measure them and save the crown the trouble of working out the problem of its own generosity.

THEODORE ROOSEVELT

Dynamic Geographer

By FRANK BUFFINGTON VROOMAN, F. R. G. S.

(*Continued*)

DEPARTMENT OF AGRICULTURE

BEHIND the advent of that political party which Mr. Roosevelt represents, and through which he has done so much to develop the principles of Alexander Hamilton, both extensively and intensively, lie in the background of the ages the swarming millions of those who, without hope and with little intelligence, have tilled the soil for their own daily bread, and for the daily bread of the world—peasants and yokels for the most part, helpless slaves in the ignorance and in the weakness of their individualism. For still other centuries this unfortunate class of men might have ploughed the same dismal furrows, but that just about the time of the Civil War a group of politicians began to deny the infallibility of *laissez-faire* and the democracy of individualism; to overturn that theory of government which is the policeman's theory of government; and to dare the innovation of loaning the resources of the Nation (after freeing one class of slaves) to lift from another bondage another class of slaves, which numbers now in the United States about 6,000,000 families of those who till the soil. The new coterie lifted the stigma from labor and made of a railsplitter their first President, who himself broke the shackles from 3,000,000 slaves. Lincoln had not been President a year before he signed the Homestead Act of Galusha Grow, which gave the settler a chance over the speculator, which opened up the enormous area of the great West, and gave free homes and farms to millions of men and women who worked with their hands for their daily bread. This idea has since been developed for this lowly and hardworking class of men into the most useful and the most brilliant scientific organization in the world. It has made as well one of the most romantic contributions of human genius to the welfare of the human race. Now the American farmer is no longer a "hayseed." He is a prosperous business man. In the past, farming was a last resource; now it is a dignified, scientific profession. It is such because we have 2,000 scientific men and trained experts probing the secrets of Nature, roaming the world, solving the problems of soils, waters, seeds, weathers, fertilizers, forests, plants, insects, and farm animals; the foods, diesases, and adaptabilities of all of them, in their affinities and possible permutations.

It is impossible in any brief space to give even the outlines of the vast work of this department. Its work is divided into many bureaus, and these, in turn, into divisions, the Bureau of Plant Industry alone having thirty-two. The Weather Bureau, *e. g.*, besides maintaining its central office in Washington, with about 200 subordinate stations scattered over the United States, Alaska, Hawaii, and the West Indies, coordinates with it, by daily telegraphic reports, observations made in Canada on the north, Mexico on the south, in the Azores and Iceland, the western coast of Europe, European and Asiatic Russia, covering every day practically the whole of the inhabited portions of the North American Continent, the North

Atlantic Ocean, western and northern Europe, and northern Asia. With this substantial basis for the forecasting of the weather, the bureau issues storm signals, flood signals, and other meteorological information for the benefit of agriculture, commerce, and navigation. The Forecast Division receives in charts twice daily telegraphic reports of the prevailing weather conditions throughout the field of observation, and is able to give reliable information to shipping through 255 special storm-warning stations over and above all the weather-bureau stations along the lakes and seacoast. The Climatological Division, with more than 3,600 meteorological stations, supplies, at the Government's expense, gratuitous information to all parts of the country by telephone, railway, telegraph, train service, regular mail service, and rural free delivery. There are many other divisions of this one bureau, each with its special and valuable work.

The Bureau of Animal Industry covers everything relating to the live-stock industry. It deals with the investigation, control, and eradication of diseases of animals, the inspection and quarantine of live stock, the inspection of meat and meat-food products, with animal husbandry and dairying. The bureau has been able, from time to time, to stamp out diseases of cattle which have threatened the whole cattle industry of the United States.

The Meat Inspection Division is now carried on at 702 establishments in 196 cities. Closely allied to this is the Pathological Division, studying the diseases of animals, and the Division of Zoology, which collects and describes animal parasites of all kinds; the Experiment Station, studying all these questions in their bearing on the public health, and questions of heredity in animals and the making of better and stronger stock. Closely allied to this is the Animal Husbandry Office, dealing with the breeding and feeding of farm animals, poultry, etc.

It is impossible to outline the thirty-two separate and distinct groups constituting the Bureau of Plant Industry, through which plant life is studied in all its known possible relations to agriculture. There are laboratories of plant and forest pathology, investigations of diseases of fruits, plant-life history investigations, together with experimentation in cotton breeding, corn, tobacco, drugs, and poisonous plants and tea culture, sugar beets, fruits, grains, forage crops, etc., with other groups devoted to farm management, crop technology, soil bacteriology, water purification, alkali and drought resistance, and many other useful lines of work.

The Bureau of Chemistry is conducting original investigations on hundreds of different lines, which have already resulted in untold good to the public health, to the prosperity of the American farmer, and is adding every day contributions to the stock of scientific knowledge of the world.

The Bureau of Soils has surveyed and mapped and analyzed the soils with reference to their utilities, always in connection with their climatic surroundings, 147,107 square miles of land in forty-seven states and territories. It sends out circulars and bulletins and reports containing detailed descriptions of soils and agricultural conditions, with suggestions for the improvement of crops and methods of cultivation, with large scale lithograph maps showing the distribution and the relations of soils to climate and organic life.

The laboratories take up such questions as alkali and fertilizers, and with the many experiment stations offer free to the whole people invaluable information on soil management, utilization, erosion, and questions of fertility.

The Bureau of Entomology, or the "War Department," in the field of agriculture, is what we might call the Government Bug Industry, and has a fascination all its own. There are bugs which destroy plant life and animal life. There are big bugs and little bugs. It costs the farmer to feed these terrifying and insiduous armies of Lilliputian Huns and Vandals more every year than it costs to run the United States Government, including the pension roll, the army and the navy, and this for the vegetarian bugs alone. This does not count those which leave with man and

beast their trail of disease and death. In the old days of *ante-paternalism* and *anti-paternalism,* days of every farmer for himself and the bugs take the hindmost, the black-scale and the grasshopper, the chinch-bug and the Hessian fly and Texas fly swept unhindered over the domain of the farmer, his homestead open at every angle of his ignorance and his prejudice and his individual helplessness, and the last scenes of the tragedy were generally seen in the auction advertisements, the sheriff's hammer and the pathetic procession of the old man and his wagon full of children driving down the road, if he had saved so much as a horse, to begin life over again as somebody's hired man. Now he drives an automobile, sends his sons and daughters to college, and the bank complains that he loans instead of borrowing money.

The farmer has been feeding about 200,000,000 pounds sterling a year to one subdivision of his bugs. Nearly half this much is saved to him every year by the Bureau of Entomology alone. In other words, because the United States Government is in the hands of those who believe in the *social organism* instead of a *social atomism,* this one department of government has revolutionized agriculture and has placed the status of the farmer's prosperity upon scientific and permanent foundations.

The wealth of the American farmer to-day is about £6,000,000,000, almost thrice the total wealth of the whole United States before the civil war. The product of the American farm last year was twenty-five per cent on even this enormous investment, and the values of the last year's product of the farms of the United States were £1,500,000,000. The American farm has produced enough in 1908 to give £100 to every family in the United States.

Such has been the intelligence and vigor and disinterestedness of the administration of agriculture under Secretary Wilson, that in Mr. Roosevelt's term of office, in the single item of live stock alone, the values have increased from 450,000,000 to 866,000,000 pounds sterling. This is largely due to the dissemination of free, scientific literature to the farmers, and other actual national assistance in combating the diseases of farm animals. The three crops of wheat, maize, and oats alone have increased to the value last year of £200,000,000 over the value of those three crops upon the year President Roosevelt was sworn in as President of the United States. During the same period the value of farm land has increased about thirty-two per cent, or from 3,300,000,000 to 4,550,000,000 pounds sterling, and this has been due largely to the study and dissemination of literature and practical field help given by the Nation to the farmers in studying the plant diseases and combating plant enemies.

Two of the most useful laws which Mr. Roosevelt has succeeded in driving through Congress and successfully running the gauntlet of every interest involved are the meat inspection act and the pure food law, the latter conducted by the Hon. Mr. Mann. Taking at random a period of four years, the Bureau of Animal Industry inspected 227,000,000 animals per year, and 148,000,000 for slaughter. I find in a report from the bureau a certain table of the causes of condemnation of carcassses, in which, roughly speaking, 19,000 cattle, 12,000 sheep, 4,000 calves, and 91,000 hogs, besides as many parts of each, were condemned and thrown away on account of the presence of forty-five different diseases. These diseases included tuberculosis, cholera, Texas fever, erysipelas, cancer, tumor, abscess, gangrene, tapeworm, trichinæ, and thirty-five others.

Under *laissez-faire* we used to eat all this.

And we didn't know what was the matter with us!

It is impossible to give, in anything less than a volume, an adequate idea of what this department alone has done, is doing, and will continue to do, for the American farmer.

The Post-office Department has made its own contribution in these seven years of Roosevelt by increasing the number

of free rural delivery mail routes from 8,000 to over 40,000. The President has just called a commission on country life to make an exhaustive study of the conditions of rural life, of what it is possible to be done by the Government to eliminate the element of isolation and loneliness, to introduce telephones, parcel post, better roads, and other measures to help forward that movement upon which the whole future of civilization depends—the movement back to the land.

More advances in agriculture have been made in one generation than have been made before since the red Indian ploughed his maize with a stag-horn and hoed it with a clam-shell, or invoked the rain with the incantation of a howling Dervish. All the past has not performed the miracles with the soil which science has wrought in forty years, and all the literature of science, so far as I know, holds no more charming tale than that buried in the Government stacks of plain black cloth and paper-covered farmers' bulletins, and United States agricultural reports and year-books—the romance of science and the soil—of the making of two farmers grow where one grew before. Let some one sing us a new song now—"'Tis the man with a plough." He is the foremost figure in the landscape, this belated scientist; and he is such solely and only because the American world made up its mind that in this field at least, individualism and *laissez-faire* are played out. No sturdier blow has ever been given to the shabby pretensions of *laissez-faire* than that by the Department of Agriculture of the United States.

FORESTRY

The annual growth of wood in our American forests does not average more than twelve cubic feet per acre, or the total annual growth is less than 7,000,000,000 cubic feet. But we are taking 23,000,000,000 feet from the woods every year. "We use each year 100,000,000 cords of firewood, 40,000,000,000 feet of lumber, more than a billion post and fence rails, 118,000,000 hewn ties, one and a half billion staves, over 133,000,000 sets of heading, nearly 500,000,000 barrel-hoops, 3,000,000 cords of native pulp-wood, 165,000,000 cubic feet of round mine timbers, and one and a quarter million cords of wood for distillation."

This is *used* every year. What we waste is appalling. An average of 50,000,000 acres of forest has been burned over yearly since 1870, and the annual average loss by forest fires for that forty years has been fifty lives and 10,000,000 pounds sterling worth of lumber. But the waste in lumber-production is even more startling because wholly unnecessary and avoidable. In the case of yellow pine alone, in 1907, it is estimated that only one-half the cut was usd, and 8,000,000 cords wasted, twenty per cent of the whole cut having been left on the grounds in the woods to rot—a waste representing the entire output of 300,000 acres in the matter of yellow pine for the year 1907 alone. And there is still more criminal waste at the mill. Only 320 feet of lumber have been used for each thousand feet that stood in the forest. Enough timber is destroyed by fire every year to last the Nation for three months, and, not counting the losses from forest fires, we are using up three and a half times the yearly growth. The condition of the world's supply of timber makes it more and more necessary to become self-sufficing, or to do more and more without the use of wood.

There is a vital relationship between forest and stream in any rational economy. The problems cannot be separated, therefore they must be coordinated. The inhabitants of the Mississippi flats are among the first to suffer from the tree thief and the land-skinner among the countless tributaries. There is inseparable relation between river-bottom or desert plain and the wooded mountain of faraway interiors.

High up on the forested canons Nature has built her great sponge reservoirs and her dams of moss and fern. Above these yet, are the ice and snow. Here open thousands of tiny sluiceways for the oozing waters that have been

let loose from melting snow and falling rain. Soaking deep, the sluggish and reluctant waters flow from their cool retreats down into the brooks, these into the larger streams, whose replenished banks guide them from their natural reservoirs into the plain. How different the canons and gullies of the treeless and arid regions, scenes of alternating forms of desolation! When it does rain, which is not often, a thousand streams pour like water off a tin roof, to expand below into an inudation in an hour, to sweep swift destruction through the valley, to subside at once into a blister upon the plains, to parch there like the forsaken victim of illicit love.

> All at once and all o'er with a mighty uproar,
> And this way the water comes down at Ladore.

A striking comparison of the types of water-supply was given by J. B. Lippincott, supervising engineer of the United States Reclamation Service, at the Forestry Congress in Washington recently. He says that Queen Creek, Arizona, discharges through a barren, treeless drainage basin of 143 square miles, in violent freshets and floods, subsiding almost as rapidly as they arise. During most of the year the channel is dry. In contrast is Cedar Creek, Washington, with the same drainage area. It is heavily timbered, and in addition the ground is covered with a heavy growth of ferns and moss. The total annual rainfall in Washington Creek for 1896 was eight times that of the Arizona Creek, yet the maximum flood discharge per second is only 3,600 cubic feet for the former, while that of the latter was 9,000 cubic feet per second. The mean discharge from the Arizona Creek was fifteen cubic feet per second, that of the other 1,089 cubic feet per second.

The Forest Service has undertaken, as one phase of its task, the solution of the problem of floods in rivers. For instance, I saw the Kansas River floods of 1903, which destroyed £4,000,000 worth of property and 100 lives. One of the most fertile valleys on the continent, 120 miles long, was partially destroyed. Here the rich soil was cut away, there it was covered with sand six and eight feet deep over the fields; holes were cut out and lakes left behind. Out of the 250,000 acres of wonderfully fertile soil, 10,000 acres were completely destroyed, 10,000 more lost fifty per cent of their value, and the uncertainty left behind depreciated the value of the whole valley.

The Forest Service has devised systems of tree-planting for the river banks, the sand-covered and deeply eroded lands. The object of the first is to prevent washing of the banks, to protect the whole area from the full force of the floods, and, in time of overflow, to check the tendency to cut new channels. The last two systems are for ultimately reclaiming the now destroyed lands and making them productive. The useless sand lands will grow cottonwood and reclaim the land for crops. A most interesting discovery was made after this flood; where the protected growth of cottonwood, which had not been cut away, checked the rush of flood waters, the land beyond was generally covered, not with sand but silt, and was often more fertile than before. With extensive planting of trees another flood would bring back, instead of further desolation, a return of fertility to much of the land now barren.

Says Mr. F. H. Newell, director United States Reclamation Service, "In six years the Government has reclaimed 250,000 acres, upon which are now living 20,000 people, representing 4,000 families. It is a reasonable estimate that, in another decade, 2,000,000 more acres may be reclaimed, upon which 250,000 more human beings may maintain themselves in reasonable comfort.

"The water for this work comes chiefly from streams rising in mountains. To maintain the supply of this water, it is essential that forests be maintained upon these mountains. To this end national forests are indispensable."

Addressing the National Rivers and Harbors Congress at Washington, D.C.,

on December 4, 1907, M. J. J. Jusserand, French ambassador, said: "It is an absolute principle—no forests, no waterways. Without forests, regulating the distribution of waters, rainfalls are at once carried to the sea, hurried sometimes, alas! across the country. After having devastated the neighboring fields, the rivers find themselves again, with little water and much sand; and with such rivers how will you fill your canals? * * * The question is as clear as can be: Do you want to have navigable rivers, or do you prefer to have torrents that will destroy your crops and never bear a boat? If you prefer the first, then mind your forests. We can tell you, for we know. * * *

"If the Mississippi is the 'Father of Waters,' the forest is the father of the Mississippi."

Mr. Roosevelt was the man who discovered that a national conservation policy, which must include a national forest policy, is all that stands between the United States and the speedy destruction of whatever foundations of wood the national utilities and industries rest upon. Through his direction, the Forest Service has been familiarizing itself with the entire public domain, to determine its highest measure of utility. This study is thorough and scientific, and includes both general and specific problems of the forest and its product, and every possible relation they sustain to the Nation and to the individual. In short, it is concerned with every possible relation existing between civilization and the tree. The Service is replanting denuded forest areas, starting new ones, and conserving old ones. It studies the tree and its relation to the drought and the flood, to the irrigation of arid land and the encroachment of sand dunes, as well as to the inundations of the freshet. It tells the man who owns timber land how to get the most out of it; the farmer who has none, what trees to plant, and how. It shows the lumberman how to avoid waste, and the millman how to save. In short, it has made possible the perpetuation of the utilities and industries and comforts dependent upon wood. It has taught the lumberman there is no future to his business if there is no future to the tree, and that the lumberman must fall in line with the Federal forest policy, or go out of business for want of one. Mr. Roosevelt said at the American Forest Conference in Washington, January 2, 1905, "I ask, with all the intensity that I am capable of, that the men of the West will remember the sharp distinction I have just drawn between the man who skins the land and the man who develops the country. I am against the land-skinner every time. Our policy is consistent—to give to every portion of the public domain its highest possible amount of use."

The Forest Service controls over seventy per cent of the forests publicly owned by the United States, but less than one per cent of the forests privately owned. This gives a total of only eighteen per cent of the total forest area of the United States, covering about 550,000,000 acres, over which there is any scientific oversight, promotion of utility, or prevention of waste. The political principles of competitive anarchy and patriotic nationalism are here thrown into such dramatic contrast that the mere statement of the problem should furnish a self-evident basis for its solution.

It is impossible to exaggerate the seriousness of the menace to the business interests of the country in the possible failure of the lumber supply. Every human interest, from agriculture, transportation, building, manufacture, commerce on the land, to the sailing-vessel on the sea with her cargo of wooden nutmegs, is directly and vitally affected by the forest sources of the wood-supply at living prices.

We have not been accustomed to think of the wood industry as such an indispensable basis of our industries as iron. We have looked upon agriculture and iron as our two most important economic corner-stones. But our cities and our shipyards use more wood now than even before the day of steamboats or steel girders.

My attention has been called by Mr. Smith, chief of the Editorial Division of the Forest Service, to the fact that while the census shows an annual output from the logging camps of only about one-half the value of that of the iron mines, viz. £74,000,000, that this takes no account of the vast amount of timber, not for the general market but for local consumption—worth, probably, in the aggregate, at least as much more. Moreover, as we use iron we use it up. So it was once with the forest. Fresh supplies of timber were available only in new territory. First the Northeast, then the Lake states, then the South, were swept clean of any great reserve. Only the Northern Pacific coast was left. Soon this would have been gone under the awful warfare with which these private interests have vandalized the past and jeopardized the future. No one who has read the history of the Forest Service, and, as well, that of the "land-skinner," can hesitate long as to whether "state interference," or *laissez-faire* (to use the larger meaning of the term) is better politics, and as to whether competitive anarchy or patriotic nationality is the better guiding principle in public affairs.

It is pretty certain that, but for a national forest policy, backed up by the Nation, the greed of the land-skinner would soon have laid bare our western states, as it has stripped the eastern and middle states, and deprived the arid region of the West of a stable water-supply.

Every true American has felt the elemental sorrow of Leatherstocking, driven to the far West because the sound of the woodsman's ax which had driven him from his forest home, still in the clearings, hurt his ears; and a lonely old man with his silent laugh and his silent grief, sorrow-stricken still in the far prairie at the sound of a falling tree. There is real tragedy here. This is a common feeling. But this sentiment has never been organized. There has been a necessity for this, for sentiment still rules the world. A growing national sentiment is behind the whole work of the Forest Service.

A national sentiment is not a national *sentimentalismus*. The pioneers of forestry, in creed or deed, have entertained no geographic grief that the dryads are dead, or that the wan shapes of the hamadryads are wandering like lost ghosts among the ragged and unroofed stumps of so many a deserted waste. We entertain a sentiment of patriotism, a religion, for the restoration of the beauty, the utility and the dignity of the land. But for the forest, which was the glory of the Nation's youth, what would that land have been to-day? What would it have been to-morrow? Surely another domain. It furnished the fortress to protect the early pioneer from the arrow of the treacherous foe. The life of the Nation's youth was nurtured in the forest. And, more or less, in every home on the continent to-day some forest product furnishes shelter.

By the substitution of the geographical economist for the land-skinner, the principle of nationalism for a competitive anarchy, we can not only produce a supply of timber four times as great as we produce now, and sufficient for our national needs, but we can kill several other birds with the same stone, as it were, for upon this central economy depends the usefulness of the streams of the continent for navigation, water-supply, irrigation and power.

(To be continued)

CLASSIFICATION OF PUBLIC LANDS*

By GEORGE OTIS SMITH, Director U. S. Geological Survey

THE necessity for classifying the public land is not a recent discovery. The earliest land legislation in this country both contemplated differences in the quality and character of the public land and planned that the officers charged with their sale should be furnished with descriptions based on field examination. From 1796 down to the present day, whatever the policy that has prompted legislation with reference to public land, whether the purpose was to procure revenue, or to promote home building, or to benefit influential citizens, most of these laws recognize classes of land and presuppose classification. Yet even the honest administration of the land laws has ever been subject to criticism arising from the fact that no adequate provision was made for land classification.

A period of national awakening to the worth of the public domain appears to have followed the close of the civil war, and in the late seventies Congress gave serious consideration to the problem of making better provision for effective administration of this great estate with its latent possibilities for national growth. We have just entered upon another epoch of realization by the Nation of the true source of its wealth and prosperity, and both the legislative and the executive branches of the Federal Government are awake to the fact that exact knowledge is essential to the proper utilization of our country's great resource of land. The earlier propaganda bore fruit in the creation of a scientific bureau, first among whose functions was the classification of the public land. But, unfortunately, this specific duty laid upon the new Federal bureau was subordinated to the more general though hardly less important task of determining the natural resources of the public domain and the opportunity for a scientific classification of the land before the larger part of the more valuable areas had passed into private ownership was lost. In the present period of aroused public opinion the land classification which leads to better use, and the field knowledge on which intelligent administration must be based, have come to be regarded as vital factors in the public-land policy.

The Secretary of the Interior may be considered to be a trustee charged with the disposition of the public land, and within his department the functions of administration are divided among three bureaus: to the General Land Office belong the subdivisional surveys, the sales and the issuance of patents; to the Geological Survey has been entrusted the investigation of the resources of the public domain, with the determination of the character of the public lands, and the valuation of those whose price is not specifically fixed by law; and upon the Reclamation Service has been laid the vitally important task of insuring the full utilization of arid lands by the construction of engineering works.

The duty of classifying the unentered public lands is now definitely accepted by the Geological Survey, and the opportunity neglected in 1879 has for several years been vigorously improved. The Department of the Interior fully recognizes that the land laws have not been and never can be efficiently administered in the absence of a detailed and authoritative classification of the land.

*Delivered before the National Irrigation Congress, Spokane, Wash., on August 10, 1909.

Thus the Geological Survey is heartily cooperating with the General Land Office to the end that the best disposition of the land may be secured, and it should be noted that no small part of the data utilized in this work represents the fruitage of the earlier general investigations of the Survey. In this present-day task of land-classification the painstaking work of the Survey geologists and engineers in the last thirty years counts for much.

Utilization is the keynote of the present public-land policy, and by utilization I mean not that kind of local development that exploits the present at the expense of the future, and is promoted by the land-skinner, but rather a development whose plan weighs national needs and calculates future demands, and whose accomplishment will serve our country's advance in the next century as well as in the present decade. Utilization is opposed to both non-use and waste. To withhold the land from private use, except where public use is of greater advantage to the people, is to check national progress; to dispose of the people's land for other than its highest practical use is to waste that property and betray the trust. The public-land problem thus resolves itself into, first, the determination of the best use to which the public domain can be put, and second, the disposition or reservation of the land now belonging to the Nation so as to assure that use. Such a land policy needs no defense, for it is based on the safe principle of the greatest good to the greatest number.

The classification of the public lands as now carried on by the Geological Survey serves two important ends, one administrative, the other legislative, and I believe both were contemplated by Congress at the time of the creation of the Survey. Not only does land classification facilitate the work of fulfilling the requirements of existing law, but the classification of the public domain and the investigation of its resources furnish Congress with the facts on which to base new legislation.

A notable example of land classification in aid of proposed legislation is afforded by the acts of March and October, 1888, wherein Congress directed that an irrigation survey should be made by the Geological Survey, and further provided that the reservoir sites and irrigable lands designated as a result of that investigation should be reserved from entry, settlement, or sale pending further legislation. The legislation of 1888 was itself the logical outcome of Maj. J. W. Powell's 1879 report on the arid lands, and his subsequent work as Director of the Geological Survey, and the law that eventually resulted from the work thus authorized in 1888 was the Reclamation Act of 1902.

As another instance where thorough knowledge of the public domain, and particularly of the character of a special tract with its strategic relation to the hydrography of the region, enabled the Department of the Interior to aid Congress may be cited the act of February 20 of this year, reserving for public use eight sections of waste land in southern California. The law provides that this land shall be used for the diversion of flood waters into underground storage, thereby replenishing the supply of underground waters in the San Bernardino Valley. While apparently of only local scope, the principle established in this legislation is really of great importance as providing a line of action that will be found adaptable elsewhere in securing effective conservation of waste waters.

Hydrographic and topographic surveys which are in progress at the present time under instructions of the Secretary of the Interior have as their purpose the collection of information that may be presented to Congress in aid of legislation looking toward the best utilization of the water-powers on the public domain.

Land classification in aid of the administration of the public lands is now actively prosecuted by the Geological Survey, and reports setting forth in detail the mineral or non-mineral character of public lands are being transmitted

to the General Land Office on the coal, oil, and phosphate lands of which the Geological Survey has made actual field examination. Another line of activity is the segregation of non-irrigable lands under the terms of the enlarged homestead act of February 19 of the present year. The recommendations of the Geological Survey on which the Secretary of the Interior bases his designations have not, of course, depended on surveys made for this specific purpose, but represent the available data collected through a period of many years by Federal geologists and engineers. The existence of this information whereby, within these few months since the enactment of the law, the Secretary has been able to designate areas in nine states and territories, aggregating 162,000,000 acres, is in itself a forceful argument for a land classification that is complete and authoritative.

The classification and valuation of the coal land is the special phase of public-land work to which the Geological Survey is giving increasing attention. Since the Executive withdrawals of 1906 the coal fields in the public-land states have been the scene of Survey activity on a scale that could not have been possible in the earlier period when the appropriations by Congress were altogether inadequate. The purpose of these classification surveys is two-fold: to expedite the complete restoration to agricultural entry of land thus determined to be non-coal although included in the general withdrawals, and to promote the utilization of the coal lands which today represent the greatest natural resource to which the people retain an unquestioned title. I agree with Mr. Pinchot on the water-power trust; but no combination controlling the coal fields of the West has as yet poked its head over the horizon. The geologic investigations of the last three field seasons have not only furnished a knowledge of the quantity and quality of the coal on the public domain, but have rendered possible the present policy of obtaining coal prices for coal lands. The General Land Office now depends on the Geological Survey to furnish detailed valuations for every forty-acre tract of coal that is placed on the market.

The scale on which this work is being prosecuted is indicated by the record of the three and a half months following the adoption of the revised scheme of valuation and reports to the General Land Office which released to agricultural entry approximately two and a half million acres.

Colorado, Wyoming, and Montana placed selling prices on nearly a million acres of coal land, with an aggregate valuation of over $50,000,000, which is an average advance of more than 200 per cent over the minimum prices fixed by law. Under the regulations setting forth the plan of valuation of Governmen coal land the price is determined on the basis of estimated tonnage, and the unit rate varies with the quality of the coal, ranging within fifteen miles of a railroad. The prices thus calculated for the public-coal deposits average less than one-tenth the usual royalty paid in the West, yet this conservative valuation will more than double the average price of public coal lands, not to mention the fact that this policy of land classification has stopped the illegal disposal of coal lands at even less than the minimum coal price. I might cite exceptional cases like one in Wyoming where the average price based on tonnage represents a fifteen-fold increase over the old minimum price. Sales are being made at the new prices and the reports from one land office already indicate a greater activity in coal lands priced at $25 and $50 per acre than existed a few years ago when they sold at the minimum price of $10 and $20.

It is conceded that this policy of basing the price on the quantity and quality of the article sold will discourage purchase by speculators, but I maintain that the Government valuation will not impede the disposition of the coal deposits for purposes of utilization. The real development of the West will be promoted, not retarded. The situation is clearly viewed by an editor of a western mining journal who has re-

cently stated that this increase in valuation "can produce but one result—the lands will be sold only as they are actually needed for mining purposes. This should reduce the danger of monopoly, without promoting over-production and wasteful competition. In the end it should give future generations cheaper coal. The unearned increment will go in part to the Nation rather than to individuals." If a scientific classification and adequate valuation of the coal lands will accomplish all this for the people of the West—protection against monopoly, over-production, and wasteful competition, as well as the assurance of cheaper coal to the consumer and a larger return to the public—what more can you ask?

The popular view in regard to the disposition of the public lands is, in my opinion, in a state of transition. Not only is the speculator now given less consideration than the entryman who desires to use the land, but by reason of the operation of the Reclamation Act, the citizens of each state are beginning to take a personal interest in the receipts of the Land Office. It is hardly necessary in this connection to bring to your attention the fact that the increased valuation of the millions of acres of public coal land must result in increased contributions to the reclamation fund and greater possibilities for local utilization of your agricultural lands through irrigation.

In conclusion, I would mention a principle that is winning increased recognition in land legislation—namely, relative worth. The earliest land laws provided for the reservation of mineral lands from disposal for other purposes and the present coal-land law expresses this principle of relative worth by giving gold, silver, and copper deposits priority over the coal, and the coal in turn preference over agricultural values. These distinctions necessitate land classification based on adequate field examination, and with such classification data at hand the principle of relative worth can be further developed. Wherever the different values conflict the higher use should prevail. For example, the reservation or disposal of a tract of land for a dam or reservoir site should have preference over its use for agriculture. On the other hand, wherever the different values can be separated, that separation by appropriate legislation is at once the easiest and best solution of the problem. For instance, the surface rights may be separated from the right to mine underlying beds of coal. The first step in this direction was taken in March of this year in the passage of the Mondell act for the protection of the surface rights of entrymen, whereby the homeseeker may secure all of which he made entry, all he swears he is getting, while the coal beneath his tillable land is reserved to the Nation for future disposal.

The ideal land classification would be that based on field examination, scientific and detailed enough to include every natural resource; the ideal land legislation is that which fully recognizes the principle of relative worth; and the ideal land administration is that which will assure the reservation or the disposition of the people's land only for its highest use.

THE WOODS

Straight as a line, in beauteous order stood
Of oaks unshorn a venerable wood;
Fresh was the grass beneath, and ev'ry tree
At distance planted, in a due degree,
Their branching arms in air, with equal space,
Stretch'd to their neighbors with a long embrace.

—*Dryden*

WORK ON A NATIONAL FOREST

No. 12. Ex-rangers

By CHARLES HOWARD SHINN, Supervisor, Sierra National Forest

WHEN the social history of the Forest Service comes to be written with sympathy and knowledge by some one of the real insiders, twenty years from now, the very strangest and saddest of the chapters will be crowded with stories of rangers who fell by the wayside and did not manage to get up again—who, in fact, deserved no consideration because they were weaklings and good-for-nothings.

If a man is at home with his rangers, and they are so with him, he will sometimes get glimpses of reasons behind reasons for these failures, from the stories told as one climbs a trail to the snows and stars, or drops into the twilight of mighty deeps between walls of granite, or sits by a mere spark of a campfire islanded in an ocean of billowy tree-clad Sierras.

"Everybody knows, but it isn't very often that anybody tells," was the way one ranger put the thing. "Why not? Well, if a thing seems funny I tell it in the end, if I have a chum to tell it to, but sometimes it takes ten years to get around to it."

It was one of the oldest rangers in the service who heard a youngster letting himself go with too free and critical remarks about other rangers. After supper, when the pipes were lit, he asked me if I knew what had become of the Yoacum family. They were down in the valley somewhere, I said, and having a hard time. The wife and girls were working in a cannery, and Yoacum was a railroad section hand. The old ranger shook his head and meditated over Jack Yoacum, the ex-ranger.

"Jack was a lovely talker, and so was his father before him. I expect it had been that way for hundreds of years in the Yoacum family. It wasn't ill-natured talk, as a rule; but it was always kinder theatrical, so to speak. He'd hear a little and guess a little, and bring lots of people into his stories. When he got all through, or maybe the next day, you'd feel that your confidence in the people he'd brought in had been a mite shaken by all sorts of little hints.

"I never could understand just how Yoacum did it, and I couldn't make up my mind whether it was done a-purpose or mostly by accident. Still, if he worked a week with a crew the men just naturally pulled apart, and yet they all stayed friendly with him. He was always cheerful and active, taking hold pretty well everywhere, and still he managed to play smash with general good feeling in a crowd.

"No, it wasn't his wife. Never was a better woman, nor better brought-up children. It was just Jack Yoacum's way.

"I remember once the district ranger went to a cattle convention, and took Jack—to teach him a little, I suppose. It was a stiff and lively meeting, and everybody had honest ideas and threshed them out in public. Nobody was hurt, and everybody felt better afterward—the stockmen understood the regulations better and the rangers understood the troubles of the stockmen better. But Jack didn't pay much attention—heard a little, misunderstood a lot, and went home and gave the boys little theatrical imitations of the worst bits of the convention, till he got them laughing fit to kill—all except one big young fellow. That one, the next day, comes up to the district officer and says:

'I understand that you quarreled with my father up in Tuolumne last week at the cattlemen's meeting. You and he talked right out at each other, as I hear. Now, my father's the best man in that country, and—blank you, here's my resignation!'

"The district ranger just looked at the youngster and sat down on a rock and laughed till the tears ran down his cheeks. Then he slapped the boy on the shoulder and said: 'Wish I had a boy like you. Now, hit the trail on leave with pay. It's Saturday night—moonlight—and you'll get home for breakfast. You can come back by Snow Creek and see the school-teacher, too. You tell your father all about it, and ask him what he thinks of our quarrel.'

"By Monday noon the young ranger was back, and, walking up to the district man, said: 'Mr. Williams, my father laughed till I thought he'd bust, and said you was white all through.' Then the boy got red in the face, but he kept right on, and said: 'He says you'll make a man of me yet, and I hope you will.'

"Pretty soon a Congressman came up here fishing, and wanted to borrow a ranger to show him where to go, you remember. I guess now it was just a new kind of try-out for Jack, but you gave him several easy jobs that month, and his brag grew on him like a jimson weed. He told the boys he was going to be a tourist ranger—better grub, lots of free cigars, and short hours. Then, when you pulled the rope in on him just a little, he talked pretty warm an' said that if things couldn't be fixed for him thus and so he would sure resign. I guess he must have said something like that to you, for I noticed he didn't stay in the office more than five minutes before he took the road, a truly ex-ranger goin' home to tell his loving wife how mean the Service was.

"His wife took in plain washing—miners' shirts an' overalls, an' such heavy things, to support the family till her Jack should settle into 'something suitable.' If she saw through him, she never let on. He kept smiling and cheerful except when the Service was mentioned; then he looked resigned and grieved, till a good many of the boys thought perhaps the boss had been pretty hard on him, and crowded him, we didn't know exactly how.

"After a bit, though, we discovered for ourselves that Jack was no good; just a sneak and a liar inside."

There was a long pause. The pipes went out, the fire burned low. I thought to have heard all that was coming about Jack Yoacum. But it was a night for confidences, and the old ranger replenished the fire, refilled his pipe, and began again:

"When he was on that other forest he got up charges against one of the boys he had camped with—one of the best rangers in the service. You know, I was on that forest, too, before I married and came down here. Well, he sent these charges clear up to the President and the Secretary of Agriculture.

"We had an inspector, and more fuss, and affidavits and interviews, and two months of worry."

"What did he say about that ranger?"

"Said that on a certain date at a certain place the ranger had taken hush-money to keep still about a timber trespass, and had got gloriously drunk on the money, lying drunk all day in a miner's cabin."

"In the same letter to the higher-ups he expressed his love for the service and his 'extreme regret' over the affair. He hinted, too, that that ranger had been throwing down the Service for years that way."

The listening rangers around the campfire spat upon the ground in silent disgust. There is no more significant expression of human contempt known on the frontier; it is not mere expectoration; it is of oriental intensity. Thus the son of the desert does to this day when he hears the name of one who has been a traitor to the tribe.

"But how did that ranger pull out?" one asked. "I suppose it was just his word against Jack's, for, of course, if he had taken hush-money, the feller that gave it would say he hadn't."

"Well, in the first place, that ranger did what most of you fellers don't do.

He wrote up his diary every night before he went to bed. And the diary showed that he couldn't have been drunk anywhere nor received money anywhere in the forest, because he was about twenty miles away, taking his wife and little sick baby to a doctor's. His leave-of-absence blank, on file, showed that, too. Then, after about twenty people had been hunted up in all sorts of places, including Jack's witnesses, and their evidence written down and compared, and after the land had been surveyed and gone over, the Government found there hadn't been any timber trespass nor any hush-money offered to anybody.

"I heard afterward that the letter Jack finally received from the higher-ups read about this way: 'Your charges against your former associate, Ranger Blank, have been found to be entirely baseless.' Of course, Jack resigned. That was before the days of civil-service examinations, and he tried the examination two years later and got in again without saying anything about any early experiences in the 'reserve' way up North.

"When he got that letter, though, he showed it 'round himself one night when he wasn't quite responsible, down at Lumbago's Indian and sheep-herder saloon, just to prove how mean the department was to a poor, hard-working man. But even old Pete Lumbago, who is just a drunken horse-thief, said: 'They seem to have sized you up, all right, Jack, as a kind of a liar.' It went all over the woods in that shape."

"Well, there!" said one big ranger. "I never knew the rights of that affair. Jack sure did throw himself down by the roadside and break his bones. He's off the roll-call when the boys line up. Gosh! I'd hate to be that kind of a dead duck!"

"Jack, he talked loose ends, and that growed on him," said another. "But 'tain't always talk that puts men out. It's gambling or it's laziness, or it's a bad temper or it's silly, little, cry-baby wives. But mostly, I think, it's stoppin' all study an' thinkin', just to feel his own head, an' then sayin' in an admirin' tone of voice, 'Ain't I jest the limit for real smart? Ain't I jest a charmin' Government ossifer in a new uniform?' "

Some one turned to me for a contribution to this symposium, and I added: "Boys, a lot of men that fail in this work do so because they were badly brought up at home; they never learned how to work hard, and they were allowed to consider themselves 'sensitive'—too averse to honest criticism, too undisciplined, in a word, either to take or to give orders or to work in a systematic way. I do not know of any more appalling waste in all America's natural resources than the waste of young manhood through such lack of discipline. It seems to many a fine young man who is beautiful to look at, splendid to fight fire beside, as if he could not unbend, or give and take, or come into the system without losing what he calls his 'self-respect' and making what he terms a 'slave of himself.' The work really needs all his superb energies, but they must be directed and controlled. He must come into harness and push against the collar, not like a mule, but like a royal-hearted man. He must do what college men call team-work. Then he becomes a part of the fellowship of the service.

"Jack Yoacum really didn't mean to tell lies; he only loved to gossip, and the real Jack inside of him liked to sneer a little at hard work and courage and get other folks into trouble. His boys are growing up just like him, but his girls have had more of the mother-training. In ten years they will make rangers' wives, and poor old Jack will sit in the sun, quite harmless, an amusing talker whom no one takes seriously. The moment he left the service his power for injuring it came to an end."

A district ranger from over the crest of the Sierra spoke up: "Well, now, I can see my way plain in a case like Jack's; but what I can't seem to handle is those fellows that one keeps on hoping against hope will do better—and they don't pan out.

"The worst case I ever knew of was that of Tommy West, over in Mono. He was bright, handsome, very popular, did everything he was told; but after four years' work with him no one could lean on him. He hadn't a bad habit, was engaged to a pretty girl, and had a lot of admiring relatives up and down the valley. Everything in the way of criticism ran right off him. He was the most attractive ranger I ever saw, and he made a continual picnic of it. Sometimes he would simply turn off work for a week, and then sag back into the old ruts. I used to lie awake nights trying to think out some way to harden Tommy up—get that steel finish on, so to speak, that will keep an edge and cut things."

"What did you finally do?" I asked the visiting district man.

"Well, the supervisor, he took a hand. He kept trying Tommy out all along the line, quiet and fine. Then one day he went riding and found Tommy's camp and told Tommy that it was a case of a round peg in a square hole.

"Tommy spoke up: 'What have I done?'

"'Nothing.'

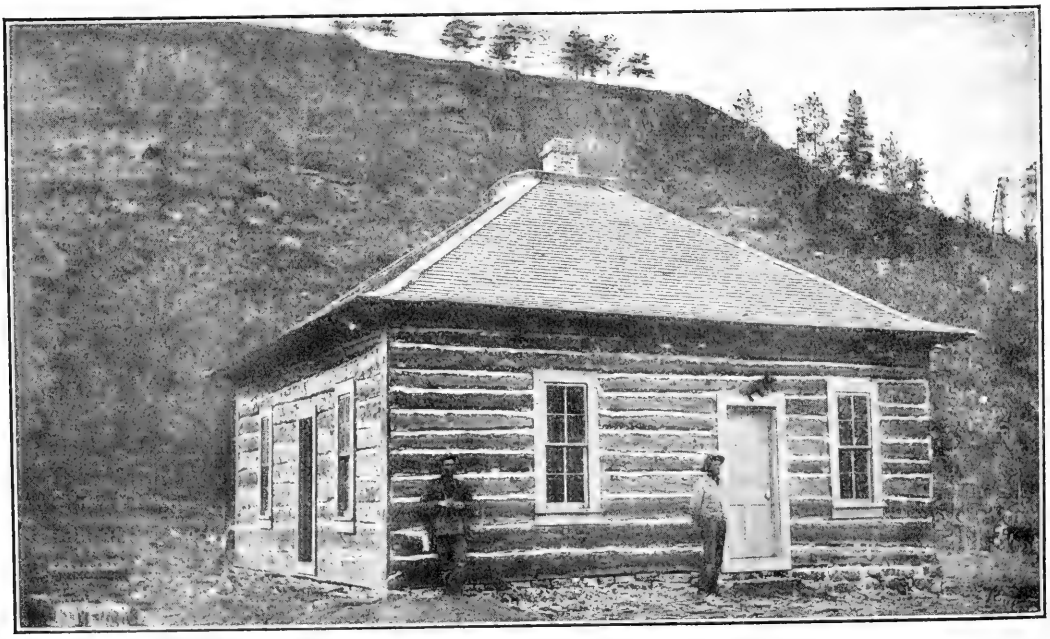
"'Then, what's the matter?'

"'It's this way: You are not able to become a living part of this Service for life or for death. You are not married to it; the work is to you merely that by which you earn your living, as you have raised cattle, or have farmed, or have driven stage.'

"Tommy shook his head cheerfully. 'Well, I don't see it's anything but giving the Government seventy-five dollars' worth of work a month, same as if I was plowing on some old jayhawker's ranch. If I had got promoted I'd have done more work. Hand over that purple blank, and I'll sign her up, and no bad feelings, only I'll tell you right now you can't run any business with sentiment. Give my regards to the Secretary of Agriculture when you write.'

"Then Tommy saddles and starts off, singing a new version of the ranger song—the which all of us know by heart now. We heard him howling up the pass at the top of his lungs:

> "'I was a happy ranger la-ad,
> The boss, he hints that I am ba-ad.
> I goes! I scoots! I seeks repose
> The other side of Lyell's snows.'"



Ranger's Quarters, Wet Mountain National Forest

THE FARM COMMUNITY*

By LIBERTY HYDE BAILEY, Director College of Agriculture, Cornell

IRRIGATION profoundly affects society and institutions; and any person who is interested in rural civilization must necessarily, therefore, be interested in irrigation.

The best rural civilization will develop out of native rural conditions rather than be imposed from without. Irrigation makes a rural condition. It provides the possibility for a community to develop; and it must, therefore, color the entire life of the community. As the civilization of New England developed about the town-meeting, and that of the South about the court-house, so must the civilization of irrigation communities develop about the ditch-meeting.

Irrigation communities are compact. As all the people depend on a single utility, so must the community life tend to be solidified and tense. Probably no other rural communities will be so unified and so intent on local social problems. We shall look, therefore, for a very distinct and definite welfare to arise in these communities; and they will make a peculiar contribution to rural civilization.

The life of the irrigation community will be expressed not only in institutions of its own, but in the literature of its own. Much of the world's literature does not have significance to country-life conditions, and very little of it has significance to an irrigation civilization. I look for poetry to come directly out of the irrigation ditch, and to express the outlook of the people who depend for their existence on the canal and the flood-gate. It is most significant of a new feeling in art and literature that we have a national irrigation ode.

All our efforts in forwarding rural civilization must express themselves in the development of the community or neighborhood sense, and this is the proper theme of my paper. Before I discuss this subject, however, I must present a point of view as to the interest of society, or of all the people, in the class of work for which this congress stands.

The people have made it possible for irrigation-reclamation to be developed; for whether the work is performed by the Government directly or by private enterprise, it nevertheless rests on national legislation; and this legislation expresses the consent and the interest of society in the work. All of the people have not only a right to an interest in irrigation-reclamation, but they carry an obligation to be interested in it, since it reclaims and utilizes the fundamental heritage of all the people. I take it that society's interest in the work is of two kinds: to see that the land is properly utilized and protected, and to see that persons desiring homes shall have an opportunity to secure them. Society is not interested in speculation in land or in mere exploitation.

In the last analysis the land belongs to all the people. No man really owns his land; society allows him to use it, and to say who shall use it when he is done with it; and every man is under obligation to society to maintain the fertility of his land. Even a farm is not a man's own, in the sense that he has a right to abuse it without check. More than that, he is under obligation to use all the natural resources of the earth with a care for those who are to come after him. No man has a moral or social right to denude the land of its forest, unless he leaves the land in condition for his successor to utilize it with satisfaction. The American prac-

*Delivered at the National Irrigation Congress at Spokane, Wash., on August 12, 1909.

tise of raping the earth of its timber has no defense, not only in economics, but also none in moral obligation. In making this statement, I make no imputation as to whether the fault lies with the timberman or with society in general.

I hope that the irrigation people realize their obligation to the society that makes it possible for them to develop their irrigation systems. Not every person in the Nation agrees to the wisdom of national reclamation, but society has given it the trial. The people in the West are interested in developing their localities and their commonwealths, and in securing settlers to them; and with this feeling we all must sympathize. I have no fear that the irrigation settlement of the West will set up disastrous competition in products with the East; the areas involved in the new irrigation projects are too small and the development too slow for that. But there is danger that the producing power of the land may not be safeguarded. The very fact that irrigation farming is intensive increases the danger. From an agricultural point of view, the greatest weakness in this farming is the fact that the animal, or live stock, does not occupy a large place in the system. Other systems of maintaining fertility must be developed.

Society has a right to ask that you be careful of your irrigated valleys. They are abounding in riches. It is easy to harvest these riches by the simple magic of water. You will be tempted to waste these riches and the time will come quickly when you will be conscious of their decline. This seems remote to you now, but the danger is real. Not even the fertility of the irrigation waters will maintain the land in the face of poor agricultural practise.

It is the flat valleys of the great arid West that will be opened by irrigation. These valleys are small areas compared with the uplands, the hills, and the unirrigable regions. Society is interested, also, that you be careful of your uplands and hills, for in the arid regions they give small yield in forage and in timber; this forage and timber must be most thoughtfully protected. When the irrigated lands begin to decline you cannot fall back on your hills.

I am not saying that irrigation-farming is proceeding in a wasteful way, or that systems are not developing that will protect society; I am calling your attention to the danger and to the interest of all the people in this danger; and I hope that you may profit by the errors of all new settlements thus far made in the history of the world.

We are everywhere in need of better agriculture, not only that every agriculturist may do a better business, but also that agriculture may contribute its full share to the making of a better civilization. Here and there, as we learn how to adapt ourselves to the order of nature, we begin to see a really good agriculture in the process of making. A good agriculture is one that is self-sustaining and self-perpetuating, not only increasing its yields year after year from the same land, but leaving the land better and richer at each generation. This must come to pass from the land itself and from the animals and crops that one naturally brings to the land, and not by the addition of mined fertilizing materials brought from the ends of the earth. Thus far in history, it is only when the virgin fatness is coming to be used up, speaking broadly, that we put our wits to work. Then the rebound comes. The best agriculture thus far has developed only after we have struck bottom, and we begin a constructive effort rather than an exploitive effort; and this comes in a mature country.

This is why so great a part of the European agriculture is so much better than our own, and why, in old New England, such expert and hopeful farming is now beginning to appear. The East is in an epoch of rebound. The East is in the process of becoming more fertile; the West is in the process of becoming less fertile. In western North America the business systems have been developed to great perfection, and the people are possessed of much activity and are so far escaped from tradition

that they are able to do things in new ways and to work togther. I hope that this great region also will apply at the outset all the resources of business and science to develop an agriculture that will propagate itself.

When all the lands are taken that can be developed or reclaimed by private resources, there remain vast areas that require the larger powers, and perhaps even the funds, of society (or the Government) to bring into utilization.

One class of lands can be utilized by means of irrigation. This form of land-reclamation is much in the public mind, and great progress has been made in it. There remain, however, other lands to be reclaimed by other means. There is much more land to be reclaimed by the removal of water than by the addition of water. There are many more acres to be adapted to productive uses by forest planting and conservation than by irrigation. There are vastly larger areas waiting reclamation by the so-called "dry farming" (that is, by farming completely adapted to dry regions). And all the land in all the states must be reclaimed by better farming. I am making these statements in no disparagement of irrigation, but in order to indicate the relation of irrigation to what should be a recognized national reclamation movement.

But even though we should recognize a national reclamation movement to include all these phases and others, it may not be necessary or advisable, in the interest of all the people, that every last acre in the national domain be opened for exploitation or settlement in this decade or even this century. The Nation may well have untouched reserves. No one knows what our necessities will be a hundred years hence. Land that has never been despoiled will be immeasurably more valuable to society then than now; and society holds the larger interest.

When the pressure of population comes, we shall fall back on our reserves. The rain-belt states will fall back on their wet lands, their uplands, and their hills. These hills are much more usable than those of the arid and semi-arid West can ever be. The eastern states have immense reserves. New York is still nearly half in woods and swamps and waste, but practically all of it is usable. The same is true of New England and Pennsylvania and great regions southward. Forests and sward grow profusely to the summits of the mountains and the hills. Vast areas eastward are undeveloped and unexploited. Even the regions of the so-called "abandoned farms" are yet practically untouched of their potential wealth. I have no regret that these countries are still unsettled. There is no need of haste. When the great West has brought every one of its available acres into irrigation and when population increases, the eastern quarter of the country will take up the slack. It is by no means inconceivable that at that time the eastern lands, newly awakened from the sleep of a century, will be the fresh lands, and the older regions will again become the new regions.

Now let me say further that irrigation is properly not a practise of arid countries alone. Irrigation is of two purposes — to reclaim land and make it usable; to mitigate the drought in rainfall regions. As yet the popular imagination runs only to reclamation irrigation. This form of irrigation is properly regulated by the Federal Government. Now and then a forehanded farmer in the humid region, growing high-class crops, installs an irrigation plant to carry him through the dry spells. As our agriculture becomes more developed, we shall greatly extend this practise. We shall find that even in humid countries we cannot afford to lose the rainfall from hills and in floods, and we shall hold at least some of it against the time of drought as well as for cities and for power. We have not yet learned how to irrigate in humid regions, for the practise of drainage is equally involved; but we certainly shall apply water as well as manures to supplement the usual agriculture practise.

Now, inasmuch as irrigation-recla-

mation is a national enterprise and depends for its development on the will of all the people, as it is one part in a much larger plan for the utilization of land, and as the people in all parts of the country have a right to ask for information, I submit that it is not only wise, but that it is the obligation of this Congress to hold sessions in the East as well as in the West. The West cannot live to itself alone.

My contention, therefore, is that the people are necessarily interested in irrigation as a national enterprise, that irrigation-reclamation is properly only one part of a slowly evolving national plan, and also that every man, whether on irrigated land or elsewhere, carries a natural responsibility to leave his land at least as good as he found it. The public domain must be safeguarded for the entire people, whose estate it is; and if the individual bears a responsibility to posterity, still more does society bear this responsibility. All schemes of protection for the public resources need to be constantly readjusted, in the details of their operation, to local conditions; but in the end, the fundamental development of the country must rest on the principles and policies of Theodore Roosevelt.

Headgates and Part of Canal, Bigham River

EDITORIAL

The President's Letter

THE President has spoken on the Ballinger case.

On September 15 he wrote a lengthy letter, indorsing the Secretary's position on the Cunningham coal claims, the reopening of lands to entry, the cancellation of the cooperative agreement regarding Indian forest lands, the vetoing of the cooperative plan on the reclamation projects, and every other point in controversy.

In a word, the Secretary has received from the President a clean bill of health.

It would be easy to criticize this letter, and to show that those who furnished the President his facts did not give him all the facts.

It could even be shown that some of the supposed facts furnished him were not facts, and that numerous representations made to him were misleading.

But the Secretary is highly pleased with the letter.

So are numerous others, conspicuous among whom are those who favor a wide-open policy on the public domain, and who, for whatever reason, have rallied around Secretary Ballinger as their champion and have regarded Forester Pinchot as the one grand obstacle to their plans.

The people have had no opportunity to see the materials placed before the President by Mr. Glavis and riddled by Secretary Ballinger. Necessarily, therefore, they can have no valid opinion upon the case.

Further, they are not reassured by the emphasis laid by numerous publications upon the statement that the President must necessarily give his Secretary the benefit of every doubt and uphold him in any event.

They hope that the Secretary's case is as good as it looks in the letter. Meanwhile, they await further facts, some of which are said to be forthcoming through the agency of Mr. Glavis, congressional committees of investigation, and what-not.

As to the question of law, the American people certainly believe in obedience thereto, howbeit there may have been less of the same than might have been hoped—on the part, for example, of "malefactors of great wealth," "land skinners," *et al.*

Deep as is the public interest in the conservation of natural resources, the people do not want those resources saved at the expense of the law.

So ardent is their love for the law that they want it conserved until it can be regularly changed. If, meanwhile, their own interests suffer through the abundance of bad law, or the paucity of good, they will try to stand it.

Nevertheless, the incessant, almost gleeful, assertion by a certain class of papers, since the appearance of the President's letter, that President Roosevelt and his governmental helpers protected the people's interests chiefly by trampling the law under foot, does not go down well.

This claim, just now, it would seem, is being considerably overworked.

The people know that President Roosevelt made an earnest effort to protect their rights and promote their interests.

They know that, in so doing, he left deep tracks on the geography and public policy of the United States.

They recall that the Reclamation Service began with him; that, in him, the National Forest Service found its strongest friend and the water-power monopoly its first formidable foe.

They know he began the movement to save for the people their coal, that he called the two great conservation conferences and created the National Conservation Commission.

The people do not impute infallibility even to former President Roosevelt, but the constant implication that he was able to save some shreds of our common heritage only by wading knee-deep through the statutes, smashing the Constitution, and functioning generally as an irresponsible anarchist is not gratifying.

There is even the feeling that if Mr. Roosevelt were still in the White House instead of in the wilds of darkest Africa such declarations would be less fashionable.

Again, law, to be of value, must be enforced, and with all their veneration and love for the law, the people know there is enforcement and enforcement.

They know that there is such a thing as "the spirit of law;" and that one who, Shylock-like, occupies himself in searching for the letter, may wholly miss this spirit.

They know that at an earlier age men, eminently respectable, tithed mint, anise, and cummin, and, at the same time, neglected the weightier matters of the law, including judgment, justice, and a square deal.

They know that law enacted nominally to serve a certain end has been used to serve an end directly opposite.

They know that lawyers, of a certain type and training, have grown rich by finding or making holes in laws through which corporations and special interests have been enabled to drive their coach-and-four.

Again, the suggestion that if the people do not like the law as it is they may apply to Congress for a better quality of law is not wholly satisfying.

Such applications have been made before. The history is long and not encouraging.

Everybody knows what it means, nowadays, to apply to the American Congress for law in the people's interest. They know who controls both Senate and House, and they remember the treatment usually accorded such measures by both bodies.

Some of these measures, it is true, have passed; but after how much effort from outside? And how many bills that should have passed have fallen by the wayside? And how many more that did pass have met their Waterloo in the courts?

So the people do not place all their eggs in the Congressional basket. Congress has its place, they know, but so has the Executive Department.

Now what the people want to know in regard to this conservation business is, Is the administration, in all its branches, on their side, or on some other side?

Is any branch of the administration saying, "Law, law;" and, at the same time, casting encouraging glances at the spoilers?

Is the administration, as a whole, doing its utmost for the people with the law as it is; and is it preparing to do its utmost to secure for them, from Congress, such additional legislation as their interests demand?

These are questions which are not to be answered merely by words; words have already been multiplied; what is now wanted is deeds.

The man from Missouri is abroad in the land; he wants to be "shown."

On this conservation question he is at last awake. His eyes are wide open.

He knows what has been going on, and what it means; and he demands the turning over of a new leaf.

He has heard of the conservationist who is "just as good," or a little better; now he wants an exhibition of him in action.

He wants to see a whole-hearted, genuine, earnest, aggressive carrying out of the conservation policies launched by the preceding administration and indorsed and adopted, under pledges the most solemn, by the present one.

If the demonstration is forthcoming, all will be forgiven and forgotten.

For this demonstration he has been patiently waiting and earnestly watching during the last half-year.

What he has seen thus far has by no means reassured him. Henceforth he will watch more eagerly and more critically than ever.

He wants the goods delivered, and nothing else will suffice.

McHarg as an Index

THE outburst of Ormsby McHarg is significant.

The public has been assured that there were no differences in administration circles on the merits of the conservation policy.

All concerned, we have been told, are deeply and equally interested in the whole scheme.

Such apparent differences as have arisen have had to do not at all with the policy, but only with the methods. Some have proposed to conserve the resources in one way and some in another.

The chief difference, it has been reiterated, has had to do with interpretations of law. Some have thought the law permitted of more latitude, and others less, in saving for posterity something out of the wreck of our once "inexhaustible" natural wealth.

But now appears Mr. Ormsby McHarg.

This gentleman occupies no less a position that that of Assistant Secretary of Commerce and Labor in the present administration.

Furthermore, he has been a trusted political lieutenant. For he tells the public that, "in the late campaign he was put in charge, by Mr. Hitchcock, of nine far western states."

Just why Mr. McHarg need have spoken at all is not clear; nevertheless, he spoke.

Furthermore, his utterances have no uncertain sound.

He was clearly "in earnest." He "did not palliate;" he "did not excuse."

So important, evidently, in his mind, was the conservation issue that he was not deterred, even by considerations of official propriety, from expressing his sentiments.

How much of a conservationist is Mr. McHarg may be judged from the following excerpts from his interview:

"Let the ordinary laws of supply and demand regulate the cutting of trees."

"There is enough timber standing in the state of Washington alone to supply this country for fifty years. Vast supplies remain in other states sufficient to maintain the supply for a much longer period. * * * The abundance of the forest was such that the alarmist statements as to approaching exhaustion of supply were utterly unfounded."

"The talk of a gigantic water-power trust being formed to lay a heavy tribute on all posterity of the land is the veriest nonsense."

"The Reclamation Service during the latter part of President Roosevelt's administration carried on a purely 'dog in the manger' policy that has done much to hold back various sections of the West."

"The Reclamation Service, without genius to carry out its projects, has, notwithstanding, located the water rights, and then stood idly by them and said: 'No one else can appropriate this water * * *.' The 'dog in the manger' policy has thus brought about a stupendous waste of natural resources."

That Mr. McHarg's fulminations represent mere sound and fury goes without saying among the informed. Further, that he failed utterly to "make good" with facts when challenged by Associate Forester Price to do so should not be overlooked.

But this is not the important thing.

The important thing is that a "near" cabinet officer displays not simply lack of sympathy with the conservation program, but violent hostility toward and contempt for it.

He even goes so far as to attribute bad faith to its chief promoters, as when he accuses the Forest Service of concealing important facts and figures "proving the truth" of what Mr. McHarg says.

All of this is exactly in line with facts brought out in the September issue of CONSERVATION in the article entitled, "The Interests versus the People."

There it was pointed out that a fight has been organized against the conservation movement, and that members of Congress are definitely enlisted in the war, even to the extent of paying dues to the Denver organization formed to fight it.

Save possibly for his indiscretions of utterance, McHarg is exactly the type of man which the Denver organization might rejoice to see in high administration circles.

Now the question is, how many more McHargs, equally committed but better able to bridle their tongues, are there in the administration?

It may be said that Mr. McHarg's philippic was a "swan song;" that he was not given opportunity to speak again, but that he was required to pay for his disloyalty with his head.

Unhappily, no such conclusion can be drawn.

Instead, we are assured that a definite understanding existed that Mr. McHarg, by his own choice, was to retire at the end of six months. He says, "It was only because of the great friendship that I entertained for the President and for Secretary Nagle that I undertook the onerous duties required of me in the first place;" and the press tells us, "there was no one in Beverly willing to say that Mr. McHarg's resignation was in any wise the result of the interview" above quoted.

McHarg is a type.

He represents the *laissez faire*, individualist, help-yourself viewpoint as applied to our natural resources.

And he is by no means alone in this position. There are others; and with them the genuine believers in conservation must prepare to deal.

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Putting Two and Two Together

THE Spokane meeting brought out a degree of hostility to Government irrigation which not all may understand.

Note the statement by Mr. John L. Matthews in the *Seattle Intelligencer* that "the water-power trust is opposed to Government irrigation projects of every sort. It wants to develop irrigation itself in order that it may have the power incidentally developed at the big storage dams, besides making profit off of the water supplied to the land."

Here we have an additional light on the motives of the water-power trust of which the country is hearing something these days.

The point brought out by Mr. Pinchot at Spokane is that this combination is seeking to monopolize the Nation's power. Hence its fight for the power sites, and its natural desire to have "friends at court."

According to Mr. Matthews, however, there is nothing small about this trust. It wants not simply the power, but it wants in addition to control the irrigation system.

Thus the trust would make two uses of the water stored in the great dams: "For a consideration," of course, it would supply the settlers with the water, as essential to their lives as atmospheric air; in addition from the water stored in these dams it would generate power and sell the same to the settlers and, with the help of long distance transmission facilities, "run things" generally.

If we ask why the fight is coming on now instead of having developed earlier, a hint is found in Mr. Newell's address at the Spokane meeting.

Speaking of private capital invested in irrigation work, he said:

"Much of this investment, however, has been made possible, or at least has been stimulated by the Government work. The fact that the National Government has deemed it wise to take up the matter has been one of the strongest arguments appealing to capitalists to do likewise."

That is, the Government first takes the risk, constructs the great engineering work, and proves irrigation on a large scale to be feasible and profitable. Then the trust says to the Government, "Stand aside, we will now take charge of this business."

Putting with this Secretary Ballinger's declaration: "I am not a believer in the Government entering into competition with legitimate private enterprise," and his actual cutting down of the work of the Reclamation Service by abolishing the cooperative plan whereby water-users paid in part for

their rights by their labor, we have altogether an interesting situation.

Meanwhile, should the trust gradually accomplish its purpose and acquire control of the water essential both to the production of crops and the development of light and power upon which the great West depends, where, we may inquire, will the people be?

A Question of Ethics and Construction

COLLIER'S, in its issue of September 18, for the second time heads its leading editorial, "Ballinger Should Go." This second demand is based upon the following facts:

When Mr. Ballinger resigned the Commissionership of the Land Office, in connection with the duties of which he had become familiar with the Cunningham coal claims in Alaska, he promptly accepted employment as counsel for one of the Cunningham claimants.

Because of its direct bearing upon this act, the following law and rulings have been adduced:

Section 190 of the Revised Statutes reads:

> It shall not be lawful for any person appointed after the 1st day of June, 1872, as an officer, clerk, or employee in any of the departments, to act as counsel, attorney, or agent for prosecuting any claim against the United States which was pending in either of said departments while he was such officer, clerk, or employee, nor in any manner, nor by any means, to aid in the prosecution of any such claim, within two years next after he shall have ceased to be such officer, clerk, or employee.

During the administration of the Interior Department by L. Q. C. Lamar (1885-88), a case arose in the Land Office directly parallel to that of Mr. Ballinger's. Luther Harrison, a former Assistant Commissioner of the Land Office, complained that the Commissioner of the Land Office refused to allow him to appear in any land cases which had arisen while he was in office. Secretary Lamar held as follows:

> The objection is that this statute has no reference to contests of title to lands, but only to claims for money upon the United States, and that the language of the statute and the policy of the act are each satisfied by this interpretation.
>
> I do not concur in this conclusion. The statute applies to all of the departments; to all of the offices of the designated classes in each one; and to all prosecutions of claims of every class in the departments pending there while the officers, clerks, or employees appointed since June, 1872, belong to them. The act is not penal in its nature. It authorizes no criminal prosecution nor does it impute discredit or dishonor, nor affix stigma on any. It creates a civil disability for the public utility.
>
> *Its design is to elevate the public service, so that it may inspire public confidence. The act plainly implies that it is not suitable or seemly for an officer, clerk, or employee, shortly after his departure from service in a department, to appear before that department as a prosecutor of the claims pending therein against the United States while he was a member of it.*
>
> The principle of the act is, that all the public servants in the department, whether officers, clerks, or employees, shall observe a *condition which at least tends to hinder them from appearance of being placed under a suspicion of having had a conflict between their duties as officers or public agents and as men, and as giving preference to the last.* * * *
>
> Neither do I concur in the argument that *cases prosecuted in the Land Office relative to claims for title to the public lands* are not included within the terms of the act. * * *
>
> (Decisions of the Department of the Interior relating to Public Lands, October 6, 1885, Vol. IV, page 179.)

On July 10, 1890, First Assistant Secretary Chandler rendered a decision in harmony with that of Secretary Lamar, saying, "The decision referred to is broad enough to cover all clerks or employees and was evidently intended to do so." (Vol. XI, page 25.)

On August 23, 1893, Secretary Hoke Smith decided that the phrase, "claim against the United States" means a money demand, only. (Vol. XVII, page 216.)

On July 25, 1904, Acting Secretary Ryan made a similar decision, its syllabus reading as follows:

> The phrase "claim against the United States" as employed in section 190 of the Revised Statutes means a money demand against the United States, and does not apply to the prosecution before the Land Department of claims involving the right and title to public lands. (Vol. XXXIII, page 137.)

And there we are. Secretary Lamar and First Assistant Secretary Chandler held that the law meant what it said, and Secretary Lamar's knowledge of law was deemed sufficient to warrant his promotion to the bench of United States Supreme Court.

"But Secretary Smith reversed him." In a sense, yes; yet the Smith decision would not help Ballinger.

Secretary Smith's decision was based on the theory that a claim for public land was not a "claim against the United States."

From his standpoint, public land was of no value to the United States. Instead, it was but so much old junk, to be gotten rid of as fast as practicable.

Whatever basis this astounding theory may have had in the practise of the Interior Department, it does not apply to claims for United States coal lands—in Alaska or anywhere else.

For the scandalous practise of selling Government coal lands for a song, President Roosevelt substituted the present plan of selling such lands for a price approximating their market value.

And he did this before Commissioner Ballinger left the Land Office.

Since this change in practise it has been and is the pride and boast of the Interior Department and Geological Survey that the Government is treating the people's coal as a thing of value, not be dumped like rubbish upon the first applicant.

A claim for Government coal lands means to the Government to-day as much as a claim for the money value placed by the Geological Survey upon such lands.

Yet Secretary Ballinger overlooks all this; and he ignores the masterly decision of Secretary Lamar, the unquoted parts of which simply add to its strength.

Nevertheless, Secretary Ballinger is a champion of "strict construction"—when it suits.

Was it not a lawyer who, on an earlier occasion, found his judgment influenced by the question as to whose ox was gored?

Construction—Strict To-day and Free To-morrow

AFTER all, is not the question of construction one less of schools than of moods and tenses?

Upon this question light is thrown by our national constitutional history.

The father of strict construction in America found it necessary, when in power, to "stretch the Constitution until it cracked" to cover an important administration measure.

On the other hand, the free constructionists, when out of power, have sought aid and comfort from the strict construction philosophy.

The fact seems to be that people are free constructionists when they want to do things, and strict constructionists when they want to prevent things from being done.

We are now in the midst, apparently, of another era of strict construction. Yet, as noted in another connection, the Secretary of the Interior forgot all about his strict construction principles when Section 190 of the Revised Statutes got in his road.

Furthermore, when it was found desirable for the Government at Washington to aid American financiers in securing a share of the $25,000,000 loan for the construction of certain Chinese railways, a way was promptly found to do so. But has any one pointed to the clause of the Constitution or the article of the Revised Statutes authorizing such aid?

Still, when it was discovered that users of irrigated land were paying in part for their water rights by their labor, or that trained Government foresters were applying approved methods to the handling of Government forests on the Indian Reservations, immediately legal lions blocked the path.

Wonderful, indeed, is law, and more wonderful still the legal mind!

Legal Last Year But Not This

THAT the plan whereby Forest Service men cared for the forests on the Indian Reservations was eminently wise, practicable and helpful is con-

ceded. The Interior Office admits it, and the President says, "The Forest Service is much better able, with its trained men, to do the work with efficiency and economy."

Nevertheless, it has been discovered that this method is "illegal" and therefore must be stopped until Congress chooses to act, whatever fires may, meanwhile, consume the Coeur d'Alene or other Indian forests.

Apropos of this question of legality, note the following passage from Forester Pinchot's letter to Secretary Wilson on July 23 last:

"But lest the Forest Service might be thought to have acted hastily in recommending the plan for cooperation to you for approval, I have the honor to report that its legality was fully considered in both departments at the time it was agreed upon; that the auditor for the Department of the Interior has approved the accounts under it since cooperation began; and that similar cooperation between departments is now and has long been in existence."

The Cooperative Certificates "Illegal"

MENTION has before been made in these columns of the cooperative plan whereby users of water rights on lands irrigated by the Reclamation Service paid in part for their rights with their labor, receiving therefor certain "certificates."

These certificates were adopted to meet a pressing and imperative need on the reclamation projects.

The settler, to hold his claim, was required to occupy it while waiting for water. This might involve two or three years of waiting, during which time he could make nothing out of the land, and could not leave it to earn a living elsewhere.

The effect on a multitude of settlers was intolerable. They begged the privilege of constructing irrigation ditches themselves, receiving from the Government some form of evidence that they had performed this work, and being credited with the same against their future obligations to the Government for water.

To the profound satisfaction of the reclamation communities these certificates, known locally as "scrip," were authorized, and the settlers were permitted to work on the ditches.

As is well known, these certificates, and the cooperative arrangement which they represented, have gone down before the strict-construction steam-roller.

The question of their legality was referred to Attorney General Wickersham, and by him decided adversely.

Before consigning these certificates finally to the dust of oblivion, a little history should be narrated.

This cooperative plan was not adopted hastily nor without advice. As noted last month, it was first carefully considered by the Secretary of the Interior, the Director of the Reclamation Service, and the Assistant Attorney General for the Interior Department.

After the plan had been in operation some three months it was taken up by the Senate Committee on Irrigation and the Reclamation of Arid Lands.

On May 18, 1908, a hearing relative to the certificates was had before this committee, and the results published. No action, however, was taken regarding the certificates save to suggest a slight change in their phraseology.

Now the present Attorney General has declared the plan illegal, the principal reason given being that it constitutes "a system for borrowing labor and material, and making the Government the debtor to intending settlers," thus violating the law providing that "no project shall be entered upon until there is money enough in the Reclamation Fund to pay for the project or parts thereof contracted for."

What are the facts?

The maximum obligation incurred by the Reclamation Service on account of these certificates has never exceeded $400,000, over against which there has always been in the Treasury to the credit of the Reclamation Fund approximately $4,000,000 available for reclamation work.

These facts, it is understood, were not before Attorney General Wickersham when he made his decision.

The news of this decision was received at the Capitol last summer, Congress then being in session, with anything but enthusiasm.

Senators and Representatives from the West knew how vital was the plan to the interests of settlers and communities, and how slender was the foundation for the Attorney General's decision.

They knew, as was brought out at the hearing above referred to (S. Doc. No. 507, page 8), that the Supreme Court of the United States had clearly enunciated the principles underlying such a case in the following language:

> A practical knowledge of the action of any one of the great departments of the Government must convince every person that the head of a department, in the distribution of its duties and responsibilities, is often compelled to exercise his discretion. He is limited in the exercise of his powers by the law; but it does not follow that he must show a statutory provision for everything he does. No government could be administered on such principles. To attempt to regulate by law the minute movements of every part of the complicated machinery of government would evince a most unpardonable ignorance on the subject. Whilst the great outlines of its movements may be marked out, and limitations imposed on the exercise of its powers, there are numberless things which must be done that can neither be anticipated nor defined, and which are essential to the proper action of the Government." (U. S. *vs.* MacDaniel, 7 Peters, 380.)

So vital was the matter felt to be that the Senate Committee on Irrigation sought a conference with the Attorney General. He was invited to meet with the Committee; to this he agreed, and a date was set.

The committee met, but the Attorney General failed to appear. Conversation by telephone developed the fact that he had an important engagement with the President which he had forgotten.

By agreement, the meeting was thereupon postponed to another date when the Attorney General could be present.

Again the Committee met, but again the Attorney General failed to arrive, and again came the word from him of a conflicting engagement.

The Committee's attempts to confer with the Attorney General were thereupon abandoned. His opinion, however, stands to-day as the law of the land.

In consequence, important irrigation plans have been set aside and settlers have been left in despair. But strict construction has scored a triumph.

Where the West Lags

Senator Gore, of Oklahoma, recently said:

> Up around Beverly, in that land of petrified conservatism, that's a poor place to get the atmosphere of the country. Up in Massachusetts they believe all progress is radicalism. It's a pity there's not more intercourse between the East and the West. They believe we're a bunch of radicals out here; the great unwashed; bulls in a china shop, and all that kind of thing.
>
> What an awakening they are coming to, with the theater of operations in this country shifting to the Mississippi Valley. It's the Mississippi Basin that's really the throne of the country. And when this power comes to the West—as it will in a decade—it will not be misused to the prejudice of the East as the power of the East has been misused to the prejudice of the West. It will be used for the country's good.

On this the *Kansas City Star* comments editorally, and with marked approval; saying, among other things:

> Within a few years, when the Mississippi Valley is united in Congress, it will make such a demonstration of its power and its sanity as to bring the eastern privilege users and their allies in public places to their senses.

CONSERVATION unquestionably appreciates the progressiveness of the West. It becomes, however, the painful duty of this publication to point out that there are respects in which even the West is not unanimously progressive.

Of all the great progressive measures that have appeared before Congress in recent years few, if any, are more fundamental, more essential to the general good and to the conservation of the foundations of our prosperity than the bill for the establishment of Na-

tional Forests, especially in the Appalachian and White Mountain regions.

Yet an inspection of the vote on the Weeks bill, taken in the House of Representatives on March 1 last and published in the June issue of this magazine, will show that record to bristle with surprises.

Among the ayes may be found, for example, the name of one Republican congressman who lost his place because of his devotion to Speaker Cannon, and of other stanch followers of the Speaker who have been less unfortunate in their districts.

There will also be found the names of Democrats who deserted their party in the Special Session and voted for the tariff bill.

On the other hand, there will be found among the noes eastern and southern men whose interests, were they guided by no broader principle, would apparently have dictated the wisdom on their part of an affirmative vote.

But more astonishing, still, we find in that list the name of the leader of the insurgent Republicans in the House, and, among the Democrats, two, at least, of the most advanced, not to say radical, members of the Congress of the United States.

And these liberal members, Democratic or Republican, hail from the Mississippi Valley, the great progressive center of the country, while the bill itself bears the name of a representative from Massachusetts, "that land of petrified conservatism."

This is another of the surprises with which politics abounds; but it also goes to show that the West has, as yet, no monopoly on liberalism and progressiveness.

The Lakes-to-the-Gulf Deep Waterways Convention

PRACTICAL though it is, the present is an age when young men see visions and old men dream dreams.

One of the dreams of the present day is of a deep waterway from the Great Lakes to the Gulf of Mexico.

Conceive of a channel which will permit ocean vessels to pass from the Great Lakes through the Desplaines, Illinois, and Mississippi rivers, the Gulf of Mexico and the Panama Canal into the Pacific and thence westward to the Orient!

The Mississippi Valley is the heart of the world. Think what such a waterway will mean for the development of this valley!

Picture in mind the teeming millions who will yet swarm in that valley, and estimate the service which will be rendered to them by this highway combined with the arteries of traffic which will radiate eastward and westward therefrom!

But three years ago the people of the Mississippi Valley began to give embodiment to this dream by the organization of a Lakes-to-the-Gulf Deep Waterways Association.

In 1906 this Association held a convention in St. Louis, where 1,100 delegates gathered.

In 1907 the Association met in Memphis. President Roosevelt went to St. Louis and thence down the river to Memphis as a guest of this Association, making an address at the convention.

In 1908 the Association held its third convention, this time in Chicago, where 3,517 delegates met. On this occasion the Association was addressed by candidates Taft and Bryan.

Now the call has been issued for the fourth annual convention. The meeting will be held in the Athenaeum in New Orleans, Saturday, October 30; Monday, November 1, and Tuesday, November 2.

The object of these meetings is, of course, to promote the great enterprise suggested by the Association's name.

How, in the opinion of the Association, the end to be accomplished is indicated by its call.

The sanitary district of Chicago has built the waterway practically to Joliet. The route from Joliet to New Orleans has been surveyed under direction of Congress by United States engineers and reported feasible.

The people of the state of Illinois have voted a bond issue of $20,000,000 to promote the project.

Representative Bartholdt, of Missouri, has introduced a bill into Congress providing for the issue by the United States Government of bonds to the amount of $500,000,000, the proceeds to be spent on this waterway and other meritorious river projects.

The Sixty-first Congress will be asked to provide that the United States Government construct a waterway from the point at which Illinois stops to the Gulf of Mexico.

As at the Spokane meeting, here again it will be observed that large bond issues are called for. In his trip down the river from St. Louis in 1907, President Roosevelt declared to the seventeen governors who accompanied him that the United States should build this waterway by issuing bonds, if necessary.

Economists have long distinguished between loans for consumption and loans for production.

Loans of the former type, represented by bonds issued for war, represent a long-time burden upon the people.

Loans of the second type, however, illustrated by bond issues for reclamation, drainage, forest conservation, flood prevention and waterways development, properly handled, represent, not a burden, but an assistance to the people.

Still, as President Hill has just pointed out, if the interest on a bond issue almost equals the principal of an adequate annual appropriation, the latter is much to be preferred.

The New Orleans meeting is to be attended by more than a hundred members of Congress, fifteen United States Senators, thirty governors, six foreign ministers, and other representative men from all sections of the country.

Not only so, but the President of the United States will also be present and address the convention.

Accompanied by numerous dignitaries, he will go to St. Louis on October 25, and from that point descend the river to New Orleans.

The President will travel in the steamboat Mississippi, which will be convoyed by some of the finest steamboats on the western rivers.

In addition, the Navy Department has ordered a flotilla of four large torpedo boats to proceed to St. Louis and convoy the Presidential fleet down the river. Moreover, the Department has directed the armored cruisers Montana, North Carolina, and New York to New Orleans, thence to proceed as far up the river as practicable to meet the President.

The presence of such vessels in the river will furnish added proof, should this be needed, of the magnificent proportions of the "Father of Waters."

Needless to say, New Orleans is making every effort to render the occasion a notable one. For the climate of the Crescent City, the date chosen is ideal.

In connection with the convention, a conservation meeting is to be held. The exact date of this meeting, unfortunately, cannot as yet be announced. The details will be handled by the New Orleans Progressive Union. Invitations are being issued by Secretary W. F. Saunders, of the Waterway Association.

Speakers at the conservation conference will undoubtedly drive home the fundamental truth, "No forests, no waterways."

The National Conservation Association

ON SEPTEMBER 15 appeared the announcement of the organization of the National Conservation Association, with President Emeritus Charles Wm. Eliot, of Harvard University, at its head.

The announcement is made by Mr. Walter L. Fisher, president of the Conservation League of America, formed something more than a year ago, with headquarters at Chicago.

The constitution of the new association contains a declaration of principles taken from principles adopted by the Conference of Governors held at the White House in May, 1908.

From the press report of these, we quote the following:

> The land should be so used that erosion and soilwash shall cease; that arid and semi-

arid lands should be reclaimed by means of irrigation; that swamp and overflowed regions should be drained; that the waters should be so conserved as to promote navigation and develop water-power in the interests of the people; that the forests which regulate our rivers, support our industries, and promote the fertility of the soil, be preserved and perpetuated; that the minerals found so abundantly underneath the surface should be so used as to prolong their utility; that the beauty, healthfulness, and habitability of our country should be preserved and increased.

The principles further comprehend the purchase or control by the Nation of the necessary land within drainage basins, the regulation of timber cutting, and the support of practical forestry. The conservation of water-powers for the benefit of the people at large is advocated.

Other principles, as reported in the press, are:

The retention by the Government of the title of all lands still in public ownership which contain phosphate rock, coal, oil, or natural gas, and development of the same by private enterprise under conditions which will prevent extortion and waste.

The direction of public attention to the need for preserving the fertility of our soils, and thus protecting the future food supply of our people.

The enactment of legislation whereby the titles to the surface of public lands and to the minerals below the surface shall be granted separately, with every appropriate facility to miners to acquire such parts of the surface as may be needed in the development of their claims.

The purpose of the association, Mr. Fisher says,

will be to unite in one great national organization all those who desire to give their personal influence and support to the movement which, under the name of conservation, has come to mean so much for the future of our country.

It is stated that headquarters for the association will probably be opened in New York, and that the necessary funds for the prosecution of its work have been subscribed.

CONSERVATION, and the older body—the American Forestry Association—which it has the honor to represent, cordially welcome the National Conservation Association to the field. There need be no fear of competition between the two organizations. "The harvest truly is plenteous and the laborers are few." While we preach, teach, organize and press for legislation, the slaughter of our resources proceeds apace. The need for organizations to educate the public, arouse sentiment and make possible such legislation as shall conserve for their highest use, for all the people, all the resources, which constitute the foundations of our prosperity, is imperative. Different organizations may supplement each others' work. They may suggest to each other methods hitherto unthought of. By emulation they may stimulate each other to higher and more effective activity, and call into being still other organizations, all of which combined will hasten and ensure the accomplishment of the grand end sought by all.

CONSERVATION notes with pleasure that President Taft is one of the first to join the new association; over against which fact may be placed another, namely, that about three years ago, Hon. William Jennings Bryan joined The American Forestry Association.

Attorney Ballinger's Fee

IN THE President's letter, Secretary Ballinger is told, regarding his connection with the Cunningham claims: "You accepted the employment; visited Secretary Garfield and Commissioner Dennett; * * * to pay your traveling expenses and for your services you received $250, and no more."

Mr. Ballinger lived in Seattle. A trip to Washington, including railway fare, sleeping car, meals *en route*, and hotel in Washington would cost almost the sum named.

Query: Did Attorney Ballinger render legal services gratuitously?

NEWS AND NOTES

The Denver and Seattle Meeting

The Trans-Mississippi Congress met in Denver, August 18, and the first National Conservation Congress at Seattle, August 27. Matter relative to these meetings may be expected in CONSERVATION for November.

Maine's Water-power Commission

Not long since, Maine placed all the forests in the state, however owned, under state control. No private owner can now cut forests clean without showing cause.

Maine has recently established a Water-storage Commission composed of three able citizens serving without salaries. Their duties will be to map out the available water-powers of the state; measure up the extent of such powers and the proportion in use; consider what can be done in the construction of storage basins to conserve and equalize the flow throughout the year; and study the matter of forest preservation in relation to this subject.

Maine's unused resources in water-power are said to be enormous.

Water-power Investigation in Wisconsin

At its last session, the Wisconsin legislature appointed a special water-power, dam and forestry committee to investigate water-power and dam conditions in the state. The committee is at work, and will report to the legislature. An important question before them is whether the water-power sites and dams should belong to riparian owners or to the state. Private interests are urging that the power sites, etc., should be of riparian ownership.

Forestry Instruction in Columbia

At Columbia University a course in forestry has been added to the curriculum of the engineering school. It is planned to place instruction in forestry on an equal academic footing with other engineering courses. It will be a four-year course, leading to a degree of forest engineer, and for the present will be open to undergraduates, no previous degrees being required for admission.—*Christian Science Monitor*, Boston.

The Woman's National Rivers and Harbors Congress

The Woman's National Rivers and Harbors Congress was organized in Shreveport, La., June 29, 1908, with seven members. It now has 22,000 members, the greater part in clubs and organizations. The object of the congress is the conservation of all our natural resources, especially the preservation and development of waterways and forests.

The congress stands for navigation, sanitation, and beautification of our waterways and harbors. It is having conservation taught in the public schools.

Its president is Mrs. Hoyle Tomkies, 980 Jordan Street, Shreveport, La., and its corresponding secretary is Mrs. Frances Shuttleworth, 621 Cotton Street, Shreveport, La.

Mrs. Tomkies writes:

"Our work is mainly to educate upon the subject, to arouse interest and secure converts to this cause. In this we are succeeding. We are putting forth all the energy and influence we can muster for the cause, lest the enemy come while we are sleeping and sow in the people's minds the tares of 'individualism' and non-conservation."

Louisiana Forestry Association

The Louisiana Forestry Association was organized April 6, 1909, and publishes its articles of association in a neat, twelve-page booklet. The president is Mr. Henry E. Hardtner, and the secretary, Mrs. A. B. Avery. The office of the association is at 254 Stoner Avenue, Shreveport, La.

Good Roads

Interest in the good-roads movement grows. San Diego County, California, has voted one and one-fourth million dollars in bonds to build 455 miles of highway.

Ten men, representing the Farmers' Association of the Southern States, visited Washington, September 19, to begin an inspection of the country roads of the East.

The governors of the New England states and New Jersey are manifesting much interest.

A movement for building a first-class high way between Washington City and Alexandria is being aggressively pushed. The

Washington Post and *Richmond Times-Dispatch* are promoting the movement.

The Post-office Department aids the good roads movement by insisting Rural Free Delivery routes shall be kept in good condition.

President Taft, in a recent letter to the *Washington Post*, shows himself to be an earnest believer in the effort to supply the Nation with adequate highways.

Wise Conservation Legislation in Wisconsin

At its last session, the legislature of Wisconsin enacted a law containing the following wise provision:

"Whenever the state of Wisconsin shall hereafter convey in any manner whatsoever any of its lands, the conveyance thereof shall be subject to the continued ownership by the state of all minerals in said lands and all mining rights therein, and shall also be subject to continued ownership by the state of all water-power rights on such lands or in any manner appurtenant thereto." (Chapter 374, 1909, Section 207 m. In effect June 12, 1909.)

S. M. Higgins Supervisor of Michigan Forest

Mr. S. M. Higgins, for several years a resident of Michigan, has been appointed supervisor of the two National Forests in Michigan, with headquarters at Au Sable. He will take charge immediately.

This appointment marks the beginning of Federal forest administration in Michigan. The waste areas Forester Pinchot hopes to develop into profitable stands of pine trees. Mr. Higgins will select and map lands which will restock naturally, lands adapted to planting white and Norway pine, and lands too barren for present operations. In addition, he will plan a system of fire protection.

State Forester of Connecticut

Mr. Samuel N. Spring replaces Mr. Austin F. Hawes as state forester of Connecticut. Mr. Hawes is now state forester of Vermont. Mr. Spring graduated from the Yale Forest School in 1903. After graduation he organized the department of forestry in the University of Maine, where he served two years as professor of forestry. In 1905 he entered the Government service and remained until 1908. At the time of his leaving the Forest Service he was the head of the Section of Tree Planting. He left the Forest Service to enter private work as a consulting forester. His service in Connecticut begins October 1, 1909.

Black Butte Mountain Fir Forest

On page 607 of this issue will be found a cut (photograph furnished by Mr. W. B. Dennis, of Black Butte, Oreg.) of a fir forest growing near the top of Black Butte Mountain, Oregon.

Black Butte Mountain is one of the buttes in a spur of the Callapooia range, which range connects the Cascade and Coast ranges. Black Butte is geographically in Section 16, Tp. 23 S., R. 3W., W. M., in the southern part of Lane County.

Black Butte Mountain contains a large deposit of cinnabar ore, which is being mined and reduced to metal in a reduction plant on the property. The mountain is densely covered with fir of the character shown in the photograph.

Oregon Caves National Monument

On July 12 President Taft, by proclamation, set aside an area upon unsurveyed land within the Siskiyou National Forest, Oregon, containing certain natural caves of unusual scientific interest and importance, as a national monument. This was done under the act of June 8, 1906, entitled "An Act for the Preservation of American Antiquities."

Club Women for Conservation

Mrs. P. S. Peterson, chairman of the forestry committee of the General Federation of Women's Clubs, and delegate to the Seattle Conservation Congress, visited Los Angeles, Cal., and spoke on conservation. Among other things, she said:

"Clubwomen are taking up the movement. We wish to have it become a part of public sentiment that shall command the attention of men, women, and children—a subject that can be spoken of from the public platform or discussed at the family fireside."

Mrs. Peterson also spoke of the waste of coal, and of the forests, the need of conservation for business and agriculture, and of the strong work Mr. Pinchot is doing to save our resources.

Year-book of the New Hampshire Society

The Society for the Protection of New Hampshire Forests has issued its seventh annual report or year-book. This is a handsome, illustrated volume of seventy-eight pages, containing the Appalachian (Weeks) bill, the new forest law in New Hampshire, the amended law for highway trees, several interesting papers, and the reports of the forester, secretary, and treasurer. The secretary, Mr. Allen Hollis, may be addressed at Concord, N. H.

Increase in Flood Damage

Gov. M. E. Hay, of Washington, in his address of August 9 to the National Irrigation Congress, stated that, since 1900, damage by flood has increased from $45,000,000 to $238,000,000.

Problems of the Waterways

The large measure of success claimed for the inland water transportation of France, Germany, Belgium, Holland, and other countries of Europe seems to be due to the policy of harmonizing the rail and water routes by operating them in connection with each other. This is only possible under government ownership, which exists quite generally throughout Europe. Successful operation seems impracticable in this country under present conditions.

It is interesting to note that the United States has by far greater railway and waterway mileage than any other country in the world. The following statistics, compiled January 1, 1907, are instructive:

	Total mileage		Mileage per 100 square miles of area		Mileage per 10,000 population	
	Rail-ways	Water-ways	Rail-ways	Water-ways	Rail-ways	W'r-ways
Belgium	7,495	1,360	65.9	11.9	10.6	1.9
Germany	57,376	17,080	27.5	8.2	9.4	2.8
United Kingdom	37,107	3,374	30.6	2.8	8.8	.8
France	47,142	7,617	22.8	3.6	12.1	1.9
Holland	3,054	2,244	24.1	17.7	5.4	4.0
Austria-Hungary	41,227	7,200	15.8	2.7	8.7	1.5
United States	222,572	51,834	6.2	1.4	25.3	5.8
Italy	16,420	664	3.6	.1	4.4	.2
Canada	22,452	3,355	.6	.09	41.8	6.2
China	3,435	9,070	.08	.2	.08	.2

From the above it is clear that Belgium has the most highly developed facilities for transportation on the basis of area and population, while the United States, exhibiting exceedingly high mileage for railways and waterways, does not reflect a growth as extensive as the countries of Europe, with the single exception of Italy.—*Wall Street Journal.*

The Dry-farming Congress

The fourth annual dry-farming congress will be held at Billings, Mont., October 26-28. Representatives of the congress are pushing it with great vigor, circulating bulletins, and otherwise arousing interest in the great and necessary work represented by the organization.

A notable feature will be "Governors' Day," when the chief executives from many western states will address the congress and discuss from the statesman's viewpoint the problems now confronting the people of the arid states. The secretary, Mr. John T. Burns, may be addressed at 407 Temple Court Building, Denver, Colo.

Work of Reforesting Islands

A movement is on foot to reclothe the Boston Harbor Islands with the trees of which they were robbed centuries ago. The Metropolitan Improvement League, Harvard College, and the Institute of Technology are interested.

A party recently cruised the harbor to examine the islands. In the party were Sylvester Baxter, secretary of the league; Charles S. Rackemann, representing the Trustees of Public Reservations; Dr. Werner Hegemann, representing the Boston 1915 movement; Prof. Frank W. Rane, state forester; Edwin A. Start, secretary of the Massachusetts Forestry Association; Allen Chamberlain, representing that association and the Appalachian Mountain Club. The matter of reforestation will be brought before the legislature.

Gunnison-Uncompahgre Lands Taken

All of the Gunnison-Uncompahgre lands for which water will now be available is already in private ownership or has been entered. It is estimated that not over 15,000 acres of Government land under this project remains subject to entry. Practically all these lands are located along the edge of the project, and will be watered from canals yet to be constructed. Owing to the present state of the reclamation fund, it is not likely that sufficiently large allotments can be made to the project for the immediate completion of the entire distribution system for these public lands.

An Ideal Pumping Device

Running water has now become a necessity on the farm. The farmer's problem has been to secure a satisfactory pump. The windmill is regarded as unreliable and the power pump expensive.

A satisfactory hydraulic ram has been awaited with interest; the Niagara seems to meet the requirements.

On account of its mechanical perfection, it will operate, with an incredibly slight fall, practically any flowing brook or spring sufficing to supply it with power. Even the smaller sizes supply thousands of gallons of water daily, while large sizes will supply water enough for a small city. This ram is invaluable for railroad tanks, manufacturing plants, irrigation projects, mine operations, and anywhere where a constant, unfailing supply of water is needed. It is the only ram made which has a double-action device by which the water of a pure spring can be pumped with power supplied from a brook or river which is unfit to drink.

This ram is handled by the Niagara Hydraulic Engine Company, 140 Nassau Street, New York City, which has a factory at Chester, Pa. The company issues a booklet and catalogue.

Conserving Human Resources

A certain brilliant literary and society woman, well known in Washington, and formerly president of the General Federation of Women's Clubs, maintains that the Nation's children are as well worth "conserving" as the forests, waterfalls, or other natural resources, and that much less attention is paid to them.

She made this statement in rejecting the offer of a Representative in Congress from Colorado to resign in her favor, saying she did not wish to sit in Congress; but, if there, she would make it her chief business to promote legislation for the children of the country. She requested the Representative to do like work, and promised him the support of every woman's club in the Union.

Bad Forest Fires

On September 14 a bad forest fire was reported on the San Gabriel National Forest, in the canyons of the Sierra Madre Mountains back of Mount Wilson.

North along the uplands of the San Fernando Valley, two great fires lit up the giant mountains and forests fell crashing in the flames as they swept over the foothills. In Chatsworth Park district the live oaks withered in the touch of the smothering fire and smoke that ate over acres of scrub and pasture land.

From Ventura and the Santa Barbara Reserve came word of forest fires raging in the wilderness of the almost inaccessible mountains.

Ringed as by gigantic beacons, lay the beautiful Los Angeles and San Gabriel valleys, while in the fire zone men battled with the flames until early dawn.

Fires were also reported from the Soledad Canyon in the Santa Barbara Reserve on the side of the Mojave Desert.

Glavis to Publish the Facts

Seattle, Wash., Sept. 20.—L. R. Glavis, who was dismissed as chief of the Seattle Field Division of the United States Land Office because of charges made against chief officers of the Interior Department, has written a letter to President Taft, as follows:

"The President.

"Sir: I have laid before you all the essential facts in my possession regarding the official conduct of certain cases by the Department of the Interior concerning coal lands in Alaska. As chief of field division, directly concerned, and because of the tremendous values involved, I felt my personal responsibility most keenly.

"The evidence indicated that a great syndicate is trying to secure a monopoly of this coal, in direct violation of the law. Ultimately, I felt myself obliged to appeal to you over the heads of my superior officers in order to bring about the enforcement of the law, which in a measure would conserve these coal lands to the people at large. I deemed it my duty to submit the facts to you, and I cannot regret my action.

"Since there may be now even greater danger that the title of these coal lands will be fraudulently secured by the syndicate, it is no less my duty to my country to make public the facts in my possession concerning which I firmly believe that you have been misled. This I shall do in the near future with a full sense of the seriousness of my action and with deep and abiding respect for your great office.

"Respectfully, L. R. Glavis."

The West in Earnest

William H. Taft has been in the Presidential office for a long enough period of time to give the country some general idea of what he intends to do, and how he intends to do it. Congress has been in session, engaged in passing a tariff bill, which, in its final analysis, has not been acceptable to the Central West. Richard A. Ballinger, his Secretary of the Interior, has been engaged in a controversy for several weeks with Gifford Pinchot, Chief Forester, over the general issue of conservation, with particular reference to the administration of the public-land laws with respect to water-power sites, coal lands, and reclamation projects. All of these subjects are of vital and even political interest in the Far West. It is manifest, therefore, that both of these sections of the country are not to be "jollied" out of their opinion on these serious questions.—*New York Post.*

The Future of Man in America

Ex-Governor Pardee of California said at Spokane:

"Wealth is too often used in this country to-day to take from the people their political rights, turn their representatives into chattels and doers of the wishes of those who desire to oppress the people by taking from them their natural resources. No one in this country who reads and thinks doubts that some governors, legislators, Congressmen, Senators, and judges have prostituted the offices to which they were elected by the votes of the people. There are those who desire to monopolize the water-power of our rivers, who are eager to grab our forests, and who desire to seize our coal lands, to use all for their private aggrandizement to the detriment of the people.

"Is there any sound reason why the public should not regulate the natural resources? Is there any real reason why the Government should turn back to 'public entry' one single

acre of forest lands which were withdrawn under Roosevelt and Garfield? To say that every man should be permitted to grab and hold what he can of our natural resources is equivalent to saying one has no objections to so arranging matters that future Americans shall be composed of a few very rich and millions of very poor people. Such a doctrine is neither decent nor patriotic."—*Springfield* (Mass.) *News.*

On the "Dynamic Geographer"

Truth is in receipt of a copy of a recent publication entitled "Theodore Roosevelt, Dynamic Geographer." It is probably one of the most comprehensive reviews of what the President accomplished or attempted to accomplish that has been issued. It is an elaboration of a lecture delivered at Oxford University by Frank B. Vrooman. It tells of the check on the corporations which were threatening to get the upper hand in the very Government itself, and how the President attempted to steer the people between the shoals of this evil and socialism. It also reviews the forest and waterways problems and details the immense benefit which will accrue to future generations as a result of the laws set in motion by the Executive. It will pay the critics as well as the admirers of the strenuous statesman to read this pamphlet. It will be a revelation to many persons who are asking what the President accomplished while in the White House.

Alaska as a Prize

From a special dispatch to the *New York Post* of September 2, the following is condensed:

Now that Secretary Ballinger has started out to open up all kinds of public land, and since the application of his principles seems to mean the breaking down of the Pinchot conservation barricade, a controversy has broken out in the Taft administration with the Roosevelt men in it.

Congress will find it necessary thoroughly to investigate the Alaskan situation. One of the most powerful lobbies operating in Washington during Congressional sessions represents opposing interests in Alaska. Alaska is worth exploiting, and a battle royal is being waged for control. A dozen railroads have been projected into the territory, each one of which has had to fight for its legislative existence in Congress against the underground as well as aboveboard opposition of "the other crowd." There has been all sorts of trouble over river navigation. The existence of valuable copper properties has been affirmed and denied on expert testimony. The last ruction over Alaskan resources is just now in process of exploitation in the Ballinger-Pinchot controversy, and the basis of it is coal. The actual situation seems to be that the Guggenheim-Standard Oil interests have fairly well corralled the transportation facilities of the new territory; garnered in the best copper claims, than which there are none better in the world, and are now reaching out for the coal.

Two years ago the railroad situation was explained in the *Post.* Within a week a powerful railroad lobby appeared in Washington composed of men from as far east as Boston and as far west as Seattle, and remained all winter, at great expense. It was here last winter and is coming again next winter.

Two years ago the Guggenheim interests had secured a practical control of the great copper belt, the best of which was the Bonanza mines, on the Copper River. Their experts in the field described these holdings to men they met in the wilderness as the greatest copper fields they had ever laid their eyes upon. In Washington they admitted the existence of copper in paying quantities. The Guggenheims were then after the control of the transportation facilities of the great territory. Through various allies, including Close Brothers, of London, they already controlled the river transportation from Dyea and Skagway, via the White Pass Railroad, to Eagle City, the American gateway to the Klondike, and then on down the Yukon to St. Michaels and Nome. Through another ally, headed by John Rosene, of Seattle, the same combination was rapidly getting control of the through-sea route from Nome to Puget Sound.

Fierce conflicts, sometimes bloody, occurred between these rival railroad interests. The Guggenheims were believed in Washington to be trying to prevent railroad building until they had secured everything worth hauling out of Alaska. Of these facts the American people were practically ignorant.

Alaska now has cable connection with Seattle, a delegate in Congress, and a new governor. The greatest impetus for the territory, however, was the appointment of Richard A. Ballinger, of Seattle, to be Secretary of the Interior. The territory is not only one of that department's wards, but the city of Seattle looks upon Alaska as one of its own children, having been the port of exit during the great Klondike rush, and it is, therefore, up to Mr. Ballinger to exploit Alaska, the word "exploit" being used in its best sense.

The most pressing question in Alaska is the opening of its coal deposits. On these all the Alaskan railroads are dependent for a goodly portion of their freight tonnage. The Pacific coast wants Alaskan coal, and the Navy Department would like a coaling station on the Alaskan coast.

The Cunningham claims have been on file in the Land Office for several years. They were filed before Congress passed the coal land law two year ago limiting the consolidation of coal lands under one company to 2,560 acres. As a matter of fact, the Alaskans thought they could just about double this amount under the law, but when they

got back home they found that Mr. Garfield's fine Italian hand had effectively tied them up to the stated amount, and they also had strong reasons to suspect that Gifford Pinchot was not far away when the restrictions were made. Since then the Cunningham crowd has sought to be permitted to file their claims under the old law, on the ground that their applications were in when it was in force. It is understood, however, that Secretary Garfield never considered a land claim had reached the dignity of having the laws finally applied to it until it had been investigated, and it is further understood, owing to the suspicion that the Cunningham claims had behind them somebody, not yet visible, intent on consolidating what was then believed to be about $100,000,000 worth of coal into one concern, never regarded the claims as more than mere clouds on the title of somebody else who might get them in the future. It is now being covertly intimated that these same claims are worth in the neighborhood of $500,000,000, and that the Guggenheim-Standard Oil crowd are beind them.

McHarg for Exploitation

Mr. McHarg's request that the "red-blooded men" of the West be permitted to do as they please, in exploiting and absorbing and confiscating the Nation's resources, just as they have taken care of the buffalo, so offends all decent sentiment as to make the Ballinger cause now more than ever difficult for President Taft to sustain. It is a peculiar habit of speech which some western men have in using "red-blooded" when they make an appeal for a bad cause, or a defense of anything that is inhumane. The theory that real strength is not possessed by persons like Pinchot and Newell, who prefer to see things done with decent regard for the larger rights of man, future as well as present, will not stand analysis.—*North Adams* (Mass.) *Transcript.*

Results Wanted

This decision of the President does not close the incident by any means, nor does it touch the vital issue which is involved. The point of view and the purpose of the Pinchotites deserve as careful consideration as is given to that of the President and the Secretary of the Interior. Mr. Pinchot represents and is backed by a very strong public sentiment, particularly in the West, which believes that there is an effort on the part of large associated interests to obtain monopolistic possession of the most valuable of remaining public lands. Past experience justifies that fear, and incidents of the present day confirm it. There is a belief that the letter of the law contains such loopholes that its spirit will be violated with impunity. The people have little faith in the law and have come to put their trust in the Executive instead. And while the President may reestablish law in its proper place, it is equally important, but more difficult, to reestablish public confidence in the law. In order to do that he will be obliged to go to Congress and ask for legislation closing some of the evident loopholes that now exist.

This is certain to be a prominent topic of discussion through the Northwest, into which the President is going. If he finds time to read the papers, he will learn that the people are very much in earnest in the matter; that they have more faith in Mr. Pinchot than they have in the law, and that if they are directed to the law as their final and supreme safeguard and relief, they will demand that the enforcement of the law produce results.—*Boston Herald.*

La Follette's on the Controversy

La Follette's Weekly, speaking of the Ballinger-Pinchot question, says:

"It involves an issue of tremendous importance. Its outcome will determine to a great extent whether or not this generation and future generations will have saddled upon them another monopoly, more powerful than any of our present trusts—a gigantic water-power combination.

"The people must take sides in this fight, for at bottom it is the people's fight. This fact must not be forgotten. Pinchot and Ballinger now occupy the center of the arena. For the moment they are the principal figures in the struggle. But back of them are two great opposing forces. On the one side is an army of citizens who are determined upon the wise conservation of our natural resources and the protection of the rights of the public in these resources. On the other side are the hosts of privilege, bent upon securing, at any cost, for private exploitation, the natural resources that still remain in the hands of the public."

"Search Their Pockets"

Every community has its group of highly respectable citizens who deplore the lawless methods of the Roosevelt regime. They tremble for the Constitution, the courts, and the people, and in their mind's eye foresee the doom of the Republic unless the too zealous partisans of Roosevelt reforms can be curbed and disciplined.

It is betraying no secret to say that these men, when they are not harmless or eccentric idealists, are those whose private interests have been in some way menaced by the Roosevelt reforms. * * *

It will probably be a safe rule to search the pockets of every man found weeping over the fall of the Constitution and the

mistakes of Pinchot. Ten to one there is concealed on his person a rebate or a pass or a canned-beef sandwich or an option on a Montana water-power. Your corporation lawyer, especially, is apt to tremble for the liberties of the people. It is a pleasure to hear his touching apotheosis of conservatism. But as we dwelt by the ancient landmarks the trusts enjoyed a freedom of action to which, if we have good luck, they shall never be permitted to return.—*Terre Haute* (Ind.) *Star.*

The People for Conservation

Two significant events have occurred within the past few weeks. Two big assemblages have met—the National Irrigation Congress, at Spokane, and the Trans-Mississippi Congress, at Denver. Both are almost wholly made up of volunteer members. The men who go to them are assumed to pay their own expenses. Almost anybody who is willing to meet this condition can get appointed as a delegate. And yet, two great gatherings thus made up have declared in strong terms for the conservation policies that find their official representative in Gifford Pinchot. * * *

The power grabbers and the timber grabbers have been liberally represented at these congresses. Their attorneys have spoken from the floor, and men affiliated with them have worn the badges of delegates. This was to be expected. The men who are grabbing power rights and public lands and public privileges stand to make millions if the conservation policy is reversed. They have already made millions by Secretary Ballinger's act in restoring to private entry the 186,000,000 acres of lands that President Roosevelt withdrew for protection of public rights. Therefore, they can afford to pay the expenses of men to attend congresses and vote and talk in a way to create the impression that public sentiment approves the grab-all policy.

When these facts are remembered it signifies much that these gatherings have stood strongly for public interest. It shows the overwhelming sentiment of the people in favor of the men and the policies that reserve our forests and our coal and our water-powers for the benefit of the public.—*San Francisco* (Cal.) *Examiner.*

Disposing of Natural Resources

There seems to be a steadfast attitude of the people in the Ballinger-Pinchot controversy, and it is with Pinchot, not for any personal or political reasons, but on the main proposition, that under no circumstances is a franchise to be given to a person, corporation, or trust, that involves the bestowal in perpetuity or a long series of years of any of the public domain or natural resources. The public lands may be distributed in small homesteads for tillage, but everything else should be reserved for the use of the people.

It is this view of the case that contributes to the popular faith in Pinchot. * * * If there is anything public judgment is against, it is the granting of perpetual franchises, of either a corporeal or incorporeal character, to anybody. Whatever benefit there is in whatever this country possesses must be left for the people's use.—*Columbus* (Ohio) *State Journal.*

Heirs and Testators

Heirs often disappoint the testator's hopes. In Mr. Taft's case, the testator is still alive and he may find it easy to revoke his bequests. It is said that on his return from wandering abroad Mr. Roosevelt will land at San Francisco. If Mr. Taft does not make good on his western trip we are likely to see Mr. Roosevelt crossing the continent with the West behind him.—*Moody's Magazine,* September.

Seeing the Point

The President was greatly impressed with his trip through the irrigated desert districts of Colorado, and he is more firmly resolved than ever to find a way in the next Congress of legalizing the projects that have been halted by Secretary Ballinger.

The President was especially impressed with the possibility for good that is to come from the completion of the Gunnison Tunnel. The Colorado people were hot on his trail to get him to make a definite promise in regard to the completion of the big work that has been held up near Grand Junction, but the best the President would do was to promise to take it under consideration and do his best.—*New York Journal.*

Pardee on the Letter

Referring to the President's letter to Secretary Ballinger, former Governor Pardee said:

"At the Irrigation Congress I read a copy of a letter approved by Secretary Ballinger and directing that over 4,000,000 acres of land previously withdrawn by Garfield to save power sites from being grabbed should be restored to entry. This was but one of the several similar orders approved by Secretary Ballinger. The President mentions but one order of Ballinger's, restoring to entry only 1,500,000 acres, and says this order of restoration was upon a recommendation of the Reclamation Service.

"I have seen documentary evidence that the Reclamation Service argued with Secretary Ballinger against the restoration order

of which the President speaks, and that it reluctantly made the recommendation only after having been repeatedly ordered by Secretary Ballinger to do so."—*Boston Evening Globe.*

The Effect of the Letter

The effect of Glavis' summary dismissal will be strongly to deter other subordinates, who may feel like questioning the acts of their superiors. It will clear up the atmosphere in one branch of the Interior Department, and it will insure for President Taft's official family at least a superficial peace. But it will not convince the West or convert it to Ballingerism. The West knows Ballinger too well. It knows his associations. The West knows Pinchot and his work. The vindication of yesterday is not conclusive of the West's interest in this matter. The West is willing, even anxious, to be convinced. It will wait to see who gets that Alaska coal, and whether Ballinger or his friends share in the profits.—*San Francisco Call.*

Senate Committee to In estigate Indian Forests

The Senate Committee on Indian Affairs is investigating Indian forests.

Senator Clapp of Minnesota is chairman, and Senator La Follette of Wisconsin is a member.

Special investigation will be made of affairs on the Menominee reservation, Wisconsin.

This inspection is significant because of the discontinuance of the cooperative work between the Forest Service and the Interior Department at the instance of the latter. Senator La Follette is deeply interested.

The Effect of Environment

The President's confidence in Secretary Ballinger is reassuring. Yet, notwithstanding the Secretary's complete faultlessness, the welfare of the administration seems to demand his early transfer to some other post. In any other Cabinet position Mr. Ballinger could probably command public confidence. The very fact that he comes from a section and environment where the public domain has been regarded as a fair prize, and where land marauders have more or less dominated political affairs assures that, no matter how pure his acts and motives, he must work constantly in a cloud of suspicion. That cannot fail to reduce the efficiency of his department.—*Lincoln* (Nebr.) *State Journal.*

How It Looks in Illinois

The President may be right—we hope he is; but undoubtedly he is on the unpopular side of the case, and in such a contest he will lose in respect of the great mass of the people. He will win the respect of the corporations who are trying to grab the public domain. His argument, if read without his signature, and its source unknown, would lead the general reader to think that it was the plea of a lawyer before a Federal court for a wealthy corporation who was charged with violation of law.

We are sorry, but the President's action in sustaining Ballinger does not look good to us.—*Alton* (Ill.) *Telegraph.*

A Typical Comment

The view of the anti-conservation press is well illustrated by the following:

"There will be some regret in various quarters that the President did not make a clean sweep of the trouble-makers and provide for the early retirement of Pinchot, who, if not at the bottom of all the controversy, is at least a malcontent and disturber, and who has been equally prominent with Governor Pardee in making charges of a "water-power trust" which the President has found does not exist. * * * As long as Pinchot is in office there can be no hope of harmony and a maximum of efficiency in the Interior Department. The proper course for him under the circumstances is to resign. If he does not resign he should be discharged.—*Kansas City* (Mo.) *Journal.*

Pinchot and Ballinger

The World's Work for October contains an editorial discussion of the disagreement of Secretary Ballinger with Mr. Pinchot on "conservaion." Say "Pinchot" to any company of men in the United States, and it is the same as saying "conservation." For this reason, any controversy to which he is a part necessarily becomes a controversy about conservation. It is not a controversy merely about a legal interpretation. The public understands this, and the enemies of conservation understand it. And these enemies get aid and hope and courage from any doubt that they are permitted to harbor about Secretary Ballinger's appreciation of this large policy and his earnestness about it. Mr. Ballinger owes it to himself to remove it by as vigorous and prompt action as possible, of an unmistakable nature.

The Kind of Fighters the People Need

Pinchot fighters are the kind of fighters that are needed to get a square deal under existing conditions. The leader who assumes

that the right thing will be done because it has been demanded and promised will not get anywhere.—*Pueblo* (Colo.) *Chieftain.*

The People with Him

The President realizes that the head Forester is a power in conservation and cannot profitably be disturbed. Mr. Ballinger will be wise if he takes the same view. He cannot crowd Pinchot out. Eight-tenths of a hundred millions of citizens would rise as one man and object.—*Woonsocket* (R. I.) *Call.*

Let Pinchot Alone

Secretary Ballinger should think twice before he falls out with Pinchot. If the public had to choose between the two on the strength of their past records, so far as they are known, it would favor Pinchot rather than Ballinger.

It is well understood that most if not all of the unfriendly critics of the Chief Forester in public and private life are men whose personal interests have been interfered with by forest-conservation work which has benefited the Nation. They have been snarling at him for years, but have not changed the popular opinion of him. It is that he is capable, honest, and unselfish, and that whatever mistakes he may have made grew out of his passionate devotion to the cause he has at heart.—*Chicago* (Ill.) *Tribune.*

The People's Country

"I hold very strongly that all the country, in every power, every faculty it possesses, belongs, first of all, indefeasibly and inalienably, to the plain American citizen.

"Public-service corporations exist to serve the people. They must be conducted not simply for the people who own them, but for the people they serve and for whom, rightly considered, they exist. * * *

"The withdrawal of water-power lands that has taken place under President Taft will be submitted to Congress, and it must then be decided whether water-powers shall be given in perpetuity or for a limited time. No decision more important than this has come before Congress in years. It is a question whether the means of lighting, heating, power, and transportation shall forever be transferred to private hands, or shall be kept under the control of the people, from whom originallv it came.

"After vested rights once attach, it is more difficult to remove them in this country than in any country on the globe."—Gifford Pinchot in Portland, Oreg., as reported in *Portland* (Oreg.) *Journal.*

Mr. Pinchot at Los Angeles

Mr. Gifford Pinchot was at Los Angeles on September 3. From the press, the following reports are clipped:

"Los Angeles, Sept. 3.—'The hardest and perhaps the most momentous fight the public has engaged in for years,' said Chief Forester Gifford Pinchot to-day, when he arrived here, 'will be before Congress at the next session on the question of preserving for the people water-power rights on navigable streams on the public domain and in the forest reserves.

"'Action one way or the other must be had at the next session. If it goes the way of private interests the possession of the water-power—and that means the possession of the most valuable public asset left—will be lost to the people.

"'Our contention is that these rights should not be granted in perpetuity. We, and by we I mean all those interested in conservation and keeping for the people what is the people's, hold that a limit of, say, fifty years should be affixed to the conveyance of each right and that a reasonable rent should be paid the Government.

"'You can have an idea of the influences that will be brought against this idea when I tell you they will include the General Electric Company, the Morgan interests, the Standard Oil, and the Transcontinental railways, who intend to use electric power for trans-mountain traffic.'"—*San Francisco* (Cal.) *Examiner.*

In an address before the City Club, Mr. Pinchot said:

"The lines in this country are being pretty closely drawn between those who stand for good government and those who stand for special privileges.

"The square deal is what we seek in the controversy between the people and the money interests. I feel that the time has come for men to stand up and be counted. * * *

"Suppose the present tendency should go on. We have seen great trusts building up. Suppose the utilities fall into the same category as the railroads. It is a pretty picture to suppose that all these resources will fall into the hands of a little group of men to decide what part of the country should be developed. I am an optimist, and do not believe we ever shall reach that condition, but unless our people take the action I think they will take, we shall reach it very soon."—*Washington* (D. C.) *Star.*

"The men who control the natural resources of the country should be controlled by the whole people. The same point of view which made it appear that the forests should be preserved also makes it clear that coal waste should be stopped, water-power developed, and lands irrigated—this same point of view goes straight on and applies to the great total of national efficiency."—*Seattle* (Wash.) *Times.*

Mr. Pinchot at San Francisco

"Corporations should no more be granted rights in perpetuity to water and power sites than a street railroad should be granted its franchise in perpetuity.

"There should be a time limit fixed by law on the rights granted corporations under governmental control.

"The next Congress will have to settle this question. The matter has been so framed that it will have to be decided for all time."

Excerpts from interview with Gifford Pinchot at San Francisco, September 1, 1909. —*San Francisco* (Cal.) *Examiner.*

President Taft to Forester Pinchot

President Taft, on September 25, gave out, at Salt Lake City, the following statement:

"In view of the published statements that the letter of the President to Secretary Ballinger was to be considered in some way a reflection on Mr. Pinchot, the President today authorized the publication of the following: That at the time he wrote the letter to Secretary Ballinger he also wrote a letter to Mr. Pinchot, assuring him that the conclusions stated therein were not intended in any way to reflect on him; that the President deemed Mr. Pinchot's continuance in the public service as of the utmost value; that he expected to continue the Roosevelt policies as to the conservation of resources, including the reclamation of arid lands and preservation of our forests and the proper restrictions in respect to the use of coal lands and water sites, as well as the improvement of our waterways, and to ask Congress for such confirmatory and enabling legislation as would put the execution of these policies on the firmest basis; and that he would deem it a great loss if, in respect to the matters with which Mr. Pinchot had been concerned, the administration should be denied the benefit of his further service."

Forester Pinchot's Statement

On the same date Mr. Pinchot gave out the following statement:

"At the suggestion of the President, I make public the following extracts from his letter to me mentioned in the statement he has just authorized:

"'I wish you to know that I have the utmost confidence in your conscientious desire to serve the Government and the public, in the intensity of your purpose to achieve success in the matter of conservation of natural resources and in the immense value of what you have done and propose to do with reference to forestry and kindred methods of conservation; and that I am thoroughly in sympathy with all of these policies and propose to do everything I can to maintain them, insisting only that the action for which I become responsible, and for which my administration becomes responsible, shall be within the law.

"'I should consider it one of the greatest losses that my administration could sustain if you were to leave it, and I sincerely hope you will not think my action in writing the inclosed letter to Secretary Ballinger is reason for your taking a step of this character.'

"These expressions by the President, which are most kind toward me and most favorable toward my work, as well as the statement authorized by him, define his attitude toward the conservation policies with convincing clearness.

"I shall not resign, but shall remain in the Government service. I shall give my best efforts in the future, as in the past, to promote the conservation and development of our forests, waters, lands, and minerals, and to defend the conservation policies whenever the need arises. I especially shall continue to advocate the control of water-power monopoly in the public interest and the use of our institutions, laws, and natural resources for the benefit of the plain people.

"I believe in equality of opportunity and the Roosevelt policies, and I propose to stand for them as long as I have the strength to stand for anything."

National Forester Pinchot's Pluck

Perhaps you noticed during the tariff debate that there was a tendency among the standpat Congressmen to denounce Gifford Pinchot, the head of the national forestry service. Of course, these attacks came from the tools of the lumber trust, and were made because Pinchot had been informing the country how the operations of the trust, with its accumulations of dried debris, laid the foundation for forest fires. Moreover, Pinchot had the nerve to tell the truth about the destruction by forest fires last year, which also displeased the trust.

Now Forester Pinchot has invited new wrath by issuing a warning against the plans of an entirely new trust, the Water-power Trust. * * * This is a bold and public-spirited utterance, and what Mr. Pinchot has to say about "legal technicalities," can be readily appreciated in Saratoga County. Here selfish corporations have been enabled to steal the prosperity of the many, and legal technicalities have been successfully opposed to the enforcement of laws in the public interest.

More power to Pinchot! The country has too few men of scientific training to speak out in behalf of the interests of the public as opposed to grasping private interests.—*Saratogian,* Saratoga Springs, N. Y.

The Row in the Interior Department

It will be observed that Mr. Ballinger insists that he is acting strictly within the law. He is doing what has so often been practised by men in power—construing the law to protect the monopolies instead of the people. It is the old trick. Mr. Pinchot is simply following the path which Roosevelt marked out to protect the public against the ring. When Mr. Ballinger says that he is following the instructions of the President, it will only be another indication that Ephraim is joined to his idols. The only question is whether we ought to let him alone.—*Peoria* (Ill.) *Star.*

A Fighter of Men

Forestry and conservation have not engaged all of Gifford Pinchot's time and energy. He was the moving spirit in the Committee on Departmental Methods, which was appointed by President Roosevelt to put the Government offices into proper shape for business. In this work, Mr. Pinchot's ideas of doing away with the duplication of effort in various bureaus, in reducing "red tape," and in applying modern business methods to governmental business was adopted, and the result has been a saving of many millions of dollars to the Government. Then, again, President Roosevelt, recognizing the signal administrative ability of Mr. Pinchot, made him a member of the Country Life Commission. Again, Mr. Pinchot was the moving spirit in the investigation which took place. Through the inspiration afforded by the work of this commission to-day, in all sections of the country, conferences are being held to put into effect many of Mr. Pinchot's recommendations. Above all things, however, Mr. Pinchot works without varying from the policy that it is better for the Nation that the small man should make a living than that the big man should become richer still. In following out that policy, Gifford Pinchot has had to fight tooth and nail organized bands of land grabbers; he has had to wage bitter contests against corporations bent upon controlling water rights; he has had to war against politicians of powerful fiber, who were politicians by grace of the land grabbers, and he has had to show up land thieves, big and little. In certain sections of the West he is not popular with politicians. He has as enemies the worst element of real estate men in the Northwest, and his bitter foes are the lumber thieves of Minnesota and North Dakota. A public man should be praised for enemies of that stripe.

To the politicians who detest the Roosevelt "square deal" policies, men such as Gifford Pinchot and Frederick Newell are obviously disliked. Director Newell and Forester Pinchot, whose policies are really their own, but which were exalted by the distinguished approval and public commendation of President Roosevelt and which were permitted to expand and materialize by reason of the approval of President Roosevelt, have no idea of changing their policies under the new administration. * * * More and more, in this country, the people are heeded in matters political, barring, possibly, the tariff, and reclamation and forestry are near to the people, and a toying with their rights will not be tolerated. Let the storm come, and the ones to bob up serenely after the hurricane will be the men who stand for the "square deal."—*Williamsport* (Pa.) *Grit.*

Titanic Struggle over Conservation

Titanic forces are gathering in the controversy with regard to the proper Government policy of conservation. A struggle has begun which is likely to be as important, before it ends, as any that has entered the politics of the Nation since the Spanish war.

We are not prepared to say who is right, because we do not know; but we do know that a tremendous principle is at stake, involving the welfare of the American people for centuries to come. * * *

Mr. Pinchot gives an earnest of his sincerity in the present controversy by staking his office upon it. He knew when he attacked Mr. Ballinger that the result would probably be the retirement of one or the other to private life, and that he (Pinchot) was burning his political bridges behind him. We like to see a man who does not put the chance of retaining his official job above everything else.—*Norfolk* (Va.) *Virginian-Pilot.*

Mathews on the Water-power Trust

In his address to the Irrigation Congress, John L. Mathews, representing the Lakes-to-the-Gulf Deep Waterways Association, said, in part:

"What is the real condition as regards irrigation in Montana?

"There stands the Great Falls Water-power and Townsite Company, owned by the Butte Electric and Power Company, owned, in turn, by the North American Company, controlled, in turn, by the General Electric Company—chief constituent member of the Water-power Trust—there it stands, hogging the Missouri.

"It has filed on all water which passes Great Falls.

"Above the falls is the arid Prickly Pear Valley and much other land which is suitable for irrigation. Montana wants to take out water for irrigation on this land. Not one drop can it take without violating the so-called rights of the monopoly. They must have it all. Governor Norris this year

tried to get his legislature to give irrigation rights precedence over prior power filings, but without success."

Continuing, he said, in part:

"The state is helpless to take water from its own abundant streams to irrigate its own rich land because its creature, slimy and loathsome, lies across the ditch.

"We have had a great deal of discussion about the carrying out of the Roosevelt policies, and there seems to be a general impression that they are being carried out on a shutter, to slow music. But the Roosevelt policies must live, despite changes in the administration, and they will so live only when they are plainly and unmistakably engraved upon our laws. Pressure on our legislators for legislation exactly enrolling these policies and making them permanent—this is what we must seek, and the shortest road to it is by a simple and convincing exploitation of the exact situation in which we find ourselves—exploitation utilized as pressure upon our legislative representatives.

"I am neither a friend nor an enemy of Secretary Ballinger. I sincerely disapprove of the trend of his actions. I came West this summer to investigate the possible grabbing of power sites he had restored. I have gone carefully over the records of the several land offices and have the facts in my possession.

"I assert, and I will readily prove, that no amount of filing on land alongside the Missouri River could have given a power site, and no withdrawal of Government lands there can prevent use of a power site. The Missouri is a navigable river. Congress has spent $40,000 upon this section by way of favor to the Helena Congressman. No dam can be erected in any river of which the navigability is recognized by Congress without express authority given in a special bill.

"Though few vessels have ever plied its waters above Great Falls, some have been used there. Congress has formally recognized the navigability of the stream, and the three dams and power sites owned and in use by the Amalgamated Copper Company's United Missouri River Improvement Company rest upon specific bills from Congress giving each separate company the right to erect a dam and maintain it.

"Such a bill must contain clauses safeguarding navigation. Sometimes they contain certain provisions for the payment for the water—but as yet not often. But no state grant, no riparian right, no filing on water or land, no ownership which the trust can acquire can cover the erection of a dam at a power site on a navigable river except by special and express authorization from Congress.

"There are abundant grounds for censuring the conduct of Secretary Ballinger in the whole course of these water-power site withdrawals without recourse to disputed facts. And in the case of the Missouri, especially, these land filings are of no importance.

"Watch these water-power bills, for you yourself have already given the right to the land away. Careless of your rights, careless of the actions of your Congressmen and Senators, except when they secure you local appropriations; careless of the rights of others which they guard, you have let them wipe out all the rights of an individual which a corporation may covet to the power and the land of a navigable river."

Iowa State Conservation Commission

The last legislature of Iowa created a commission known as the Iowa State Drainage, Waterway and Conservation Commission, composed of seven men appointed by the governor, Hon. A. C. Miller, of Des Moines, being the chairman. The commission has had one meeting and organized. Results are expected later.

Conservation in Wisconsin

The Wisconsin Conservation Commission has been holding meetings to formulate recommendations to the governor for the conservation of the water-powers, forests, and soils in the state. One of its members, Mr. G. A. Whiting, of Neenah, a big paper manufacturer, protests against renewing a recommendation that the state levy a special charge on all developed water-powers of the state for the purpose of securing money for the extension of the state forest reserves. The question involved is that of taxing franchises, for the development of the water-powers of the state. The commission is expected to inspect the water-powers of the Fox, Wisconsin, and Chippewa River valleys and interview the owners of water-power properties regarding the adoption by the state of an equitable policy toward such properties and the issue of franchises for undeveloped water-powers.

More Incendiary Fires

A correspondent of the *New York Sun* holds that the forest fires which for three weeks have raged in the Shawangunk Mountains, Minnewaska, N. Y., are started by berry-pickers, who burn the woods to obtain better crops. The landowner fears to take legal proceedings lest worse things come upon him. The consequence is that one of the most picturesque regions in the state of New York is fast becoming an unsightly wilderness. The evil is apparent to every one except the authorities.

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To OTTO LUEBKERT
Secretary American Forestry Association
1417 G Street N. W., Washington, D. C.

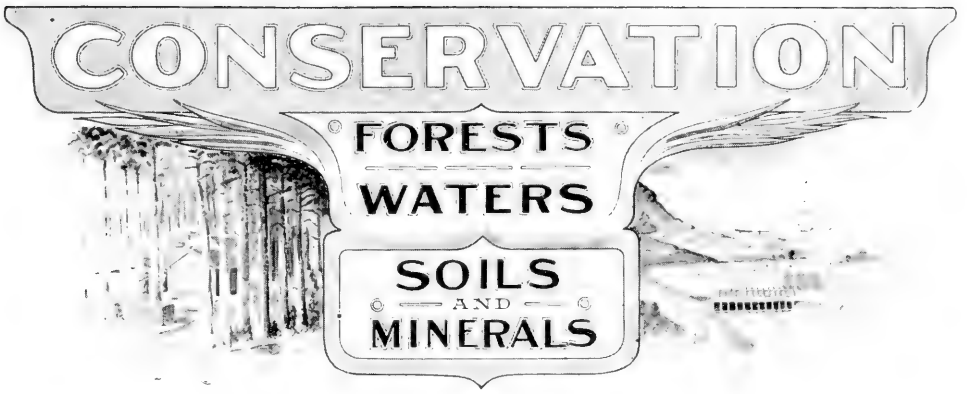
Dear Sir: I hereby signify my desire to become a member of the American Forestry Association. Two Dollars ($2.00) for annual dues are enclosed herewith.

Very truly yours,

Name _____

P. O. Address _____

Blue Gum (Eucalyptus) Showing Bark, Leaves and Flowers



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How Our Forests Are Wasted, and Why the Need of Government Control

By S. T. KELSEY

ALL of the water upon the land surface of the earth comes in the form of rain or snow, and can doubtless be depended upon so long as the ocean endures and the sun shines.

Though certain as the sunshine, the rainfall is as variable and uncertain as the wind, and as uncontrollable by man's devices; but after it has fallen it is controlled and its effect upon the earth regulated by conditions for which man is largely responsible — conditions which he may direct and modify, but may not defy with impunity.

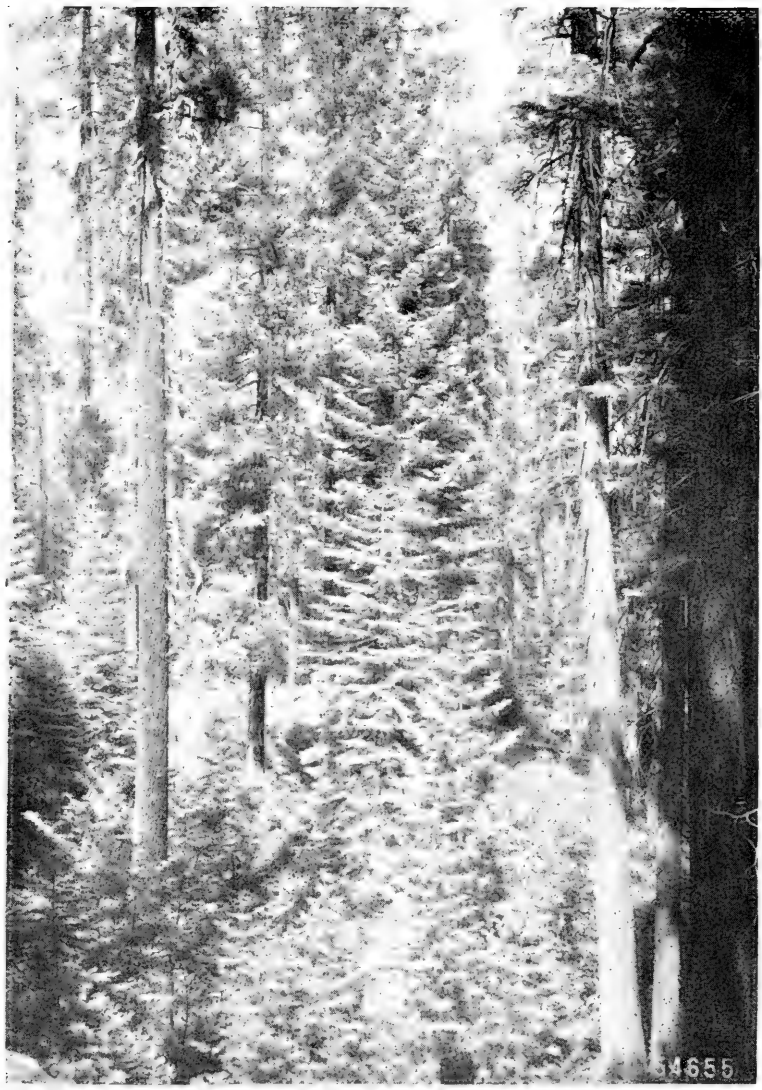
One condition is that the bare, loose covering of the earth, exposed to the falling rain, is sure to be washed from the higher levels into the valleys, the streams, and at last into the ocean below. And no practicable substitute has been found for the forest-covering that nature has provided for regulating the run-off of the water and protecting the earth's surface from disintegration, displacement, and ultimate barrenness.

We in America came into possession of a land stored with the accumulated wealth of the ages. In our reckless haste for gain we are destroying more of this stored-up wealth in a single decade than any of the older people of the earth have done in a century.

But the direct destruction of our resources is not the worst feature of the case. The land was protected from erosion, practically everywhere. The greater portion was covered by dense forests that had formed a bed, or forest floor, of porous soil and decaying wood and leaves, all held in place by a mass of entangling roots, forming a sponge-like covering of the earth that absorbed the water in time of excessive rainfall and allowed it to percolate slowly through, furnishing a constant supply to moisten the earth and maintain the springs and streams.

To the early settlers the forest had no commercial value and must be cleared off the land to prepare it for growing crops.

The woods then were the greatest



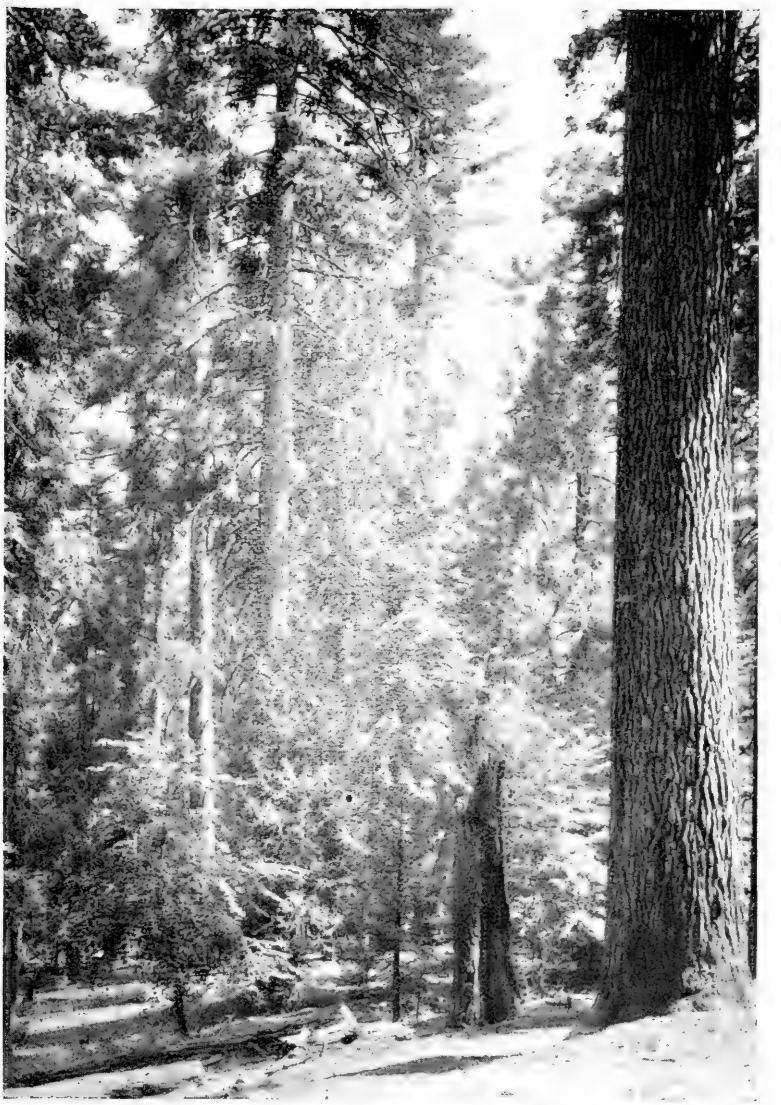
Forest Covering Provided by Nature to Regulate Run-off (Page 657)

obstacle in the way of settlement, and the prime object was to get rid of them in the quickest and cheapest manner.

They had no friends or protectors, and, besides the destruction from clearing, lumbering, and accidental burning, they were deliberately fired to improve the range for the settler's stock, to give the children and hogs a better chance to gather the chestnuts and acorns, to kill off the snakes, and, if there appeared no better reason, they were fired just for the fun of seeing them burn.

The early lumbering operations consisted in running over the country and taking only the best timber wherever it would pay for manufacture and transportation, and the forests were so extensive that the lumbermen, by ever seeking new fields for exploitation, could get the pick of the standing timber almost for the cutting.

Only the best timber in the best trees was taken; the rest of the forest was not considered worth preserving, and so what was cut and not taken was left



Sierra Forest Reserve, Illustrating Protective Covering (Page 657)

on the ground to feed the flames and increase the destruction from the next forest fire. And this common practise of cutting the best and burning the rest has been followed up until it has so far depleted and degraded the stand that our remaining forests, east of the Rocky Mountains contain but a small amount, probably less than one-fifth, of the valuable timber that they might have had with reasonable care and protection.

The repeated burnings have largely destroyed the forest floor that held back the water and protected both the mountain and the valley from destructive flood and drought, and robbed the soil of its ability to reproduce a protecting growth.

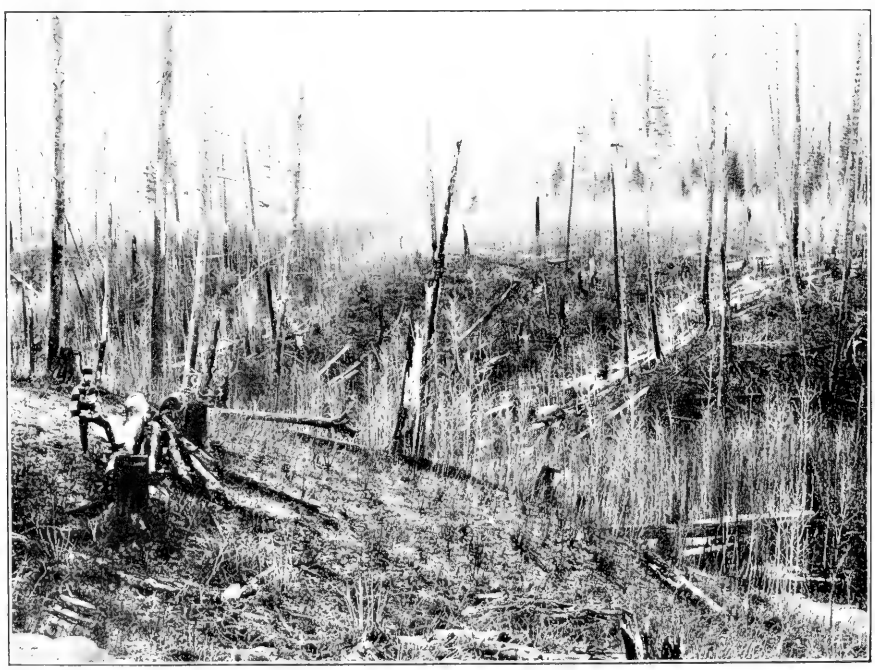
Formerly, the settlers selected the more level land for clearing, but, with the increasing demand and abandonment of the older, worn-out fields, they are now pushing their clearings up

Forests Were Once Deliberately Fired to Improve the Range (Page 658)

the steeper hill and mountain sides, which, in their turn, must necessarily soon be washed and worn to sterility.

The lumbermen first operated in the lowlands where the best timber grew and logging and transportation were cheapest and, cutting only a part of the trees, they left a semblance of forest behind.

With the depletion of the lowland forests, they have moved up, through the foothills and into the mountains, and are now stripping the mountain-tops and sides of whatever usable tim-



Fire Follows the Lumberman: White Pine Wreckage in Wisconsin (Page 661)

Stripping the Mountain Tops; White Mountain Scene

ber the settlers, the forest fires, and the sporadic lumbering had spared.

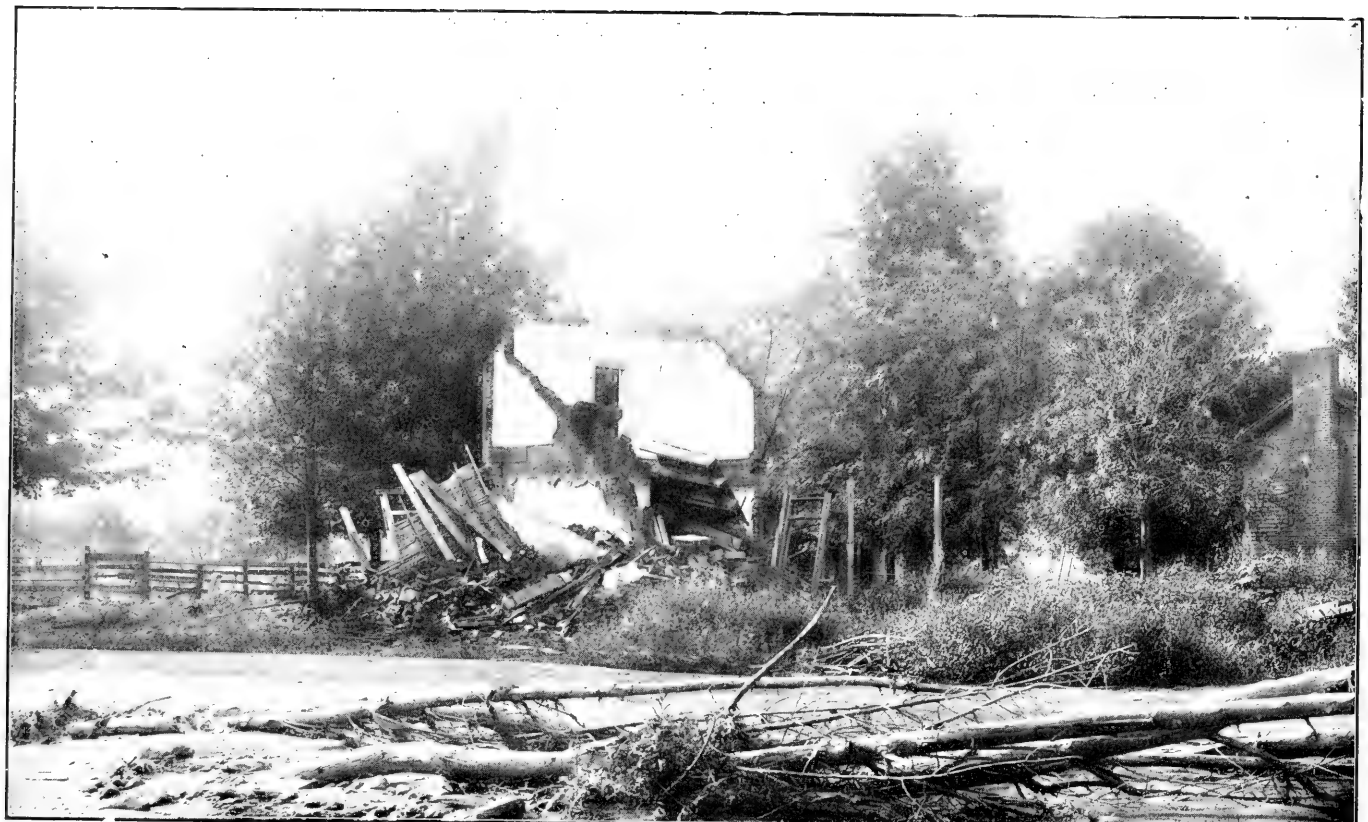
The cheaper grades are in demand, and nearly everything is cut down to seven or eight inch saplings; the brush and tops are, as heretofore, left upon the ground, and the fire that is sure to follow completes the work of destruction. And the damage is not confined to the cut-over lands; the fire, fed by the dry brush, becomes uncontrollable and spreads to adjoining lands, oft-times burning over large tracts of standing timber and destroying other property of many times the value of the lumber taken from the cut-over land.

A few years more under the present mismanagement and our original forests will be gone; and even if we begin now to plant and grow for future use, we cannot provide a supply soon enough to prevent a timber famine that will cripple almost every industry, affect every citizen, and be of incalculable loss to the country.

But the danger of loss from timber famine is small compared with the loss that is sure to follow the general destruction of the remaining mountain forests.

We are told that already "more than a thousand million tons of our richest soils are swept into the seas every year, clogging the rivers on the way and filling our harbors."

The waters from our melting snows and heavy rains rush swiftly down the denuded mountain sides, overflowing the creeks and rivers below, wrecking roads and railroads, dams and mills, and submerging farms, villages, and cities; many lives are lost and millions of property are gone. The water is



Flood Follows Deforestation: Scene Along Nolichucky River

Debris from Wreck of Sawmill and Log Boom on Linville River, by Floods, in Western North Carolina, in Region of Proposed National Forest Reserve

also gone. A few weeks of sunshine follow the flood and the papers report, "Unprecedented conditions of drought. Crops and stock perishing. Forest fires burning up a million a day. Mills and factories idle for want of water. Steamboats and barges stranded on the shoals. The small streams dry." And, "Boys playing ball in the middle of the Ohio River."[1]

These conditions, the evident results from the rapid destruction of our forests, were foreseen and foretold by thoughtful people long ago. Such wise and patriotic citizens as Dr. John A. Warder, Robert Douglas, Wm. Cullen Bryant, and his brother, Arthur Bryant; Rev. Frederick Starr, and many others warned the country of impending danger, and efforts were made, immediately after the close of the war in 1865, to awaken an interest in favor of intelligent reform in forest management and to secure legislation, state and national, for encouragement of forest protection and extension.

But warnings were unheeded; stockmen and lumbermen preferred the free range of the plains and forests to any Government restrictions or supervision. They saw money in the grass and trees, and their object was to get it out as quickly and cheaply as possible; and so, between the general apathy of the community and the opposition of those immediately interested, little has been done to stay the rapid course of waste and coming want. The great white-pine and hardwood forests of the North have little left but culls and inferior grades.

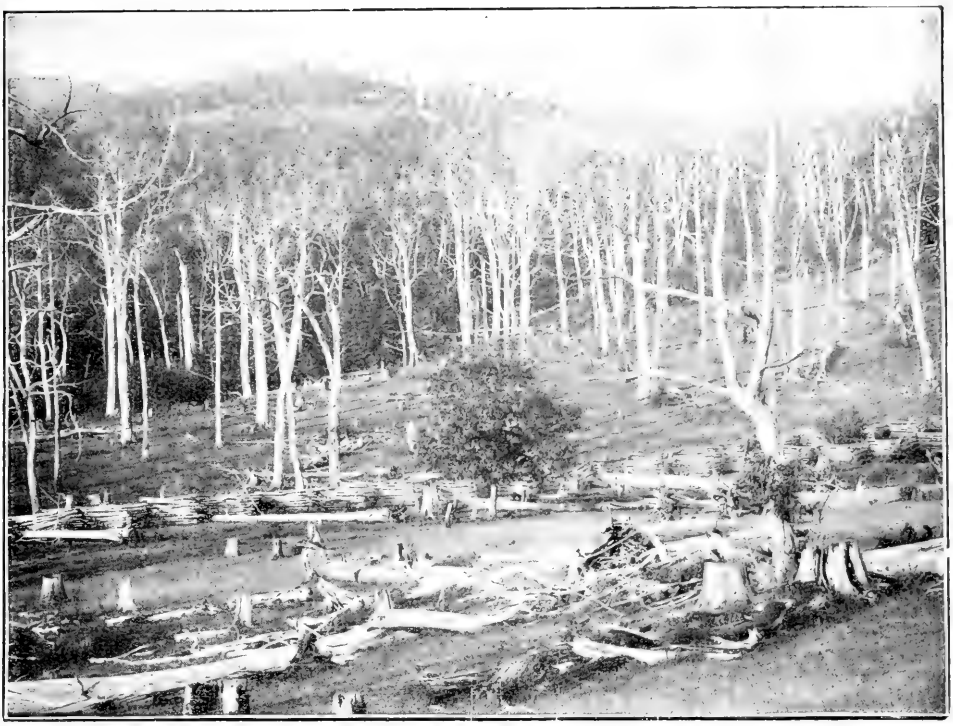
At the present progress of cutting and burning, the timber supply of the Southern Appalachian Mountains, now almost our sole dependence for hardwood lumber, will be practically exhausted in from twelve to fifteen years, and the streamflow of the Mississippi,

[1]Head-lines from a single copy of a New York tri-weekly paper of September, 1908.

Forest scene in the Southern Appalachian Region

the Ohio, and all of the important rivers of the East and South seriously affected.

It is generaly observed that erosion on uncovered lands in the southern mountains is much more destructive than farther north, due probably in part to the winters' protection of snow on the northern lands and difference in texture of the soil and underlying earth; but also largely to the use of the northern mountain lands for meadow and pasture, while the southern lands are more generally cultivated and tended in annual crops, so long as they will pay for cultivation. They are then abandoned to their fate. There are now millions of acres in all possible



Forest Destruction in Southern Appalachians

conditions of degradation, and millions more to follow.

When the Southern Appalachian Forest Park bill was first introduced into Congress there were large areas of the average of uncut timbered lands that could be bought for from $1 to $3 per acre. A commission was sent out to investigate, and its able report, backed by the President, recommended the passage of the bill. Everybody seemed to favor it; but when it apparently could have passed both houses of Congress, it was held up for some reason unknown to its friends outside; and it has been held up ever since.

Meanwhile, attention having been called, by official investigations and reports, to the rapid exhaustion and consequent prospective increase in price of the remaining timber, buyers from the older and largely exhausted lumber districts have overrun the ground, buying up whatever they thought could be used, or, as we have heard some say, "sold to Uncle Sam at a good profit." And thus, while action has been delayed, most of the remaining Appalachian forests, of present and prospective value, have been bought up by lumbermen and speculators, and are now held at prices many times above what they would have cost when the Forest Park bill was first considered.

And now we are told that, "owing to the high price that would have to be paid for virgin forest land, but little of such land can be bought."[3]

"It will be the wisest course under present conditions for the Government to purchase cut-over rather than virgin lands. Even cut-over lands with no prospect of a timber crop inside of ten or twenty years will cost as much now as virgin lands ready for the saw would have cost eight years ago. Barren and eroded lands, of which there is a greater area now, will cost no more to-day than

[3]See Report of the Secretary of Agriculture on the Southern Appalachian and White Mountain Water-sheds, 1908, pages 8 and 30.

in the past. But, considering the expense of planting the timber on them, and the time before returns can be secured, they become the most costly class of lands that can be purchased."

It appears, then, that efforts to secure Government aid for preservation of the Appalachian forests have so far had no practical results, except to make their destruction more rapid and certain and their rehabilitation more remote, difficult, and expensive, and it will require many years of active work, and expense without returns, to reproduce even as favorable forest conditions as existed "eight years ago."

In the West, where the Government owned the lands, large areas have been reserved within the last ten years for the preservation and extension of National Forests; but in the East, where private ownership controls, it certainly appears as if all efforts for the preservation of the forests have thus far accomplished *less than nothing*.

The Government spends hundreds of millions in dredging the rivers and harbors. And now it is proposed to dig a deep waterway from the Lakes to the Gulf, dredge out the rivers and build great reservation dams to regulate the streamflow and provide a national system of inland water transportation and water-power. It is a great scheme and its accomplishment greatly to be desired; but we are a great people, and the glamour of great undertakings is alluring.

We have already proved that if we shall say unto the mountain, "Be thou removed, and be thou cast into the sea; it shall be done;" but we have not yet proved our ability to stop the mountain on its way, or prevent the destruction that its removal may cause. The reservation dams may, for a time, check the flood and delay the movement; but the delay will be but temporary, for, once started on its way, the detritus will fill up the reservation ponds, lakes, and river-beds, and finally reach the ocean harbors.

Therefore it is suggested that before undertaking the expenditure of two or three hundred million dollars on the Lakes-to-Gulf deep waterway, and a thousand or two millions more reclaiming the remainder of our waterways, it might be well to consider the economy of beginning at the headwaters and eliminating the causes of decadence of our water-courses rather than burdening the country with the continuous expense of trying to undo the effects.

We know, of course, that the forest covering cannot control the water-flow altogether, but it is the best known regulator of the run-off and a nearly perfect protection against erosion; and, reinforced by the reservation dams to hold back the flood, would at least greatly reduce the cost of construction and maintenance of the deep waterways. And besides giving protection to the land and waterways, the forest will furnish material for useful employment of the water-powers, and commodities for transportation more valuable than mud and sand.

We are talking conservation, but little is yet being done to stop the needless, wasteful works of destruction.

We are reclaiming desert lands in the West, but we are making deserts much faster in the East. We are destroying more acres of forest every week than we are recreating in the whole year; and, while we are proposing a great national system of deep waterways, we are stripping our steep hill and mountain lands of their only protection against erosion and turning loose additional billions of tons to fill up the already clogged rivers and harbors.

We are despoiling the earth and wasting its resources as much faster than any people who have gone before us as the swift-running railroad train is faster than the slow-going pedestrian.

If present wasteful and destructive ways are continued we shall, in the near future, have little to export from the products of our forests, our fields, or our mines, and a dearth of the wherewithal to feed, clothe, and employ our own people, and will be facing questions of vastly greater consequence than the fixing of tariff schedules, building inter-ocean canals, or hunting open doors for our surplus commodities.

Dams Now Proposed to Regulate Streamflow: Dam Site on Lower Colorado (Page 666)

We can hardly blame the lumbermen more than operatives in other industries for past practise or present conditions. Like other people, they are in business for the profit, and too busy with the things of to-day to take thought for the morrow; and, with no authority to stay the work of destruction, competition has compelled them to adopt such practise as experience has shown to be necessary for success.

But it is evident that the short-sighted policy of private control cannot be trusted for protection of the common interests, and, if we would stay the work of destruction, we must provide some system of Government guardianship and supervision of the remaining forests.

Our authorities estimate the original forested area of the United States at 850,000,000 acres, and that clearing, cutting, and burning have reduced the acreage to 550,000,000.

Of this remaining so-called forest, 100,000,000 acres, an area as large as New York, New Jersey, Pennsylvania, Maryland, and Virginia, is said to be so damaged by cutting and burning that its growth is of little value, while 250,000,000 acres partially cut and burned over are restocking naturally with sufficient young growth to produce a fair crop of timber. This leaves but 200,000,000 acres of unculled forest, less than one-fourth the original forest area.

Of this amount there can hardly be over 50,000,000 acres of unculled forest east of the Mississippi, and a considerable part of this has been left because, on account of its inferior quality or quantity, it has not been worth the cutting.

The 350,000,000 acres of culled and burned-over forest lands have been so persistently stripped of their best productions, and the least valuable left to grow and propagate their kind, that the natural reproduction is largely of undesirable and unprofitable growth; and though the estimates on the amount of standing timber, taking the lower grades into account, may be approximately correct, it is certain that some of our most valuable and indispensable woods for many important industries are already nearly exhausted.

Forests Cannot Wholly Control Waterflow: Reservoirs Afford Valuable Supplements.
A Reservoir at Hartford, Conn. (Page 666)

The German forests are producing four times as much annual growth per acre as ours and, while the Germans are stocking their forests with the most valuable trees, and improving the product, we are stripping our forests of whatever is worth the cutting and leaving the least valuable for future growth and forest renewal.

A few years more of such practise and, if one would get a good carriage, farm implement, or utensil of any kind made wholly or partly of wood, it may become necessary to see that it is "made in Germany."

In Los Angeles, lately, I went through the yards and found considerable quantities of lumber imported from Japan and the Philippines, and was told by the dealers that, while nominally it cost the same as American lumber, they got a better quality for the same grade.

It was probably for the same reason that shiploads of railroad ties were coming into San Pedro, the port for Los Angeles, from across the Pacific.

We Are Reclaiming Desert Lands in the West. Nevada Lands Withdrawn from Entry (Page 666)

But we cannot long depend upon importing lumber of any grade; for with the general awakening of the nations, the world over, they are likely soon to want what they have for themselves.

In any case, it is useless to talk of importing our forest supplies. We must provide for them at home or practically do without, whatever the consequence.

We are told by some of our high and wise counselors that the United States, the only authority that can furnish efficient protection to our forests and streams, can adopt no general plan of control because it would be unconstitutional.

The country has never made a real advance movement without meeting this same objection, and, if such counsel had been heeded, the United States would have gone to pieces long ago; but fortunately, when unforeseen dangers threatened and new conditions required adjustment to meet new wants, we have had men directing the affairs of state wise and strong enough to use such available means as became necessary to safeguard the welfare of the Nation.

The people have sustained such action, and the "broken Constitution" has been, in some way, adjusted to the new situation; and when the people demand national supervision for our forests and streams, they can certainly find a way to *make* it constitutional.

The real dangers are from apathy and indifference of the people regarding the urgency of the case, and the greed of private interests that would deceive the country as to actual conditions, seek control of remaining resources, and continue the work of destruction.

Our Forest Service, with its thoroughly competent chief, able assistants, and intelligent foresters and rangers, is working out our various forest problems and demonstrating the best means for meeting present and future wants, as fast as the laws and means provided will permit, and can be depended upon for wise direction of whatever larger operations the country may undertake.

We have, then, the nucleus already established, and should be able to evolve some system of national control, under guidance and supervision of the Forest Service, that shall insure such protection, development, and perpetuation of our forest resources as may be necessary to safeguard the paramount and permanent interests of the whole country. Not necessarily Government ownership, but some system of cooperation by which, in consideration of aid and protection to state, local, or individual owners, the Government should receive a reasonable per cent on sales of the forest products.

If well managed, we believe there is land enough in the United States worth more for forest than for other purposes, much of it an idle waste, and, under present conditions, rapidly deteriorating, to provide for probable future necessities of the people.

A steady demand for forest material is quite certain to make the production profitable for the timber alone; while, as a regulator of the water-flow and protector of the lands, the forests are, by far, the most valuable asset of our destructible resources, and their proper care and preservation of vital importance.

THE FUNCTION OF THE FOREST*

By Dr. N. KAUMANNS
Imperial German Agricultural Attache to the United States

IF IN my speech I do not touch some questions of importance to your interests, you may seek the reason for this in the fact that, only lately, your first authority on forestry has published a most thorough and able pamphlet in this direction, entitled, "What Forestry Has Done."

I am proud and at the same time glad to read in this pamphlet, what position Mr. Pinchot assigns to German forestry in the Union, and that is why I, too, gladly accepted your kind invitation to speak here about the importance of forestry in general.

If we wish to assign some reason for the great pleasure and interest Germans and peoples of Germanic race take in forests and things of the forest more than peoples of Latin stock, we must seek it in their character. From ancient times the Germans have regarded their groves with great veneration. Under the branches of trees still more ancient, our ancestors conducted the solemn ceremonies of their worship. The deities spoke to them in the rustling of the leaves and the creaking of the boughs. And to-day their descendants break out in song and jubilation amid leafy shades that centuries ago witnessed the solemn procession wend its way to the sacrificial altars.

The inhabitants of ancient India, also, venerated the forests as the special dwelling-place of their divinities, but the early Germans were, in a greater sense, children of the woods. They lived in the forests. The forests furnished them all the necessities of life, just as the wild beasts, particularly the bear, clothed them with their furs. The wild bees, hanging their busy hives on the boughs, gave them honey, which, when mixed with the sap of the birch, made a wholesome beverage. Their huts were built of the wood of the trees about them; they warmed themselves at fires whose fagots came from the timber. Their weapons, particularly the long spear, were for the most part fashioned from the stoutest woods. Their religion was essentially a forest-cult, traces of which are still to be found in the inborn love and appreciation of their modern representatives for the beauties of the woodlands, their leafy solitudes, the music of the wind in the branches, the caroling of the birds in the lofty treetops and the soft murmurs of some half-hidden rill. "The God of the German dwelt not in the cold wealth of marble fane, nor in the echoing vastness of grand cathedrals, but mid the fresh groves of eternal oaks." Under these venerable trees the ancient German adored his gods, for there only, it seemed to him, could divinity properly dwell.

It is but natural that men who had been brought up in the close companionship of the forests should transmit to their offspring, through well-nigh countless generations, some of their deep regard for woodland beauty, antiquity and associations. But with this regard they associated due appreciation of the present economic value of their forests. The question of their preservation and distribution, so that all places may at all times derive their share of the benefits from them, is one of pressing importance. Aside from every consideration of the past, the

*Delivered before the National Irrigation Congress at Spokane, Wash., August, 1909

Dense Foliage Facilitates Exchange of Gases: White Pine Plantation (Page 673)

The Beauty of the Woodlands: Hemlock Seedlings (Page 671)

Forests an Important Factor in the Economy of Nature

forests, as producers of fuel and lumber, with all the uses to which these are put, to say nothing of by-products, are intimately connected with the welfare of men. Many of them live by working at trades either directly or indirectly dependent on them.

What position do the forests hold in the economy of nature, that is, in the relations and interworkings of what we may call its four primal factors—the animal, vegetable, and mineral kingdoms? These are closely connected with one another. For example, animal and vegetable life are especially interdependent, not only as regards the furnishing one to the other of the essentials of existence, but also in their relation to the atmosphere—a matter of great concern to man. It has often been shown that the same carbonic acid gas which is destructive for animal life, is an essential for vegetable life. Plants need this gas to develop their organs, and in turn emit oxygen, which is equally vital to animals. All plants, but particularly areas of trees with their wealth of foliage, are instrumental in effecting this exchange of gases; hence, any discussion of the chemistry of the atmosphere has to take into account the great and real influence of the woodlands. A beech wood, which furnishes on one hectare 9½ feet of wood in a year, will in this period throw off 51,567 cubic feet of oxygen, enough for the requirements, in that regard, of eight adults the same length of time. But while thus fitting the atmosphere for animal life, trees with their green leaves and branches bind the carbon of

Forests Absorb and Surrender Moisture: Typical Forest of Ohia Lehua in Region of Heavy Rainfall, Hawaii (Page 675)

the gas for use as fuel, starch, etc. Even this brief statement of facts goes to show that forests are an important factor in the economy of nature, contributing not only to the habitableness and beauty of the land, but also to the health, nay, to the very existence of its inhabitants.

A second function of great moment is the regulation of the temperature. They truly measure out rain and sunshine. They absorb the vast quantities of water that men do not use. Close observation has shown that a leaf of ordinary size can absorb about fifteen to forty-five grains of water in a day, and a leaf of larger dimensions sometimes even as much as a small pailfull. But where evaporation proceeds unhampered, warmth is held bound and cold produced. Forests, therefore, temper the heat, hinder radiation and so lessen also the amount of lost heat. This warmth, necessary for the process of evaporation, can only be taken from the atmosphere, the temperature of which is thereby lessened. A wooded region, then, slowly warms and cools by turns, and produces a corresponding change in the temperature of the neighborhood. The moisture acts as a cooling influence in evaporating, while the atmosphere and clouds hold their heat because radiation is in a large measure checked. The numberless vapor-laden leaves facilitate the formation of mist and dew. Their warm dampness assists in cloud building; while the whole wide area of vapor, inhaling and exhaling foliage at the top of the trees, holds them and the mists, to the decided advantage of the neighborhood. Thus, this process of cooling and evaporating, itself productive of rain and mist, in turn benefits the forests themselves and the neighboring fields and meadows. All the phenomena of the atmosphere work together to the great end of making possible the existence and well-being of earthly life.

The forests are, however, even in another sense essential to the natural organization of forces, as water-gatherers and distributors and spring-builders and feeders. We have seen how life on earth is dependent on air and water. Now, the forests absorb much moisture from the air and again surrender it freely. They retain a great part of the moisture collected in their locality, and so act as reservoirs for all atmospheric condensations. In this way they become the sources of numerous springs and streams; prevent extremes of dampness and drought and keep the precipitation from flowing off too rapidly. The raindrops falling on the leaves and trickling down the stems reach the ground with much less force. There, if not to a large extent immediately absorbed, the water is at least retarded in its flow, so that it gradually sinks into the real ground below (which is always kept open by the mass of dead leaves lying on it), whereas on a bare, sloping plane it flows off in large measure. The snows, too, melt more slowly under the influence of the milder conditions fostered by the protection of the trees, and penetrate into the ground, which for the same reason is seldom frozen hard beneath its blanket of grass and fallen foliage. These waters are slowly and constantly drained off to feed the springs, wells and rivulets. Men have often found the ordinary sources of their water-supply exhausted, because the mountain and hill-tops had been cleared of their woods, and that, too, at times when the water was most needed in the houses and on the farms. This also explains why after a heavy rainfall the water may be so murky as to be entirely unfit for use. There are no cheaper, better and more sanitary water reservoirs than the forests. Artificial water reservoirs in the shape of ponds or produced by dams can never equal them because their capacities are limited, their contents may be diminished by evaporation and may become poorer in quality as the drouth proceeds. The water that is drawn from the bare floor of such a reservoir into the pipes for daily consumption is often contaminated, and entirely lacking in refreshing carbonates. Ponds and reservoirs must, indeed, be constructed where the forest lands have been cleared, but they are at best only makeshifts.

That many regions may be made unproductive and even uninhabitable because of the destruction of their woodlands is evident from what has been said. Persia, once the most productive and prosperous of lands, is now nearly all a desert; it is only with grave dan-

Snows Melt More Slowly Under Influence of Forest Conditions: Michigan White Pine Forest Scene in Winter (Page 675)

We Should Transmit Our Woods and Waters, in Unimpaired Beauty and Usefulness, to Our Children (Page 678)

ger of starvation that one travels to the ruins of the world's proudest cities: Susa, Babylon and Persepolis. Sicily, in ancient times the granary of Italy, has now large stretches of stony waste instead of luxuriant groves on its mountain-sides, and every rain washes the moraine into the valleys below. In the southern part of Italy, heavy rains have injured the productivity of the fields by fully ten per cent. In the Tyrol, too, at least one-third of the area under cultivation a century ago is now waste land. The same is the case in Spain, Portugal, Greece, Iceland, Ireland —all have suffered in point of productivity because of the loss of their forests.

Forests, moreover, are important for sanitary reasons. Swamps and morasses, which breed disease by their miasmatic dampness, are dried up through their influence.

If we are to further national prosperity by the development of industries, it is also to our interest to transmit the forests, the legacies we have received from our fathers, to our children in unimpaired beauty and usefulness. Therefore, it is a matter of national concern that your forests should be protected. The effects of wholesale and unreasonable exploitation by private concerns are often farreaching; the springs are dried up, a drought ensues and not infrequently high winds result. Fields and meadows need water, and in considerable quantities, but it is of benefit only when the supply is slow and steady. Heavy rains flow off, for the most part, and if the area is an open stretch they can supply no springs because there is no vapor nor constant passage of moisture in such places. The forests, however, with their dense foliage, furnish protection and the necessary barrier for precipitations without which it would be well-nigh impossible to make any successful settlement. With the passing of forests, we have shown, disappeared prosperity, and whole regions have become wild and barren. The waters rush from bare mountain-sides, after a heavy rainfall, down into the valleys, working destruction on the farmers' fields and pastures. But the torrents are absorbed and retarded and transformed into refreshing springs and profitable rills where the high places are covered with trees.

Again, while woodless flats hardly condense the clouds blown over them by favorable winds, and so do not perform their work of refreshment and revivification, wooded districts attract every wandering cloud and make it yield a gentle shower. The influence of forests on the rainfall of a region is expressed also in the fact that they render the climate more equable. The warmth which is received by them through the day and held because of their moisture pours out on the fields at night, relieving their coolness. So, also, do they mitigate the heat of the day, for they emit much of their vapor then, which serves to cool off the air and often raises a refreshing breeze. They attract the mist and the dew, whose cooling moisture it again turns into rain. In woodless districts heavy rains may fall, but seldom for any length of time, and then they are usually followed by a long dry spell. The woods, too, break the force of storms, cloudbursts and hail. Wooded eminences act like a wall against hurricanes and violent winds. The torrents of cloudbursts are arrested by them. Passing over them, violent rain and hail storms are tempered and so lose their force when blowing over the adjacent cultivated areas.

Our discussion would be almost indefinitely prolonged were we to consider forests in their disinfecting and air-clearing functions, their prevention of epidemics and contagious diseases. These functions are of the greatest importance to men. We are keeping entirely within the bounds of truth when we say that, in the destruction of the forests, humanity loses one of the necessaries of life. Therefore, you should always look carefully after the preservation and propagation of your forests.

RESERVOIRS ON CHIPPEWA RIVER

By Hon. THAD C. POUND

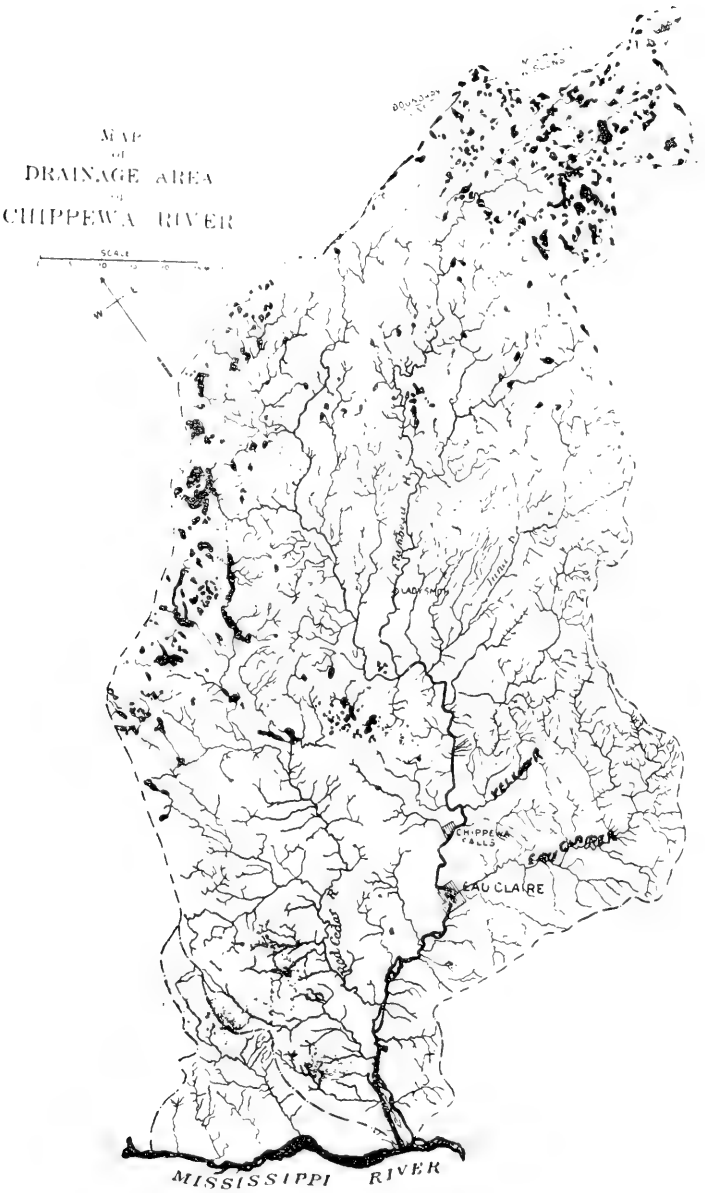
THE prevailing ignorance regarding the work already undertaken by the Government and information submitted to Congress prompts me to present to the public some significant facts and conclusions respecting the subject of reservoirs.

Thirty years have elapsed since Congress asked the War Department to investigate and report upon the practicability and cost of reservoirs to improve the navigation of the Mississippi River and its navigable tributaries. The reports of such investigation, by extended surveys, examinations, and expert calculations of the engineering bureau, have been submitted to Congress from time to time, and some valuable work on the headwaters of the Mississippi River has been done. But this all-important subject has been in the main strangely neglected. The wonderful awakening of the entire Nation respecting our great natural resources, and the importance of their conservation and utilization, invite the fullest available information regarding our natural waterways, and the best means of their improvement for the various uses which they may subserve, among the most important of which are navigation and water-power.

It chances that the first step to be taken, the creation of an extensive system of reservoirs, will accomplish a purpose of immeasurable utility, namely, the prevention of disaster resulting from destructive floods. This alone would justify the expenditure required for fully carrying into effect the system. To make clear the feasibility, economy, and efficiency of the reservoir system in the prosecution of this great work is the purpose of this article. In order to present with brevity the significant facts involved, I shall take as an example the Chippewa River, in the state of Wisconsin, and submit summarily the conclusions relating to it to be found in the reports of the War Department. It is doubtful if there exist on the continent or anywhere else conditions so unique, extensive, and complete in every detail as are found upon the headwaters of the Chippewa River, in Wisconsin, for the accomplishment and maintenance of results proposed by the reservoir system, to wit, the prevention of disastrous floods, facilitation of water-power, and the promotion of navigation. The total drainage area of this river and tributaries is 9,573 square miles, its course extending from its source to its junction with the Mississippi River, being 267 miles, and its volume being supplied by more than 100 lakes, large and small, and countless springs. In the annual report of Maj. Chas. J. Allen for the year 1880 will be found, under the head of "Examination and Surveys at Headwaters of Saint Croix, Chippewa, and Wisconsin Rivers," the following relating to the Chippewa River, abbreviated:

The report states that twelve eligible sites for dams were found, the first being upon the Manitowish River at the outlet of Red Lake; proposed dam, fif-

NOTE.—This article, by the Hon. Thad C. Pound, of Chippewa Falls, Wis., is intended to supplement an article by the same author published in CONSERVATION for December, 1908. The former article gives the origin and progress of the reservoir system, designed to restrain floods and improve river navigation, the initial step for which was taken in the year 1877 by Mr. Pound, then a member of Congress from Wisconsin. The facts are of vital interest.



teen feet in height and 250 in length; resulting reservoir capacity, 1,840,000,000 cubic feet, corresponding to 236.62 cubic feet per second for ninety days; surplus supply, 184,615,360 cubic feet, to be retained in Bear Creek Reservoir; cost of construction, $7,615; calculation of results in this and all cases based on an average annual rainfall of thirty inches, with the impounding of one-quarter of the precipitation. It is well here to observe that the low-water period during the open season is calculated to average "ninety days."

Second site, on Bear Creek, ten miles below the outlet of Flambeau Lakes; dam, fifteen feet in height and 2,500 feet in length; reservoir capacity, 5,401,567,152 cubic feet; cost, $47,000. The supply from these two reservoirs will insure 552.81 cubic feet per second for a period of ninety days.

Third site below Park Lake, on Turtle River; dam, fifteen feet high and 296 long; reservoir capacity, 120,782,720 cubic feet, yielding 79.83 cubic feet per second for ninety days; cost, $9,941.

Fourth site, at outlet of Butternut Lake, a dam ten feet high and 331 feet long gives a reservoir capacity of 585,446,400 cubic feet, yielding 75.71 cubic feet flowage per second for ninety days; cost, $5,216.

Fifth site, at outlet of Round Lake, on the Upper Flambeau, a dam ten feet high and 170 feet long will produce a reservoir with a capacity of 1,353,031,416 cubic feet, yielding 135.93 cubic feet flowage for ninety days; cost, $10,550.

Sixth site, about two miles below the outlet of Squaw Lake; a dam nine feet high and 280 feet long gives a reservoir of 731,808,000 cubic feet; cost, $4,000.

Seventh site, below outlet of Bear Lake east fork of the Chippewa River; a dam nineteen and one-half feet high, 1,015 feet long, creates a reservoir of 1,114,148,851 cubic feet capacity, with surplus supply of 3,147,009,144 cubic feet of water, and yielding 143.15 cubic feet flowage per second for ninety days; cost, $25,925.

Eighth site, at Little Chief Lake, east fork of the Chippewa; a dam twenty-four feet high and 710 feet long will create a reservoir with capacity of 771,332,000 cubic feet; surplus supply, 232,290,391 cubic feet of water; cost, $40,702.

Ninth site, at the outlet of Moose Lake, west fork; a dam twenty-seven feet high and 1,235 feet long creates a reservoir with 2,021,783,402 cubic feet capacity, with surplus supply 1,712,179,798 cubic feet, giving an average flowage of 271 cubic feet of water for ninety days; cost, $45,090.

Tenth site, below Pakwewang Lake, west fork of Chippewa River, a dam twenty-three feet high and 840 feet long will create a reservoir with a capacity of 6,193,132,598 cubic feet, portion of supply to be drawn through Moose Lake surplus, affording a flowage of 791½ cubic feet of water per second for ninety day; the cost of this dam, $55,511.70.

Eleventh site, at Lac Courtes Oreilles; a dam five feet high and 260 feet long will produce a reservoir of 1,981,331,000 cubic feet capacity, furnishing flowage of 255.44 cubic feet of water per second for ninety days.

Twelfth site, on the Chippewa River, below the mouth of Paint Creek; a dam twenty-two feet high, 620 feet long, will create a reservoir with capacity of 508,336,720 cubic feet, to cost $60,000.

The foregoing, summarized from Major Allen's report of 1880, shows the result of an incomplete survey and examination of the Chippewa River and branches above the city of Chippewa Falls. It may be safely stated that a complete examination would result in the discovery of eligible sites for reservoirs equaling in capacity the above-described. It is significant to note further that two large tributaries flowing into the Chippewa below Chippewa Falls, to wit, the Eau Claire and Red Cedar, are omitted, the improvement of which would be more valuable to navigation from Eau Claire City to the Mississippi.

Summing up the results of this incomplete examination, the major states that, as a result of the reservoirs named, "2,800 cubic feet per second for ninety days would be added to the normal low-water discharges of the stream." The low-water discharge of the Chippewa River at the mouth or at the jetties may be taken at about 2,600 cubic feet per second and about 3,400 cubic feet above the entrance of Beef Slough. (Beef Slough is now closed, adding 800 cubic feet at the mouth of the river.) When 4,000 cubic feet per second pass through the jetties good navigation obtains from the mouth to Eau Claire. Adding the increase (2,800 cubic feet) to the 2,600 cubic feet at the mouth, we have at least 5,400 cubic feet for ninety days, or 1,400 cubic feet more than absolutely required for purposes of navigation. To these may be added 800 cubic feet formerly diverted through Beef Slough.

That the Chippewa River is by nature a navigable stream is evidenced by the fact that from the earliest settlement of the valley it was navigated by many steamboats as far as Eau Claire; and, less frequently, to Chippewa Falls, until its valuable use for such purpose was suspended by the exclusive control of logging and lumbering interests for the driving and storage of logs. Happily for the public good, the driving of logs has ceased below Chippewa Falls; and all interests may be subserved by the employment, by the Government, of effective means of improvement for navigation, the facilitation of water-power, and restraint of floods.

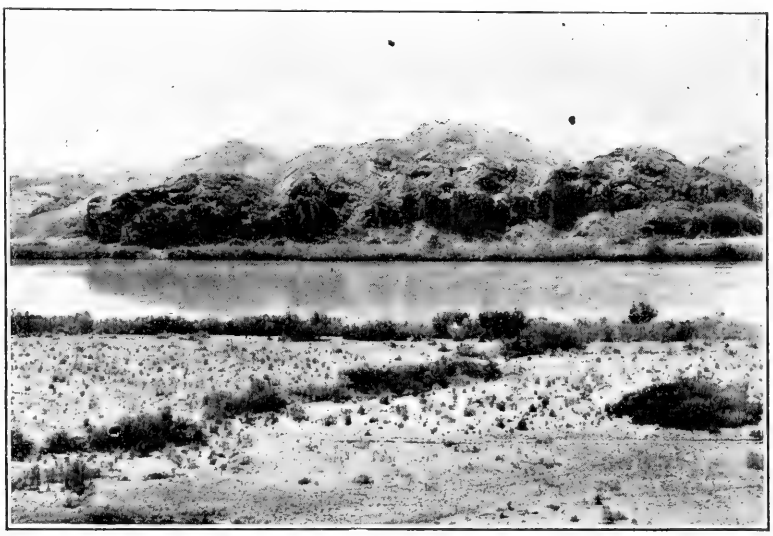
What is true of the Chippewa is also true of the Wisconsin and St. Croix rivers in Wisconsin. With the improvement of these rivers as proposed, the Mississippi River will derive a benefit which will insure a six-foot channel from St. Paul to Dubuque, where it will be supplemented by other methods of improvement; and the cost of all methods for the entire navigable stretch of these tributaries and the Mississippi be reduced fully four-fifths by the stability of channels and the checking of erosion from the banks.

The magnitude and importance of this great work cannot be overstated.

When such uniform flow from the Chippewa River shall have been secured, a great benefit to the navigation of the Mississippi will be insured. When supplemented by a like flowage from the St. Croix and Wisconsin rivers, a low-water channel of at least six feet will be maintained in the Father of Waters, and the cost of improvements under present methods will be reduced fully four-fifths.

The incalculable benefits to navigation and water-powers and the restraining of floods are certain to be realized. The duty of Congress to provide for the earliest accomplishment of the great work is clearly manifest. That the engineer bureau is in full accord with the system is shown by reports on file in the War Department.

When theories prove to be practicable and valuable, action should not be delayed. That the management and operation of the reservoir system by the Government officials may not satisfy all private interests involved may be conceded; but may we not more safely trust the Government, which has full authority in the premises, than to yield control to private individuals or corporations who are expected to serve their own interests regardless of the public weal?



Yuma Dam Site, Colorado River, Right Abutment, California

PEOPLE'S RIGHT TO RUNNING WATER

By HARRISON WILLIAMS, Spokane, Wash.

IT IS quite safe to assume that, in the absence of any Government interposition or restriction, combinations of capital would monopolize the greater water-powers of the country, especially the enormous unimproved water-powers on the public domain; and those properties would, as a rule, be capitalized as high as steam-power competition admits. How and to what extent would the people, considered as a political and social unit, be affected by such monopoly control, and its incident capitalization? That is the question of the hour.

Examination of a large amount of available data will, I believe, establish an average ratio of the cost of steam-power to that of water-power at not less than three to one. Assuming that ratio; to capitalize as above would be to capitalize at three times as much as the actual investment; so it will be seen that two-thirds of such capitalization would consist of something which is not investment. This something is simply the usufruct of running water; nothing else is discernible in it. But running water is Nature's gift, wholly apart from anything that man has done, and of such a nature that it cannot be set apart as property (proper to a person), nor can its usufruct rightfully be capitalized by individuals or corporations for profit.

This usufruct element is the people's rightful, equitable interest in running water when used for power. It would seem to be a self-evident proposition that only the earnings of capital should inure to capital and that the benefits of Nature's endowments should inure to the community, the people as a social unit; inure in the way of cheap motive power, cheap electricity, and in kindred ways, not in the way of a revenue to replenish the national treasury—regarded with alarm by the reactionists; though even that were incomparably better than that it should materialize in swollen fortunes.

Water-power trusts having the benefit of two dollars of Nature's gift to one of their own contributions, and in a field so vast as a water-power monopoly would provide, would inevitably beget swollen fortunes exceeding that monstrous progeny of Standard Oil.

To get a good perspective of the magnitude of the people's stake in this problem, let us consider a single stream. The Pend Oreille River, in the panhandle of Idaho and northeastern Washington, has a potential capacity which could not be duplicated by steam-power for less than $35,000,000 a year, in support of which allegation I submit the following data:

Water-supply and Irrigation Paper No. 135, United States Geological Survey, gives the average rate of discharge of that stream for the year 1904 at 28,130 second-feet. But that is not all "commercially" available for power, as there is not available reservoir capacity to hold back but a small part of the water of the freshet season; and it is not practicable to equip for a stage beyond that which can be maintained for a considerable portion of the twelve months. To illustrate: The maximum rate of flow in May, 1904, was 92,000 second-feet, and the average for the month was 74,540 second-feet. For June, the rates were 93,000 and 85,040 second-feet, respectively, while the average for the seven lowest-water months was but 10,756 second-feet.

Calculations based upon the best obtainable data show a reservoir capacity which will give an average rate of 7,600 second-feet during the above

seven months. I estimate, however, that half of the reservoir capacity goes to make up the seven months' rate of 10,756 second-feet, leaving 3,800 second-feet to be added to the ordinary seven months' rate, making 14,556 second-feet available for power—a little more than half of the total run-off of the stream.

The fall of the Pend Oreille in its entire course—mostly in a few miles of it—is 750 feet. Reckoning on the basis of eighty per cent of the theoretical for useful effect, we get a result of 992,454 horsepower, of which 259,090 horsepower goes to the credit of the reservoirs, Flathead, Pend Oreille and Priest lakes.

A writer in a technical journal a few years ago stated the cost of steam-power for operating the New England cotton mills, where up-to-date engines were employed, at $36 per horsepower year. That would make the cost of the above amount of power produced by steam $35,728,344 a year.

As much power may be had from the surplus water a considerable part of the other five months as it may be found practicable to install plants to utilize. So much for one stream; a large one, however, known locally as "The Mighty Pend Oreille." But there are other streams which, together with the Pend Oreille, have an aggregate capacity of 2,000,000 horsepower, in an area of 30,000 square miles of the Spokane country. The foregoing large figures will indicate the enormous stake the people have to gain or lose in the controversy which is agitating the country.

There need be no apprehension that there will not be capital for investment in the improvement and utilization of water-power for good profits on the capital actually invested. When there shall be a fair understanding as to what belongs to capital and what belongs to the people, and the people find themselves in a position to command what belongs to them, there will be a general disposition to be liberal with capital. In fact, the almost universal custom has been to be too liberal. But, as every user of water for power is using an element which is not the separate property of such user—an element which, in fact, does not possess the property nature—the Government has the right to know what the actual investment is. But the Government's control must be exercised in a common-sense way, as is suggested, for instance, by the legal maxim that "the law does not concern itself with trifles."

But if the foregoing reasoning is sound—and I think the more it is considered the more generally it will be approved—it follows that all water-power, improved and unimproved, whether on the public domain or elsewhere, is subject to the people's equity, for the usufruct doctrine is the announcement of a fundamental principle. The people's equity is inalienable. It would be a serious matter if the Government's control related only to water-power hereafter to be improved in the public domain, or on navigable streams. If such were the case, it would be only a question of time when the Government would have to take over the water-powers and operate them for the common good, for it may as well be understood that the predatory exploitation of the Nation's resources, those resources which are peculiarly Nature's gift, has to cease. The effect of such exploitation is to create and foster a plutocratic class, whose millions are the result of diverting, not the water, but its usufruct, from the people to whom it rightfully belongs to themselves.

Now, holding this usufruct element to be inalienable, there are important reasons for reserving water-power and reservoir sites from the acquisition of private title. One of these is that the Government can maintain its control better by having the title to itself. More important is that if the title to the land is in the Government it cannot be capitalized to participate in dividends.

The Government can enable a community to realize its equity by fixing horsepower rates. The power to fix rates was found to be the key to the solution of the railroad-merger prob-

lem. The Northern Securities Company was dissolved, but the merger still exists as a fact. And there are other railroad combinations which are virtually mergers—through the great financial institutions. The fact is, such combinations are not evils in themselves.

Combination promotes economy and efficiency. It prevents waste of economic energy, and as such it is a good thing. But monopoly is the perversion of a good thing, which the Government seeks to prevent without sacrifice. In the case of railroads and water-power, fixing rates appears to be the best way to accomplish these results, and it would seem that these results could be accomplished with greater facility in the case of water-power than of railroads.

Regarding the question of jurisdiction—whether state or Federal—the usufruct doctrine can be applied with equal facility under either jurisdiction.

SUGGESTION FOR THE CONSERVATION OF PETROLEUM

By ROSWELL H. JOHNSON

THE strong appeal that ex-President Roosevelt's efforts for the conservation of natural resources have made is surprising and significant. That the Nation will henceforth judge legislation and executive orders largely from this standpoint is assured. It is rather remarkable, therefore, that the greatest influence to-day making for the needless overproduction of petroleum is the lease form which the Department of the Interior, under Mr. Roosevelt, has forced upon those operators who leased from the Indians.

The business of producing oil is naturally one of rapid growth, because of the large prizes which follow success and the relatively small amount of capital which is necessary to engage in it. In this respect it resembles the mining of gold in contrast to the mining of other metals. When, therefore, governmental regulation adds to this a legal stimulus to oil-production, the conservation of petroleum suffers severely.

In the oil fields off the reservation it is customary to charge an annual rental upon leased lands until a well is drilled, when a royalty on the oil produced is paid. But when an operator leases from an Indian, the Indian Office forces him to pay $1.15 an acre a year the first two years; $1.30 an acre a year the second two years, and $1.75 an acre the fifth year until he drills; and if he fails to drill in five years, to lose the lease. The effect of these provisions is obvious. It forces operators to drill in spite of overproduction. It prematurely tests large areas of land, and brings into development pools which would otherwise lie reserved for years.

The demand of some rental for every year that a well is not drilled is an old feature of oil leases which should stand, but the automatic enlargement of this payment from year to year and the limitation of five years are wholly unnecessary and work a great disadvantage to the Nation.

It might be said that the department must look after the interests of the Indian first, even though the welfare of the Nation suffers; but the Indians collectively would probably receive more money from a flat rental with no time restriction, because of the larger number of leases which would be so carried on Indian lands, and because the oil coming on the market in response to its normal demands would bring a better price than when produced without effective demand, as at present.

THE WESTERN PHOSPHATE LANDS

By MORSE S. DUFFIELD, Utah

IN THE inventory of resources reported by the National Conservation Commission it was stated that at the present rate of use and waste the supplies of phosphate rock would be consumed within twenty-five years; and on December 10, 1908, President Roosevelt withdrew from entry certain public lands in Utah, Idaho, and Wyoming supposed to contain phosphate.

That his course was wise seems evident from facts adduced by the commission. In 1890 there were mined 510,488 tons of phosphate rock in the United States; in 1907, 2,265,000, and of this amount 1,018,212 tons, or about forty-five per cent were exported. The rapid rate of increase in the domestic use of phosphate, taken in connection with the limited supply, causes serious enough concern, but what called forth the most vigorous protest is the exportation of nearly half the product.

President Van Hise, of the University of Wisconsin, is authority for the statement that it has been shown, as the result of agricultural experiment station work in Wisconsin, Ohio, and Illinois, that in fifty-four years certain cropped soils of these states have been depleted of one-third of their original phosphoric acid—1,080 pounds, or twenty pounds per annum per acre. The Geological Survey says: "Applying this rate of exhaustion to the 400,000,000 acres of cropped land in the United States, it would require 12,000,000 tons of phosphate rock annually just to offset this loss, or as much as the total amount that has been mined from the Florida deposits. The phosphate rock of North Carolina is nearly exhausted, and the Florida deposits—once popularly considered practically inexhaustible—have reached their maximum production and will soon begin to decline. Tennessee has comparatively large deposits, but this field alone would, at the present rapid rate of increase, last, according to the geologists, only eleven years. There is some phosphate rock in Arkansas, but it is of low grade. The large deposits of the public-land states must furnish the most of the phosphate of the future."

In the light of these facts, the withdrawal of phosphate lands as an emergency measure was ordered by President Roosevelt, pending action by Congress. And it is to be regretted that bills now before Congress tend directly toward anything but conservation. Senator Smoot's bill merely suggests investigation and is mainly tentative in character; but the other two bills—one by Senator Flint of California, and the other by Mr. Mondell of Wyoming—are designed primarily to cure past litigation in the field, and do not have in view the conservation of the deposits. Of these two bills, Mr. Mondell's is the worse from the point of view of conservation. And the attention of the friends of this country's resources should be called to this question.

To begin with, Mr. Mondell's bill is dated May 13, 1908, and hence could not have been designed for the conservation of the deposits, because the phosphate lands were not withdrawn until December 10, 1908; on the contrary, it bears strong internal evidence of having been designed on behalf of litigants in the phosphate field. It provides that locations made either under the placer act or under the lode act, prior to the withdrawal of the lands, shall hold according to their priority, irrespective of whether the land was placer or lode—according to the Fed-

eral Statutes at the time of location. It further provides that where locations were made under the lode act such locations shall have no apex or extralateral rights (the right to follow the dip of the vein under the side lines). Besides these provisions, which are aimed to affect certain litigation now in the Federal courts, and are of doubtful constitutionality, it provides for the location, hereafter, of the lands under the placer laws.

To understand the significance this holds for the friends of conservation, it is necessary to understand the difference between lodes and placers. This is a distinction not widely known in the East, and, hence, not given its due importance in the consideration of this bill. Under the placer laws, locations are made on valuable mineral deposits —not "in place"—that is, *alluvial.* In Florida, most of the phosphate deposits are *placers; i. e.,* they are a phosphate gravel in river-beds and under more or less overburden, but not enclosed in bedrock.

Under the lode law, locations are made on valuable mineral deposits, lead, copper, asphaltum, gilsonite, etc.—*"in rock in place"*—that is, being in veins having well defined walls and a well defined outcrop.

From the staking of phosphate deposits in this western field under these different acts there has resulted much confusion, and several such conflicts are now in the Federal courts. The lode locators outnumber the placer locators, but the latter are mainly powerful corporations (one in particular, the Mountain Copper Company of London) being active on behalf of legislation favorable to the placer claimants, and if this legislation is passed its constitutionality will no doubt be tested in the courts.

The question naturally arises, Where does the theory of conservation come in? Under either the placer or the lode act, if there is no limit to the number of placer claims or the number of lode claims one may acquire, the deposits will be taken up *in toto* sooner or later, and probably at no distant date.

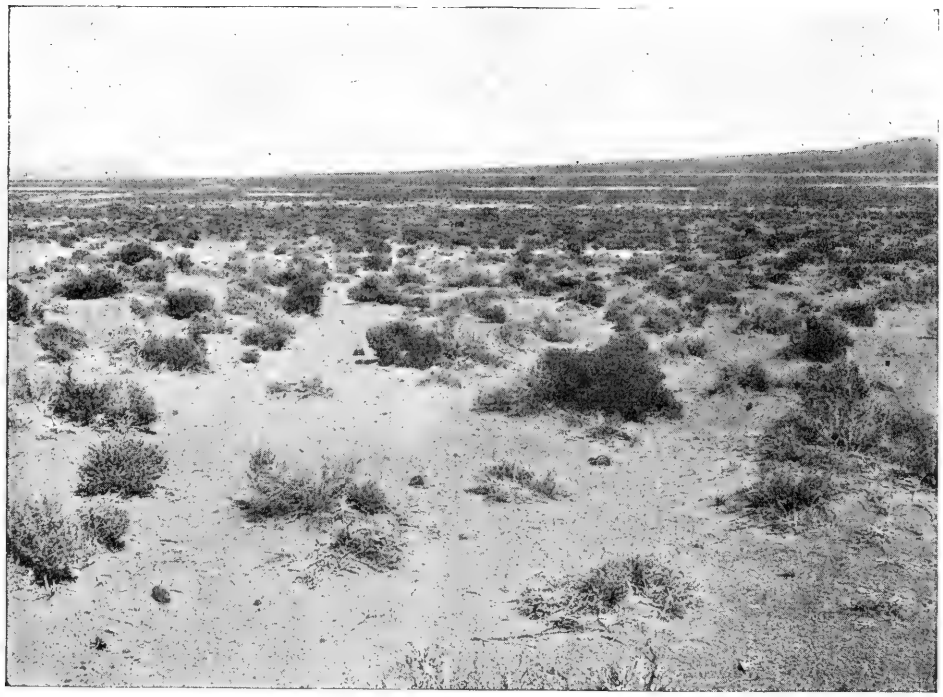
To consider the question better, let us examine the placer law briefly. By using seven names or powers-of-attorney other than his own, a locator can claim, under this act, 160 acres, making but one discovery and placing only four stakes in the ground. Upon the expenditure of $500 in development and the payment of $2.50 per acre to the United States, he can patent his claim of 160 acres. In other words, the land costs him, under the placer act, $900 for 160 acres, or $5.625 per acre. Where the phosphate vein is nearly vertical he can, under the ten-acre subdivision regulation of the placer law, stretch his claim out along the outcrop of the vein, so as to embrace the equivalent of nearly eight lodes, or perhaps more, according to the contour of the outcrop. Where the phosphate dips between thirty degrees to forty degrees, he can widen his claim so as to control the dip of the vein to all practicable depths of mining. He has this great choice, and his land costs him only $5.625 per acre to patent—less than its grazing value.

And now let us see what the lode locator must do. He is restricted to 1,500 feet along the outcrop of the vein and 300 feet on either side of it—only twenty acres in all to one location. He must spend $500 in development and then pay $5 per acre (twice what the placer locator pays) to the Federal Government—*i. e.,* $600 for twenty acres, or at the rate of $30 per acre. To be sure, to offset this he gets the right to follow the "dips, spurs, and angles" of his vein; but when the dip is very steep, his surface rights extend only to his side lines, and in such case he has scarcely any advantage over the placer locator, who can regulate the shape of his claim at will.

As stated above, there has been no limit nor is there any suggested to the number of claims a man may take under either the placer or the lode laws, and the western phosphate deposits cannot be conserved to the American people by allowing unrestricted action under either law. But to place the preemption of these deposits under the

placer laws (to say nothing of the retroactive and unconstitutional infringements on the rights of existent lode claimants that this bill contains) places the phosphate deposits at the disposal of locators at a price less than the grazing value attaching to adjoining land. The sheepmen will hunt up enough phosphate to constitute a legal "discovery," and then patent whole quarter-sections at $5.625 per acre. In that way the sheepmen will get valuable summer range with the phosphate deposits "thrown into the bargain."

Such promises to be the result of the legislation thus far proposed since the President's withdrawal of the deposits from entry. It will cause a rapid location of the entire field that would not otherwise have been expected. The irony of such attempts at conservation is in line with the familiar story of the loss of the rest of our natural resources.



View Showing a Stretch of Irrigable Lands That Have Been Filed Upon and Homesteaded Under the Main Truckee Canal Nevada; Five Miles Southeast of Wadsworth, Nev.

THEODORE ROOSEVELT

Dynamic Geographer

By FRANK BUFFINGTON VROOMAN, F. R. G. S.

(*Continued*)

RECLAMATION

OUT of this work, and alongside this work, has been developed, and is being developed, the great national undertaking known as the "Reclamation Service," which has already made vast contributions to the prosperity of sixteen states and territories.

President Roosevelt is the first President who ever mentioned the subject of irrigation in a message to Congress. This work is as much his own as any such work can be said to be the work of any one man. In his first message to Congress, after referring to the effects of forests on water-supply, he said: "The forests alone, however, cannot fully regulate and conserve the waters of the arid regions. Great storage works are necessary to equalize the flow of the streams and to save the flood waters. Their construction has been conclusively shown to be an undertaking too vast for private effort. Nor can it be best accomplished by the individual states acting alone.

"Far-reaching interstate problems are involved, and the resources of single states would often be inadequate. It is properly a national function, at least in some of its features. It is as right for the National Government to make the streams and rivers of the arid regions useful by engineering works for water storage, as to make useful the rivers and harbors of the humid regions by engineering works of another kind. The storing of the floods in reservoirs at the headwaters of our rivers is but an enlargement of our present policy of river control, under which levees are built on the lower reaches of the same streams.

"The Government should construct and maintain these reservoirs as it does other public works. Where their purpose is to regulate the flow of streams, the water should be turned freely into the channels in the dry season, to take the same course under the same laws as the natural flow.

"The reclamation of the unsettled arid public lands presents a different problem. Here it is not enough to regulate the flow of streams. The object of the Government is to dispose of the land to settlers who will build homes upon it. To accomplish the object, water must be brought within their reach.

"The reclamation and settlement of the arid lands will enrich every portion of our country, just as the settlement of the Ohio and Mississippi valleys brought prosperity to the Atlantic States. The increased demand for manufactured articles will stimulate industrial production, while wider home markets and the trade of Asia will consume the larger food supplies and effectually prevent western competition with eastern agriculture. Indeed, the products of irrigation will be consumed chiefly in upbuilding local centers of mining and other industries, which would otherwise not come into existence at all. *Our people as a whole will profit, for successful home-making is but another name for the upbuilding of the Nation.*" (December, 1901.)

This is no place for even an outline of the history of conservation, but it

is well to note that irrigation has been practised in Egypt, India, Mexico, and many other lands for long periods of time. It is a proud heritage for any race that wherever their flag has gone, there, constructive and scientific work has arisen for the benefit of the peoples who had, from time immemorial, been subject to flood, drought, famine, plague. When was there ever so propitious a day for Egypt and the Soudan as when the British flag was planted there, with British engineering skill and British millions of pounds sterling? The dams and canals, channels and barrages already finished, with the new ones planned, have brought a prosperity and a peace to the North of Africa which never has been seen, and never has been possible in all the weary millenniums which have dragged over its thirsty wastes. Though there has been irrigation in India from time immemorial, it has been on a small scale. No vast projects were ever undertaken until the British occupation, such, for example, as the Chenab Canal, which irrigates 2,000,000 acres, or two-fifths as large an area as all of cultivable Egypt—a canal with six times the discharge of the Thames at Teddington. Thirteen millions of acres of the 44,000,000 acres under irrigation in India are watered from wells, but the vast government undertakings have become the main insurance against the recurrence of famine, that dread visitant in this overcrowded land.

The first Presidential message to Congress recommending Government aid to agriculture was that of George Washington, in 1796, himself a member of the first agricultural society ever organized in the United States. He recommended "a national board to encourage and assist agriculture * * * by stimulating private enterprise and experiment."

The first Presidential message recommending aid to irrigation and the national control of water-supply was the first message to Congress of President Roosevelt, December 3, 1901.

Legislation waited on Washington's recommendation forty-five years later, when Congress appropriated £200 for the purpose, which the Government took three years to spend! Within seven months after the recommendation of President Roosevelt, Congress enacted the most beneficent piece of public-land legislation which has become a law since Abraham Lincoln signed his Homestead Act in 1862. Eleven days after the measure became a law, recommendations were made for the withdrawal from entry of areas in six localities to prevent speculative filings on them, pending an act.

On the third anniversary of the passage of the Reclamation Act, on June 17, 1905, and within three years and seven months of the first presentation to Congress by a Presidential message of any plan for the national policy of the reclamation of arid lands by irrigation, water was turned on to 50,000 of the thirsty acres of Nevada, the first section of this national project to be completed. This is known as the "Carson" project. A very interesting incident in connection with the digging of the ditches of this project illustrates the value of the Hydrologic Survey. This irregular tract comprises a flat desert, which lay in the line of the immigrants' trail to California about the time of the gold discovery. There were here forty miles of country where never a drop of water was to be found. It was several, and sometimes many days' journey, with horses or mules or oxen, and every drop of water used had to be carried with them. Not all the immigrants knew this, and the consequence was that hundreds perished, with thousands of animals, and very often the only monument left to mark the spot where some father, mother, son, or daughter had perished and was left six feet deep in this desert soil was an old gun-barrel or steel ramrod to mark the place. Three wagon-loads of such pathetic mementoes were recovered from the digging of the main ditch. But the Hydrologic Survey has ascertained the fact by this time that this entire region, in fact almost the whole of Nevada, contains vast quantities of underground water, and had any one out of

those thousands of sufferers digged a grave six feet deeper, he would have found a well of life-giving water.

It is believed by the hydrographers who have surveyed the states, that the artesian water from the underflow of the streams and valleys can eventually be utilized for irrigating an additional 1,600,000 acres in Nevada alone, very much the greater part of whose land surfaces are so arid that they have hitherto been considered as irreclaimable desert.

Mr. C. J. Blanchard, statistician of the United States Reclamation Service, writes in a picturesque way of that far southwestern corner of the United States, "where everything bears mute evidence of a terrible struggle for life. It is the land which some one called 'The land that God forgot.' Everything that grows is covered with a thorn; everything that crawls is deadly. It is a topsy-turvy wonderland. We may not drink of the waters of the desert stream, for they are salty. In this strange region they dig for wood and climb for water, for the water is found in cup-shaped pools in the hills, and the wood is the big root of the Mesquite."

Down here somewhere is where the Salt River has cut through the mountains a narrow gorge, in which the Government is putting a dam of cement and sandstone, which will rise 284 feet above the river. This dam will be 170 feet thick at the base, 1,080 feet long on top, with a roadway twenty feet wide across it.

Down in the bed of the canyon is the city of Roosevelt, with its schools, churches, and houses, with electric lights, waterworks, and modern equipments, built by the Government for the dam-builders, which will soon lie 220 feet in the new inland sea, from which canals will carry water to assauge the desert thirsts below.

Every one of the twenty-eight Government projects which are scattered over the whole western half of the United States presents some new and interesting engineering problem to be solved. * * *

Any detailed account of one, or of all, of these projects, forms a subject and a task by itself. This is not the place to recount the details of all the different projects undertaken under the new national policy by the United States Government. But this much is certain, that the initiation of the project considered as a Government enterprise is another silver screw in the lead coffin of *laissez-faire*. It is sufficient to say that within seven years after the first recommendation ever made by a President to a Congress on the subject, many thousand people have already made their homes on land that was once a desert, and considered worse than useless, and was the home of the lizard and the rattlesnake. There are 25,000,000 acres of land already planned by the Government into farms and homes and cities, and, according to the late Major Powell, there are 75,000,000 acres more of this land capable of such transformation, where many millions of people will be able to make their homes, and the whole thing done on such business principles as that in fifteen years longer it will not have cost the United States Government so much as the value of a copper halfpenny in principal or interest.

Surveys and perfected estimates have been completed for twenty-eight irrigation projects. Out of these, all begun, many are finished and are already producing abundant crops.

A summation of the work of the Reclamation Service for 1907 shows that it has dug 1,881 miles of canals, or nearly the distance from Washington to Idaho. Some of these canals carry whole rivers, like the Truckee River, in Nevada, and the North Platte, in Wyoming. The tunnels excavated are fifty-six in number and have an aggregate length of thirteen and one-half miles. The Service has erected 281 large structures, including the great dams in Nevada and the Minidoka Dam in Idaho, eighty feet high and 650 feet long. It has completed 1,000 headworks, flumes, etc. It has built 611 miles of wagon road in mountainous country, and into heretofore inaccessible regions. It has erected and in operation 830 miles of

telephones. Its own cement-mill has manufactured 80,000 barrels of cement, and the purchased amount is 403,000 barrels. Its own sawmills have cut 3,036,000 feet board-measure of lumber, and 23,685,000 feet have been purchased. The surveying parties of the Service have completed topographic surveys covering 10,970 square miles—an area greater than the combined areas of Massachusetts and Rhode Island. The transit lines had a length of 18,900 linear miles, while the level lines run amount to 24,218 miles, or nearly sufficient to go around the earth.

The diamond drillings for dam sites and canals amount to 66,749 feet, or more than twelve miles. To-day the Service owns and has at work 1,500 horses and mules. It operates nine locomotives, 611 cars, and twenty-three miles of railroad; eighty-four gasoline engines, and seventy steam engines. It has constructed and is operating five electric-light plans. There have been excavated 42,447,000 cubic yards of earth and rock. The equipment now operated by the Service on force-account work represents an investment of a million dollars.

This work has been carried on with the following force:

Classified and registered service, including Washington office..	1,126
Laborers employed directly by the Government.....	4,448
Laborers employed by contractors.....	10,789

or a total of all forces of 16,363. The expenditures now total nearly £250,000 per month. As a result of the operations of the Reclamation Service eight new towns have been established, 100 miles of branch railroads have been constructed, and 14,000 people have taken up their residence in the desert.—*The Statistician.*

WASTE

Nothing in all the history of civilized nations in modern times has shown a wastefulness so reckless, so insensate, so criminal, as the wastefulness of the American people with the natural resources of their continent. The net result is the modern American billionaire and the imminent bankruptcy of the continental domain. Whatever gratitude posterity may cherish for institutions bequeathed, may be overcome by the indictments of the disinherited descendants of those who, in their insane scramble for immediate gain, have cried, "After us the deluge," and have burned the Nation's patrimony.

For a President to have discovered this; to have been intelligent and forceful enough to have, in a measure, stopped it; to have guaranteed our great-grandchildren the remnants of use left of a great geographical inheritance, is quite enough for one man in a lifetime to have accomplished.

The report of the National Conservation Committee, now in the hands of Congress, presents an appalling indictment of the political intelligence of the American people.

Three generations ago the American forest covered an area of a million square miles, one-third the land surface of the United States. Now there is not enough timber left to last the generation playing marbles in the school-yard.

Although the mineral production of the United States is second only to agricultural value, adding £400,000,000 per year to the national wealth, the waste in mining and treatment of mineral substances sum up an average loss to the American people of about £60,000,000 a year. The use of fuels which supply light, heat, and power, owing specially to the fact that manufacturing has increased so rapidly, has itself increased much more rapidly than the population of the country. The available and accessible supplies of coal in the United States aggregate 1,463,800,000,000 tons. But this includes the poor coal; we have been using the best and most accessible. We have already used seven and one-half billion tons and wasted nine billion tons of coal. The anthracite will hardly last twenty years, and the bituminous 100, at the present rate. But the use of coal is increasing almost, as it were, in geometrical progression, for in the decade

1896-1905 almost as much coal was mined as had been produced during the whole previous history of the United States. In 1906 the consumption was forty-six per cent greater than that of the average of the preceding decade, and the next year, 1907, consumed 66,000,000 tons more than was mined in 1906. Mr. Carnegie has said: "Still more wasteful than our process of mining are our methods of consuming coal. Of all the coal burned in the power plants of the country, not more than from five per cent to ten per cent of the potential energy is actually used. * * * Indeed, in ordinary electric-light plants, hardly one-fifth of one per cent, one five-hundredth part, of the energy of coal is actually utilized." Dr. I. C. White, state geologist of West Virginia, said at the White House Conference, speaking of the waste of natural gas: "From personal knowledge of conditions which exist in every oil and gas field, I am sure the quantity will amount to not less than one billion cubic feet daily, and it may be much more. The heating value of a billion cubic feet of natural gas is roughly equivalent to that of one million bushels of coal. What an appalling record to transmit to posterity."

"There can be no doubt that for every barrel of oil taken from the earth there have been wasted more than ten times its equivalent in either heating power or weight of this, the best of all the fuels, and also that much more than half of this frightful waste would have been avoided by proper care in oil-production and slight additional expenditure."

The United States is turning out nearly half the iron product of the world, and at a rapidly increasing rate, promising absolute extinction, at the present rate of consumption, in forty years. Inasmuch as there is no reason to suppose that the world will come to an end before that time, there is an imperative call for the geographical economist to take a hand in this insane scramble of individualism.

The loss to farm products due to injurious mammals is something like £26,000,000 annually, through plant diseases, approximately £80,000,000, and through insects, £134,800,000 each year.

Water is one of the economies of the Nation, as vital to our existence as the air we breathe. The sun lifts from the ocean and spreads out over the United States, in the form of rain or snow, 215 trillion cubic feet of water every year. One-half of this is evaporated, a third of it flows into the sea; the other sixth is absorbed or consumed. Out of the seventy trillion cubic feet annually flowing to the sea, less than one per cent is harnessed and utilized for local purposes, and less than five per cent is used for navigation or power. What becomes of the rest? The question as to whether it shall be economized and used, or wasted and allowed to devastate the land, shall be decided in the future, on the basis of the Nation's verdict concerning nationalism *versus* individualism. Over sixty trillion cubic feet of the seventy trillion cubic feet are not only absolutely lost to all intelligent purposes of a rational government and an economic civilization; not only are they unused for irrigation, navigation and power, but they exhaust themselves in the wholly avoidable devastation of freshets and floods. With the recent denudations of the forest-covers of our water-supplies the steady increase in the yearly damage by floods is startling. Since the year 1900 this annual damage has been steadily increasing from nine million pounds to forty-six million six hundred thousand pounds per annum, with the indirect losses running into figures very much higher than these. It is estimated that the annual loss to farmers alone in soil erosion is £100,000,000, and that the billion tons of soil matter annually carried into lower rivers and harbors, or into the sea, is all of this taken every year off the farms and lands of the country, resulting in even greater losses in the pollution of waters and the impediments of navigation and terminal transportation uses.

This waste of the soil touches the foundations of all and every civilization.

The water flowing to the sea goes back to the land from the sea; the soil never does. The water, as it were, is the devastating agent, the soil the victim. So that as the continental plains are being torn down the ocean beds are being filled up. The water returns to the soil, but the soil remains in the sea.

One of the most important problems, therefore, is to keep the thousand million tons of annually eroded soil on the land which needs it, 400,000,000 tons of which is being emptied into the Gulf of Mexico every year through the Mississippi River alone. When we remember how much of the top of the superficial area of the North American Continent the Mississippi has carried to the Gulf of Mexico, and made a layer approximately a quarter of a mile deep, and laid it over an area of nearly a hundred thousand square miles of the Gulf coastal plain, we realize the importance of stopping the soil erosion, which has been increased rather than diminished by the wasteful hand of man. We must save those forests which Nature has providentially planted along the tens of thousands and hundreds of thousands of miles of tributaries and sub-tributaries, which the settler in his recklessness has been cutting away; we must build great reservoirs in the hinterland where the eroded soil may be deposited, where the water may be clarified and shorn of much of its cutting power, where the water which now stands for freshet and disaster may be held back until the river banks have been bared by the drought; and we must turn these stored floods through the irrigating ditches to fertilize the desert, and over power wheels to make the "wheels go round."

Let it be remembered that it takes 10,000 years for Nature to make a foot of soil, and that through our blundering unintelligence we waste often in ten years what it will take Nature a thousand years to restore.

We are told that the possible horsepower in our streams is over 230,000,000, of which we use about two per cent; that there is enough of this available, *i. e.*, 37,000,000 horsepower, even now, as cheap or cheaper than steam installation, to exceed the entire mechanical power in use in the United States and to "operate every mill, drive every spindle, propel every train and boat, and light every city, town, and village in the country. And there are over four times this much horsepower running to waste over the Federal Government dams alone."

Mr. M. O. Leighton, chief hydrographer of the United States Geological Survey, says: "Our inland waters are our greatest national resource. The water flowing down our western mountains far exceeds in value the fabulous wealth represented by all the metals and minerals lying between the Rockies and the Pacific.

"To-day most of this resource is wasted. Each year at least 1,600,000 horsepower runs over Federal Government dams. Rented at $20 per horsepower, this would yield $32,000,000. Capitalized at three per cent, it represents an investment of $1,066,000,000 now wholly wasted."

And yet, with an unintelligent and incredible parsimony, we refuse the initial investment which would utilize a large portion of the ninety-eight per cent of waste water-power, while we are using up our coal and gas and oil as if they would last forever.

Out of the 215 trillion cubic feet of water annually raised by the sun and available for human uses, it has been seen that ninety per cent of the available dynamic power in foot-tons of the seventy trillion of cubic feet are not only wasted, so far as economic power and use are concerned, but are each year becoming a monster of destruction more ungovernable. The question of water-supply and conservation and use instead of avoidable disaster, becomes one, therefore, of vital moment for the entire Nation. It requires the immediate and intelligent and sustained attention of the legislative and executive departments of the country, as well as that of the whole people, who must decide at once between the patriot and the land-skinner. This is a subject that cannot even be approached from the point of

view of the individualist. The problems here involved can never be solved without the element of intelligence and patriotism. This is a question of a simple political application of scientific knowledge to the matter in hand, in one great national scheme and purpose, in one continental view, for one universal aim and end, and that is "The greatest good to the greatest number for the longest time."

Government experts have estimated that a working capital is needed for the national conservation scheme of £100,000,000; that the income from water-power alone would pay the whole thing, or that the cost of half a crown a head a year would save 50 shillings a year in certain few avoidable losses. They claim that not only would the destruction of floods and freshets be practically eliminated, and hence this enormous loss be saved, but that such an undertaking, which it would take ten years to finish, besides preventing £30,000,000 per year of flood damage, £73,000,000 annually of loss by forest fires, or £200,000 a day, which could be prevented by intelligent management, would save also £50,000,000 annually alone in transportation if one-fifth the freight could be handled by water; and quite another £100,000,000 in the prevention of soil erosion and through other benefits to farm lands. In these items alone the expenditure of two and sixpence a year *per capita* would save £2 10 shillings a year a head. This is making no account of the water uses in irrigation, the drainage of swamp and overflow land, and a purified and cheaper water-supply, and the consequent prevention of an enormous loss of human life from preventable disease, the economic gain from the mitigation of preventable disease being estimated at £300,000,000 a year. It is pointed out by these experts that there are many indirect benefits which would arise from these projects, *e. g.*, the development of water transportation instead of that by rail would reduce the increasing consumption of ties and mine timbers, or iron and coal. Every farmer in the country would benefit directly from cheaper transportation. It has been estimated that the income derived from power developed by works for the improvement of navigation would pay the entire cost of maintenance and continue further development, and pay interest on the expenditure of £100,000,000 as working capital. The full development of all the feasible water possibility of the country would furnish a power probably greatly exceeding five times the present total horsepower of all kinds in the Nation, or 150,000,000 horsepower. In addition to the reclamation of 25,000,000 acres of arid land, there are about 77,000,000 acres of swamp land now useless, but of inexhaustible fertility, which, if drained and thrown open to agricultural uses, would, allowing forty acres to each family, furnish homes for 10,000,000 people.

A working capital of £100,000,000 would save, directly and indirectly, £1,000,000,000 a year, and yield vastly more of economic good to the people and their posterity than can be reckoned in pounds and pence; and yet the land is infested with interests whose tools are in Congress, blocking this investment with the cry of "economy" and "deficit," with which they are blocking also the national defenses, and then boasting that we have laid up more wealth in a generation than Great Britain in half a millennium, and own over a quarter of the world's wealth. What posterity will think of these enlightened and disinterested patriots may be imagined from the opinion of some of their contemporaries—this Congress which has refused Mr. Roosevelt's request that £10,000 be voted for the maintenance of the National Conservation Commission. I believe the members of the Inland Waterways Commission worked for nothing and boarded themselves; otherwise we would never have had one.

(To be concluded)

THE NEW POLITICAL SCHOOL

By THOMAS ELMER WILL

MR. J. ARTHUR EDDY, temporary president of the (Denver) National Public Domain League, pays the conservationists the compliment of calling theirs the "'new-thought' political school." Mr. Eddy may be building better than he knows.

There is, developing in the United States, a new political school.

It is not attached to any party; its representatives are scattered through or located outside of all political parties.

This school represents a revolt against individualism and *laissez-faire*.

And how are we to understand these terms?

Mr. Eddy regards an attack on individualism as suicidal. Note Webster's definition of "individualism:" "An excessive or exclusive regard to one's personal interest; self-interest; selfishness."

This is exactly what the Denver school stands for; likewise, it is exactly the thing against which the conservationists protest.

What do we understand by *laissez-faire?*

The phrase originated in France in the years preceding the revolution of 1789. It characterized the economic philosophy of the Physiocrats.

In their day, the Physiocrats were reformers, "radicals," "dreamers," "cranks," representatives of a new era whose thought, combined with other men's actions, was to make that era a fact.

They were the protestants against decadent feudalism, the prophets of the new regime of modern business.

Feudalism, then on its last legs, meant paralysis to industry. That the new order might be born, the old had to be overthrown.

To be overthrown, its weaknesses had to be understood, and the superiority of the new gospel made plain.

This task fell to the philosophers—the Rousseaus, Voltaires, Diderots, and D'Alemberts—and to the economists—the Mirabeaus, Turgots, Quesnays, and Gournays.

These men protested against the old restrictions in thought and action, and demanded liberty.

The liberty the economists preached was, however, primarily that of the business man; the man protesting against internal tariff restrictions which forbade him to transport his goods from one portion to another of the kingdom without having them eaten up by dues and charges.

It was a protest against royal orders prescribing the styles of goods to be manufactured, their qualities, sizes, materials, shapes, and other features.

It was a demand that the dying order should take its hands off the newly arising one, and give it an opportunity to establish itself and render its service to the world.

Adam Smith, who revolutionized British economic thought, studied these doctrines at first hand in France, and his book became the bible of statesmen at home.

William Pitt swore by it, and sought, in so far as practicable, to put it into effect.

Barring occasional exceptions, the gospel of Adam Smith's Wealth of Nations was the gospel of *laissez-faire:* hands off, leave industry and commerce alone; let each work its will; let the business man buy in the cheapest market and sell in the dearest; give him a free field and no favors; unshackle trade, abolish monopoly, and let wealth flow as freely from point to point, within or without the nation, as the waters flow from shore to shore of the mighty sea.

For the time, the *laissez-faire* economics was necessary.

Feudalism had to be destroyed, modern industry had to be established; to the extent that thinkers and teachers can change systems, men of the type of the Physiocrats and Adam Smith effected this change; and to them the world owes a great debt.

But the new system, like its predecessor, was born to do its work, to die and pass away.

For society is a living, growing, evolving thing; institutional forms are not rigid, but plastic; not permanent, but temporary.

As the snake sheds its skin, human society sheds successively its economic garments, and takes on new ones.

The time came in Europe when "Smithianismus" became a fetter, as feudalism and Colbertism before it had been fetters.

Laissez-faire meant the triumph of the Whig, and the conquest of society, industry, and politics by commercialism; it meant the unbridled, lawless reign of the money-bags.

On one side, society was brilliant; but on the other, it was rotten.

Under *laissez-faire*, help yourself, get all you can, and devil take the hindmost. "the fortunes of Lancashire" grew up, "not by tens, but by hundreds and thousands per cent."

And while swollen fortunes were mounting, Mrs. Browning was voicing the "Cry of the Children," and "the Bitter Cry of Outcast London" was heard in the land.

Gradually, the conscience of Europe awoke; Carlyle wrote his "Past and Present;" Ruskin punctured the bubble of orthodox economics, and German historical economists exposed the absurdity of the "classic" fundamentals.

Like its predecessor, feudalism, *laissez-faire* read the handwriting on the wall.

National self-interest, moreover, opened its eyes, and men who could see beyond the profits of the rich began to reflect upon the question of the national defense.

Could England, for example, with an army recruited from slums and pauper warrens, protect herself from invasion?

And if starvelings could not fight, could they be expected to work? Could a nation maintain its commercial and industrial supremacy with a laboring population depleted, emaciated, and broken in spirit?

To such questions there could be but one answer. How increasingly definite it is to-day becoming we may infer from the goings-on in parliament, the Lloyd George budget, the hustings and the returns from by-elections.

America, the child of England, followed, as was to be expected, in the footsteps of the parent country. As she inherited the common law, so likewise she inherited the economics of England.

Until yesterday, Adam Smith, Ricardo, and Malthus ruled the colleges and universities of America.

To-day, in any up-to-date institution in the land, they are as dead as Julius Caesar.

Why?

Because the era of *laissez-faire* business—long rampant in the United States as in Europe—has at last run its course.

Because the people are awakening to the fact that "get all you can," and "devil take the hindmost" mean one rich man and an army of poor men.

And the army of poor men can outvote the one rich man, and are gradually getting ready to do so.

Our Denver critics lament that we quote Roosevelt. Why do we?

Because Theodore Roosevelt marked the governmental recognition of the out-of-dateness of *laissez-faire*, and of the incoming of the new regime.

And what is the new regime? Primarily, it is that under which the chief concern of America will be the interest, not of a few industrial magnates, but of the people at large.

It is the era which will recognize that a happy, contented, prosperous, patriotic, intelligent people, with time to live and the ambition to serve, is, from every point of view, vastly to be pre-

ferred to an era in which social and industrial policies are controlled by a handful of millionaires, while a multitude of common people, when permitted, do their bidding for a scant subsistence.

If the Denver champions of exploitation for the benefit of the few will inform themselves, they will ascertain that this new school is abroad in the land.

Were it not invidious, names of its representatives might be quoted at length.

Among them would be found leaders of contemporary literature at home and abroad.

The roll would include names high in the lists of the clergy, here and elsewhere.

Representatives of this school are writing the modern drama, and packing great houses night after night.

At last, after an era of proscription, they are being heard in American colleges and universities.

Others of them address select audiences in the parlors of the rich and cultivated, and multitudes from the most influential platforms.

Further, the spokesmen of this school are to-day found in legislative halls.

In the last session they well nigh captured the American House of Representatives. They speak in thunder tones in the United States Senate; and, while representatives of the old order flock to the cloak-rooms, the great American people stop and listen.

The Denver school may sing its song, but the song is that of the dying swan.

It may boast of the fight that is coming in Congress, but soon, under the dome surmounted by the Statue of Liberty, it will meet its Waterloo.

The people are not dead. Neither are they willing to pass on to their children a land looted and despoiled of its natural resources, and ruled by a few great trusts.

They have not read in vain the history of the Mayflower Pilgrims, who "sailed wintry seas to found Christian states."

The stories of Samuel Adams, Patrick Henry, and James Otis were not taught them for nothing, nor are the names of Wendell Phillips, William Lloyd Garrison, and Harriet Beecher Stowe meaningless.

And they still recall a President who declared that this Nation could not live half free and half slave.

And what lessons would we draw from such history? This, for one:

That the United States of America belongs to the people who occupy its territory, and not to a small percentage of them.

We would learn that, while exploiters and industrial freebooters may thus far have helped themselves to the wealth vouchsafed us all by bounteous Nature, the people meanwhile passively acquiescing, the day of passive acquiescence will not continue.

That day, in fact, has already about passed. The people are reasserting themselves.

Again, they are preferring their claims to that which is indefeasibly theirs; and, henceforth, we may expect them to insist upon the right to live normal, healthful lives, and upon the preservation of the opportunities which alone make such lives possible.

EDITORIAL

Competitive Methods

DISCUSSING Senator Burton's views on water transportation, the *New York Commercial* says:

> He goes on record in published interviews as declaring it to be absolutely necessary to secure national legislation for preventing the railroad interests of the country from conspiring to suppress water traffic; he says that it is useless to attempt any development of the freight-carrying possibilities of our American waterways until such a conspiracy has been impossible; and his proposal is that a law should be enacted by Congress forbidding the owners of railroads that parallel waterways to cut the rates of carriage below a certain minimum. Commissioner Smith, in his recently submitted report on transportation by water in the United States—part one, "general conditions of transportation by water"—records substantially the same opinions. * * *
>
> It may be that freight rates are too high nowadays—in some instances it is indisputable—but when it comes to forbidding railroad companies to makes rates below a legally established minimum, the proposal does not appear to be in the public interest. If a railroad paralleling a natural or an artificial waterway can haul freight at a profit at rates below those that the waterway can maintain profitably, it most certainly ought to be permitted to do it; otherwise, a burden is placed on the public that is essentially unjust and unreasonable.

Does the *New York Commercial* understand the situation?

More than twenty years ago the country was made acquainted with "the long haul" and "the short haul." In fact, abuses growing out of the long and short haul were potent factors in causing the establishment of the Interstate Commerce Commission.

The point was simply this: Two important shipping points, as Chicago and Omaha, were connected by several competing railway lines. To get business, these lines underbid each other on rates.

This process continued until profits in cases disappeared. Did this mean that the railways lost money? Not at all. What they lost on the long haul between the competing points they made up on short hauls between points on their individual lines which did not enjoy the advantages of competition. Thus was explained the marvel that goods might be hauled from Chicago to Omaha and thence back to some intervening point at less cost than they might be hauled direct from Chicago to the intervening point.

The same principle has been applied by the packing houses. When the trust's meat-shop moved into town, it proceeded to drive out all the other shops. This it did by cutting rates below the point at which the other shops could live. If necessary, it sold meat for a time at cost or even at a loss.

Then, when the other shops were gone, and the trust shop was secure in its monopoly, it simply raised prices and recovered what it had lost during the competitive war, with as much in addition as the market would bear.

This principle, according to the testimony of waterways experts, is exactly that which the railroads have employed in the destruction of river traffic.

A railroad has paralleled a river, cut the rates on the traffic for which the river competed, made itself whole on other traffic for which the river did not compete, and so put the river out of business.

Now, Senator Burton proposes that this little game on the part of the railroad shall be blocked by the enactment, by Congress, of a minimum rate law.

To this, the *New York Commercial* objects, saying further:

> There is no sense in, no justification for, a law that compels the public to pay extra high freight rates merely for the purpose of keeping alive waterways-traffic enterprises that otherwise would die.

From such comments one might infer that the *New York Commercial* was not familiar with competitive methods.

Make the Rivers Available for Transportation

THE tide of western demand for river transportation facilities is steadily rising.

A new and potential argument has been found in the $8,000,000,000 crop predicted by the United States Department of Agriculture. At first thought, such a crop would seem to call only for rejoicing. However, as in monetary discussions we are constantly informed, crops, to be available, must be "moved."

To move crops we must, of course, have the mechanism of exchange; we must, in addition, have the mechanism of transportation.

The West has by no means forgotten car shortages in the past, and it is now menaced with a similar shortage in the early future.

The Interstate Commerce Commission, through its chairman, Martin Knapp, has announced that the railroads this year will be unable to handle the enormous traffic that will come from large crops and the unusual activity in business and that there will be a car shortage similar to that of 1907, when millions of bushels of grain were left to rot upon the ground in the West because the railroads could not move the freight.

The vision is not enticing. The West has not forgotten the hillocks, almost mountains, of wheat which have been piled for weeks together upon the bare ground awaiting transportation and menaced by storms. But President Hill has long since assured the country of the utter incapacity of the railroads at any reasonably early day to handle the country's freight. The only remaining resource must be those highways used so generally and for so many centuries before railways were dreamed of, namely, the rivers.

Mr. Hill says:

> The freight to be carried by the railroads has increased two and a quarter times in ten years. The machine for handling it has increased its size little more than one-fifth. Production and business maintain their growth and volume. The railroads have nearly exhausted their resources for public service.
>
> In seeking more ample ways for traffic the country turns to its waterways for relief. These are about to emerge into an era of restored usefulness and influence in the development of our resources.
>
> The severest pressure upon transportation facilities and the greatest increase of demand upon them originates in the Middle West. From these fertile lands comes the surplus agricultural product that constitutes the real wealth of this country, and that, either directly or converted into meats or other foodstuffs, furnishes the body of our foreign exports. The time is soon coming when their product will be twice or fourfold what it is to-day. The problem of getting these food supplies out of the central basin and into their ultimate markets is the most vital to its economic welfare that the country has to consider.
>
> A vast traffic like that which will gravitate from the whole interior toward the Gulf as soon as facilities are offered needs river transportation. The embargo on commerce would be lifted. Not only would the products of the Middle West find an open door with a material lowering of the cost of reaching a market, but traffic all over the country would gain by this relief from pressure at critical points.

We have by nature the greatest system of inland waterways on earth; but, as President Roosevelt informed Congress, these rivers are, for transportation purposes, used less and worth less than fifty years ago.

The growing disuse of rivers for transportation is to be traced not to their inutility, but, we are told on high authority, to railway hostility.

Happily, however, this hostility is waning. President Hill, as noted, and President Finley, the first representing the Great Northern and the second the Southern Railway, have publicly declared in favor of the development of our inland waterways. These men possess sufficient breadth to perceive, what the history of waterway development in Europe has proved, that the increased use of the rivers, instead of hindering, has helped railway transportation.

Freight of which railways may in increasing measure well seek to rid themselves, that, namely of excessive weight and bulk, and commanding low rates, had far better be borne by the rivers, leaving to the railways a constantly in-

creasing bulk of other and more profitable classes of freight.

The development here, as everywhere among living and growing things, of the need for "differentiation and specialization" has from the first been inevitable and is now evident.

Our friends, however, who are so deeply concerned in the development of our inland waterways must not overlook the intimate and vital connection existing between those waterways and our forests. They cannot ponder too earnestly the words of Ambassador Jusserand: "It is an absolute principle: no forests, no waterways. * * * The question is as clear as can be: do you want to have navigable rivers, or do you prefer to have torrents that will destroy your crops and never bear a boat? If you prefer the first, then mind your forests. We can tell you, for we know. If the Mississippi is the 'Father of Waters,' the forest is the father of the Mississippi."

Unfortunately, not all waterways advocates have grasped this fundamental truth. For example, one of the leading advocates in Congress of internal waterways voted last March against the Weeks bill, a measure absolutely essential to the protection of eastern and southern waterways. All of which proves the need of increasing education, even in high places, as to the importance, breadth, and depth of the forestry movement.

Farmers Building Their Own Roads

A DESPATCH from Brenham, Tex., tells of a mass meeting of the people of Washington County, of that state, to devise ways and means to establish good roads.

As a result, an organization was effected called the Good Roads Association of R. F. D. No. 9.

We are told that there were over 100 progressive men present, that they agreed to tax themselves 50 cents per month, and that nearly all the members paid the first assessment.

Some may style this "individualism;" some, "communism;" some, "cooperation;" while others may see in it the germ of the town meeting far removed from its habitat in New England, Old England, or the German forest as seen by Caesar and Tacitus.

By whatever "ism" it be characterized, it is good, hard sense.

Governments, national, state, and municipal, have a vast work to do—vaster far than any of them have as yet undertaken.

But this does not exclude initiative on the part of individuals or interested groups.

Schiller's maxim, "Do the duty next to hand," applies not simply to individuals or to Governments, but to all to whom duty may seem clear, and who may not be barred by laws "strictly construed."

The work which might be accomplished locally and without waiting for further legislation is unquestionably vast. At our last annual meeting Secretary Wilson urged that everybody, whether Government did its duty or not, should plant trees.

In like manner many, while urging governmental action but not waiting for it, may enormously promote the good roads movement by attacking the problem where they are.

The Dry-farming Congress at Billings

BEFORE this issue reaches the readers of CONSERVATION, the Dry-farming Congress, due at Billings, Mont., October 26-8, will have been held. This Congress has been thoroughly advertised by a most efficient press agent. The prospect for a large attendance is excellent. Those enlisted in the movement are pressing enthusiastically for the conquest of the desert, not all of which is expected to be reclaimed by irrigation.

The Department of Agriculture, as Secretary Wilson writes Governor Norris, is scouring the world for plants that will grow and put organic matter into the soil during the year that is now occupied in fallowing. Others are working industriously to ascertain the best methods of conserving such moist-

ure as the soil actually receives. There seems little doubt that, between irrigation on the one hand, and dry-farming methods on the other, the arid area will, from now on, rapidly shrink until, we may hope, with the aid of forests for mountain slopes, it will have disappeared altogether.

Where to Get the Money

ON OCTOBER 7 the Upper Mississippi River Improvement Association closed its eighth annual convention in Winona, Minn.

Congressman Tawney, of that city, chairman of the Appropriations Committee of the United States House of Representatives, addressed the association.

He admitted that its object was desirable and "should succeed." The great problem, however, was that of "securing the means."

Said he: "The Government owns all the navigable rivers and all the harbors in the country, and to keep them all in good condition and repair would require a fabulous sum."

The proposition advocated by the convention, namely, a six-foot channel in the upper Mississippi, would require, he stated, twenty millions of dollars for its completion—a sum larger than Congress had ever before appropriated or authorized for any improvement except for the Panama Canal. The proposal for a bond issue was one in which he could not concur.

Mr. Tawney deprecated the costliness of wars, past and prospective, and expressed the hope that "the bill now pending, authorizing the improvement" of the Mississippi "at a cost of $20,000,000," and "carrying with it an appropriation of $20,000,000 per year for ten years" would pass. He, however, failed to indicate where the money would come from.

Every conservation proposal coming before Congress may, of course, expect to be met with the cry of "economy and deficit." To this, there are two answers, either of which is sufficient.

First, the country is full of wealth, practically unreached by taxation. Two ways of reaching it were suggested by President Roosevelt in the following language: "A graduated income tax of the proper type would be a desirable feature of Federal taxation. The inheritance tax, however, is both a far better method of taxation, and far more important for the purpose of having the fortunes of the country bear, in proportion to their increase in size, a corresponding increase and burden of taxation."

Legislation providing for either or both of these taxes might have passed at the recent special session, and might again pass with a little more encouragement. Through such channels, wealth can easily be drawn to meet every proper requirement of the National Government.

Second, conservation, properly handled, yields far more than it costs. To hesitate at an expenditure for reclaiming deserts, draining swamps, improving inland waterways, preventing erosion, or saving forests and waterpowers, is like hesitating to spend money for seed corn.

Ordinarily speaking, a crop pays for itself and yields a profit besides; the same is true of conservation policies properly established and administered. To object to them on grounds of national poverty is to confess incompetency in statesmanship.

Courts, Congress, and Conservation

A DECISION recently rendered by a Federal judge in Oklahoma bears upon an aspect of the conservation movement.

Oklahoma is rich in natural gas; the people of that state desire to guard this utility for their own benefit.

To do so they have utilized their state constitution. In framing this document they inserted a section denying to any corporation the right of eminent domain or the use of highways unless a domestic charter was first taken out.

Thus safeguarded, it was believed the state could place upon the corporations such restrictions as it might see fit, and so preserve its natural gas and other interests.

But the constitution-makers, it seems, failed to reckon with the Federal courts. A Federal judge is now reported to have launched a sweeping injunction restraining state officers from interfering with the plans of corporations to pipe gas into other states.

The judge holds that, like grain or coal, natural gas is a product of interstate commerce, with the handling of which the state has no right to interfere.

The state of Maine has a similar law, prohibiting corporations from transmitting electric power beyond the confines of the state.

It is now suggested that, if the Oklahoma law in invalid, the same is true of the Maine law.

But how, may we inquire, may the interests of a state be protected?

If its own legislature is powerless, recourse must next be had to the National Congress, the responsibility of which body is correspondingly increased.

Yet appeals to Congress do not always bear fruit, as friends of Appalachian legislation can testify.

When they call upon Congress to protect the forests and streams of New England and the South by enacting appropriate legislation, they are told to go to the state legislatures, and not trouble Congress with state affairs.

Are the people's interests to be kicked like a football from state legislatures to Congress and back again?

Are their rights to be denied them through a "dog-in-the-manger" policy under which Congress will not, and the state must not take the necessary protective steps?

Is the "twilight zone" between state and Federal jurisdictions to be a permanent obstructive fact?

With the convening of Congress just ahead, light on this point would be appreciated.

Conservation Not Owned by Mr. Pinchot

AS HAS already been pointed out in these columns, the city of Denver is the headquarters for the fast-vanishing but die-in-the-last-ditch contingent who still believe that the yet ungobbled portions of our national heritage belong, by inalienable right, to the grabbers who can get there first.

CONSERVATION, including especially the September and October issues, is evidently read in that fair city, and the wails that ascend from those whose means of gain at the people's expense are threatened by the great American awakening, are wild and weird.

From the press utterances emanating from Denver, it may be gathered that, in the opinion of the contingent referred to, this magazine and the press bulletins issued by this office are the property of Mr. Gifford Pinchot, United States Forester.

For the benefit of these, and any others who may labor under like delusions, a brief historical statement may be submitted.

There was a period when the Secretary of Agriculture was the president of the American Forestry Association, a fact dwelt upon by the present writer in CONSERVATION for March, 1909.

There was also a time, practically coincident with that of Secretary Wilson's presidency, when Forester Pinchot was chairman of the Executive Committee of the same Association, and when other members of Government Bureaus associated with him were members of its Board of Directors.

But on April 24, 1907, Mr. Pinchot wrote the following letter to the Secretary of the American Forestry Association:

Dr. Thos. E. Will,
Secretary, American Forestry Association,
Washington, D. C.

My dear Doctor Will: After mature consideration, I have decided to present my resignated both as chairman and as a member of the Executive Committee of the American Forestry Association. I do this partly because I am about to leave Washington for an absence of six months, and partly because I believe it to be unwise for a Government forest officer to be connected with the American Forestry Association in a

position of such great influence as this. In other words, it is my strong conviction that the Association should stand upon its own feet and be independent of the Forest Service in all respects. While I hope strongly that the Forest Service will continue to contribute all it can to the cause which the American Forestry Association so well represents, I believe it unwise that the two institutions should continue to be merged to the present extent by the officers of one acting also as the officers of the other.

This resignation must take effect upon the date of this letter, and I beg you to call a meeting of the Executive Committee, or to correspond with its members, in order that the committee may choose its own chairman until the Board of Directors can take action.

Very sincerely yours,

(Signed) GIFFORD PINCHOT.

Non-governmental members of the Board, and the Secretary as well, urged Mr. Pinchot not to press this resignation. He was absent for a number of months, and action upon it was not taken.

At the meeting of the Board of Directors preceding the annual meeting of the Association, January 28, 1908, Mr. Pinchot again insisted that he must retire; this time, not only from the Executive Committee, but also from the Board itself. The minutes of that meeting contain the following:

Mr. Pinchot made a statement setting forth that, to avoid confusion in the public mind between the American Forestry Association and the Forest Service, he felt that he should no longer continue as a member of the Board of Directors of the Association. To this end he requested that he be not renominated.

At the same meeting, Secretary Wilson stated that, for the same reason, he ought to retire from the presidency of the Association. As, however, in the case of Mr. Pinchot, other members of the Board strongly demurred, and Secretary Wilson's resignation was deferred for practically one year, at which time it was reluctantly accepted.

At the present time no representative of the United States Government, whether in or out of the Agricultural Department, including the Forest Service, is in any way connected with the management of this organization. No representative of the United States Government has any voice whatever in controlling or suggesting the policy of this Association or of its publications. No Government representative saw, before publication, or knew in advance the character of any matter that has appeared in this publication since the Ballinger-Pinchot controversy began.

The CONSERVATION magazine is free to criticize Mr. Pinchot and all his works if it sees cause to do so.

That it has supported and still supports him in his conservation fight is due not to his influence or control, direct or indirect, but to the fact that this publication recognizes that in this great struggle he is on the people's side. While he stands there, CONSERVATION will continue to support him. When he fails to do so, this publication, with whatever influence it may command, will be arrayed against him.

Whither Are We Drifting

AT THE meeting of the Colorado Conservation Commission, Dr. John Grass, of Trinidad, endeavored to introduce an amendment to a resolution, his amendment being:

"We recognize the right of Government control of the public domain, and hold that the natural resources of the country belong first of all to the whole people."

Ex-Senator Thomas M. Patterson, chairman of the committee on resolutions, and one of the leading opponents of our National Forest policy, opposed this amendment!

Upon what grounds, is it asked, could any sane, intelligent American citizen oppose such a resolution? His grounds, we are informed by the press, were two-fold, namely, "that the first clause was 'academic' and the second *'socialistic!'*"

Is it to this complexion that the forestry and conservation controversy has brought us?

This magazine is not an exponent of socialism; it is, however, an exponent of the principles of the conservation of natural resources.

As such, it stands emphatically, unequivocally, and everlastingly for the

principle "that the natural resources of the country belong first of all to the whole people."

It rejoices, furthermore, at evidence, piled as Ossa upon Pelion, that a daily increasing number of disinterested American citizens and of citizens concerned for the well-being of America and the perpetuity of the race, stand with equal emphasis for this identical principle.

And now comes a former member of the United States Senate announcing that this principle is "socialistic."

CONSERVATION has only to remark that if Mr. Patterson desires to convert a majority of the American people to socialism, he has but to give adequate publicity to the doctrine announced by him to the Colorado Conservation Commission.

Whose Is the Land?

SINCE ex-Senator Patterson shied at Doctor Grass's declaration that "the natural resources of the country belong first of all to the whole people," we wonder what he would think of Prof. Liberty Hyde Bailey's statement at Spokane.

Here is a paragraph from his address given at the National Irrigation Congress, and published in CONSERVATION for October:

> In the last analysis, *the land belongs to all the people. No man really owns his land; society allows him to use it, and to say who shall use it when he is done with it;* and every man is under obligation to society to maintain the fertility of his land. Even a farm is not a man's own, in a sense that he has a right to abuse it without check. More than that, he is under obligation to use all the natural resources of the earth with a care for those who are to come after him. No man has a moral or social right to denude the land of its forest, unless he leaves the land in condition for his successor to utilize it with satisfaction. The American practise of raping the earth of timber has no defense, not only in economics, but also none in moral obligation.

For the Denver school, this should be bitter medicine.

This view, however, rests not simply on the declaration of Doctor Grass or Professor Bailey. Should it be challenged, a cloud of witnesses in its defense can be produced to whose testimony even that element must listen with respect.

More "Progress" Backward

IN ITS issue of September 20, the *Portland Oregonian* published a half-column story from Washington stating that, "as a result of the Pinchot-Ballinger row, the administration may later determine to recommend the transfer of the Forest Service from the Department of Agriculture to the Department of the Interior.

"Such a change," the writer says, "can only be made by act of Congress, and it probably would call for considerable pressure from the President in order to get the necessary authority, especially if Gifford Pinchot is permitted to remain as Chief Forester."

The writer goes on to argue that the Forest Service is out of place in the Department of Agriculture, having nothing in common with the other bureaus of that department, but much in common with the General Land Office and Geological Survey of the Department of the Interior.

He states that "on several occasions the suggestion has been made that the Forest Service should be transferred" to the Interior Department, "but during the last administration Mr. Pinchot had sufficient influence with the President to get the support of the administration in his objection to the change." Now, however, he thinks, in view of the Ballinger-Pinchot controversy, and the supposed attitude of the President, the latter himself might lead in the demand for the transfer.

The writer continues:

"If the Forest Service was made a bureau of the Interior Department, it would be on equal footing with the Land Office, and under the control of the same Cabinet officer. The Secretary of the Interior then would have a say, not only as to questions of title to forest-reserve lands, but as to all questions of forestry administration."

He repeats that such a transfer would, of course, be opposed by Mr. Pinchot, but he opines that if "Secretary Ballinger believes in the transfer and says so, it is a reasonably safe guess the President will urge Congress to authorize the change."

All of which, of course, is refreshing.

From the tone of the article, one might imagine the writer looked upon such a transfer as in the line of a natural evolution.

Whether or not he knows it, however, the evolution is in exactly the opposite direction. On February 1, 1905, the administration of the Forest Reserves, hitherto in the Land Office of the Department of the Interior, was transferred to the Secretary of Agriculture and turned over to the Forest Service.

As everybody knows, who knows anything about it, this step was one of the most momentous and beneficent ever taken in the history of Government land or forest administration.

Hitherto the Government forests had been in charge of men who knew nothing about forests, while the trained foresters were in the Agricultural Department, where they had little or nothing to do with forests. The act above quoted brought the forests and foresters together, where, of course, they had from the first belonged, and the results have amply justified the move.

But now comes the *Portland Oregonian,* which ranks along with several Denver papers in opposition to conservation policies, and proposes that the Government beat a retreat.

Again, the *Washington Post* recently published an editorial to show that the Interior Department is doomed to disappear. With the appropriation of the public lands by settlers, the work of the Land Office will be finished. The Reclamation Service belongs with the Agricultural Department; the Pension Office, with the Bureau of Commerce and Labor, and so on. But the *Oregonian* would reverse this process and build up the Interior Department at the expense of the Department of Agriculture.

The suggestion that the Forest Service "be placed on an equal footing with the Land Office, and under the control of the same Cabinet officer" should arouse enthusiasm—in certain quarters. The general standing of the Land Office is such that the Forest Service should feel proud of such company.

Within a week, an employee in the Land Office has been heard to remark, unchallenged, in the presence of other employees of the same office, that in the course of a recent vacation trip it had been impossible to discover anybody who regarded any one connected with the Land Office as above suspicion.

Members of the force of that office are, of course, equal in point of honesty with other people, and many, if not most of them, sympathize with the Pinchot policy; but that such an opinion as above expressed should have gained prevalence is a sad commentary upon "Land Office methods" with which the country has become all too familiar.

The notion that the Forest Service has nothing in common with the other work of the Agricultural Department is characteristic of the view of the timber-thieving, resource-plundering class.

The idea of raising successive crops of timber on a forest, as a farmer raises successive crops of grain on a field is, of course, quite beyond them.

With them, timber harvesting is simply a matter of "once and out;" and that "once" for the individual as against the public. Government control, under the Pinchot management, discourages this process, hence their antagonism.

That Secretary Ballinger and his constituents are supposed to be backing this transfer should be enough. With the record that officer has already made, one may guess the result of his control of National Forests.

Let these once be committed to the tender mercies of his department, to which the principles of scientific forestry are unknown, and the public domain is but spoil for individuals, and the looters will once more have their innings.

The headline-writer of the *Oregonian* informs his readers that the "transfer is urged," that the "Forestry Service may go to the Interior Department," that "loud wails are expected," that "Pinchot and the conservationists will set up a howl, but if the President makes the suggestion, the anti-administration will lose out."

If any such scheme is brewing, it is well that it has come to the surface thus early, for the cat is now out of the bag. Forewarned is forearmed. The people are already on the alert; they realize that, if their interests are to be protected, they, themselves, must be constantly on guard, and they are getting ready for the coming session of Congress.

Following the Spokane meeting they were heard from. Let the above attempt be made, and to the outburst which will follow, that which succeeded the meeting named will be but as the popping of a firecracker to a cannonade.

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Power and Similar Bills

THE attention of the public has been and is being called to the importance of the water-power question.

As the black coal goes, "white coal" —as water-power is coming to be styled —must more and more take its place.

That this power may be appropriated, legislation must be had and will, without doubt, be diligently sought.

The recent special session of the Sixty-first Congress was supposed to be devoted, almost exclusively, to the tariff. Nevertheless, persons interested in water-power and similar legislation took time by the forelock.

Twenty-three bills, some duplicates, were introduced into one or the other house of Congress in that session. All were printed, several were read twice, and all but one were referred to their appropriate committees. These bills, therefore, are all ready to be taken up and pressed at the coming regular session.

Some of these bills may be harmless; others, however, will bear close inspection.

No power bill should be permitted to pass Congress unless it contains three provisions, namely:

1. The grant or privilege should be limited in time, say to fifty years;

2. The recipient of the grant or privilege should pay to the Government a reasonable fee or charge;

3. This fee or charge should be subject to revision by Congress at intervals, say, of ten years.

The day for grants in perpetuity is past; no more should be tolerated. The attempt, in future, to secure such grants should impugn the good faith of the applicant.

Since water-power is a valuable asset, and its use a source of substantial revenue, the grantee should be willing and should expect to pay for it a reasonable price.

Finally, inasmuch as, with the growth of population and industry, the value of a water-power site whose source is adequately protected may be expected to increase from year to year and generation to generation like the values of lands in thriving cities, the charge for its use should be subject to periodical revision. A utility worth a dollar to-day may be worth ten dollars or a hundred dollars some years hence; for this reason, a long-time contract based on a rate which is fair to-day may, later, become grossly unfair.

One of the chief scandals marking the system of English land taxation is the fact that, until recent years, lands in London were still taxed at the valuation fixed in the year 1692!

Some of those lands have since become worth as much as the gold sovereigns which, placed on edge, would pave them. Yet every attempt to adjust the taxation to the increasing value of the lands was successfully resisted.

To establish to-day in America, in connection with water-power grants of inestimable value, a similar system is preposterous and intolerable. Whoever, hereafter, gets the use of a water-power must be required to pay for it what it is worth. Gratuities and pensions to millionaire promoters should, henceforth, be recognized as "out of fashion."

Following is the list of bills, numbers, names of introducers, and abbreviated titles:

BILLS PERTAINING TO DAMS, LOCKS AND DAMS, NAVIGATION WITH WATER-POWER DEVELOPMENT, USE OF WATERS AND USE OF WATER-POWERS, INTRODUCED INTO THE 61ST CONGRESS, 1ST (SPECIAL) SESSION, SPRING AND SUMMER OF 1909

H. R. 11408 (Tilson)—To construct a dam or dams across the Connecticut River.

H. R. 11592 (Aiken)—Permitting the building of dam across the Tugaloo River at Hattons Ford, Georgia, South Carolina.

H. R. 6277 (Patterson)—To build a dam across the Savannah River, mouth of Stevens Creek.

H. R. 11590 (Aiken)—To build a dam across Savannah River, at Trotters Shoals.

H. R. 11591 (Aiken)—To build a dam across Savannah River at Calhoun Falls.

H. R. 11593 (Aiken)—To build a dam across Savannah River at Cherokee Shoals.

H. R. 1052 (Cullop)—To build a dam across White River, near Decker, Ind.

H. R. 2263 (Crow)—To build a dam across James River, Stone County, Missouri.

H. R. 6867 (Hamilton)—To authorize city of Sturgis, Mich., to build a dam across the St. Joseph River.

H. R. 11579 (Moon, Tenn.)—To amend act relative to erecting of lock and dam in aid of navigation in the Tennessee River.

H. R. 6181 (Hull, Tenn.)—To lock and dam Richland River between Dayton, Tenn., and mouth.

H. R. 11571 (Henry)—To improve navigation of Connecticut between Hartford and Holyoke, and develop water-power.

H. R. 10026 (Richardson)—To improve navigation of the Tennessee over Elk River Shoals and Big and Little Muscle Shoals in connection with development of water-power.

H. R. 10937 (Burnett)—To amend act authorizing use of waters of Coosa River, Alabama.

H. R. 10025 (Oldfield)—To provide for use of water-power on White River, Arkansas, at dam No. 2.

H. R. 1471 (Oldfield)—To provide for use of water-power on White River, Arkansas, at dam No. 1.

S. 2896 (Bulkeley)—To construct dam or dams across Connecticut River.

S. 1120 (Clay)—To build dam across Savannah River at or near mouth.

S. 2179 (Tillman)—To build dam across Savannah River.

S. 574 (Stone)—To build dam across James River, Stone County, Missouri.

S. 2036 (Burrows)—To authorize city of Sturgis, Mich., to construct dam across St. Joseph River.

S. 424 (Flint)—To build dam across Colorado River near Parker, Ariz.

S. 2761 (Bulkeley)—To improve navigation of Connecticut River between Hartford and Holyoke, and to develop water-power in connection therewith.

THE FOREST GIANT

By Charles Albert Brewton

Tall, stately, grand, it rears its head,
The monarch of the woods,
From out its topmost branches peer
The eyes of fairy gods.

King of the trees, it stands erect,
As Nature's monument,
While saplings thin and puny men
Look up in wonderment.

What but a superhuman hand,
A never-failing eye,
Could build from but a single seed
A ladder to the sky?

NEWS AND NOTES

Mr. Start Made Secretary

At a meeting of the Board of Directors of the American Forestry Association held in New York City on October 18, Mr. Edwin Augustus Start, of Boston, Mass., was elected Secretary of the American Forestry Association.

Through his connection with the Massachusetts Forestry Association, of which, for a number of years, he was secretary and treasurer, and because of his activity in the American Forestry Association, particularly in pressing the Appalachian-White Mountain bill, Mr. Start is well known to the members of this Association.

At its last annual meeting, he was elected to the Board of Directors, at which time he nominated Hon. Curtis Guild, Jr., for the presidency of the same body.

Mr. Start was born at North Bridgewater, Mass., June 1, 1863; he graduated at Tufts College in 1884, receiving the degree of A.M. from Harvard College in 1893.

On September 9, 1885, at Windsor, Conn., he married Miss Julia Edith Moor, who died January 21, 1902.

From 1885 to 1892 Mr. Start was occupied with journalism; in the eight years following he was head of the Department of History in Tufts College.

Mr. Start is a member of the American Historical Association, of the New England History Teachers' Association, and of the New England Historic Genealogical Society. He is a Royal Arch Mason, a member of the Phi Beta Kappa, the Theta Delta Chi, the Twentieth Century, and Appalachian Mountain clubs, and a contributor to the department of modern history in the *New International Encyclopedia*. Mr. Start has written numerous articles in magazines, and has aided in launching the new *Twentieth Century Magazine*, successor to the *Arena*.

Mr. Start may be expected to give special attention to Appalachian-White Mountain legislation, together with the other large interests for which the American Forestry Association stands.

Conservation Congress Resolutions

The National Conservation Congress at Seattle adopted the following resolutions on the water-power question:

"We urge upon the states the enactment of comprehensive water laws, framed in accordance with the policy pursued in several western states during recent years, incorporating the principle that the waters belong to the people. We hold this right of the people to be inherent. Recognizing the necessity of administering this invaluable possession for the people, we deny the right of state or Federal governments to alienate or convey water by granting franchises for the use thereof for commercial or power purposes in perpetuity, or without just compensation in the interests of the people.

"We hold that all natural resources belong primarily to the whole people and should not be alienated by municipal, state, or national grants or franchises to individuals or corporations except for limited periods."

President Taft to the Conservation Congress

President Taft sent to the first National Conservation Congress at Seattle the following telegram:

"I congratulate you upon the objects of your meeting and sincerely hope that your deliberations will result in useful conclusions. You can count upon earnest support from this administration for the policy of conservation of natural resources by every reasonable means properly within the jurisdiction of the Federal executive, and such recommendations to Congress as may best be adapted to obtain useful legislation toward the same end.

"WILLIAM H. TAFT."

President Taft on Conservation

On September 28 President Taft discussed the conservation question at Spokane, Wash. He spoke of the preservation of the National Forests, the reclamation of the arid and semi-arid lands by irrigation, the disposition of water-power sites, and the disposition of coal, oil, and phosphate lands belonging to the Government. Following are his remarks, in part:

"The wonderful progress made by Mr. Pinchot, with the earnest support of Mr. Roosevelt and Secretary Wilson, at times has met the denunciation of persons in this western country on the ground that property was being taken which Congress intended for individuals, and was being withheld from them. But I think general opposition to Mr. Pinchot's plans has disappeared and that the great body of the American people recognizes the benefit of the reform in reference to forestry and greatly regrets that it was not begun years before. Congress has come

fully to recognize the necessity of pursuing forestry reform by making liberal appropriations for the purpose. The forest lands of the United States ought to be surveyed and carefully preserved and its jurisdiction in respect to them clearly defined. The regulation of forests in private ownership within state boundaries is not plainly within the scope of Federal jurisdiction, and it should be undertaken by the states. I don't think that the states have taken up the matter with as much energy as they should, and have not improved the opportunity which was given them by way of example by the Forestry Bureau of the United States. * * *

"There are some thirty projects which have been entered upon by the Reclamation Bureau, and I believe that all of them are to be commended for their excellent adaptation to the purpose for which they were erected and for the speed with which the work has been done. It is believed, however, that in the planning of a number of these improvements the enthusiasm of the projectors has carried them to a point where they begin to feel embarrassed in the matter of resources with which to complete the projects, and begin to show that prudence was not observed by those engaged in executing them. * * *

"Now, it appears that it will take $10,000,000, or more, which is not available in the reclamation fund at present, fully to complete the projects, and it also appears that a great number of persons, by reason of the beginning of the projects, have been led into making settlements, the expenditure of time and labor, with the hope and upon the reliance that such reclamation enterprises would be carried through in a reasonable time. * * *

"I think it wise to apply to Congress for relief by urging the passage of an enabling act which shall permit the Secretary of the Interior to issue bonds in the sum of $10,000,000 or more to complete all the projects. These bonds should be redeemed from the money paid into the reclamation fund after the completion of the projects.

"From conversation with Senators who had visited much of the reclamation work, I infer that such appeal seems to them to be the easiest way out of the difficulty, and I shall take pleasure in recommending the passage of such a remedial measure by the next Congress.

"No one can visit this western country without being overwhelmingly convinced of the urgent necessity for the proper treatment of arid and semi-arid lands by the extension of systems of irrigation. The results in the productivity of the soil when irrigated are marvelous. The mere fact that the Reclamation Service has gone ahead too fast ought not to prevent Congress lending its aid to overcome the difficulty. * * *

"I shall * * * urge upon Congress at its next session the passage of a law authorizing the disposition of such water-power sites upon terms to be agreed upon by the Secretary of the Interior with the proposed purchaser. My impression is that the demand for water-power is going to be so great that these restrictions will not prevent the investment of capital, but will ultimately bring to the public coffers a revenue from an entirely proper source and will secure the development of a power for manufacturing industries that will probably in time exceed the utility and value of coal and become a substitute for it. * * *

"It seems wise, in the disposition of coal lands, and, indeed, of all mineral lands having agricultural value, to separate the surface of the land from its mineral contents, and then either to lease the right to take coal from the lands at a specified compensation per ton—that is, to provide a system of royalties—or to sell the deposits of the land outright to the coal miner. In every case restriction by way of forfeiture ought to be included to prevent monopoly of ownership. This is the greatest object of a change in the method of their disposition. The same provision should be made with reference to the disposition of the phosphate land in Wyoming and Idaho which contains the wonderful fertilizer which it will soon be necessary to use on much of the land in the United States. The oil lands of California, as well as the phosphate lands and practically all the coal lands, have been withdrawn from settlement in order to await the action of Congress, and I expect to recommend to Congress legislation on the lines above indicated. What, however, I wish to make as plain as possible is that these purposes cannot be accomplished unless Congress shall act. The executive can recommend, but the legislature must enact."

The President stated that his administration "is pledged to follow out the policies of Mr. Roosevelt" (with respect to conservation), "and while that pledge does not involve me in any obligation to carry them out unless I have Congressional authority to do so, it does require that I take every step and exert every legitimate influence upon Congress to enact legislation which shall best subserve the purposes indicated. I hope nothing will prevent our taking the further steps needed when Congress meets. Secretary Ballinger of the Interior Department, upon whom will fall the duty of executing the new provisions of the law, is in entire accord with me as to the necessity for promoting in every legitimate way the conservation of the resources which I have named, and he can be counted upon to use the great influence which he must have as Secretary of the Interior to this proper end."

Mr. Pinchot at the Trans-Mississippi Congress

At the Trans-Mississippi Congress, which met at Denver, Colo., August 18, United States Forester Pinchot said in part:

"Conservation as a practical business policy will grow, for it is based, like commerce

itself, on prudence and foresight. It is the application of common sense to the common problems for the common good, and it represents the best spirit of to-day, the spirit which yearly brings this congress together to discuss, develop and promote the common good of the whole West.

"Conservation is the central factor in the galaxy of the Roosevelt policies—the policies of equal opportunity. I want to repeat here what I had keen pleasure in saying at Spokane, that as a Nation we are fortunate at this time in this fact, above all others, that the great man who gave his name to these policies has for his successor another great President, whose administration is most solemnly pledged to support them. And every man who has read President Taft's letter on the importance of conservation to business men will realize how strongly he stands behind the conservation policy.

"The National Forests are a part of the property of the Nation. They exist for the public good, and have no other reason for existence. The governmental machinery organized to make them useful is the Forest Service, and like the National Forests themselves, it has no other object and no other excuse for existence but the general welfare.

"Whatever mistakes it may have made, whatever shortcomings it may have been, or may still be guilty of, I claim for it at least the credit of an honest and earnest effort to be of real use.

"In the times in which we live the road to usefulness commonly follows the line of cooperation. This is true of the great business interests which you represent, and it is no less true of the Forest Service.

"The outlook for forestry has grown steadily brighter of late with each succeeding year, and it was never so bright as now. But of all the good signs there is none so cheerful and none so welcome as the increase in cooperation between the users of the National Forests and the Forest Service. This is due in large part to the establishment of six branch offices in the West, so that the users of the forests can get immediate action on all local questions by men familiar with local conditions and local needs. It is due in still larger part to a better understanding between the users of the National Forests and the Forest Service. The forest users realize better what the Service is trying to do and the Service itself is learning to do better work—adapting itself better every year to the needs and desires of the West.

"It is true that cooperation is not always possible. Increasing usefulness to all the people must sometimes entail smaller usefulness to one or more individuals. Like every other government institution, whether municipal, county, state, or national, the Forest Service is at times required, in the course of its duty, to prevent some man from getting what he would like, but ought not to have. But that is simply a part of the effort for the general good, and the firmness which such work requires is obviously necessary in the public interest.

"The Forest Service is a public servant—our servant in the work of preserving our forests. It asks, I believe it deserves, and I know it desires and expects your admonition, counsel and assistance in the work the American people have given it to do."

Mr. Pinchot at the Conservation Congress at Seattle

At the First National Conservation Congress, held at Seattle, Wash., August 27, National Forester Pinchot said, in part:

"Conservation has three primary objects:

"First, to develop our natural resources, so that this generation may have its full share and use of the riches of this earth.

"Second, to prevent a needless waste and destruction of these resources, so that future generations may likewise have a just share in the material foundation of our prosperity.

"Third, to see that our great natural resources, when so developed, shall be protected and used for the permanent welfare of the many, instead of the few.

"This conservation idea covers a wide field. It aims at the greatest good for the greatest number for the longest time. It is simple, definite, and direct. It advocates the use of foresight, prudence, thrift, and intelligence in public affairs and private business.

"It proclaims equal rights, and it is the duty of the people to think and to act for the benefit of the whole people.

"Therefore, in a word, it demands the application of common sense to common problems for the common good.

"Conservation, the application of common sense to common problems for the common good, will lead directly to efficiency wherever it is given control. We are coming to see that conservation will have two great results—to conserve our natural resources which guarantee our welfare, and to lead our people to greater wisdom and effectiveness in every department of our common life. The outcome of conservation is national efficiency.

"The principles of conservation, thus described, have a general application, the breadth and value of which is very remarkable. The development of our resources and opportunities, the prevention of waste and loss and the protection in this by foresight, prudence, thrift, and intelligence—all this applies with clear and undeniable force to the conservation of our national resources. But it applies just as clearly and undeniably to the conservation of every interest that is necessary for the entire people.

"Conservation, from my viewpoint, is as valuable in education as in forestry. It applies to the body politic as well as to the earth and its minerals. It applies as much to municipal franchises as it does to the earth and its minerals. Municipal franchises

are as squarely within its sphere as franchises for water-power. It applies to the subject of good roads as well as to waterways, and the training of our people in effective citizenship is as germane to it as an increase in the productiveness of our soils.

"President Roosevelt himself said that the policy of conservation is the most typical example of the policies which will bear his mark. Fruitful, vital, and beneficent, these policies are both deeply needed and widely cherished by our people.

"As a Nation, we are fortunate at this time, as I said in my recent speech at Spokane, in this fact above all others, that the great man who gave his name to these policies has for his successor another great President, whose administration is most solemly pledged to support them."

Pinchot's Conservation Ideas and Municipal Franchises

One of the strongest pleas for conservation of the country's resources was that delivered before the National Conservation Congress, in Seattle, by Gifford Pinchot, United States Forester. Joseph N. Teal, of Oregon, one of the most active workers of the National Municipal League in the Northwest, presided over the session. Speaking of the principles of conservation, Mr. Pinchot said:

"The principles of conservation have a general application, the breadth and value of which are very remarkable. The development of resources and opportunities, and prevention of waste and loss, the protection of the public interests by foresight, prudence, thrift, and intelligence—all these apply with clear and undeniable force to the conservation of natural resources. They apply just as clearly and undeniably to every interest and necessity of the people. The conservation point of view is as valuable in education as it is in forestry. It applies to the body politic as it does to the earth and its minerals.

"Municipal franchises are as properly within this sphere as franchises for water-power. It is as applicable to the subject of good roads as to that of waterways, and the training of our people in effective citizenship is as germane to it as the increase of productiveness in our soils.

"Conservation, the application of common sense to the common problems for the common good, will lead directly to efficiency wherever it gets control. The outcome of conservation is national efficiency."—National Municipal League Clippings.

Hawaii Wide Awake

Mr. Ralph S. Hosmer, chairman of the Territorial Conservation Commission of Hawaii, sends clippings from a number of Hawaiian newspapers showing the alertness of the press of the island to the conservation situation here, and its appreciation of the merits of the present controversy.

Mr. Hosmer says: "Here in Hawaii the relation between the continued prosperity of the territory and the right use of the natural resources is so intimate that it is perhaps more clearly appreciated than on many parts on the mainland. This has led to the formation of the strong public sentiment in favor of conservation, which recent events only tend to broaden and strengthen."

Speaking of the tendency of newspaper men to emphasize the personal element in the Ballinger-Pinchot controversy, the *Sunday Advertiser* for September 19 says editorially: "But the real question at issue—the vital point—is not of difference between men. It is whether the remaining natural resources belonging to the Nation, necessary as they are to the health and life of the common people, shall be legitimately developed, and exploited in the interest of all the people, or whether they shall be so disposed of to-day that, sooner or later, they could fall into the ownership of great corporations that, controlling the situation, could in the end exact a crushing tribute from all except the favored few in control."

To put the situation more clearly in the same number of words would be difficult.

The *Pacific Commercial Advertiser* of September 23 says editorially:

"That Roosevelt should have found opposition is but natural; that Pinchot should have been blackguarded by those whose destructive enterprise he had stopped was to be expected. That those vitally interested in the exploitation of the great natural resources of the country for their own private gain should object to having the excellent source of revenue cut off was a foregone conclusion. But abuse and threats have not dissuaded Pinchot and his lieutenants from the course which they have mapped out for themselves. The effort to befog the real issue in a mist of political sculduggery will not blind the people to the necessity for conserving the natural wealth of the land, not only for the future generations, but for the enjoyment of the present."

It was understood at the beginning of the controversy that Mr. Pinchot's audience was large. These Hawaiian papers make it clear that this audience is well represented in that remote island, and that the people there have ears to hear and minds to understand.

The Changing Sentiment

Certain masters of industry, not long ago regarded as models of enterprise because of their rapid accumulation of wealth through the exploitation of forests, coal, oil, and gas, phosphates or water resources, now to their great bewilderment, find themselves looked upon with serious suspicion. It is no longer regarded as good citizenship to sacrifice ruthlessly the interests of future generations, in

order that wealth may be accumulated in this. The manager of a great coal or lumber company, who has taken pride in creating an industry, building up a community, and accumulating wealth for himself and his associates, and too much engrossed or too careless to watch the trend of public opinion, is shocked some day into an amazed and resentful consciousness of the changed public attitude toward himself and his enterprise. Is not the coal or the lumber to use? he says. Is it not perfectly legitimate to create wealth by an exploitation of these resources, in the possession of which the Nation is so fortunate? Suppose he does leave a path of destruction behind him. Future generations can take care of themselves, as this generation must. Is he not reaping but the legitimate reward of his foresight and enterprise in acquiring these great bodies of coal and oil, timber and phosphate? Are they not his own? Whose business is it, anyhow, how he mines or how he cuts his lumber? Of course, he does it in the way that yields the largest returns. That's what he is in business for. Fifty per cent of the coal wasted? All the young undergrowth killed? Well, that's because it doesn't pay to save it. You don't expect him to waste his own and his stockholders' money in outlays that bring no returns, do you? So he fusses and fumes. He has not changed, but his standing in the community has. It is irritating beyond understanding. He may even be threatened with indictment because it is found that he has acquired his large holdings of coal or of timber in the usual way by using dummy entrymen. He, the most prominent man in the community, a criminal! Inconceivable. Who is this man Pinchot, anyhow? What is conservation? A fool and his fad. A dreamer and his dream. Away with them. Let us have a business administration.

This type of man has been passed in the evolution of public opinion. A few years ago he represented the normal, usual attitude toward his business. But the public conscience has developed and now he represents only an irritated and decreasing minority. But he has rights that must be respected. He is not criminal in intent. He deserves and will receive a hearing and time to comprehend the change that is coming about, and to adjust himself to it.—Address of Mr. W. C. Mendenhall, of Washington, D. C., before local representatives of the Woman's Rivers and Harbors Congress, Honolulu, Hawaii.

Single-taxers With Forester Pinchot

Among the resolutions passed by the Women's National Single-tax League in its eighth annual conference at Arden, Del., was the following:

"That the league indorse the work of Chief Forester Gifford Pinchot in his struggle to save the heritage of the people for the people; and that the attention of single-taxers be called to the growing importance of water-power sites and to the equally rapidly growing danger of monopolization of those water-power sites."

Irrigation at Yakima

Workmen in the employ of the Government are building a large dredge at the Sunnyside Canal in the Yakima Valley, west of Spokane.

The present water supply is inadequate for the irrigation of the rapidly growing Sunnyside project and it was decided to increase the capacity of the canal, which is now 600 second-feet, to a maximum of 1,080 second-feet, an increase of seventy per cent. An excavator was put to work on the upper bank of the canal.

Many important advantages could be gained by a floating dredger, so the construction of one was commenced two months ago. Twenty-one men are now at work on it, and it will require six engines to operate it. Steam will be provided by two large boilers. The value of this work to the valley cannot be overestimated. It will increase the irrigated area from Parket to Prosser and beyond, which means many new homes, new orchards and fields, and many millions of dollars to be taken from the soil.

Reclamation Service Notes

Mr. F. H. Newell, Director of the Reclamation Service, returned from the West October 1, after a month's trip with the Senate Committee on Irrigation, Hon. Thomas H. Carter, chairman.

The committee visited the reclamation projects in Montana, Oregon, Idaho, Washington, Wyoming, South Dakota, and Nebraska, spending thirty days of strenuous travel. Adjournment was taken until November 1, when the trip will be resumed to visit remaining projects in Colorado, Utah, Nevada, California, Arizona, and New Mexico. The results of the inspection so far have been very advantageous to the work, as the Senators have become personally acquainted with the opportunities and difficulties, and appreciate more than ever the nature of the work and the organization carrying it on.

There was general discussion of the desirability of expediting construction, which is now being carried on with an expenditure of about $8,000,000 per annum, this being the present income of the reclamation fund. The projects which have been undertaken have been planned with a view to expending economically about this sum, although a larger amount could be used to hasten results.

It is very gratifying to note that President Taft is appreciating this matter and

has announced himself in favor of a bond issue of $10,000,000. This will enable work which would otherwise take two years or more, to be accomplished in one year. The plans can be readily adjusted, and the organization is able to carry on the work. The Senate committee discussed this matter informally, and individually expressed the opinion that it would be practicable and desirable to issue bonds to the amount of $10,000,000 per annum for a time, securing these not by the general credit of the Government, but by the reclamation fund, the investment of which already amounts to over fifty millions of dollars. Western bankers express the belief that bonds bearing a low rate of interest and secured by the reclamation fund could readily be floated at par. As a business proposition, it is unquestionably sound. Every dollar invested in irrigation work returns ultimately a gross income to the country of 100 per cent. That is to say, every acre of land reclaimed at a total cost of $40 will yield each year at least $40 in crops when handled intelligently. If money can be borrowed at three or four per cent on property yielding an income of 100 per cent per annum, there should be no hesitation in thus expediting the work. The interest charge could readily be included in the cost of the works, as this is repaid by the settlers in ten annual instalments without profit or interest on the investment.

Mr. Newell has been with Mr. Ballinger on several occasions, going over the projects, obtaining from the Secretary and the Senators advice and suggestions with reference to the policy to be pursued in expediting the work in the future.

Mr. Ira W. McConnell, M. A. Soc. C. E., supervising engineer in the Reclamation Service, has resigned to go into private practise. His most notable work for the Government has been the construction of the Gunnison Tunnel which was formally opened by President Taft on the 23d of September. He has also had charge of the large earth dam near Belle Fourche, S. Dak., one of the most notable structures of its kind in this country.

The loss of such a man as Mr. McConnell emphasizes one of the difficulties under which the Government labors owing to the relatively meager salaries which are paid to the higher officials. The work of the Government itself is of such magnitude as to demand the highest possible business efficiency and engineering skill. The services of an engineer who demonstrates ability along these lines are in unusual demand at the present time.

The resignation of Mr. McConnell is a distinct loss to the Reclamation Service.

The Secretary of the Interior has approved a contract entered into by the Reclamation Service and the officials of Spanish Fork City, Utah, whereby the former agrees to furnish the city of Spanish Fork electricity for lighting purposes in amount not to exceed 65,000 kilowatts per month. The rate charged is eight-tenths of a cent per kilowatt hour.

Crop reports from Huntley, Sun River, and Lower Yellowstone projects are exceedingly satisfactory. The irrigation manager on the Huntley project states that some of the better class of farmers are reporting a net profit from forty-acre farms of from $1,200 to $1,800.

The Clear Lake dam of the Klamath project, Oregon-California, as a whole is about fifty-five per cent completed. Excavation for the month of September amounted to 12,000 cubic yards, 10,000 yards being placed in the embankment, making a total in all to date of 24,000 cubic yards.

Construction of the dikes at the south end of Clear Lake is proceeding rapidly. Surveys for the low-line canals on the Upper project and along the margins of the Lower Klamath Lake continued during the month, and fifty-five miles of plane-table topography were taken.

Plans are under way for the construction of a new flume across Lost River, and also for the building of a concrete check in the main canal.

The Lower Yellowstone Valley in Montana and North Dakota, where the Reclamation Service has one of its large projects, furnishes a most impressive example of the beneficence of irrigation. The transformation from a vast free range for live stock to a thickly settled community has come quickly. New towns have sprung up, a railroad is building the entire length of the valley, and as far as the eye can reach broad fields of wheat, oats, and corn dot the landscape which a short time ago was marked only here and there by habitation.

Ten steam threshers have been constantly at work during September harvesting a bountiful crop. With oats yielding from forty to sixty-six bushels per acre, and weighing forty-four pounds to the bushel, and wheat from twenty-five to thirty-five bushels per acre, the farmers are naturally rejoicing. Potatoes are being dug and it is demonstrated that a superior grade can be grown in the sandy loam soils of the valley. A satisfactory crop of field corn was produced by a number of farmers.

The opportunities for homeseekers in this valley are unusually attractive, especially for those who are accustomed to the climate of our northern states.

During the month of September 70,000 cubic yards of material were placed in the Owl Creek embankment of the Belle Fourche project, S. Dak., making a total of 1,348,000 cubic yards to date, and about 40,000 cubic yards were placed in the Owl Creek gap. The fill has now passed the danger point from a raise in the reservoir, since the waste can be carried through the conduits.

The project as a whole is about seventy-five per cent completed.

Good progress is being made in building

the branch line of the Chicago Northwestern Railway through the project. This railroad will pass through the new Government town site which will be opened for the sale of town lots shortly after the completion of this project.

At the present time about fifty Indian and thirty Government teams, with sufficient force of laborers, are engaged on excavation work in connection with the canal system of the Blackfeet project, in northern Montana. A gang of twenty-five men is doing rock work on the same project.

During September construction work was continued on the Jocko and Mission divisions of the Flathead project, Mont., including the building and placing of wooden turnouts, bridges, etc. The excavation for the "K" canal headworks was completed. At Polson excavation work on first-unit canal continued and good progress was made for the first unit. The tunnel force is now grading at the power-house site at the lower end of the tunnel.

In connection with the farm-unit work, sixteen square miles have been mapped, eighty miles of secondary levels were run, and three farm-unit township plats were completed. Much interest was displayed in the auction sale of the Government town sites at Polson and Dayton, the prices secured averaging two to three times the appraised values of the lots.

During the month of September the contractors on the Roosevelt dam, the principal engineering feature of the Salt River project in Arizona, laid 7,800 cubic yards of rock, bringing the dam to eighty-three per cent of completion.

Active work on the concrete construction of the Shoshone dam, Wyoming, was resumed on September 1. This structure is now 181 feet above bedrock, leaving 147 feet to be built.

With the completion of many large structures and the approach of winter the field force of the Reclamation Service is being rapidly reduced. A number of experienced men are resigning to accept private employment; others are going on furlough, and few, if any, new employees are being taken on, excepting in the lower grades.

Owing to favorable weather conditions, construction work on the Klamath project, Oregon-California, proceeded rapidly during September. Three gangs of foreign laborers were shipped in from Portland to make up for scarcity in the local supply.

During September the drainage work on the first unit was completed, and the force of men was transferred to the south end of Clear Lake, where work was commenced on the dikes. The site has been cleared of rocks, the surface plowed, and a cut-off trench under the earth portion of the embankment has been excavated.

The Salt River project, in Arizona, is eighty-two per cent completed. On the great Roosevelt Dam the most important engineering feature and one of the largest structures of its kind in the world is within fifteen per cent of completion.

The cement mill operated by the Reclamation Service was run twenty-six days, with an output of 13,023 barrels burned and 8,901 barrels ground. Good progress was made on the transmission line and substations.

Engineers throughout the country, and especially those engaged in irrigation development in the West, have been greatly interested in the progress of the construction of a remarkable dam across the Colorado River near Yuma, Ariz.

This enormous structure, nearly a mile in length, nineteen feet in height, and 246 in width up and down stream, was built by force account by the Reclamation Service. It rests upon the quicksands of the turbulent Colorado River, and is the only structure of its kind in this country.

Since its completion many prominent engineers of the United States and several from other nations have visited the site.

The erratic stream has several times spent its fury in vain against the obstruction which man has placed in its channel, but the severe tests which the dam has withstood are evidences that it was built to stay.

Mr. Arthur P. Davis, chief engineer of the Reclamation Service, left Washington early in October to inspect the work on the Truckee-Carson project in Nevada. From there he will proceed to points in California, and during November will be with the United States Senate Committee on Irrigation, Hon. Thomas H. Carter, chairman, in the trip through Colorado, Utah, Nevada, California, Arizona, and New Mexico.

Writing from Fallon, Nev., under date of October 10, he said:

"I am delighted with the outlook on the Truckee-Carson project. Many of the settlers have made excellent showings, and they are sufficiently scattered to serve as demonstrations of all the different types of soil. No one can hereafter honestly say that the natural conditions here are not favorable. Many farmers have raised from nine to ten tons of alfalfa, and all fruits that have been tried have succeeded well. Within a few years it will not be possible to buy average land with water right at less than $100 per acre in this valley."

The project engineer on the North Platte project, in Nebraska, reports a most successful irrigation season for 1909. Notwithstanding the newness and extreme length of the main canal and lateral system, the delivery of water was made in ample quantity to each settler without a single disastrous break.

It is a pleasure to travel over the newly reclaimed lands to view the bountiful harvests. The crops are all made, potatoes are being dug, the corn has ripened, and wheat and oats are in the stack awaiting the thresher. On the whole, the yields have been

satisfactory, and an atmosphere of optimism pervades the valley.

The four-mile tunnel, an important feature of the Strawberry Valley project, Utah, has been excavated 4,383 feet, the rate of progress for September being 370 feet.

The wonder-working miracle of mixing water with the desert soil has been wrought here. A settled, prosperous, and contented community has been established, which from this time on will take its place among the best of the newly developed sections of the West. To the Reclamation Service, the most cheering feature is the complete harmony which prevails in the relations of the local engineers and the farmers. The mutuality of interests is recognized and all are working together for the success of the valley. The Service regards the North Platte project as one of the best examples of the wisdom of the Reclamation Act.

Floods and Forests

Maine has been stricken with great floods, cloudbursts, and rivers overflowing. The extent of the damage, the amount of the loss, cannot be accurately computed. Always following such outbursts of nature's fury there is a train of loss and hardship which escapes the statistician. The lesson is none the less plain, and it is that if the country is not to lay itself open to many such experiences as this of Maine a more effective and comprehensive forestry policy and performance must be attained.—*Boston* (Mass.) *Advertiser.*

Enrollment in Pennsylvania State College

Pennsylvania State College has enrolled as forestry students ten seniors, twenty juniors, forty sophomores, and over eighty freshmen for the year 1909-10.

Need for Protecting Pacific Coast Forests

A member of the American Forestry Association writes: "There is great need for protecting the remaining forests on the Pacific coast south of San Francisco.

"Santa Cruz County has a satisfactory rainfall for our timber on the Santa Cruz Mountains, but in all of California south of our county the rainfall is irregular and often fails altogether. The little remaining timber in these mountains will be exhausted in a few years. The result will, I fear, be disastrous. The time has come to act."

Forestry Pamphlets

The United States Forest Service and the Bureau of the Census of the Department of Commerce and Labor are cooperating in the preparation and publication of a series of interesting pamphlets on Forest Products. "The work is conducted under the direct supervision of a committee of four, consisting of W. M. Steuart, chief statistician for manufactures, and J. E. Whelchel, expert chief of division, representing the Bureau of the Census, and R. S. Kellogg, assistant forester, and A. H. Pierson, forest assistant, representing the Forest Service."

Pamphlets recently published cover slack cooperage stock, tanbark and tanning extracts, tight cooperage stock, wood distillation, cross ties purchased, and poles purchased.

Meeting of Connecticut Forestry Association

A field meeting of the Connecticut Forestry Association was held at the home of Doctor Mathewson, "The Larches," south Woodstock, Conn., on October 8. There were forty-six members of the association present. Prof. H. S. Graves, director of the Yale Forest School, spoke upon "The Handling of Woodlands." Mr. S. N. Spring, who was appointed state forester of Connecticut on October 1, addressed the meeting on the subject of "Forest Plantations." After the meeting an inspection was made of the improvement thinnings in Doctor Mathewson's woodlot and an examination was also made of his extensive larch plantation.

The First National Forest in the United States

Mr. Robert Underwood Johnson, associate editor of the *Century Magazine,* criticises the statement by Mr. Philip W. Ayres in CONSERVATION for October (page 608) that "Mr. Cleveland established the first National Forest."

Mr. Johnson points out that "the first reserves were established by President Harrison through the efforts of his Secretary of the Interior, Gen. John W. Noble, of St. Louis, who is still living. Mr. Cleveland's service to this great cause is not to be underestimated, but it is well to remember in these days of its general acceptance the farsightedness displayed by Mr. Harrison and General Noble, who were the first persons officially to turn the face of the United States in the right direction."

Mr. Johnson is, of course, correct, as Mr. Ayres will willingly concede. On March 30, 1891, President Harrison created the first reserve, namely the Yellowstone Park Timberland Reserve, while on February 22, 1897, President Cleveland, upon the recommendation of the National Academy of Sciences, created thirteen additional Forest Reserves, of 21,379,840 acres.

Mr. Ayres was, without doubt, distinguishing between a National Park and a National Forest.

Forestry Patrol Recommended

Prof. C. H. Goetz, of the Washington State College, states, from experience in the Cascade Mountains last summer, that the best way to protect a forest against fire or trespass of any kind is to have a sufficient patrol to keep out small fires, and to prevent fires from starting. The moral effect of a good fire patrol on the fishermen, lumbermen, miners, prospectors, and even railroad employees is wonderful, a fact which accounts for the small number of fires started in Washington State last season. If every state that has timber to protect had a state fire association, as has the state of Washington, there would be very little heard about large fires destroying our woods. The Washington State Fire Association has spent from $50,000 to $75,000 a year for keeping a good fire patrol, and has found it a paying investment, the annual saving being now three times the cost of fire protection.

Professor Goetz writes enthusiastically of the forestry work in the Washington State College, the situation of which institution for forestry work is highly favorable.

State Control of Maine Forests

Mr. D. H. Darling, treasurer, Bradstreet Lumber Company, writes from Richmond, Me., correcting the news note found on page 642 of CONSERVATION for October, and says:

"The facts are as follows:

"The legislature of 1906-07 interpellated the state supreme court to learn if the state could regulate the cutting of forests without compensating the owners thereof.

"The court's answer, that they could, has been widely circulated, but, so far, the state has not availed itself of the right to enact such a law.

"Since this decision, but one attempt to enact a cutting-regulation law has been made, and this was embodied in the bill I drew and had presented at the last session, but which was referred to the next."

Mr. Darling sends a copy of the bill.

Governor Hughes on Forest Conservation

In his address at the Hudson-Fulton celebration, Governor Hughes said, in part:

"This celebration should not only prove a stimulus to endeavor by its commemoration of distinguished achievements, but it should also quicken our appreciation of the natural conditions which made these achievements possible, and direct our attention to the conservation of this priceless gift of nature. At the headwaters of the Hudson and its principal tributaries we learn the necessity of forest preservation. If we would preserve the source of industrial power, if we would secure and maintain proper regulation of the flow of our streams and make them agencies of progress rather than devastating forces, we must conserve the forests of the country. It is only within a few years that we have appreciated the importance of this policy. The people have not awakened too soon. In the state of New York during the past few years large areas of forest tract have been acquired by the state, and under the amendment to the constitution adopted fifteen years ago all lands so acquired are to be kept inviolate. It is to be hoped that these purchases will largely be extended and our forest tracts put beyond danger of devastation.

"The river should be kept, so far as possible, free from pollution. We must maintain this noble stream as a wholesome river and not permit it to become a mere sewer. This is a problem of great difficulty because of local exigencies and of the demands of established industries upon which the prosperity of many of our communities depends. There are diversities of conditions which should have intelligent appreciation, but we must not be indifferent to the necessity of protecting the health of the people and to the importance of keeping our streams pure."

Governor Hughes also plead for the preservation of the scenery of the Hudson, and expressed the earnest hope that the two states interested would cooperate "to safeguard the highlands and waters in which they are both deeply interested."

Conserving Miners' Lives

Lyman Beecher Stowe says in the October *Outlook* that about 30,000 men have been killed in the coal mines of the United States since 1889. About 7,000 were killed and injured in 1906 alone, and, in 1907, he states that over 3,000 were killed and 6,000 injured. Mr. Stowe's article, which is entitled "To the Rescue," describes the work of the newly organized Government Rescue Corps, started as a result of the work of Dr. Joseph A. Holmes, chief of the Technologic Branch of the Geological Survey. In May, 1908, Congress authorized the investigation of mine explosions, and in July, 1909, a Federal appropriation of $150,000 was made to start mine-rescue work in connection with a station which had been opened the previous December in Pittsburg. Three foreign experts on mine disasters came to this country with suggestions for the development of the rescue corps. The Government has already established two experimental stations, the one already mentioned at Pittsburg and a substation at Urbana, Ill., in connection with the University of Illinois. Government mining engineers are assigned to these stations, and aside from the rescue work the experts test explosives.

Reports on all mine accidents, both in the United States and foreign countries, are there collected. After each disaster mine experts

are sent to study the conditions and find out, if possible, the cause of the accident. The data thus gathered are then tested by experiments in the artificial mine galleries and in a mine which is used as an experimental laboratory. The Government is to establish other mine stations at or near the greater centers of accidents.—*The Survey.*

Drainage Circular

Mr. J. O. Wright, supervising drainage engineer of irrigation and drainage investigations of the United States Department of Agriculture, has prepared Circular No. 76 entitled "Swamp and Overflowed Lands in the United States, Ownership and Reclamation."

This circular carries a map showing graphically the swamp and overflowed lands in the states east of the Rocky Mountains, the total area of which is almost equal to that of Illinois, Indiana, and Ohio. Florida leads in swamp lands, Louisiana is second, Arkansas, Mississippi, Minnesota, North Dakota, Michigan, South Carolina, Georgia, and North Carolina follow in the order given.

Mr. Wright declares that "after considering what has been done to reclaim the marshes of Holland, two-fifths of which lie below the level of the sea, and the difficulties that have been overcome in draining the fens of England, it would be a reflection on the skill and intelligence of the American engineer to proclaim the drainage of our swamp lands impossible." On the contrary, the engineering problems are simple.

Mr. Wright argues that drainage is a public function, but that the cooperation of the interested landowners is necessary. Drainage legislation, he maintains, should be enacted.

"Were this 77,000,000 acres of swamp and overflowed lands drained," says Mr. Wright, "and made healthful and fit for agriculture and divided into farms of forty acres each, it would provide homes for 1,925,000 families." The swamp he regards as a nuisance which should be abated and made to contribute to the support and upbuilding of the United States.

Redeeming the Great Valley of California

Mr. A. D. Foote, M. Am. Soc. C. E., has prepared a paper entitled "The Redemption of the Great Valley of California."

The writer compares conditions in the Great Valley with those in Egypt. He mentions a case where 5,000 acres of wheat were flooded in the winter of 1908 and 1909, "but that the owner did not regret it much, as the next crop would be more than doubled by the fertilizer deposited by the water." "In this simple statement," says Mr. Foote, "lies the secret of the redemption of the valley. It is no exaggeration to state that the floods of last winter carried down enough fertilizing material to produce millions of bushels of wheat, could it have been placed at the disposal of the tiller of the soil."

He continues: "If engineers would study Egypt and follow the teachings of her long experience, in so far as conditions admit, they would be trying no experiment." The basin irrigation of upper Egypt, gradually developed through 5,000 years, has proved in that country highly successful.

"Basin irrigation is dividing the land with dikes into so-called basins and introducing flood-water, usually carrying considerable sediment, from two to six feet deep over the entire area, and letting it stand for several weeks until the sediment has settled and the water has soaked into the soil as much as it will. The water is then drained off quickly, and the crop is sown on the mud, often before it is dried sufficiently even to harrow. The areas of these basins depend largely on the slope of the land. In Egypt they vary from a few acres to, in one instance, 40,000, the average being about 5,000 acres. This system of irrigation would be especially beneficial to alkali lands. The experience in Egypt is that where land has deteriorated and shows white efflorescence from perennial irrigation, one or two years of basin flooding restores it to its former state, and in no case has basin irrigation produced alkali lands."

This method Mr. Foote regards as entirely practicable in the Great Valley of California, and far superior to dependence on "precarious rainfall to grow an inferior crop on a deteriorated soil, and unsuccessfully fending off the flood in terror lest it destroy the country."

"It is proposed, therefore, to construct dikes to form basins, as in Egypt, over the entire floor of the Great Valley, comprising some 3,000,000 acres; and to feed these basins, during the winter or flood time, by suitable regulating gates and dams, from the various rivers and creeks entering the valley; and to regulate and control the feeding of the basins so as to relieve the rivers of flood waters, as much as possible, and hold these flood waters in the basins, or let them move slowly through, that they may deposit the silt and soak the land, and finally drain through escape channels in time for the crops to be sown in the spring. It is proposed to provide escape channels, through the lowest parts of the valley, of sufficient capacity to drain the basins rapidly, if required, and assist the rivers in times of excessive floods."

This scheme, Mr. Foote admits, will cost many millions—possibly $75,000,000. On the other hand, he is convinced it will return hundreds of millions.

The money, he holds, "can be borrowed by the state as needed, and returned to the state by the lands benefited, in instalments, after the benefit has been received, in a manner similar to that followed by the United States Reclamation Service."

Mr. Foote's paper is accompanied by an admirable map of the Great Basin, and is reprinted from the Proceedings of the American Society of Civil Engineers.

A National Land Exposition in Chicago

From November 20 to December 4 of this year will be held in the Coliseum, under the auspices of *The Chicago Tribune,* the United States Land and Irrigation Exposition, which will provide authoritative, graphic information about the vast land opportunities now opening up in many states for homeseekers, farmers, and investors. There will be exhibits of the wonderful fruits of virgin soil from all sections of the country. Elaborate panoramas will show what is being done to irrigate, drain, and cultivate it. Arrangements have been made for Government exhibits of great value.

The National Land Laws

During its existence as a nation the United States has given or sold to private owners hundreds of millions of acres of public lands which to-day represent in their total a valuation expressed in billions of dollars. The policy adopted and pursued in the early days was defensible and even commendable. Settlers were wanted in the great West and inducements were necessary. Free land or cheap land proved an irresistible attraction and settlers swarmed westward. Railroads were needed, and land grants on a gigantic scale made railroads possible. Under this system endless miles of wilderness became one of the world's greatest producing areas and the home of millions of industrious and prosperous people.

The change in conditions was not attended by change in the laws. There was a continuance of the policy of treating public land as of little or no value, to be given, or at best sold cheaply, to those who applied for it. Under these antiquated laws petty frauds and gigantic swindles came into existence and flourished mightily. All attempts to remedy the evil, to adjust the laws to the new conditions, were fought by the representatives of those who were making money by processes which were, in fact, the equivalent of robbery of the American people. All efforts to punish offenders were blocked and delayed, in spite of the courage and the fidelity of such men as the late Ethan Allen Hitchcock, until the prosecution of land-fraud cases has come to be almost a farce.

Last year the General Land Office reported the United States (the American people) as the owner of 754,895,296 acres of "land areas unappropriated and unreserved." This includes Alaska's 368 021,509 unsurveyed acres. Leaving out the Alaskan area and the approriated and reserved areas of the country proper, it appears that the United States is now the proprietor of 386,873,787 acres of the least valuable land out of an original possession of 1,441,436,160 acres. Out of this 226,690,938 acres are reported as "surveyed" and 160,182,849 acres as "unsurveyed." Very little farming land remains for distribution. Much the larger part of the timber land has been either distributed or included in the National Forests. The mineral resources of the unsurveyed regions are either little known or quite unknown. * * *

The gift or the bargain sale of highly valuable forest and mineral lands for the enrichment of the few by the careless liberality of the many is now a national folly. Every possible acre of public land should be reserved until by proper survey a fair valuation can be determined and a fair price set on the property. About three-quarters of the original national holding has passed into private hands. A considerable percentage of the whole has undoubtedly been acquired by processes of doubtful legality, and much has been acquired by glaring fraud. For what remains as national property new laws should be devised in the interest of the present owners, the people of the United States.—*The Sun,* New York City.

Let's Focus on Something for Conservation

What if every man, woman, and child in the whole country could be convinced of the need for a vigorous conservation program? Would they get it? Not in a thousand years if they didn't organize the fight.

The Forester has been at work to organize that fight for ten years. The administration tells us it is doing all it can to the same end now. The Conservation Commission and the American Forestry Association are far from idle. But all these forces together have not gone a great ways.

James J. Hill has hit the conservation nail on the head. There will never be any progress, thinks that astute empire-builder, until the plan of waterways development is made solely in the light of the greatest good to the whole country. Congress will keep to about its present tire-exploded pace as long as Goose Creek is fighting Sugar Run. So with restrictive legislation as to the cutting of young timber. So with planting for the protection of soils. So with everything else —even the tariff.

A waterways commission was Mr. Hill's plan. It would require Congress to eliminate itself. But the end is so much to be desired that maybe Congress could be persuaded to do so. Then, in the further judgment of this same student, there must be sane financing. * * *

What ought to be done by the friends of the conservation movement, and done right away, is this:

The fight should be focused. There ought to be as nearly as possible unanimous demand upon Congress for one thing. That

one thing should be a commission to lay general foundations for future appropriations as to the further purchase of national forest lands, the development of mineral resources in the public lands, the protection of soils, as well as to digging channels and building dams.

If that can be accomplished—and there is a tarnel sight more chance of it than of getting any billion-dollar bond issue—then there is some hope for the whole cause of conservation. Somebody ought to send out a farmers' bulletin on the need of getting together.—*Washington Times.*

Colorado Conservation Commission Resolutions

Among the resolutions passed by the Colorado Conservation Commission at its recent meeting were the following:

A resolution expressing the intention of the Commission to cooperate with the state and Nation in every proper conservation effort, in which monopoly was guarded against and the law respected.

A resolution indorsing the general conservation policy of the Government and urging other states to cooperate in the work.

A resolution advising the Government to limit the time of its franchises for water-power on the public domain.

A resolution favoring legislation to prevent mineral lands being obtained under the guise of agricultural land.

A resolution favoring legislation encouraging bona fide irrigation enterprises.

A resolution favoring more stringent game laws.

A resolution favoring the plan of taxing timbered land on its value outside of the trees on it, and favoring the exemption from taxation of all land up to ten acres which any settler plants in new trees.

A resolution favoring the cooperation of the state with the Federal Government in protecting the forests from fire and depredation.

A resolution favoring the sale of matured timber on forest reserves to settlers needing it for local consumption.

Japanese Visitors in America

The party of honorary commercial commissioners of Japan, a large and distinguished body composed of noblemen, captains of industry, educators, agriculturalists, financiers, lawmakers, and men prominent in the affairs of the empire, now touring the United States, met with a distinguished reception in Spokane.

Baron Shibusawa said: "Often we have traveled in England and Europe, and in the smoky cities we have seen signs, 'English spoken.' To-day in your beautiful city we have seen 'Japanese Spokane.' * * *

"You have spoken in warm terms of our progress, but you have not mentioned the fact that we owe it all to America. If it had not been for America—for Commodore Perry—we would not to-day have been able to boast of the progress of which we have been so proud.

"You are citizens of the inland empire of the West, while we are of the island empire of the East; I have heard that Spokane means 'sons of the sun,' while our nation, too, claims descent from the goddess of the sun, so that our two peoples would, after all, seem to be really one."

Mr. Poindexter was cheered to the echo in closing his remarks with the declaration that the wealth of forest and water on the mountain slopes belongs to the people, and should be protected for their benefit.

Jinie Nishimura, member of parliament and president of the Kyoto Chamber of Commerce, who has started transportation projects with capital aggregating $500,000,000, headed a party of bankers and experts on a visit to the Washington Water-power Company's works, and they expressed keen interest in the machinery and turbines. The falls of the Spokane River, where thousands of horsepower electrical energy is generated, also proved a source of interest.

Waterways Meetings

Waterways meetings abound. On October 7 the Upper Mississippi River Improvement Association closed its eighth annual convention in Winona, Minn.

On October 7 the Good Roads and Waterways Conventions called by Governor H. H. Hadley, of Missouri, met in Sedalia, of that state.

On October 14-15 the Ohio Valley Improvement Association met in Cincinnati, Ohio.

On October 21-23 the fifth annual convention of the Interstate Inland Waterways League was held at Corpus Christi, Tex.

On October 29-30, and November 1-2, the Lakes-to-the-Gulf Deep Waterways Association will meet at New Orleans.

On November 10-11 a waterways meeting will be held at Fort Wayne, Ind., to promote the Toledo, Fort Wayne and Chicago Deep Waterway project designed to construct a ship canal connecting Lake Erie and Lake Michigan by way of the Maumee River and Fort Wayne.

On November 15-16 the Mississippi-Atlantic Inland Waterways Association will meet at Jacksonville, Fla.

On November 17-20 the Atlantic Deep Waterways Association will hold its second annual convention at Norfolk, Va.

Meanwhile the American Waterways Commission, with Senator Burton, chairman, is touring Europe studying the inland waterways question.

Meetings of the American Society of Mechanical Engineers

Meetings of the American Society of Mechanical Engineers have been advertised as follows:

In New York, on Tuesday evening, October 12, at eight o'clock, in the Engineering Societies Building, with a paper by Prof. R. C. Carpenter, of Cornell University, upon "The High-pressure Fire System of New York City."

In St. Louis, jointly with the Engineers' Club of St. Louis, on Saturday evening, October 16, Professor Carpenter's paper to be repeated.

In Boston, on Wednesday evening, October 20, at eight o'clock, jointly with the Boston Society of Civil Engineers, in Chipman Hall, a paper to be presented by Prof. Gaetano Lanza and Lawrence S. Smith on "Comparison of Results Obtained by the Use of Three Theories of the Distribution of the Stresses in Reenforced Concrete Beams," with the experimental results.

The Nature Lovers' League

To aid in awakening the public conscience to a sense of moral obligation toward vanishing nature, the La Rue Holmes Nature Lovers' League was organized, not quite two years ago, and is doing its part to that effect.

This movement originated with a young naturalist, connected with the Museum of Natural History, New York City, whose name was given the organization after his premature death, when but upon the threshold of his intended work. It was the outgrowth of an intense, sorrowful love for retreating nature.

The Nature League accomplishes its purpose largely through the formation of chapters in schools, both public and private; the introduction of literature and lectures treating of natural history themes and of kindness to all the humbler forms of God-given life—of kindness to humanity by dealing with nature as a sacred heritage to be passed on to the future unimpaired, as far as possible, if not enriched, through our guardianship.

As a means of familiarizing our children and youth with the utility of our birds, the relation between animal and vegetable life, the mission of forests, etc., themes are presented to school chapters, pupils writing brief essays, embodying information given, as well as items of personal observation.

Many of these little essays, written frequently by very young members, are printed through the courtesy of the press, not only stimulating interest among members of league chapters, but frequently presenting items of more or less interest concerning various forms of humble life calculated to increase sentiment in behalf of nature's passing pageant.

If our forests are not to be remorselessly felled; if our water supply is to be maintained throughout the land; if our birds are not to be sacrificed as mere targets and decorations for the thoughtless, our young people must be led out of the ruts, cut deep across the heart of nature by past generations, and up to a plane of outlook whence may be clearly seen the relation between the preservation of nature's riches and national prosperity.

California to Raise Eastern Hardwoods

The Pacific Coast will soon be the scene of an interesting tree-growing experiment. The United States Forest Service is planning to introduce a number of the more important eastern hardwoods in California, and will this year experiment with chestnut, hickory, basswood, red oak, and yellow poplar or tulip trees. Small patches of these trees will be planted near the forest rangers' cabins on the National Forests, and if these do well larger plantations on a commercial scale will soon be established on wider areas.

There are over 125 different species of trees in California, a number of which produce some of the most valuable varieties of lumber in the country. Although considerably over one-half of the species are hardwood or broad-leaved trees, yet, with the exception of the exotic eucalyptus, there is not a single species of hardwood here ranking in commercial importance with the leading eastern hardwoods. Climatic conditions in many parts of California are undoubtedly favorable for the growth of a number of the valuable hardwoods, and the absence of these trees is due mostly to unfavorable factors of seed distribution.

If the experiments are successful, a valuable asset will have been added to the forest resources of this state, which should prove of special benefit to the local furniture and vehicle industries. Chestnut and red oak are highly esteemed for furniture, while with hickory, basswood, and eucalyptus at its command, California should lead all other states in the vehicle industry.

The Smoke Nuisance

The smoke nuisance in cities seems to be not only a burning question but a question of burning—of combustion. A bulletin just published by the United States Geological Survey (Bulletin 373) on "The Smokeless Combustion of Coal in Boiler Plants," by D. T. Randall and H. W. Weeks, gives the results of smoke studies carried on in thirteen large cities and of tests made at the Government fuel-testing plants at St. Louis and Norfolk. A preliminary report on the same subject was made in the Survey's Bul-

letin 334, "The Burning of Coal without Smoke in Boiler Plants," by Mr. Randall, the edition of which is now exhausted. The report just published consists of 186 pages and forty illustrations.

The conclusions reached may be summarized as follows:

Smoke prevention is possible.

Any one kind of apparatus is effective only if so set under boilers that the principles of combustion are respected.

Stokers or furnaces must be set so that combustion will be complete before the gases strike the heating surface of the boiler.

No one type of stoker is equally valuable for burning all kinds of coal.

Although hand-fired furnaces can be operated without objectionable smoke, the fireman is so variable a factor that the ultimate solution of the problem depends on the mechanical stoker—in other words, the personal element must be eliminated.

The small plant is no longer dependent on hand-fired furnaces.

In short, smoke prevention is both possible and economical.

Soil Fertility the Foundation of Progress

Agriculture is being given more prominence among the educators of our Nation than ever before. There are now fifteen state agricultural high schools, and forty others which receive state aid. Two hundred and fifty high schools and academies are giving instruction in agriculture and there are also sixteen colleges privately endowed with funds to carry on this same farm training. One hundred and fifteen state and county normal schools are teaching our teachers to teach these principles. The people have seen a great light. It is a most hopeful sign of a hopeful Nation that we are placing our trust in the soil as the foundation of our material prosperity. Our food comes from the soil. When a man is reasonably assured of his daily bread, he may begin to cast about him for other means of betterment, but the bread must be provided first. As with one man, so with a nation. While we firmly establish our agricultural greatness, we shall have no fear but that our other growth and prosperity and general progress will follow right along. In all this we shall never forget that it is the soil fertility of America that most directly furthers her might.—*The Wisconsin Farmer.*

Maine's Timber Loss

According to Fred A. Gilbert, of the Great Northern Paper Company, of Bangor, Me., the annual loss to the state of Maine through failure to utilize its wealth of timber is over $10,000,000 on five of the most common kinds of lumber—spruce, pine, fir, hemlock, and cedar. Besides this loss, the state is also slowly losing its principal asset—the standing growth of the timber itself. This latter loss, in the opinion of Mr. Gilbert, is not due to the annual cutting and marketing, but to the waste and decay and losses by fire and wind.

"Given the needed railroad facilities into this now inaccessible wealth of timber," says Mr. Gilbert, "a proper care in cutting, and an efficient fire patrol, and the state is capable of producing 1,400,000,000 feet of spruce, pine, cedar, hemlock, and fir annually, or 650,000,000 feet (less unavoidable fire and wind losses) more than it is now marketing, to say nothing of hardwoods, and yet gain in the quantity of timber standing."—*The Paper Mill.*

Reforestation in Ontario

The Ontario Department of Agriculture has published a Report on the Reforestation of Waste Lands in Southern Ontario. It states:

"In spite of the assertions of so-called practical men that nature will look after the replacing of the forest, the following is certain, that on large areas where no seed trees of commercial species exist, it will be impossible to obtain satisfactory new growth within a reasonable time."

It estimates that southern Ontario could eventually have over 10,000,000 acres of private woodlands, and maintains that "it is very important that the private landowner be urged and educated to feel the necessity of protecting existing woodlands, and replanting waste areas. This branch of work can be greatly assisted by demonstrating forestry methods on these larger areas. * * *

"Government forest nurseries * * * will be able to supply planting material to owners anxious to replant waste land.

"In addition to their value as object-lessons in forestry methods, these areas should be preserved for the people of Ontario as recreation grounds for all time to come. * * *

"The policy of putting these lands under forest management has many arguments in its favor. It will pay as a financial investment; assist in insuring a wood supply; protect the headwaters of streams; provide breeding ground for wild game; provide object-lessons in forestry, and prevent citizens from developing under conditions which can end only in failure."

Forestry in California

The California State Board of Forestry issues a small, four-page folder, the moral of which is, "Do your best to prevent forest fires." From it we clip the following items:

"Would you set fire to any man's house?

"If you saw his house burning, would you pass by without doing anything?

"Do you realize that timber is quite as valuable to the owner, and much more so to the community and to you?

"He can build a new house, but not a new forest. As for your own interest, think over the following facts:

"California has 160,000,000,000 feet of standing timber, even now worth $400,000,000 as a resource. If manufactured and sold even at present lumber prices, it would bring $2,500,000,000 into the state for labor and supplies.

"California sells over $20,000,000 worth of lumber a year. Of this, $14,000,000 is received by employees, who put it into local circulation. You share it.

"About 1,000,000,000 feet is destroyed by fire in California every year. If manufactured, it would bring in $15,000,000.

"On every 1,000 feet burned the stumpage owner loses at least $3, but the community loses $8 in wages.

"Timber means pay checks to support all industries, but burned timber pays no wages.

"Care with small fires is the best way to prevent big ones.

"Don't toss away burning matches or tobacco!

"Don't make a camp-fire in leaves, rotten wood or against logs, where it may spread or you can't be sure it is out!

"Always clear away all inflammable material before building your camp-fire!

"Never leave a fire until it is out!

"Don't burn brush, grass or slashings without a permit from a fire warden.

"Don't operate an engine using fuel other than oil without having it equipped with a spark arrester.

"Put out any fire you find if you can. If you can't, notify a fire warden or other public officer or the landowner. Remember that any little fire may become a big one if left alone."

Similar folders might well be circulated by forestry and conservation people throughout the country. It is education that counts.

Saving the Great Oak at Edgewood

One of the finest oaks for many miles around has been saved by the aid of the tree surgeon, to be, it is hoped, for many years to come a delight to the eye, a comfort and joy for old and young, for man and beast and bird.

The grand old tree in question stood in the middle of one of the roads at Edgewood, W. Va., and, thanks to the wisdom of those who laid out that village, was not then destroyed. Decay had set in, and each year's rains and insects did their deadly work, until it commenced to look as though its years were numbered. The great hole in the trunk became larger and larger; more from thoughtlessness than any motive of mischief, children—nay, those of larger growth, who knew better—come to fill the hollow trunk with rubbish—motley and offensive. Serenely the oak looked down upon them all, and with dignity and patience strove to repair the undoing of insects, man and weather. Hundreds of years had this oak been growing in beauty and usefulness; possibly when Columbus first saw the New World it was a lusty young sapling, shouldering its way among elms and beeches. Many an Indian has it sheltered; many generations of men has it seen come and go; many thousands of birds has it sheltered in its arms; many a song has it heard; many a woodland tragedy has it known. Then one brother after another fell before the ax of the settler, until finally our friendly tree stood forth alone, displaying all the majesty of his girth and spread of limb. Perhaps it was a lightning stroke started the mischief of decay; perhaps the wanton carelessness of man. A tree surgeon was brought, who studied the situation, brought his assistants, ladders, tar, cement, skill and knowledge, and to-day our friend the tree rejoices in healing wounds, recovered health and a discharge certificate from the surgeon's hands, prepared to defy the storms of many a year.

The credit for this work is due to Mrs. Virginia Kendall and Miss Nellie Humphreys, of Edgewood.

Exhaustion of Mineral Resources

The report of the National Conservation Commission of 1908, showing the reckless manner in which our natural resources are being wasted, finds an echo in a bulletin (No. 394) just issued by the United States Geological Survey, in which are reprinted the papers on mineral resources contributed by members of the survey to the conservation report. The data on which these papers are based were not obtained especially for the occasion, but were taken from the files of the survey, where they had been accumulating for years. Taken together, they present a state of affairs that may well awaken reflection.

COAL

Coal is considered first, and it is shown that waste in mining loses forever about one-half as much as is marketed. This half is either left in the ground in thin beds or in the shape of pillars to support the roof. Coal has been extensively mined in the United States for not much more than half a century, but the consumption is increasing so enormously that if this increase should continue, all the easily accessible coal would be exhausted by the year 2040, and all coal by the middle of the twenty-first century. It will, of course, not continue at such a rate, for the increasing scarcity will raise prices and check consumption. Water-power, too, will undoubtedly largely take its place.

PETROLEUM AND NATURAL GAS

With regard to petroleum the situation is a good deal more serious. Petroleum has been used for less than fifty years, and it is estimated that the supply will last only about twenty-

five or thirty years longer. If production is curtailed and waste stopped, it may last till the end of the century. The most important effects of its disappearance will be the lack of lubricants and the loss of illuminants. Animal and vegetable oils will not begin to supply its place. This being the case, the reckless exploitation of oil fields and the consumption of oil for fuel should be checked.

In natural gas the waste is enormous; 1,000,000,000 cubic feet are estimated to be wasted into the air every twenty-four hours. The gas supply will last about twenty-five years—about as long as it has already been utilized.

IRON

Iron is very abundant in nature, but usually is found in ores so poor that it cannot be extracted at any reasonable cost. The best ores are being rapidly worked, and it is estimated that within thirty years they will have been exhausted, and that it will be necessary to resort to ores that cannot now be worked at a profit. This, of course, means higher prices unless new and much cheaper processes shall have been invented.

GOLD, SILVER, ETC.

Gold, silver and zinc are all so abundant that the supply is likely to last for centuries. Copper is also abundant, but is largely in low-grade ores, which cannot now be profitably worked. At increased prices, however, the supply will probably be abundant. For lead, however, the outlook is much less favorable. Its production in the United States is still increasing slightly, but is decreasing elsewhere in the world, and this despite a marked increase in prices. Probably the world's output has already reached a maximum, and will henceforth decline.

The phosphates, it is estimated, will be exhausted in about twenty-five years, and the farmer will then have to look elsewhere for fertilizers.

Fresh supplies of all these materials may, of course, be found, but (except for gold) it seems unlikely that they will be great enough or valuable enough to materially affect the estimates.

Bulletin 394 can be had, free of charge, from the director, United States Geological Survey, Washington, D. C.

Utilizing Waste

When the great lumber barons stripped Wisconsin, Minnesota, and Michigan of their pine trees, the land was considered practically valueless and not worth the cost of clearing it of stumps. But now the chemist has come to the rescue and demonstrated that there is wealth in the waste pine stumps. The stumps are therefore being grubbed out, broken up, and placed in retorts, where by distillation valuable products are obtained. Tar and turpentine are the direct products, and the charcoal residue is also proving of value. From the turpentine comes acetic acid, formaldehyde, creosote, and wood alcohol, and an endless variety of color dyes. Among the by-products are embalming fluid, shingle stain, sheep dip, metal polish, lacquer, and tree spray. In addition, the cleared land is worth something for cultivation.—*Omaha* (Nebr.) *Bee.*

Squirrels Menacing Forests

The tree squirrel is reported as menacing pine forests in California. His principle food is the pine nut. With the cutting of pine timber the supply of nuts diminishes, the result being an intensified competition by squirrels for food, with the consumption of practically the entire crop of pine nuts. In consequence the stand of pine trees for the future is threatened. The question is arising whether the trees should be protected at the expense of the squirrels or vice versa, or whether some mode may be devised for protecting both.

Making Engines Spark-proof

The first inspection by representatives of the public service commission, second district, of all locomotives to be used within the forest preserve of the Adirondacks disclosed that forty-three per cent failed to meet the requirements named by the commission, owing to defects in the spark arresters or ash pans. These were ordered corrected; and, later, three examinations were necessary on two of the roads before the engines were put in satisfactory condition. On the New York and Ottawa, nine out of ten examined were found to be defective upon the first inspection, and on the Carthage and Adirondacks, every locomotive proved to be more or less defective.

On the Mohawk and Malone division of the New York Central, the general mechanical condition of the locomotives was found to be good, practically all the engines having had general repairs at the West Albany repair shops within four or five months. A result of this thorough work is that practically all of the locomotives on the division are in good operating condition, and responsible mechanical officers of the New York Central have advised that this has resulted in a substantial saving of fuel, which has more than offset the increased cost of inspection and experimenting made necessary by the proceedings and order resulting from the forest-fire investigation of the commission.

Additional inspections will be made each month during the summer to ascertain whether the spark arresters and ash pans on the railroads operating in the Adirondacks are maintained in satisfactory condition, and whether the other requirements of the commission's orders are being enforced.—*New York Commercial.*

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To EDWIN A. START

Secretary American Forestry Association

1417 G Street N. W., Washington, D. C.

Dear Sir: I hereby signify my desire to become a member of the American Forestry Association. Two Dollars ($2.00) for annual dues are enclosed herewith

Very truly yours,

Name _____

P. O. Address _____

Falls of Elk Creek, near Cranberry, N. C.

CONSERVATION
FORESTS
WATERS
SOILS
AND
MINERALS

Vol. XV DECEMBER, 1909 No. 12

FORESTRY IN JAPAN

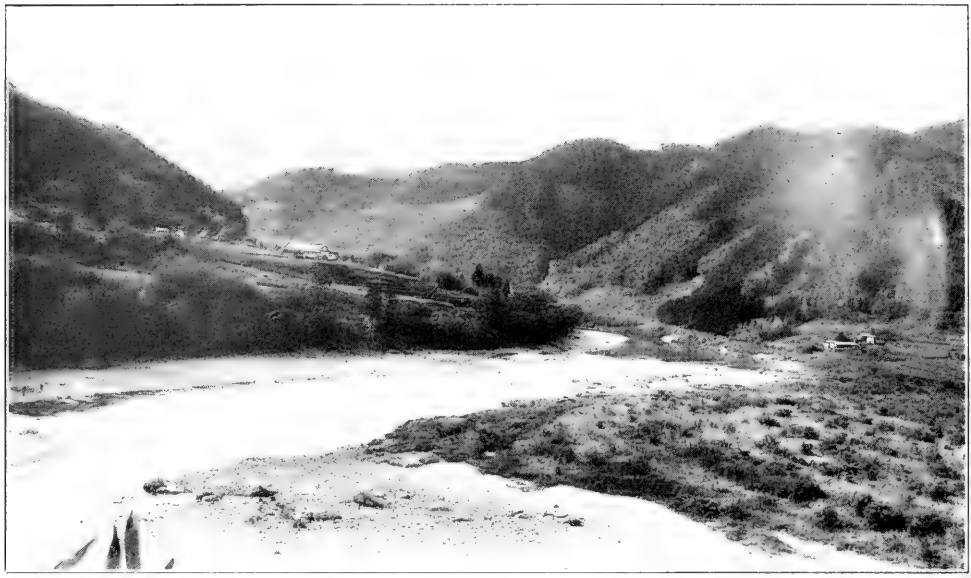
By J. BARRINGTON MOORE, M. F., United States Forest Service

I—INTRODUCTION

DURING the last five or ten years the civilized nations of the West have been watching with open-eyed amazement the astounding achievements of the Japanese in all lines of material progress. Forestry, now generally recognized as one of the most important factors in the development of any civilized nation, has been little thought of because eclipsed by the more spectacular feats of this remarkable people. Yet fully as much substantial progress has been made in forestry as in anything else which they have undertaken. In the short space of a magazine article it cannot be expected to give more than a brief general idea of the conditions of this important science in Japan.

Among the factors influencing the development of forestry, aside from outside influence two stand out pre-eminently as the key to most of the others. The first of these is the smallness of the islands and the consequent over-crowding of the population. Not only are the islands small, but also only twelve per cent of this small area is agricultural, the remainder being too hilly to farm. The result is that to support such a large population every foot of land must be productive. If it cannot be made to produce a crop of rice it can be made to produce a crop of trees. The second factor is the despotic form of government which prevailed until recently. Under the iron rule of the old Daimyos (feudal lords) the depredations of the individual in the forests were kept severely in check. Forestry in Japan must not be thought of as a brand new science transplanted there bodily at the time of the opening of the country. Forest protection had been enforced under the despotic Daimyos since the ninth century, and some form of management had been practised for the last 300 years. In one case at least this old management was remarkably well advanced and intensive (in the Yoshino private forests). Of course forestry received a great impulse after the opening of the country and was greatly influenced by European ideas, but the foundation was there long beforehand.

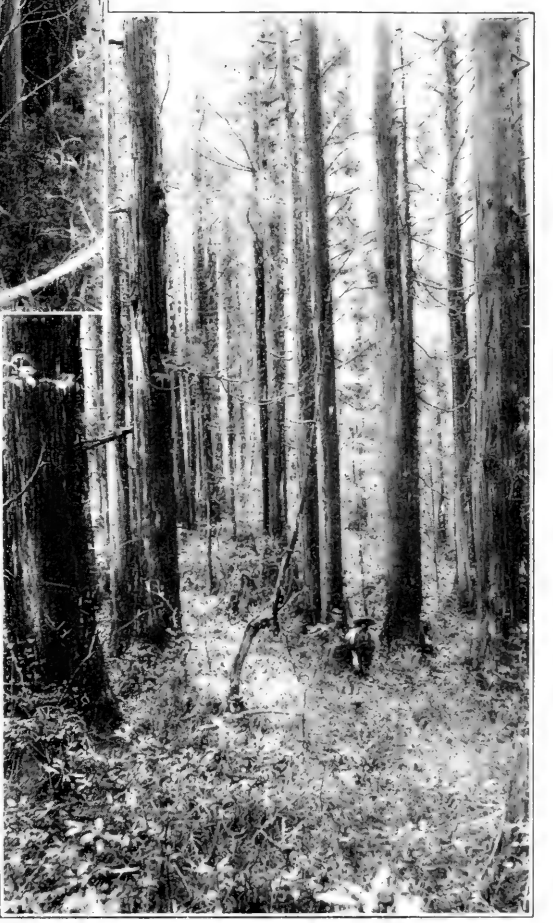
For the sake of clearness the forests will be considered under three heads:



Private Forests of Yoshino. View of the Valley of the Yoshino River. An Excellent Example of the Combination of Forestry and Agriculture. The Bottoms Cultivated, and Slopes Covered with Plantations of Trees

Private Forests of Yoshino. Plantation of Cryptomeria (*Cryptomeria Japonica*) a Hundred Years Old

Imperial Forests of Kiso. A Typical Piece of the Coniferous Type Shinoki (*Chamæcypris obtusa*), Shiba (*Thujopsis dolobrata*), and Sawara (*Chamæcypris pisifera*) near Top of Slope (Page 732)



State Forests of Nagakizawa. A Typical Piece of the Fine Stand of Cryptomeria Comprising This Forest. This Would Run Forty to Fifty Thousand Board Feet per Acre. It Is as Yet Uninjured by the Sulphur Fumes (Page 739)

(1) Private, (2) imperial, and (3) state. The proportionate of these in round numbers are: Private, 23,000,000 acres; Imperial, 6,000,000 acres; State, 29,000,000 acres.

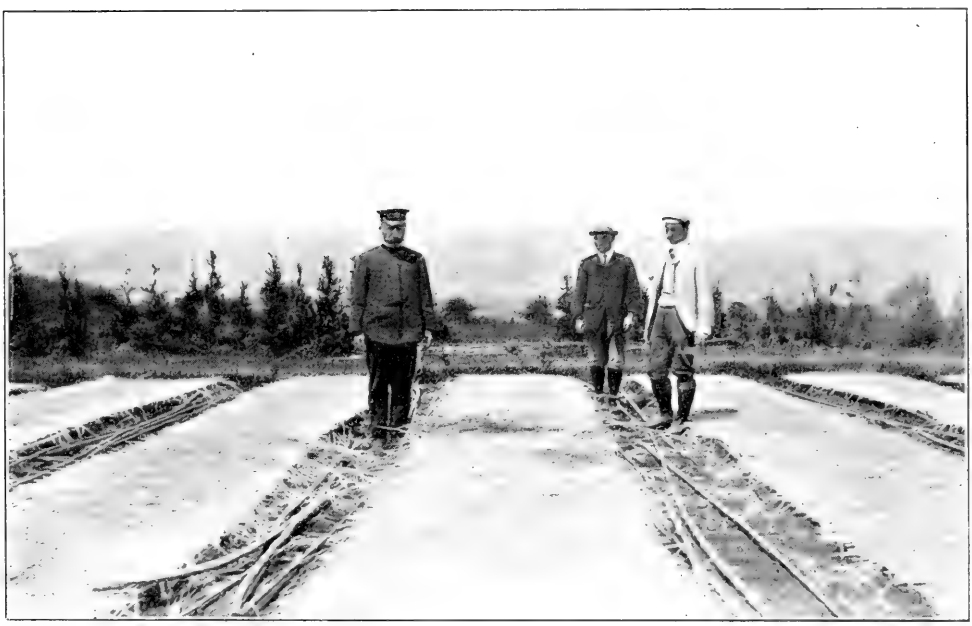
II—PRIVATE FORESTS

The most important of these are in what is called the Yoshino region (named from the Yoshino River), in Yamato Province. This region presents a spectacle absolutely without parallel anywhere in the world. It is a rugged and hilly country with but an insignificant amount of land on which farm crops can be raised, and yet it supports a large and extremely prosperous population because every inch of these slopes is covered with trees. The remarkable feature of the region is that the whole area is divided up into small pieces each owned by a different man. It is an ideal community of prosperous small owners (an excellent example of what our own western communities can be made into by the continuance of the present policy of the Forest Service to favor the small owner and to develop as large a number of small homesteads as possible in and around the National Forests).

It is said that 500 years ago there was absolutely no timber in the region, so that the people were forced to plant enough for their own use. They happened to grow a little more than they actually needed and threw the surplus into the river to be sold down below. This was found to be very profitable, so that everybody started planting trees. The result is that growing trees is today the main industry of the region. There are practically only two species used, the Cryptomeria (*Cryptomeria Japonica*) and Shinoki (*Chamæcypris obtusa*), both conifers. The Cryptomeria does not resemble any tree in the United States, but the Shinoki is very much like our northern white cedar or Arbor Vitæ (*Chamæcypris thyoides*) except that it produces a much finer and stronger wood. The Cryptomeria grows on the moister sites, and the Shinoki on the drier. The system of sylviculture is entirely clear cutting and planting, using three-year-old Cryptomeria plants and four-year-old Shinoki, spacing as close as three by three feet. Thinnings begin at twelve years and are repeated every three or four years till the stand is twenty-four years old. After that they are repeated at intervals of five years till the stand is forty-five years old, then at less frequent intervals till the final cutting, at 100 years. These thinnings are possible on account of the excellent market, which makes even the smallest sizes salable, and the easy water transportation. They are done with such extreme care and such a high degree of skill that they are even better than a great many of the thinnings in the well-managed forests of Germany.

There are not many elaborate theories in Yoshino, and there is no cumbersome mass of office work, on account of the peculiar condition of ownership; but the actual practise of forestry in the field is more intensive than anything to be found in Europe, strange as this may sound to foresters accustomed to look up to Germany as the home of all intensive forestry. For example, in stands forty to fifty feet high, which had been somewhat bent by the snow, the trees were tied back with ropes fastened to the tops of the trees *forty feet from the ground*. The amount of labor in carrying out such an operation can easily be imagined. Also, some high, rocky slopes were planted which were so bare that even the *soil had to be carried up there to plant the trees in*. Another site was seen which was so steep that men had to be *actually lowered by ropes* down the face of the cliff *to do the planting*. It is claimed by one of the owners that the returns are higher than anywhere in the world, being $17 *per annum* per acre, compared with $5.30 for Saxony. This is too high, because he failed to figure in the interest on his investment. But even so the returns are remarkable because of the almost perfect combination of favorable conditions, fairly fertile soil, abundant moisture, a ready market, and cheap transportation, together with very cheap labor. Another noteworthy feature of

Private Forests of Yoshino. Four Ages on a Single Acre. Plantations One Year Old, Four Years Old, Eighteen Years Old and Fifty-seven Years Old. This Looks Like Any Well-managed Forest in Germany (Page 730)



State Forest of Takahagi. Seed Beds Covered with Mulch of Rice Straw (Page 738)

this wonderful region is that there is a company of consulting foresters who advertise that they will apply their 300 *years' experience* to any forest problem.

Thus we find in Yoshino the oldest and most intensive forestry in the world, an absolutely natural growth untouched by outside influences, resulting from an absolutely unique combination of conditions.

III—IMPERIAL FORESTS

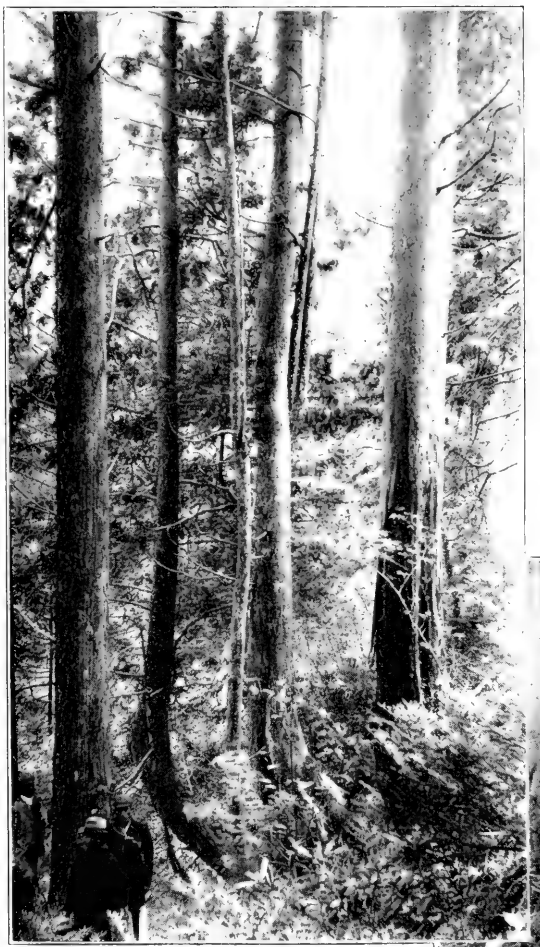
The best Imperial Forests are those commonly known as the Kiso forests. These are three forests with a total area of approximately 60,000 acres, situated in about the middle of the main island of Japan. They are in a rugged, mountainous country, from about 1,000 to 6,000 feet in elevation, made up of very steep slopes and narrow, rocky gorges. The soil, where there is enough of it, seems to be of very fair fertility, and there is an abundance of moisture (eighty inches rainfall). There are only three distinct natural types as far as could be observed. These are: (1) along the stream beds and less precipitous lower slopes, a forest of mixed hardwoods with occasional conifers; (2) on the middle slopes an even mixture of hardwoods and conifers, more or less in groups; (3) on the steep, upper slopes practically pure conifers. Among the hardwoods a species of birch (called Misume), almost like our yellow birch (*Betula lutea*), formed sixty per cent of the stand. The rest was made up of a kind of chestnut, a white oak (very much like *Quercus Alba*), a maple, Magnolia and a cherry. In fact this hardwood type might have been anywhere in the eastern United States from all appearances.

The coniferous forest is made up of three principal species, all of them very much like our northern cedars (*Chamæcypris* and *Thuya*), in the general appearance of the bark and leaves. The most important of these is the Shinoki (*Chamæcypris obtusa*), the same as the one planted in the private forests of Yoshino, forming forty per cent of the stand in the original forest. The other two, both of which have soft, coarse wood, are: Sawara (*Chamæcypris pisifera*, forty per cent of the stand) and Shiba (*Thujopsis dolobrata*, ten per cent). The remaining ten per cent is made up of other less important conifers.

That part of the forest cut over under the old regime has come up in almost pure hardwoods. The tops of some of the hills thus cut over are now covered with a birch almost exactly like our poplar birch (*Betula popyrifera*).

These forests have been under some sort of management for about forty years. But only in the last twenty-five years has planting after felling been practised. The species planted is Shinoki. Until within the last five years this planting was done in a haphazard manner, with only 1,000 plants per acre, and was not followed up by cleanings. The result is that these old plantations are now mostly covered with hardwoods through which an occasional Shinoki has managed to struggle up. Within the last five years they have been using three-year-old plants, putting in about 2,000 to the acre, and have been cleaning the area before planting, and every year for five years after planting.

The present working plan was revised three years ago, and it is the intention to revise it every ten years. It is very closely modeled on the German working plans, giving everything in tabulated form. The rotation is figured as 120 years, with twenty-year felling periods, and ten-year subperiods. The whole forest is divided into working circles, compartments and subcompartments, the subcompartments serving as the basis of the year's cut. The stand on the entire forest has been estimated, the yearly growth found, and the cutting regulated according to area and volume. They have two sets of maps made by a special bureau in Tokyo, one on a scale of 1-5,000, the other on a scale of 1-20,000. The utilization is curious on account of the lack of animals which is so characteristic of the whole of Japan. As they have no machinery to make up for this lack of animals, everything has to be done by "man-power." They have a tramway



State Forest of Uechimabe. Showing Stand of Pure Shiba (*Thujopsis dolobrata*) Lightly Cut Over by the Daimyos (Feudal Lords), with Excellent Reproduction in the Opening (Page 739)

State Forest of Nagakizawa. Cutting Up a Felled Cryptomeria. This Tree Is Only About Medium Size for This Forest. Showing the Peculiar Kind of Saw Used (Page 739)

with a two-foot gauge run by gravity to take the logs from the logging area to the main stream, a distance of five miles. The logging area itself is so steep that an elaborate system of stops and slides has to be constructed to get the logs down. And they fell the trees across the slope instead of up or down for convenience in peeling and for the safety of the men.

The working plan and system of sylviculture would compare favorably with almost any in Europe except that, perhaps, the formulas used for figuring the annual area and volume to cut were rather crude, considering the intensity of the rest of the management.

The only criticism of the system is the rigidity with which it is applied. Very steep, rocky slopes on which the forest should be managed as protection forest under some system which would keep the crown cover intact, are clear-cut and planted. The result is that on large parts of such slopes the cutting destroys the forest conditions so that planting becomes impossible. This point, however, may be looked at in another way. Under any system of natural reproduction the valuable Shinoki would be crowded out by the inferior Shiba on account of the poor power of reproduction of the Shinoki and excellent reproduction of the Shiba. Hence, from a strictly financial point of view, it may pay better to get a patchy forest of Shinoki than a solid one of Shiba.

IV—TRAINING

Before taking up the state forests it will be well to give some idea of the kind of training which foresters receive in Japan.

There is no regular forest school as such, but forestry is taught as one of four parallel courses in the College of Agriculture in the University of Tokyo. The four parallel courses are: (1) Agriculture, (2) agricultural chemistry, (3) forestry, and (4) veterinary medicine. Of course, this is the same thing as having a forest school.

The staff consists of five professors, three assistant professors, and one lecturer on law. These men are for forestry alone, not for the other courses as well.

The course extends over three years, covering very completely all the subjects in technical forestry, and the allied sciences. Before entering the forestry course, a man must have been three years in a "higher school." This is not like our "high schools," but much more advanced, more like our ordinary colleges. A man is generally about twenty when he graduates from one of these higher schools and enters the university. Thus the course in forestry is practically a post-graduate one and is built on a good, broad foundation. In addition to the four parallel courses mentioned above, there are three subsidiary courses in agriculture, forestry, and veterinary medicine. For forestry this subsidiary course extends over three years, has the same staff of instructors as the higher course, and practically the same subjects. The only difference is that the three years in the higher school are not required before entering (admission being by competitive examination), and therefore there is not the same foundation to build on. Unfortunately, there is a rush for the subsidiary course, three times as many applying as can be admitted, while there are not enough for the higher course. The courses, both higher and subsidiary, are all influenced by German methods, and even a certain amount of teaching is in the German language. All the technical phraseology is German.

The university is very fortunate in the matter of college forests, owning five in all, aggregating 206,509 acres. Of these, one of 5,421 acres is within easy reach of Tokyo, and serves for giving the men practical field training. Of the others, one of 57,000 acres is on the Island of Hokkaido, or Yezo, to the north, and serves only as a field for special investigations of the individual students or professors, and the other, of 144,000 acres, is on the Island of Formosa, and is practically untouched. Most of the vacations are spent in touring through the different forests of the country.

Imperial Forests of Kiso. An Example of Too Rigid Application of the System of Clear Cutting and Planting. Steep Slope Clear Cut, Where There Should Be Protection Forest (Page 732)

State Forest of Takahagi. Slopes Formerly Bare, Now Planted with Shinoki (Page 738)

The whole university, as well as the higher schools (which are attended only by men who are going to enter the university) are government institutions. Therefore, a man is admitted directly from the forestry course into the government service without further examinations. In addition to the forest courses in the University of Tokyo, every province has a forest school. These are much higher than ordinary ranger schools. The one seen, in Yamato Province, near the private forests of Yoshino, was a combination agricultural and forest school with 200 students, about equally divided between the two branches (forestry and agriculture). The course took three years, and took in a large proportion of the necessary subjects.

Thus it can be seen that forest education is well advanced in Japan.

V—STATE FORESTS

Historical

A very brief outline of the history of forestry in Japan will serve to give an idea of its position to-day.

Under the old regime (the feudal system) rigid rules for protection and careful utilization were enforced in all forests, private as well as those belonging to the Daimyos. At the time of the restoration of the Mikado and abolition of the feudal system these strict rules were largely done away with, on private land at least, and considerable cutting was carried on. The state took over all the forests belonging to the Daimyos, but there was considerable confusion between the boundaries of these different Daimyo forests and between the Daimyo and private forests.

To remedy this a plan was drawn up in 1890, called the "First Adjustment Program." By this plan the state holdings were to be consolidated by the sale of small, isolated bodies of forest of under 150 acres in extent and of land, whether forested or not, which was more suitable for agriculture than for forestry. This program was to extend over fifteen years, from 1890 to 1904. In 1898 the program was revised and a special fund created from the proceeds of these sales. This fund was to be used in carrying on the work of adjustment, and demarcating the boundaries of the forests and purchasing such forests as were required, in mapping the forests, marking working plans, planting denuded areas and in permanent improvement. This fund will amount to $11,500,000 in fifteen years, during which time it is expected that the work (readjustment, working plans, permanent improvements, etc.) will be completed. At present most of the forests have been demarcated and mapped, and have working plans made for them. The work of permanent improvement and planting denuded areas [1] is being vigorously pushed and will also soon be completed. This work is under a special branch in the Bureau of Forestry.

Organization

The main organization is practically identical with that of our own Forest Service. The Bureau of Forestry is under the Department of Commerce and Agriculture. There is a central office (Sin-rin-kioku) at Tokyo. The whole country is divided into ten major offices (Dai-rin-kuchos), corresponding to our dictricts. Under each major office are a number of minor offices (Sho-rin-kuchos), 300 in all, corresponding to our National Forests.

The head of the Bureau, Mr. Kamiyama, is a lawyer, as are also two of the ten heads of the major offices. The whole force consists of: twenty-six secretaries, men who have for the most part had a higher training in law at the University of Tokyo; ninety-eight higher trained men, 997 lower trained men (from the subsidiary forest course, or perhaps a provincial forest school), 970 ordinary clerks, and 1,428 rangers and guards. The higher trained men are generally in the major offices, or

[1] The planting which is paid for out of the special fund is only the planting of denuded areas. The regular planting following the cuttings is paid for out of the regular appropriation for the running expenses of the forests.

Imperial Forests of Kiso. One of a Series of Stops Built on a Steep Slope for Logging, with the Partly Completed Slide Being Built Up into the Stop (Page 733)

Private Forests of Yoshino. A Thirty-year-old Plantation of Shinoki (*Chamaecyparis obtusa*) Just Thinned (Page 730)

districts, and the lower trained men generally in the minor offices, or forests.

The organization of the different branches is somewhat different from ours. They have six branches:

1. Finance, personnel, and miscellaneous business.

2. Supervision of private forests. This branch takes in: (*a*) Cooperation with private owners; (*b*) care of protection forests, no matter to whom they belong;[2] (*c*) policing of private lands (against trespass, etc.); (*d*) dealing with forest corporations; (*e*) administration of forest law on all forests; (*f*) education.

3. Works: (*a*) Planting plans; (*b*) lumbering (all cutting is done by the government); (*c*) the disposition of all the products of state forests.

4. For the adjustment of state forests (this is only a temporary branch having charge of the work being done under the adjustment program, and will be done away with as soon as this work is completed): (*a*) Investigation, surveying, and making working plans; (*b*) distinguishing between forest and agricultural land, and disposing of the latter; (*c*) planting denuded areas.

5. Protection and management of state forests (corresponds to our branch of operation): (*a*) Supervision of major and minor offices; (*b*) protection and management; (*c*) dealing with profit-sharing plantations;[3] (*d*) investigation and giving back of private lands wrongfully taken from the people at the time of the Restoration in 1868; (*e*) dealing with litigations, both judicial and administrative.

6. Experiment station: (*a*) Utilization of forest produce; (*b*) forestry proper (silviculture); (*c*) collections of things made from forest materials, and of birds, insects, etc.

STATE FOREST OF TAKAHAGI

The first state forest visited was that of Takahagi, in the Tokyo Dai-rin-kucho (major office).[4]

This has an area of 60,000 acres covering part of a range of more or less gently sloping, rounded hills near the coast, with an elevation of from just above sea level to about 1,600 feet. It is practically all either poor, deciduous forest or bare slopes. When the forest was taken over by the state ten years ago 18,000 acres had been planted by the former management. During the ten years in which the Government has had charge 30,000 acres have been planted, and they expect to plant the remaining 12,000 in the course of the next three years.

The important thing to be seen at Takahagi was the large state nursery, the largest in Japan. It has an area of 150 acres and a capacity of 8,000,000 plants per annum. The species are mostly Shinoki (*Chamæcypris obtusa*) and Cryptomeria (*Cryptomeria Japonica*) with a mixture of pine, chestnut, and elm. It supplies five other state forests in addition to Takahagi. A striking feature of the nursery is the fact that both Shinoki and Cryptomeria are *transplanted every year.*

The object is first to make the roots grow, and secondly, so as to save space, because *labor is cheaper than land rent.* This fact is very significant of the whole situation in Japan. Labor is cheap and land is dear, due to the over-crowded condition of the whole country. The cost of raising the plants is only $2 per thousand for Cryptomeria and $2.20 for Shinoki. In planting, they used to space five by five, but now they put them in six by six feet. Three-year-old plants are used. On account of the cheap labor (20 cents a day for a man putting in 450 plants) the total cost of planting is only $3.10 per acre. Cleanings must be done in the plantations every year for five years at a cost of 50 cents per acre per annum.

The working plan seems to be very closely modelled on the German plans, even more so than the one at Kiso. There are four separate parts to it, all in tabulated form: (1) The prelimi-

[2]The Government has authority to prohibit cutting on any private forest.

[3]It used to be the practise to allow individuals to plant state lands for a share of the profits. This is being done away with on account of the litigations to which it gave rise.

[4]There is a major office (district headquarters) in Tokyo, as well as the central office.

nary plan, giving all the data; (2) the main working plan, giving the basis of the cutting and planting plans; (3) the cutting plan, giving also the prescriptions as to what to do with the area, and (4) the planting plan.

STATE FORESTS OF UECHIMABE

The forest of Uechimabe is in the Aomori Dai-tin-kucho (district) at the very northernmost end of the main island of Japan. It has an area of 16,000 acres covering part of a range of hills which runs parallel to the coast. These hills are steep in the middle, about up to 300 or 1,000 feet elevation, and more gentle on their outer edges, with a flat strip of rice fields from two to five miles wide between them and the shore.

The forest was of practically pure Shiba (*Thujopsis dolobrata*) except for occasional patches where mixed hardwoods, beech, maple, etc., would be found. The stand is more or less even aged, with excellent reproduction wherever openings occur.

Under the Daimyos the forest had been lightly cut over, and just enough taken out to make small openings in which there is abundant reproduction. The management has taken advantage of this fact and prescribed a system of natural reproduction, *the only case of natural reproduction seen in Japan.* The system used is an adaptation of Schlich's Shelterwood Compartment system with three cuttings and a period of reproduction of twenty years. They are supposed to wait five years between the first and second cuttings, and fifteen years between the second and third. As a matter of fact they admit that they will have to make one or more thinnings between the second and third cuttings unless the second cutting is made rather heavy, which would be bad, because it would favor the hardwoods against the Shiba. In general, they have considered the fellings made by the Daimyos as the first cuttings, and are now carrying out the second and third. Blanks are planted up with Cryptomeria. The system is really an excellent one if properly carried out. The trouble is that they have unwisely left the markings to untrained guards, with disastrous results in some cases. If this kind of marking is continued the system will have to be abandoned in favor of clear cutting and planting. It is probable that this will be done sooner or later.

The working plan, though made by a man who had only the subsidiary forest course in the University of Tokyo, showed a good deal of care and skill. The whole forest had been mapped and divided into working circles, blocks, and compartments. The compartments were based on topography, and are for convenience in estimating and location. They were made before the estimate and then used as units in estimating, each being estimated separately. The rotation is 100 years, with a felling period of twenty years. The object is to obtain sustained yield by cutting equal areas and equal volume. For this purpose five site qualities are distinguished according to the soil and the stand. That is, the soil might be quality I, and the stand quality III. The net revenue is figured at a little over a dollar per acre per annum.

STATE FOREST OF NAGAKIZAWA

This forest is in the northwest of the main island of Japan, some thirty miles or so from the coast. It is really in the Odate minor office (corresponding to our National Forest), in the Akita Dai-rin-kucho (district), just south of the Aomori Dai-rin-kucho. As with most of the forests of Japan, it is in a mountainous region, some of the hills being rather high and steep. This forest is famous for containing one of the finest bodies of virgin Cryptomeria in Japan. It is a solid body of about 40,000 acres in extent, of large, mature Cryptomeria, remarkably even-aged, averaging thirty inches or more in diameter at breast height by about sixty feet, merchantable length. The stand would run from forty to fifty thousand board-feet per acre throughout the whole tract. There are a few patches of hardwoods on the edge of the forest, but these are comparatively insignificant.

The working plan, which was made seven years ago, is an excellent piece of work with a remarkably good map, as good as any to be found in Germany. It prescribes a system of clear cutting and planting with a ninety-five year rotation. The trouble is that the forest is situated within eight miles of the Kosaka copper mine, the largest in Japan, which gives off fumes of SO^2 (sulphur dioxide) gas to such an extent that all the timber within that part of the forest nearest the mine has been killed. The working plan was revised five years ago so as to exclude that part of the forest which was being injured. But the damage was so great that the plan had to be revised again last year to exclude a still larger area. At present they have practically had to abandon the working plan entirely and devote their cutting operations to the areas most badly damaged. Of course, it is useless to replant the cut-over areas under such circumstances. They are carrying on experiments with a large number of native and foreign species to find something which will resist the fumes. The only species so far found is the Nara (*Quercus grosserata*), a kind of ash of little commercial value. They say, however, that the production of timber is of minor importance so long as they can keep a protective covering on the slopes. The mine authorities are offering rewards for a process which will do away with the fumes. Unless some such process is soon discovered, the whole forest of Nagakizawa is doomed.

VI—CONCLUSION

It is probable that the forests seen were the finest ones, not typical of the general average in the country, because one state forest seen on a special trip, not on the itinerary made out by the chief of the bureau, comprised large areas of poor, scrubby hardwoods liberally interspersed with blanks.

(The grazing problem in Japan is noticeable by its absence, because there are practically no cattle in the whole country. Hence the revenue is derived only from the sale of forest material.)

The ordinary expenditures for 1908-1909 were $2,199,000. This is from an appropriation which is put in the regular budget and voted on by the chamber. The extraordinary expenses, for working plans, planting denuded areas, permanent improvements, etc., were $1,323,500, derived from the sale of isolated pieces of land. And the *net revenue amounted to* $5,000,000, a very striking figure when we think of the comparatively small area of their forests; that is, compared with ours. It shows the enormous profits to be derived from well-managed forests in a thickly settled country, a thing which we hope to have in the United States some day.

One of the finest and most instructive things about Japan is that a large part of the absolute forest land, that is, land unfit for agriculture, belongs to the state. Such of it as is now bare is being rapidly planted up, so that it will soon all be productive. The absolute forest land in the hands of private individuals can be controlled by the state if necessary, but is managed by the owners as permanent forest under scientific principles.

This is a state of affairs which is difficult for the ordinary American of to-day to realize. But it is one which, the sooner it is understood and adopted, the better it will be for the future welfare of the whole country.

Forestry has been called the "yardstick" of civilization. Judged by this standard, Japan is one of the most highly civilized nations in the world to-day.

The South's Concern in the Appalachian Project and How to Make Its Influence Felt

By JOHN H. FINNEY, Secretary Appalachian National Forest Association

THE Appalachian Forest Project, that proposed plan whereby the National Government shall acquire a forest area in the Southern Appalachians of about 5,000,000 acres lying at the headwaters of the important southern streams, is no new thing.

In one form or another, as a great "National Park," "National Forest Reserve," etc., it has been proposed for nearly twenty-five years; it has been before the Congress for the past ten years at almost every session, asking for national recognition as a national duty owed by the Nation to itself. It has, in all this time, received the earnest support and indorsement of patriotic men, women, and national leaders everywhere, of associations, scientists, engineers, geologists, agriculturists, foresters, commercial bodies, navigation, power, and manufacturing interests, almost without number. Testimony that cannot be disputed as to the value of it; as to its vital necessity to the South and to the Nation, has been piled up in an absolutely convincing manner, that this area should be acquired—two Presidents of the United States have earnestly recommended and worked for it.

The only unconvinced body seems to be the Congress of the United States!

Let us look into the basis for the South's concern: The first, because most obvious, is the timber question.

The South contains, in its 234,000,000 acres of timber lands, nearly one-half of the Nation's remaining, and its most valuable, timber. It contains, in the largest portion of the 75,000,000 acres lying within the Appalachian range, four important timber facts:

(*a*) That this area, which in the main is non-agricultural, *is* the natural home of the hardwoods, where they most flourish and best grow, and where, in the main, *only* trees can grow; (*b*) that here is contained practically the only remaining stand of hardwoods in the Nation; (*c*) that here is practically the only remaining source of supply of hardwoods for the future; and equally as important, (*d*) that this area is being cut and devastated as rapidly as lumbering skill and ample capital can do it, and that a continuance of these operations, under present conditions and at the present rate, means the practical extinction of this whole timber area and industry in from fifteen to twenty years!

The second fact of the South's concern is that this vast area lying in eight states is an interstate problem involving, were it *solely* an intrastate duty to be performed by the states, the simultaneous cooperation of these eight separate states, to render any action effective—but it is more than that; for while the states do have a grave duty and a heavy responsibility (which they must in time assume in forest conservation), the largest duty rests on the Nation, because of its guardianship of the streams.

See how this is true in just one illustration: In North Carolina rise the important streams such as the Broad, the Wateree, Pedee, Saluda, Pacolet, Tugaloo, Savannah, etc. Their headwaters are not navigable; they are small streams in North Carolina; and, while useful for some power in North Carolina, they reach their greatest usefulness for power and their use for navigation solely within, and for the benefit of, South Carolina. Surely, North

Reproduction of Hardwood Forest in the Southern Appalachians. The Large Trees Have Supplied the Seed from Which the Smaller Ones Have Grown

Scene in a Typical Longleaf-pine Forest

Carolina cannot reasonably be expected to tax herself with the large investment involved in the purchase of the forest cover of these streams for the benefit of her sister state. And these same conditions apply to the whole problem, whether it be one state or another in which this forest area lies.

Were all these eight states so altruistically inclined as to work out an effective cooperative plan, the lack of money in all our southern states, and the tremendous task of getting funds appropriated, through bonds or otherwise, would prevent effective action until too late.

The National Government is obviously, as the guardian of the navigable streams, the natural and proper guardian of the headwaters of these same streams, and under either the commerce clause or the general welfare clause of the Constitution has ample power and authority to act, if and when IT SO WILLS!

It, only, has the money. It, only, can so promptly act as to save the forests before their total destruction. It, only, can intelligently handle and patrol the area thus set aside so as to most fully utilize it and make it effectively perform its varied functions.

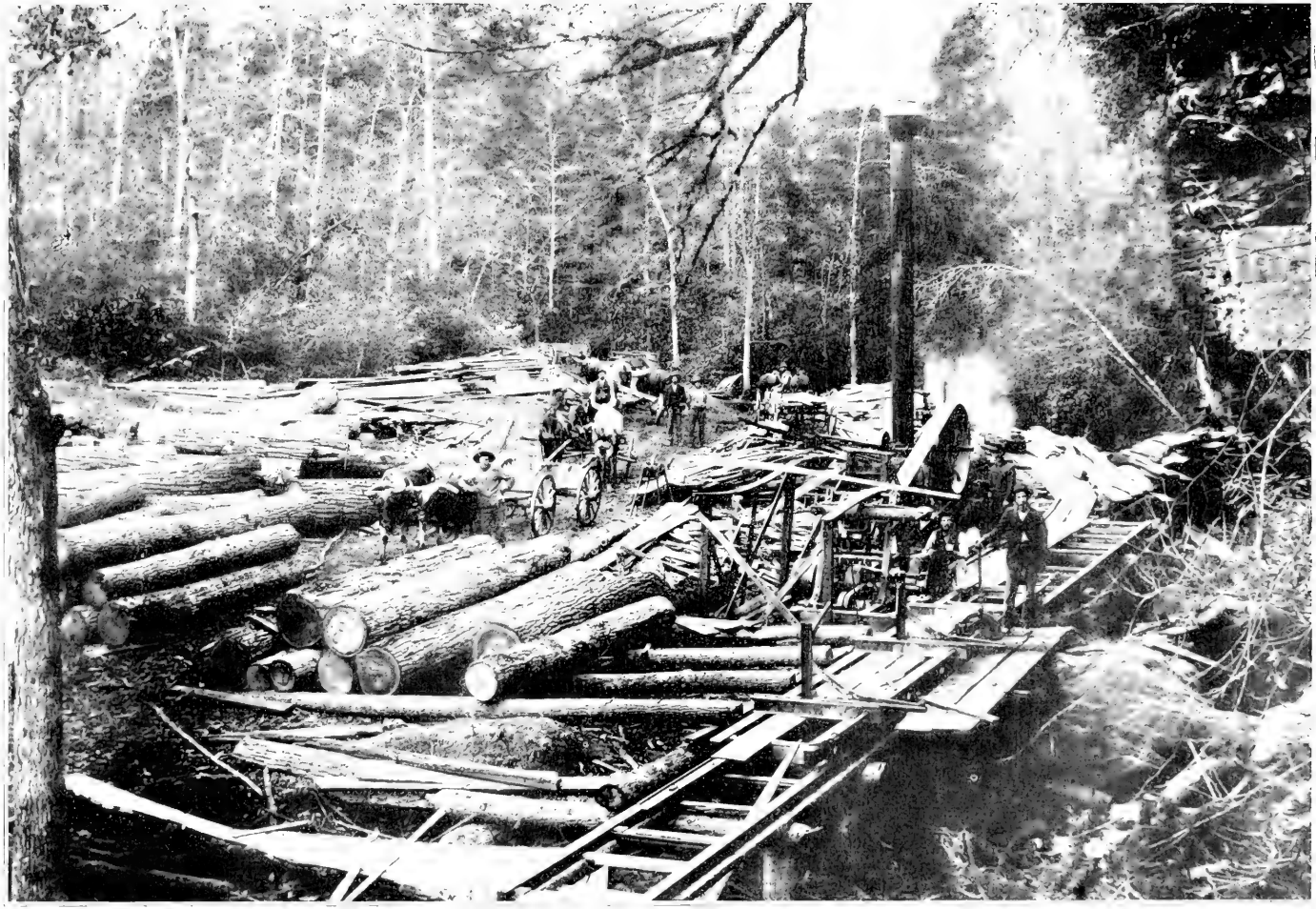
The next fact in the South's concern is brought about through considering the forest functions in other matters than a timber supply, or its effect on navigation. These functions have to deal with the even more important forest influences, as water-power, water supply, agriculture, health, and climate.

We need not go into great detail; we know, who know southern conditions, that the controlling factors in the making of the South into a manufacturing section rest on four fundamental facts: (1) Climate, which enables us to grow, (2) cotton, on (3) fertile soil, and (4) cheap water-power.

These things are intimately bound up with the forest question, for without the forest the climate changes, the soil erodes and washes away, the cotton field becomes a barren waste, and the water-power is ruined through damaging floods or prolonged droughts.

Can a picture such as this be complacently regarded by the man who knows and loves the present fair and prosperous Southland? Can he imagine what these conditions will mean to the coming-generation South (nay, indeed to the present one!); for these conditions are not merely future possibilities nor the imaginings of dreamers or

View Showing Effect of a Forest Fire. The Branches and Smaller Trees Bent and Twisted by the Intense Heat (Page 741)



A Sawmill in Eastern Kentucky (Page 741)

Cascades Near Head of Catawba River. There Are Hundreds of Cascades as Beautiful as This in the Southern Appalachians. As Long as These Mountain Forests Are Preserved These Streams Have a Regular Flow; United They Furnish the Water-powers Which Operate the Factories Valued at Increasing Millions (Page 741)

Wreck of a Railroad Bridge, Doe River, Tennessee (Page 744)

A Flooded Farm—Orchards and Fields Under Water, With Residence and Outbuildings Threatened (Page 744)

pessimists, but are the sober words of warning of students and engineers and scientists who know, and who have testified to their knowledge of conditions before Congressional committees time and time again in language as earnest and unmistakable as this.

It is likewise a sober statement of fact, that, should the Appalachian forest disappear, as it must and will if some action be not taken by the Nation, the very life of the South is at stake—its prevision and patriotism a sham, its civilization a misnomer.

Is it an unreasonable thing that we are asking of the Government? The Government's ability to do it is unquestioned; it is spending millions in irrigating western arid lands; it owns and is splendidly handling and conserving 172,000,000 acres of western forest lands; it is spending millions in river and harbor improvement; it is maintaining many agencies for the betterment of the Nation, and is wisely doing all these things.

Is not the Appalachian project in the same class—nay, is it not even more important than some of them, in the light of conditions that can only be described as critical?

This thing must be done NOW. Doing it now means that the National Government shall lead in a work that requires national leadership, a leadership that will finally compel the states to act in respect to the wide field covered by their duty to the forest question.

To-day, no southern state has an acre in state forests; no southern state is making a serious effort to get one, *but,* when the states have an adequate demonstration and object-lesson of this size, that forest conservation is sane and possible and profitable, surely all the states must finally resolve to have state forest areas under competent foresters; must enact adequate fire laws; must properly tax forest lands, and must do such other things as are necessary to the perpetuation of the South's large and enormously valuable timber area now in the hands and under the sole control of individual owners bent on cutting them!

Whether the cost of this to the National Government be five millions or more matters little, for it can be wisely spent as a national investment, yielding satisfactory yearly financial returns, quite regardless of the actual benefits to the South and to the Nation that cannot be measured in dollars and cents.

Dollars spent now mean the avoidance of hundreds of dollars later in costly reforestation plans such as France has undertaken; each day of delay makes the problem more difficult, more expensive — the situation more critical, the menace more alarming!

It being a thing that the Nation must finally do as a matter of self-protection, if no higher motive actuates it, *it should do it now,* and it can be brought about, if the South *acts, and makes its influence felt.*

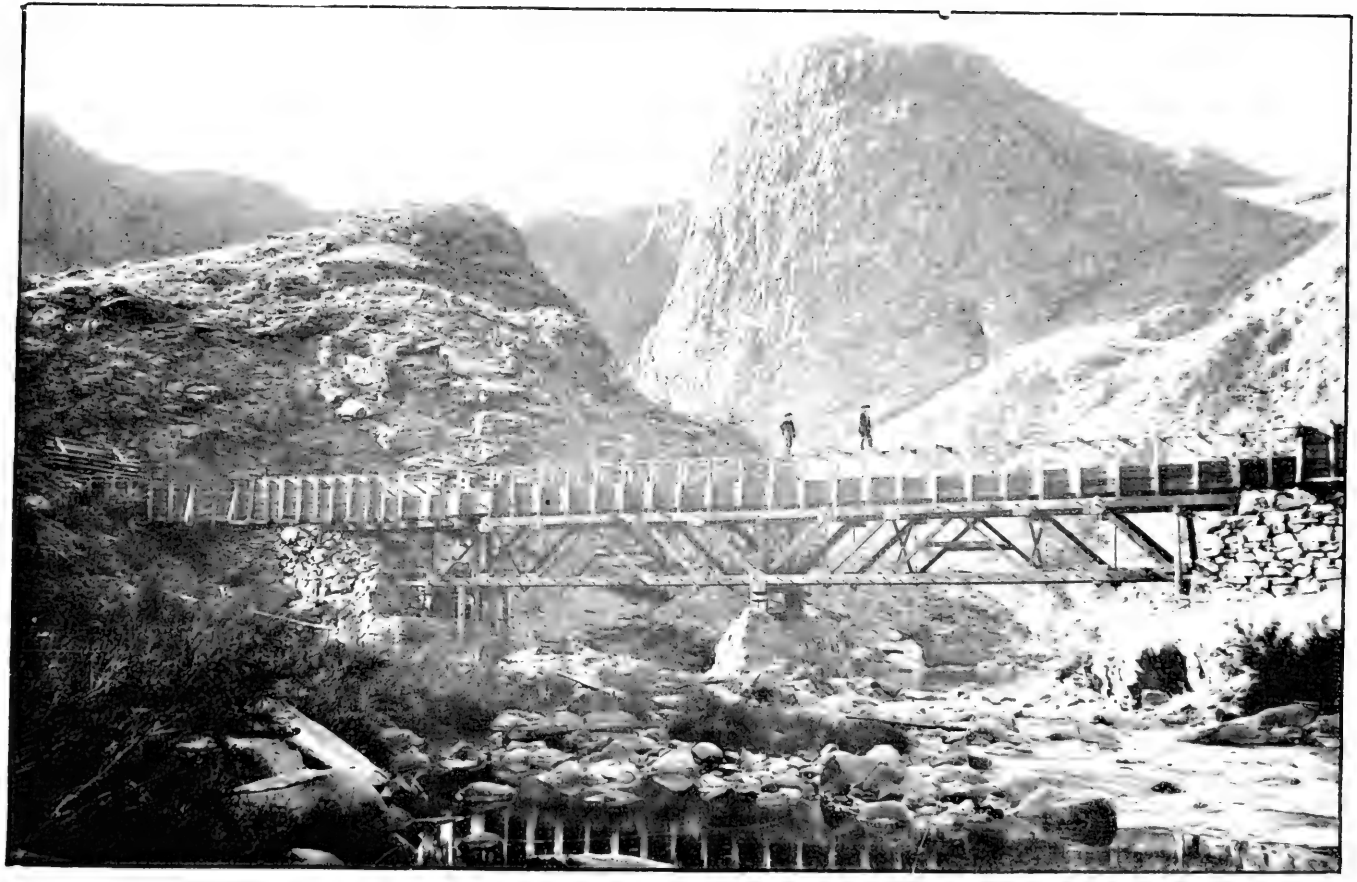
In the last Congress there was taken, on March 1, a vote on the Weeks-Lever forestry bill, a comprehensive and wise measure, general in form, providing for the purchase by the Government of forest areas at the headwaters of navigable streams.

This bill did not specifically name the Appalachian or White Mountain projects, but it was generally understood that the bill was framed primarily in the interests of these two great national reserves, as being the most urgently needed areas in the way of water protection.

Of the many measures presented in Congress in the ten years of attempted legislation on this question, the Weeks-Lever bill was not only the best and most comprehensive, but it alone, of the several Appalachian bills, came to an issue on the floor of the House. It passed the House by a vote of 157 to 147, but (because of lack of time) failed in the Senate.

How did the South vote on a matter of such vital concern to itself? This is the record: The fourteen southern states—Maryland to Texas, including Arkansas—had 119 votes. They were cast as follows: For the measure, 53; against the measure, 36; not voting, 30.

Thirty-six southern men actively against the project—some of them sav-



Conveyance of Water for Irrigation in Flumes. View of North Poudre Flume Near Greeley, Colo., 300 Feet Below Dam, Showing Canal Crossing the Stream from Which Its Waters Are Taken

agely attacking it—with thirty so indifferent that their votes were not recorded at all. Look at the details:

State	Ayes	Noes	Not voting
Maryland	3	0	3
Virginia	7	1	2
West Virginia	2	0	3
Kentucky	5	3	3
Tennessee	6	4	0
North Carolina	7	2	1
South Carolina	4	1	2
Georgia	2	6	3
Florida	0	0	3
Alabama	6	2	1
Mississippi	2	3	3
Louisiana	4	1	1
Arkansas	2	2	3
Texas	3	11	2
Totals	53	36	30

This is the record as it stands, and, frankly speaking, as it will probably stand, in the next Congress and in succeeding ones, unless the South can prod indifference into action, and change misrepresentation into representation.

Contrasted with the vote of New England on the same measure, where, out of a total of twenty-seven votes, twenty-six voted aye and only one is recorded as not voting, there need be no hesitancy on the part of intelligent and patriotic southerners in characterizing the vote of our southern representatives as a reflection on the intelligence of the South and a disregard of the South's best interests.

It is not a record to be proud of (and it is said by a southern man), and it should mean such an arousing of the South as will give the Weeks-Lever or a similar bill in the next session a majority that comprises every southern man in Congress!

It should further mean that the South is determined to have this forest area; that it will closely follow proposed forestry legislation in the next session:

Bluffs on New River Forty Feet High at a Point About Eighty Feet Below Sea-level. New River Channel Rises Above Sea-level and Disappears at 280 Feet Below

that it will impress its wishes upon its congressmen; that it will attend in overwhelming numbers (as New England does) any congressional-committee "hearing" given on the bills; that each individual in the South believing in the necessity and the righteousness of the South's demand for action in this matter will pledge himself to the forest cause and aid actively in this work.

We can win the fight at this session of Congress, but it depends on what the South does, and the South, in its final analysis, means YOU.

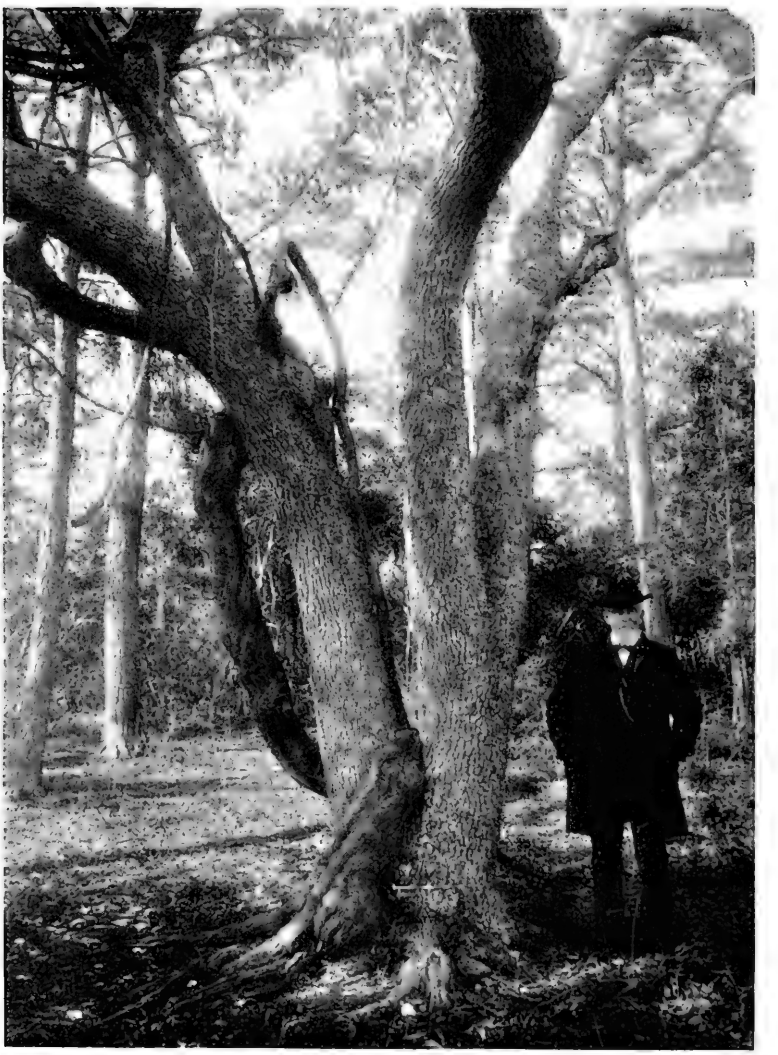


Illustration of a Finish Fight Between a Live Oak and a Grapevine in a North Carolina Forest

A BEGINNER IN FORESTRY

By ANNE WARNER

Paper Six

WHEN we returned on the 25th of January the winter had fallen thick and white upon Brunswick. The view from the Burgberg was no longer of toy villages set out on a patch-work quilt of greens and browns; it had now become toy villages set out on a shining sheet of silvery snow with sunny little trees dotted pin-like in many directions. So pretty every day! So wonderful when storms came drifting out of the gray north! And presently we—indoors or out—found ourselves in the midst of a blinding snow that whirled and swept and reeled about, and then after fifteen minutes of fury, sailed sweetly and calmly away. As the little girl, the poodle, and I all huddled together against a big tree during one of the fiercest of these blows it came to me what "with no other shelter than a tree" really meant. Uncivilized races feel first and try to explain what they feel as they learn language, but we civilized people are so well educated that we can describe everything without knowing anything about it. I have even been given to understand that some hold that knowing about things places easy speakers at a real disadvantage. I can hardly believe that, but I do feel keenly the inadequacy of words after you are thoroughly permeated by the real feeling. When I was in London and longed, with a heart-sick loneliness that no one believed in, for the forest, I found myself looking in despair on those who never would understand.

Now I am back in it and life and language, trees, and my soul, run smoothly abreast again. The gray, and brown, and purple lights and shadows lie quiet and wait for us to come to them, and when we go there the wide silence, the soft snow, the little black flowing streams, gurgling under its icy coat, the tiny new green things piercing upward—they are all ready with a welcome. The forest is so full of interest in its wildest form—and here it is so full of its life with men. Such a wonderful inter-weaving! As we go along in the still quiet we come suddenly on the wood cutters—or on the long rows of cut and piled wood. The trees were marked before we went away. They were felled while we were absent. The largest were chained on wagons and drawn to the railroad. The next were sawed with long, thin handsaws worked by two men each, and then corded up for sale. The smallest were cut and trimmed and swathed together in long, curious hedge-like piles. The waste and twigs the poor received gratis. For a fortnight the drawing away has been going on, and I cannot see that the trees are thinned out at all. The head forester conducted the wood sale here in the little Kurhans ten days ago. It was a bitter cold day and they borrowed the oil stove out of my guest room so that the head forester would not freeze while he sold wood.

I wish it were possible for more children at home to learn the winter life in the woods. Most children get under the trees in the summer, but comparatively few in the winter. The winter is just as full of interest as the loveliest possible summer season if one can only get a chance to enjoy it. We've been amused to see that the mole digs along under the snow exactly as if it were

earth; we've found patches out in the open where the rabbits have evidently held either a parliament or a ball, the deer make their own convenient short cuts and keep them in trim, and the pheasants when they fly low do not trouble to carry their heavy tails, but let them train on the snow. It is so droll to see where a pheasant came quietly along, where he stopped and scratched up some dinner, where he jumped about a bit to warm his feet, and then where he flew lazily off, dragging his tail.

One of the most interesting studies in a well-brought-up forest is the tremendous part played by the fallen leaves. When a tree is wastefully cut it isn't just its wood and its future growth that are lost—it's also all that annual crop of fallen leaves. What the leaves here do is a never-ceasing wonder to me. Not to speak of the joy it gave us to kick them as we walked all through October and November, or their lovely likeness to a plum-cake too thinly iced, often, now, they do such a vast amount of real labor in every thaw that I am forever amazed. The object-lesson in the prevention of floods is one that I shall never forget again. There was a large, low place out of which a little stream meandered across a road and into a small hollow. The stream was very slow and feeble as it was choked with leaves, and Nanna took a stick and spent some time making a free channel. Then she and I wandered farther on and, returning in half an hour, found our stream again blocked. We soon learned that we couldn't free it, the leaves allowed the water to filter through and that was all. The fallen leaves are the cook and the nurse and the personal bodyguard of every tree, and, like everything else in this world, they cannot do their duty well by one without doing a great good indirectly to countless others.

As the days go on and I fail to find time to learn all the technical knowledge that I so crave, I do find that, indirectly, I am learning anyhow. As a little child learns to love books by playing in a library, so I find myself gradually becoming a somewhat experienced forester just by being very happy for two hours daily in the Lichtenberger Wald.

THEODORE ROOSEVELT

Dynamic Geographer

By FRANK BUFFINGTON VROOMAN, F. R. G. S.

(*Concluded*)

COORDINATION

A FAIR question to ask in estimating the value of any service, public or private, is "How would it have been with us otherwise?" What the country was without the Reclamation Service we have seen who knew the arid West years ago. What American agriculture would have been without national interference one could imagine who knows what farming was a generation ago. What the land would have been without a National Forest Policy the average man cannot imagine. Under the laws for which Mr. Roosevelt was responsible a hundred and twenty million acres of the public domain have been set aside to be held in public ownership for the public good, making 168,000,000 acres in all of Forest Reserve. In connection with this act of administration he sounded the note for the whole conservation policy. "It is consistent," he said, *"to give to every portion of the public domain its highest possible amount of use."* This large domain is now held for *development and use.* These reserves are for the people. The land-skinner was abroad. It became necessary for Mr. Roosevelt, when he came to office, not only to set aside the Forest Reserve, but to take the most vigorous measures to secure bona fide settlers in their rights, and to prosecute those who had unlawfully taken the land. During a period of five years of this administration, fences were removed unlawfully enclosing public land from 3,518,583 acres, and suits have been recommended on other actions, and steps taken to remove such enclosures, from more than an equal amount. During the administration something like a hundred thousands pounds have been collected by the Government for timber trespass on the public lands, and legal proceedings taken involving trespasses of half a million pounds. During this time, there has been secured in public land cases, involving perjury, subornation of perjury, conspiracy, forgery, false affidavits, timber trespasses, and unlawful enclosures, 3,096 indictments, 871 convictions, with 251 prison sentences with many indictments awaiting trial. During the same period 7,874 fraudulent land entries have been cancelled, restoring over a million and a quarter acres to the public domain.

It was also found that large tracts of public coal lands were being illegally obtained. The President at once took measures to ascertain the extent and value of the coal areas, and the Geological Survey was directed to classify and value coal lands. It has been found that the Government still owns between seventy and eighty millions of acres of known coal fields of the West. The President immediately withdrew from all entry 67,000,000 acres of this land, and the Geological Survey fixed the prices at from two to twenty pounds sterling, which had hitherto been illegally acquired at from five shillings to four pounds per acre. This economic work of the administration, on the basis of the actual field investigation of the coal geologists of the Survey, has not only increased but has multiplied many times the return to the

Government from the sales thereof, and has prevented monopoly of the coal fields.

Another very interesting item connected with these economic investigations is the act providing for fuel and structural material tests passed four years ago. For example, the Survey has demonstrated the important fact that the low-grade bituminous coals and lignites, of which there are tens of millions of acres, formerly considered of but little, if any, economic value, can be converted into gas and used as gas fuel, with double the efficiency possible under the steam boiler. The item that ten millions of acres of coal have been doubled in value and made a national asset by one little scientific experiment successfully concluded by a Government bureau could be duplicated in many other illustrations.

Under the new arrangements the mineral and agricultural and timber resources are available to the settler with strict provisions against waste. Throughout these large areas of the public domain, the Government has made large expenditures for roads, trails, bridges, houses, telephone lines, fire-fighting accessories, and other needs and conveniences.

The principle involved in the Roosevelt Conservation Policy, while carried out on strictly historical lines, and strictly constitutional principles, is, in its practical and in its political effect, almost revolutionary. While the Government is owner of these hundreds of millions of acres, it is not as the ordinary landowner. If owned by private interests the resources would be wasted in the interest of the immediate profit. At least, such is the verdict of experience. And it is because of such a verdict that a hundred and sixty-eight million acres have been withdrawn from private ownership to start a real *public domain* and for the *common good*. A fair beginning! These resources are to be developed, not in the interest of the Government as landlord, but in the interest of the present population and their posterity forever, with the Government as trustee.

Mr. Roosevelt has constantly insisted upon the most exhaustive and scientific investigation of all the water resources of the country. During the past year over 500 stations have been maintained to determine the average flow of the rivers toward their utilization in irrigation, drainage, and power, and for the development of inland navigation.

The integrity of the great irrigation works, built and being built by the United States Government, depends on the scientific accuracy and thoroughness with which the hydrographic surveys have been made.

The division of Hydrology or Hydrogeology of the United States Geological Survey, which was organized on January 1, 1903, deals with underground waters, on the same principles as the division of Hydrography deals with surface waters, and strictly scientific investigations were begun at once in about two-thirds of the states or territories. The work is divided into six departments—the bibliographical, statistical, technical, legal, scientific, and economic. The scientific work seeks to solve such problems as the measurement of direction and rate of underflow by electrical apparatus; to make experimental field investigations of the general movement of ground water; to study the general movement of spring water; the relation of topography to underground drainage in regions of soluble rocks. The "economic" deals principally with reports and maps on the location and extent of water-bearing horizons, the depth of water below the surface, and the height to which it will rise, the quality and quantity of the supplies, and problems relating to purity or pollution of the ground waters.

In close connection with this work, also, are the features of rainfall, texture of water-bearing materials, and of adjacent land surfaces.

The economic results to be obtained from such studies depend also on the general topography, the main direction and velocity of ground waters, etc., in

order to furnish a basis for a requisite thorough knowledge of topography.

The Geological Survey is constructing a complete topographical map of the United States, in sheets of about 250 square miles, one of which is issuing every third day. Nearly 2,000 of these sheets have already been engraved, and already more than one-third of the United States has been covered. This will be as complete a map as any in the world. It is the aim to do this work so thoroughly that one may be able to trace the course of every stream, and locate every mountain and hill, with accurate knowledge of steepness and altitudes with reference to making it equally valuable to the engineers of irrigation or drainage systems or railroad extension, as well as to help the farmer who may wish to drain a swamp. To this sort of information the Geological Survey adds data, not only regarding rocks and soils exposed to the surface, but with remarkable accuracy shows what may be found at hundreds or even thousands of feet in depth.

The mapping of the catchment basins presents problems which are both topographic and geologic. The determination of the geologic structure of the depth of water horizon and of the depth of flow of each water well are all of great value in outlining artesian areas, whose charts are reduced to folios which include topographic, geologic, and economic data, and are issued by the Geological Survey.

It must be remembered that before anything definite was done, practically the whole problem had to be stated. An enormous preparatory work of scientific investigation must be laid down before the engineering work of construction could be even begun. To be sure, a great deal was already at hand, but in many fields it was pitifully inadequate. One must remember, also, that before Mr. Roosevelt's administrations began, public opinion in the United States as to the Government taking the initative, or assuming the responsibility of a great project like the Reclamation Service or the Forest Service, or the Inland Waterways Plan, was in a state of doubt or open hostility.

And there are still other problems to solve. Experts must be called, each to make his contribution toward the solution of the difficulties offered, from the Mississippi Delta through to Lake Michigan, and again from the muddy waters back to the very snow-drifts whence flow its primal supplies. There will be chemical problems, physical problems, geological problems, botanical problems and engineering problems. There will be projects of swamp and sanitary drainage, the making of reservoirs for the developing of water power and for impounding potable waters and waters for irrigation and navigation supplies. There will be other works for protecting slopes, river banks, bottom lands, valleys, and plains, and for conserving their soils, and many other details and problems and all of them subsidiary to the great geographical conception of opening up and artificializing and controlling the entire interior empire of the United States and Canada, tributary to the Mississippi and the Great Lakes. The idea of state control, and the realization of the ethical possibilities under certain phases of state ownership, have grown more during the Roosevelt administration than in all the rest of the history of the United States put together.

That Mr. Roosevelt has been able to accomplish so much of a definite and concrete nature which was dependent upon the technical surveys and investigations of thousands of scientific experts, and get this vast mass of material together and mapped out and organized and digested and transmuted into its proper engineering channels; that he has been able practically to educate the Nation on the subject, or put it in the way of being educated; that he has been able not only to get so many concrete engineering works accomplished, but that he has been able to inaugurate so much of ethical legislation, and ethical administration, straight away in the line of the enlargement and moralization of the sphere of the State and the extension of the sovereignty of the

State over the sphere of private exploitation, is one of the astonishing things to those who know the intensity of the individualism of the American people in all the achievements of modern American history.

President Eliot said at Harvard quite recently, "American people are opportunists; they will adopt institutions, socialistic or not, if they are practical, but they will not follow an idea beyond the stage where it becomes inefficient." All of this, and more, is exactly true, and President Eliot might have said that until the Roosevelt administration the American people were not, and even to-day are not, willing to follow an idea as far as it is efficient, or else they hesitated to make any new application of the idea, on the principle of keeping out of the water until they knew how to swim. But the time has come when policies no longer answer. The opportunist temper is inadequate. We want an idea. World-making is no piecemeal, *laissez-faire*, individualist job. The Roosevelt work is of one piece. It shows one mind and one idea. It requires that one mind and that one idea in the coordination of scientific effort, in the direction of the investigation and observations for data, in the application of one administration toward the utilization of these data, and the framing of a single engineering scheme for its support by the National Government—nothing less. The control of rivers and harbors cannot intelligently be left in the hands of one set of men in one department of the Federal Government, and that of the control of water sources and supplies left in another department of the Federal Government. This great work is of one piece; it should be administered as one scheme.

A great and immediate need of the United States Government is a new Federal department. Mr. Roosevelt created the Department of Commerce and Labor. Perhaps Mr. Taft will create the Department of Public Works. Instead of being administered with more or less duplication and omission and economic loss by the Federal Departments of Agriculture, War, Interior, and Commerce and Labor, these functions, together with such new ones as are necesary, should be synthesized and coordinated under one Federal department. While the results already achieved by the Government are brilliant, the mass of scientific data necessary to the intelligent administration of such a complicated scheme are still very meager and imperfectly correlated. So vast a scheme, upon which so many scientists and engineering experts are engaged, presents a complication and interrelation of problems which can be satisfactorily administered only by one department under the control of one mind according to one overruling idea.

NATIONAL PROGRESS—RATIONAL, NOT FORTUITOUS

It should be apparent by this time that we have here a new kind of politics. What we have all been taught heretofore, when, indeed, we have been taught anything on the subject, has been political science. Just what this is, nobody seems to have a very clear idea, and for the most part it has been confined to a classification of historical systems. Although it has been vaguely and erroneously confused with political philosophy, the two are as separate and distinct as either one is from the study of history.

But here we have something different. Instead of political science we have scientific politics, and it seems to be what we have been waiting for a long time. To be sure, we can find scientific politics, as, for example, in Germany, where politics are rational and not fortuitous. But in the Roosevelt scheme scientific politics is laid on democratic foundations, or, perhaps, what would be just as accurate to say, democracy has been laid on scientific foundations. This new movement seems to have come not a moment too soon in the evolution of civilization.

A swift glance ahead 100 years with Asia in possession of our industrial and military secrets, with its own unequaled natural resources untouched and our own squandered, should occasion a

diurnal nightmare for the incredible unintelligence which refuses immediate expenditure of that £100,000,000 which will save £1,000,000,000 a year, and possibly the future of our race. The future belongs to those nations who own the soil and rule the sea—whose people shall have to use and not to abuse the natural resources of the earth. There is no future to any nation without these.

The time has come in the history of western civilization for a new politics. There is something wrong with our politics; there is something the matter with our theory of life—Individualism. Anglo-Saxondom, in particular, is losing ground, and on the racial escutcheon should be blazoned WASTE. Individualism made the Anglo-Saxon great, but it cannot keep him great. Individualism has ceased to be true. Once we wanted protest—protestantism; reform—reformation; revolt—revolution. Now we want something else, something archetectonic—we want overmind—"oversoul." The infallible inspiration of the gospel of helter-skelter is succumbing to the higher criticism of the science of economic geography. For in the United States things can never be again as if Theodore Roosevelt had never been. He has not merely given us the idea; he has embodied the idea in an immortal, scientific achievement. His politics means that the principles of intelligence, scientifically applied to the physical conditions of life in North America, have not only made progress possible, but acceleration of that progress possible. It means the quintuplication of the economic resources of the people of the great Mississippi Basin. It means the renaissance and enrichment of the South, and vast good to central Canada. It means this because one man had sense enough to know that things could not get themselves scientifically done by themselves; that progress is rational, not fortuitous. What he has already achieved is the guarantee of what his scientific policies have promised, and a warrant for the hope which most Americans have been holding in a dreamy way, but which a few great minds have foreseen as an accomplished thing in future time, of a superlative destiny for this new western world, this world of the morn and the dew, this world whose vast fallow and fecund wildernesses have lain so long in the dark, while successive civilizations have depleted the potentiality of the larger and antipodal hemisphere where so much of humanity has grown old and gray.

"America," says Hegel, "is the land of the future, where, in the age that lies before us, the burden of the world's history shall reveal itself. * * * It is the land of desire for all those who are weary of the historical lumber-room of old Europe. Napoleon is reported to have said: *'Cette vieille Europe m'ennuie.'* It is for America to abandon the ground on which hitherto the history of the world has developed itself. What has taken place in the New World up to the present time is only an echo of the Old World — the expression of a foreign life."[1]

Mr. Roosevelt has worked out his idea on rational and constitutional and human lines. This was his task. His struggles for a square deal for the common people have been successful. His geographical economics have been unparalleled. But his chief distinction is that he has given an ethical and constructive democracy a chance, for the first time on the Western Hemisphere, on principles which, avoiding both anarchy and socialism, shall conserve the ends of liberty, not merely as an end in itself, but as the condition of a national moral perfection.

Facing the failure of the democracy of individualism, already about reduced to its lowest terms of economic slavery and financial despotism, and socialism ready to occupy the field by reason of sheer want of another, and more rational, program, he is the first American statesman who has wrought into deeds a fundamental body of doctrine involving a rationalization and moralization of the American democracy. The foundations of the new construct-

[1] Lecture delivered winter of 1830-31.

ive democracy are geographical foundations. This democracy is organized and centralized, but it avoids the common dangers of centralization in that it *is* democracy, *i. e.*, that it is *self*-government. It differs from the fundamental idea of the old democracy of individualism in that it is self-government in its corporate and public aspect. It is national self-government in those areas which concern the national and common good. For the very life of this democracy, and its fitness to survive, are bound up in the proposition that the whole people is fit to govern, can govern, and does govern itself.

A new era dawned in the United States with a sudden and almost revolutionary enlargement and moralization of the sphere of the State during this one administration. The National Government, *qua* National Government, has for the first time frankly acknowledged its own responsibilities in the matter of the commonwealth and the common good, and the whole American people have overwhelmingly supported the constitutional creed of Mr. Roosevelt to "promote the general welfare."

The political significance of the conservation policies is that under them the aegis of the Constitution has been thrown over an unpreempted area of human endeavor, that recognition has been given to the revolutionary doctrine that people may better work together than against each other for their common good. Results have been achieved undreamed of under *laissez-faire*. No section will profit so greatly as the new South, the stronghold of the democracy of individualism, the South looking toward a prosperity never before thought possible, because of these very conservation policies, which their own confederacy would have made forever impossible. For the Montgomery constitution expressly declared its Jeffersonian individualism in that no public improvement should ever be undertaken at the public expense.

But the South, more than all other sections, is to learn the value of the political application of scientific knowledge to human welfare through their own organ—the State, if, indeed, the people of the South have not begun to suspect it from the Government war on the stegomyia mosquito and yellow fever. The stegomyia mosquito defied the philosophy of individualism for hundreds of years, to surrender to science at last.

The American people have shown their ethical soundness in nothing more than in the support they have given their President in his effort to reconcile ethics and politics, in his aim to guide the rebound of political theory and practise in its unmistakable reaction from the extreme of anarchy toward the extreme of socialism, and to hew the highway of the national destiny straight along the middle way, on sound, safe, and rational, and at the same time, ethical lines of historic nationality. * * *

The twentieth century dawned upon the world in a state of arrested democracy, with the creed of the revolutionary forefathers discredited as not having fulfilled its promise. Conservatism was sterile and without a social program, and glued to the *status quo*. Liberalism the world over had found itself bankrupt, except where it had maintained solvency by borrowing heavily from socialism. The ultra-individualism of the eighteenth and nineteenth centuries had been a good protestant philosophy in an age of reaction and revolt. It marked the end of an era. But, as Mazzini has said of the French Revolution, it was incapable of marking the beginning of a new age, for it had no program and no possibility of a program.

It may be as well to state here that Mr. Roosevelt's political philosophy is founded on neither individualism nor socialism as a theory of life. There is a middle ground between the two, and an element of political philosophy lying outside the two, which define the ground held by the Roosevelt school of politics. Unfortunately, no one yet has been able to coin a word which will cover this ground. But the seven and a half years of his term of office have called a halt on the democracy of individualism, have stemmed the tide of socialism by the substitution of something better

than either, which, for want of a better word to describe an ethical democracy, I call tentatively Nationalism.

It is due to Theodore Roosevelt almost wholly, not only that the distinction has been made between the democracy of individualism and ethical democracy, which is not exactly, perhaps, the democracy of altruism; but that foundations have been laid for a democracy which implies that human progress is rational and not fortuitous, that its foundations are scientific, and that they do not lie in the quicksands of whimsicality and blind chance and *laissez-faire*.

A new era in American politics dates from the beginning of the Roosevelt administration. While this new era is revolutionary in its results, it is the simplest development, on conservative lines, of a principle as old as the American Republic. He has opposed two philosophies, or at least drawn a sharp distinction between them—the philosophy of individualism, that of all rights and no duties, which has found its classic expression in the Declaration of Independence, and the philosophy of duties as well as rights, of the reciprocity of the golden rule, which has found its expression in the Constitution of the United States. The trend of Mr. Roosevelt's work has been straight away from anarchy and toward law and order. It has led away from individualism, and, while not toward socialism, it has tended toward socialization, toward national organization, in other words, so far as it can be conceived from a strictly political standpoint, by scientific methods, and limited by American institutions. His position is that of the old nationalism, developed and up to date, which began to call order out of the individualist chaos of the national history from the moment Alexander Hamilton entered the debates on the Constitution; that nationalism which without cessation has been encroaching upon the political atomism of democracy—the atomism Thomas Jefferson adopted from the school of the French Revolution; the atomism whose direct lineage can be traced through Hobbes and Locke and further back through Epicurus to Democritus, the founder of atomism and doubtless of the Democratic party, if Epicurus can be believed that Leucippius never existed. And, by the way, speaking of the political atomism of democracy, Democritus, the first consistent, and perhaps the original, Jeffersonian Democrat, conceived the universe as constituted of infinitesimal atoms floating in an infinite void. Everything happens from the accidental meeting of these atoms in this void. There is a god upon the throne of this universe, endowed with two functions, namely, mixture and separation. The atoms themselves, devoid of qualities, are regulated by a force outside, not immanent, and Aristotle has not unjustly named this god *Chance*. If this exact theory could be transferred to a theory of politics, excepting the doctrine that the atoms are devoid of qualities, you would have a pure democracy of individualism. In it you have individualism minus the selfish instinct. Endow each atom with a sovereign, selfish motive; predicate of progress that everything happens from the accidental meeting of these self-seeking atoms floating in the social void; assume that there is no immanent reason or ethic among them, but that a blind god is shooting the arrows of whimsically undirected forces at random through time and space, and you have something like an individualism so pure that Democritus and Thomas Jefferson both might have claimed it as their own.

And so the individualist and democratic conception of the American State is that of a conglomeration of 85,000,000 self-centers, in more or less of juxtaposition, each moving toward something or other with a selfish and introspective instinct, and that something certain pleasurable sensations to be enjoyed by that particular organism. Each self-center pulls and struggles without common spirit or will, without archetectonic reason, or "oversoul," and unrestrained by considerations of right or wrong, except in terms of pleasure or pain. The fundamental error involved in this whole theory is that so

many selfish instincts can ever coincide, or that 85,000,000 private selfishnesses can ever be harmonious. Of course, it goes without saying that most individualist democrats are better than their creed, but there is no room in their theory for the conception of nationality or sociality. Individualism conceives no entity of the nation. But there is an entity of the nation. It is neither a convenient fiction nor a pleasing dream, nor a formula of words, nor the translucent film of metaphysical cobwebbery, nor yet a trick of the multiplication table of one multiplied by 85,000,000, or thereabouts. There is something abroad in society not accounted for in the materialism of individualism. The cash-nexus of Carlyle will not satisfy us. One cannot name it. But this is certain: whatever it is—what Jesus and Paul called "Charitas," or what Aristotle called "Philia," which was something wider than friendship—it is that which binds society together and makes human society possible. It is the centripetal and not the centrifugal forces of life. Its essential principle is cooperative rather than antagonistic. It is altruistic rather than egoistic. It is rational rather than whimsical. It is ethical rather than selfish. It is not atoms at war, and it is one Wordsworth has caught the idea—

"As leaves on the trees whereon they grow
And wither, every generation
Is to the being of a mighty nation."

Thomas Hill Green has taught us, here in this university, that the introduction of a doctrine of duties with the doctrine of rights involves the idea of a common life and a common good. This idea of a common life and a comman good is the foundation of the politics of this modern Aristotelian, Theodore Roosevelt, and in facing the issue of the twentieth century he has opposed sharply the foundations of the Declaration of Independence of all rights and no duties, to the philosophy underlying the Constitution of the United States, which is nationality, including duties as well as rights; and he has dragged out of the preamble of that Constitution a principle long forgotten, but a principle upon which the very Government was founded and for which it was founded—*to promote the general welfare*. This principle he has relaid on geographical foundations as substantial as the Archaean Hills.

It is not claimed by the new politics that legislation will recreate human character or reform the world, or that the State, centralized or decentralized, can ever become what Bentham characterized as a "mill to grind rogues honest." The vain regret is as old as the memory of Antisthenes, who implored the senate of his time to make horses of asses by official vote. The new democracy of nationalism claims for itself that it offers the forms of a rational association in a sphere of the State, enlarged and moralized, which will constitute a political environment where everything in the individual that is best and worth preserving will be encouraged instead of thwarted, and where the kindlier impulses of the human heart, the most of which are being choked in the maelstrom of individualism, shall have at least even chances for existence. If the State will offer a political environment which will make the public well-being possible, the public will look out for itself. The pathetic message of history is that the people have never had a chance. What they want is a chance. An ethical democracy would offer them a chance. Whether the legislative and economic forces which environ the daily lives of the multitudes are rational and ethical and social determines the limitations, and, to a large extent, the destinies of those lives. Whether they are the archetectonic constructions of rational foresight, or the unplanned or unintelligent accidents of chance, will decide whether individuals shall walk in blind alleys or open avenues.

If the scientific and ethical and philosophical contribution of Theodore Roosevelt to the United States, to the twentieth century; if his warfare with the billionaire anarchist and his defense of the people's domain succeeds in awakening the national intelligence and

the national conscience in stemming its wayward course, in outlining the path of its future development, in drawing the large outlines of the only kind of democracy in which politics and ethics can ever coincide; if he has drawn the line of cleavage where it belongs, and has set the party of State Rights over against the party of Nationality; if he has opposed the principles of anarchy and sociality, the motives of egoism and altruism, the parties of self-interest and the general welfare, the philosophy underlying the Declaration of Independence and that of the Constitution of the United States; if he has with sufficient distinctness contrasted a political atomism with the social organism, the historian of a future age will have the right to compare him with the Fathers of his Country as a constructive statesman.

STORIES TOLD IN RANGER CAMPS

By CHARLES HOWARD SHINN, Supervisor of Sierra National Forest

No. 1

SIX or seven years ago I rode into a ranger camp on Bubbs Creek, and found three men there, intently listening to a young ranger from Inyo. Those were the days in which not only the total inadequacy of the force to anything except the most perfunctory patrolling of the back-country, but also our definite orders, compelled the rangers to be camped many miles apart. If I should map this ranger's district topographically, all of you who read this would be sorry for him—and for the forest (in those days the "reserve").

But the ranger, a fine and fearless but somewhat young mountaineer, was not at all sorry for himself. Plenty of pleasant people went past, along the great Kearsarge trail, or fished in the magnificent rivers, and he gave them easily and well of his really superb knowledge of that whole region. According to his lights, he was an honest ranger and resisted every temptation to leave his beat and go hunting, or to climb the peaks. Then, coming back, some of the tourists took dinner with him, and left him little mementos or surplus grub.

So I let my horse wander and crop grass, and told the ranger to "go ahead with his old yarn," which I write down here partly to show the stock from which this type of ranger springs, partly to illustrate "the times that were," but chiefly, I think, because I liked the straightforwardness of the story itself.

"Now, my uncle," he was saying, "was just that kind of an up-and-down man, and after that trouble he came to California, in 1850, when he was twenty-five years old." Evidently I had lost the boyhood of the hero of the epic, but from the solemn tone of the young ranger, one could see that his uncle's career had become a proud family tradition.

"My uncle was mighty strong an' quiet by then, an' people was generally careful what they said to him. He was fifteen years older than my father, but when they growed up they acted an' looked a good deal alike."

The ranger, stretching himself out on the rocks, added: "An' those that knew them say I am cut off the same stick, only I am bigger—an' lazier."

Looking at the careless young giant of twenty-two, one could have given anything to have seen him truly and completely aroused in some great cause. He looked like a yellow-haired Viking up among the high places of Norway, looking for pines to build a sea dragon—under orders, for some one else to sail into the West.

"Well," he continued, "my uncle came to California, and looked around a little and noticed that every feller had to take care of himself pretty lively at times. Then he went south of San Francisco on the road to San Jose, and built a roadhouse and eating station, fenced in a patch of land (squatter title) and got him some hogs and a few cattle. Of course, he run a little saloon—every roadhouse needed that.

"In a year everybody who traveled that road stopped at the place, an' he dealt square. Then he picked up a boy of sixteen out of some deepwater ship in the bay—a boy who had run off from his home in Vermont and had learned to ride and shoot. He was kinder reddish and freckled and went by the name of Brick. He didn't talk much, and he had gray eyes that shut out everything behind them—but he got

along all right with my uncle. Didn't he have any last name? Guess he left it somewhere, same as my uncle did. Nobody called him Richard Freeman; it was just 'Dick,' and 'Dick's Station.'

"The old California pioneers will sometimes tell stories of the outlaws of those days, and of the 'Hounds' and the 'Sydney Ducks' who robbed and murdered so many returning miners. It was the crimes committed all over California by such people that led to the forming of the vigilance committees, you know.

"One day a gang of nine men rode up to my uncle's place. It was hot weather, and for once he was caught asleep in a chair. They piled into the saloon and began spreading themselves before my uncle could get to a weapon. They took all the whisky and cigars they wanted, an' treated him out of his own stock. Of course, he knew enough to be a good feller with the bunch. Brick, you see, was somewhere around outside when this happened. Not that he would have counted just then.

"After the crowd was pretty well satisfied that my uncle wouldn't hurt a fly, they went off in the gulch by a spring and made a camp. They took a ham and some other truck out of his cabin and began to get supper. Pretty soon they shot some fresh pork. It would have made a Quaker mad to see how they acted.

"Brick come home after a little, and found my uncle round behind the cabin. He had got together the rifles, and a couple of the old Colonel Colt revolvers and two shotguns crammed with buckshot.

" 'Here, Brick,' says my uncle, 'will you stand by me in a fight?'—an' he tells Brick all about the thing.

" 'Of course,' says Brick. 'What you want me to do?'

" 'Take that gun an' that pistol. It's near sunset an' the men are at supper. You begin at one end an' I'll begin at the other, an' we'll shoot to kill.'

"My uncle an' that sixteen-year-old boy went out to the west edge of the bank an' looked down on the camp. The nine men had been drinking a lot, but they were all sound and capable, and hardly one but had his pistol strapped on. They was eatin' supper. They was easy clost, and the brush was broken so that everything was plain to be seen, but nobody noticed the man an' the boy in the edge of the field by the fence above the spring.

"My uncle takes Brick back an' gets hold of his hand a second. 'You'll do,' was all he said, an' then they walks up an' begins to shoot the men.

"Well, in less than four minutes they killed them all. If I was a novel writer I could give you the details, an' make a great fight of it. The boy shot four men an' my uncle five, an' my uncle chose the end where the most dangerous-looking men were. It was done awful quick an' complete. I think they got a few shots back, but the sun was in those fellers' eyes an' they didn't damage my uncle nor Brick none.

"My uncle sent Brick off to get some of the cattlemen and ranchers to come over. Then they found that every one of the nine men had a bad record, and the rewards on some of them summed up $1,500. They collected that money an' divided it. It was pay for one of Joaquin's gang, an' an escaped convict from Australia, and a big nigger from Chili.

"Brick sat and looked at his share, one evening later, so my uncle used to say. Then he remarked in the slow, scared way he had, 'I ain't sorry I shot them fellers, but I'd ruther not get into the habit of it, so I guess I'll take this cash an' go back to Vermont.'

" 'Can you stay there?' says my uncle.

" 'Yes, I can!' answers Brick, 'an' I can get rich there, too.'

"My uncle always said he had no doubt that Brick held up the Vermonters.

"About my uncle? Well, he had managed it this way, you see: His neighbors who helped to bury the dead men knew that nine had been shot. But the officers took notice of only the three that carried rewards. It didn't make much stir. He could have run for sheriff, once, on the strength of it. He went to Frazier River in the gold ex-

citement there, and then to Nevada. and after that to Inyo, and at last over beyond Panamint, a feller shot him in the back and was tried and hung for it by some vigilantes. But no one that I ever heard of ever blamed my uncle for that Madre Corte shooting over San Mateo way."

I looked at the three young tourists, and they were really pale. They had restless, unguided, novel-fed imaginations; they saw and felt all the things which the ranger had left out of his simple tale—the chill, slow wrath of boy and man; the swift, unexpected death stroke; the dead and dying desperadoes suddenly falling down into their campfire and over the outspread supper. They heard the first shots, the wild cries of terror, surprise, and rage; the few ineffectual shots of reprisal and the plunging of frightened horses, until a red and awful silence followed tumult in that green hollow of the foothills fifty-five years ago.

"It was murder," said one, "and I should have thought that even a California jury would have hung those two. I cannot believe that such a boy ever came out of the Green-mountain State."

"It was mere savagery," said another. "Your uncle could have sent for an officer and arrested the trespassers."

The third tourist was older, bronzed by wider travel, trained in some wise to the main differences in points of view between East and West. "I think that I might have liked your uncle," he said, "but Brick was the real center of the play. I suppose that he went into politics later and moved on ruthlessly to his chosen ends. He certainly could take care of himself."

"Nobody knows what become of Brick," said the ranger; "but my uncle and the cattlemen buried them nine men the next day with no help from Brick. He went fishing. And after he went back East, he never wrote no letters to my uncle—jest dropped out."

"Told you so," remarked the third tourist. "Brick was suited to any destructive game. The sight of that little seven hundred and fifty in California slugs and gold dust simply turned his predatory instincts into new channels. Perhaps he went to New York and slaughtered his foes in Wall Street."

"Didn't take much stock in Brick, myself, even when I first heard about it," said the ranger. "But don't none of you mistake about my uncle. He never wronged a man. He played a straight game. He helped every friend of his that was down on his luck. Accordin' to my views of those times, he had to shoot those men—or else run away and leave his ranch. Before morning they might have burned his buildings, or cut off his ears to make him tell where his money was. There was no law to speak of in that neck of the woods."

The tall ranger rose with an air of finality, and went to saddle his horse to start up the trail with me. The tourists gathered up their manifold belongings and went off the other way.

"Never again will anybody hear that story from me," the ranger declared, that evening after supper. Too many people say: 'How very Californian!' in a tone that really means, 'How very wicked!' I can't see any blame coming to my uncle. Is it because he sold whisky when everybody drank it, or because he didn't get a sheriff when there wasn't a sober one within fifty miles? Wasn't that gang all armed? Didn't he take mighty big chances?"

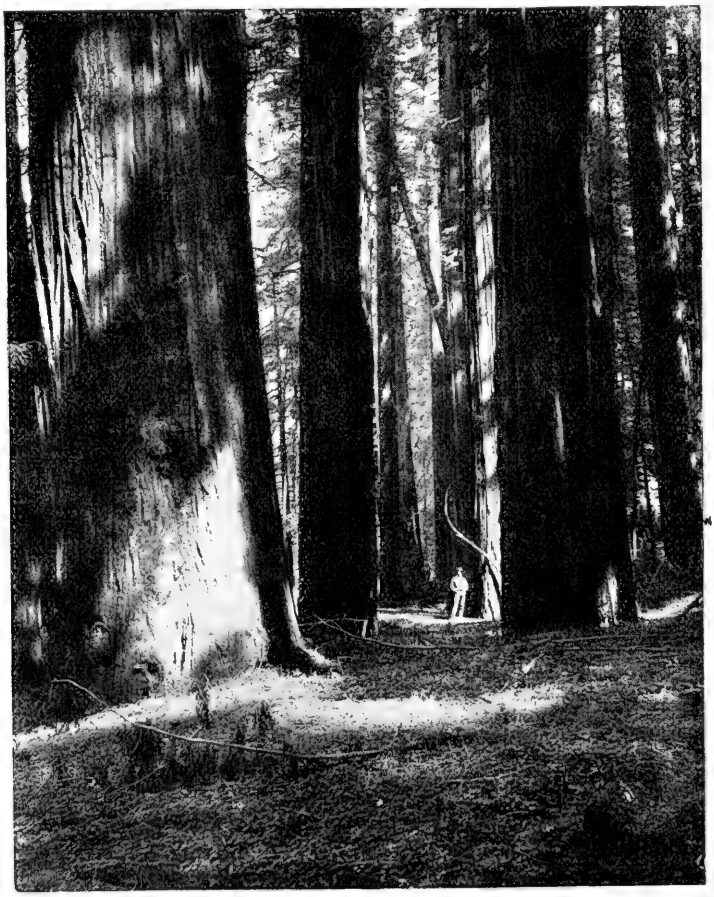
"There, there!" I told him. "Go slow, youngster. The mistake is yours. You tell that story to tenderfeet, and it seems to them brutal. Besides, it belongs to a civilization in which they have no part. The whole situation is beyond their comprehension. They like to read in western novels of all sorts of dressed-up, excited mix-ups; your uncle's affair seems to them too cold, too deadly, too simple. Now, I will gamble that your uncle or the boy went down and took the rest of the ham, and cooked it for supper."

"I suppose, of course, they did, if that was the last ham," said the ranger, "and why not?"

"Why not, of course, if you are of the elemental sort? The fight was over; it was supper time. Yes; they replevined the ham. You would have done it."

That night, as the ranger lay in his blankets in front of the campfire, my thoughts were busy with the relations of himself and of others like him to each other and to the Service. What quiet, calm, yet undisciplined natures they had! With what straight simplicity they went forward to fateful conclusions. How immense the responsibility upon the officers of the forests to train, control, restrain, direct these hereditary forces! And I remember the dictum of an old supervisor a year or two earlier when he said to me? "If I told that ranger to shoot a man, in the name of the Government, and his reason approved, he would kill him, and never lose a minute's sleep over it. But if his reason did not approve, he would resign and leave the camp without stopping for dinner" (a serious proposition out West; to leave that way is like refusing to take salt in the tent of an Arab).

Such was the bringing up of some of the older types of forest rangers before the days of reports and business details of timber sales, grazing permits, and land matters. They did their work, and fulfilled themselves, under very hard conditions. Their virtues have been handed on down the line, and their successors, with much better educations and fuller comprehension of forest problems, are still valuable in the main according to the degree in which, like the rangers of 1891-1903, they speak and live the truth as it is revealed to them. Honesty, fidelity, capacity for hard work, and belief in the game we are playing, are now, no less than in pioneer days, the requisites, the imperative demands of the Service upon the ranger.



EDITORIAL

The National Conservation Association

THE American Forestry Association will extend a cordial welcome to the National Conservation Association, the organization of which has just been announced. For over twenty years, through many of which forestry was misunderstood and unpopular, and "conservation" remained hidden in the dictionary, awaiting its Roosevelt as America awaited Columbus, this association has worked for better conservation legislation, and for wider and sounder knowledge of forestry, with all that it means to the people's welfare. To it the advocacy of the vital issues raised by the conservation movement seemed in a measure to fall, because it was the strongest and most completely organized popular association in the field, and because forestry is the keystone of the conservation arch and soils and waters look to the forest as parent, conserver, and restorer. This must inevitably influence our work in the future. We cannot, if we would, divorce the forestry cause from the whole great conservation work, but there is much to do and our work is so large, so important, and so well defined that we rejoice in the appearance of a strong combination, in which we hope to find a powerful ally, which assumes the obligation to push the conservation work along other lines.

An impression has been fostered by some newspaper outgivings that there is some rivalry or hostility between the two associations. For our part we know of none, nor reason for any. Our own work remains clear before us, and becomes larger year by year as the need of forestry and the public appreciation of it grow. To make this magazine the representative and authorative popular presentation of *American Forestry*, with all that the term implies in maintaining the primary forces of conservation; through it and through all the educational means at our command to inform the people on forestry and the allied subjects of soils and waters; to secure the most effective legislation in the Nation and each of its commonwealths—this is our program, and it is big enough and definite enough to enlist the support of all good Americans. We recognize no rivalry except that of who shall accomplish most for the public welfare.

Prevention of Timber Waste

HOW to prevent waste is one of the great forestry topics, along with taxation, forest fires, reforestation, and the other familiar headings of the forest creed. On this subject Capt. J. B. White, of Missouri, made an admirable address at the recent southern conservation meeting in New Orleans. Incidentally he paid his respects to the popular idea of a lumber trust, maintaining that it did not exist, and that high prices for lumber were not due to artificial forcing, but were the natural result of a supply inadequate to meet the demand. We believe he was right.

He discussed the proposal that the states should regulate the cutting of lumber by restricting it to a certain size, finding this impracticable, as have all professional foresters who have considered it, so far as we know. Often, he said, the smaller tree would be of more value than the larger for specific purposes. Size regulation is imprac-

ticable as a plan for conservation, and if practised, should come only as an incident. As one means of economizing production the lumberman might put up the prices for his better grades, thus widening the market for poorer stock. The use of fiber for packing boxes, which many of the box men have regarded as inimical to their business, he found not harmful, but beneficial, since it utilizes otherwise waste material and saves good lumber. Here are some further suggestions from Mr. White's address:

Tracts that are intended for forestry should be registered and exempted from taxation, only as the product is cut for market. And this law should apply to the farmer with his small wood lot, if he sets it apart for growing trees, as well as to the party having larger holdings. And when the time comes, as it some time will, that it will pay as well to grow trees as to grow other crops, then a new basis of land values according to adaptability will have come also. But wood will be more valuable. Lumber will be higher. While we will be able to grow stumpage in soft woods at from $10 to $12 a thousand under a favorable tax system, yet the lumber from these trees will be inferior to what we have now. It will not be like the ripe 150 and 200 year old growth which we are now cutting. Our children will not have the percentage of clear and upper grades of well-matured wood which we now have. They will have to be content with forty to fifty year growth of sound lumber with sound knots, and their finishing lumber may be what is even better than ours is now—a fine, clear fiber board that will be free from liability to check or shrink, and susceptible of a high polish.

Then Mr. White emphasized a point which he had already touched upon, the growing importance of the small trees. These, he declared, are to be the commercial timber of the future. They are already in demand for telegraph and grape poles, mining props, railroad ties, wagon hub and spoke, and handle timber, and for many other uses:

A rapidly increasing population, wanting bread as well as trees, cannot wait 200 years for trees to grow, and I do not believe it will be economy that they should. We should sell from our forests whatever is most valuable regardless of mere size and we should plant again, protect, and grow another crop governed by intelligent forestry methods. The farmer finds that he often gets more for his young corn than it would bring him if matured. He gets more very frequently for a six-weeks'-old veal calf than he would get for that same calf a year old. So it is with lumber trees. Let us supply the market demand and keep reforesting, conserving, and growing trees for the market. Germany, France, England, and other foreign countries are coming to America for their lumber, because they buy here cheaper than they can raise it at home. Some time the market will advance so it will become necessary and profitable for them to raise their own trees, even as we will have to grow ours. Lumber to-day is worth at the mills forty per cent less than it was worth two years ago. The farmer's wheat and corn are worth twenty-five per cent more, and his cotton 100 per cent more than it was a year ago, and it is all due to the market conditions governed by the law of demand and supply.

This necessity of utilizing the smaller trees and growing more rapid rotations will be regretted by the lover of the big forest, but we shall have to recognize the compelling force of daily needs. More and more we must consider this subject of the prevention of waste. We are glad to have this discussion of it by a practical lumberman—not a last word, but a good word. There was much of the ethical spirit of the forestry and conservation movement in Mr. White's closing sentences, and we commend them for the breadth and enthusiasm that animated them:

Forestry and agriculture will work hand in hand. Each needs the other in the work of conservation and reclamation. In the realities of life we need both its poetry and its prose. We need the trees and the flowers, the golden grain and the ripening autumn days; we need youth and spring and old age, and we need most public patriotism, moral courage and human love.

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Who Is Able to Stand Before Envy?

"WRATH is cruel, and anger is outrageous; but who is able to stand before envy?"

Thus spake the wise man thousands of years ago, and his words are appropriate to-day.

These reflections are called forth by another Denver outbreak. The thing which now chiefly disturbs the equanimity of the would-be land-grabber

and resource exploiter in Denver is the popularity of Forester Pinchot.

The writer begins by mentioning "the 'spontaneous' and 'enthusiastic' indorsements procured for the Forest Service by Mr. Pinchot." These, the writer declares, "are the most carefully planned and manufactured 'outbursts' of popular feeling that were ever expressed this side of a Roman mob of supes on the mimic stage."

"Just now," we are told, "the Chief Forester is competing with Secretary Ballinger for Presidential favor. * * * Hence he organizes an intelligent conspiracy for popularity. And President Taft will be deluged with resolutions approving the Chief Forester and all his methods."

"And most of this 'outbreak,'" we are assured, "is all humbug."

The writer then proceeds to explain how Mr. Pinchot has carefully organized a claque, and "at every possible gathering" they do their stunt, "put over a resolution or a speech lauding him and his work, and his press bureau does the rest." This, the writer assures us, "is the rankest fake ever perpetrated * * * the method of the cheapest demagogue."

Really, this Denver "continuous performance" has in it the element of the pathetic.

Here we have Mr. J. Arthur Eddy serving for months together as "temporary" president of his organization and, as he informs his constituents, with an empty treasury, devoting his time, talents, strength, and zeal to the great cause of "dividing up" our "national heritage" and parceling it out among those who can most expeditiously and certainly "make money out of it:" and all this without even the poor tribute of the praise of men.

He goes to a meeting, bravely attacks the "feudal baron" of the Forest Service who insists that our natural resources be conserved for the use of all the people, present and to come, instead of being turned over to a few Guggenheims and the like—masters of the gentle and joyous art of "getting on" by "getting others off"—and, for these things, he must needs receive a drubbing in his own bailiwick from divers and sundry of his own neighbors, while the groundlings "throw up their sweaty night-caps," applaud the "feudal baron" as "all right," and pray that his tribe may increase.

That Mr. Eddy should be required to keep this thing up indefinitely without even being made permanent president of the National Public Domain League argues, on the part of the magnates whose interests he serves, a callous indifference that should wring the hardest heart.

Again, is there not some one in Denver who will kindly pass the basket and recoup the long-since empty treasury of the league? For business is business: printers' bills must be met, and Uncle Sam will not carry press bulletins unless the postage is prepaid.

And cannot some good soul "put over" at least one resolution commending the unselfish efforts of Mr. Eddy and his league?

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Labor for Public Improvements

AT THE Corpus Christi meeting, Lieut. Gov. A. B. Davidson raised the labor question in connection with waterways improvements.

It seems that the constitution of Texas bars state activities in waterways development, leaving such work to the Nation. Instead, however, of relying wholly upon the National Government to develop the streams of Texas, Mr. Davidson proposed that the state cooperate with the Nation in this work.

The state, he believed, could aid by furnishing the labor for the work; to do this, he would utilize the 3,600 convicts now maintained in idleness by the state.

This, it would seem, is as little as a state could do in promoting an enterprise so great. Yet Governor Campbell is quoted as having opposed Lieutenant Governor Davidson's scheme and favoring the development of the Texas

waterways as a national proposition, pure and simple.

In certain southern states, convict labor is utilized in draining swamps. That any one should prefer permitting a great body of men to rot in idleness in the penitentiary when they might be usefully employed in developing the resources of the state, is hard to understand.

In this connection, however, it may be pointed out that not all our unemployed are in penitentiaries. A body of them, ranging, from time to time, in size from regiments and brigades to an army, herd in our great cities or tramp the railway tracks seeking employment.

An American railway official has recently estimated that our railways destroy a human life every hour and injure a human being every ten minutes. A large percentage, it is believed, of the killed and wounded in our annual railway holocaust consists of unemployed men wandering about the country seeking employment.

When we speak of utilizing natural resources, it should be remembered that human resources rank first in importance.

In the unemployed people, some of them graduates of our leading universities, others clerks, skilled workmen, and professional men, we have a resource of far-reaching importance.

Have we reflected upon the extent to which this human resource might be utilized in conserving the sub-human, or material resources?

There is a great good-roads movement on in this country. Have we thought of the possibility of utilizing unemployed men in creating good roads, paying the expenses in large measure, or wholly, from the taxation of betterments?

Have we figured upon the number of acres of desert which might be irrigated, or of swamps which might be drained each year by the employment of these unemployed men, the bill being paid by those who use the reclaimed lands?

Horatio was informed by Hamlet that "there was more in heaven and earth than was dreamed of in his philosophy." The same might be said with equal truth of the political philosophy of the old-fashioned statesman.

Here, right before us, is an opportunity to do a great good to a great body of hopeless, despairing people; to render a great service to the Nation in constructing highways and redeeming lands, and all by methods which need not cost the Nation a penny, but which should, on the other hand, result in a vast increase of the Nation's wealth. Why should not such proposals be seriously considered?

Trouble in Illinois for the Deep-waterways Movement

THE deep-waterways movement in Illinois has struck a snag.

This obstruction is located, in part, in the Des Plaines River, in the form of a big dam built by a corporation; and, in the second place, in the supreme court of the state, which supports the company in building this dam.

Governor Deneen is deeply interested in the Great Lakes-to-the Gulf project. A part of this highway is the Des Plaines River.

This little stream rises in Wisconsin and flows into the Illinois. For reasons not explained, the Illinois and Michigan state canal commissioners, appointed by the governor, leased to this corporation—the Economy Light and Power Company—at a low figure, the state property on this river.

The company then proceeded to build a great dam and power plant at Dresden Heights, on the river, where practically the full water-power of the stream is available.

Of course such a structure would interfere materially with the deep waterways project.

Governor Deneen, in behalf of the state, started proceedings to enjoin the completion of the plant. A temporary injunction was granted by a Cook County court, but, on hearing, was dissolved.

The case went to the supreme court of the state, where the state maintained:

1. That it owned the bed of the river at the point where the dam was built;

2. That the river is a navigable stream, and that the proposed dam would constitute an obstruction to navigation; and,

3. That certain contracts executed by the canal commissioners, under which the Economy Company claimed certain rights, were void and offered no justification for the construction of the dam.

At every point, however, the supreme court has decided in favor of the corporation. The river, it holds, is not navigable; the bed, therefore, belongs to the riparian owners, including the Economy Company; the contracts referred to are valid and the corporation is entitled to build its dam.

If, now, the state is to proceed with its waterways project it must institute condemnation proceedings, get possession of the property owned by the company, and, for this property, make "just compensation," which, it is claimed, will amount to the tidy sum of some $12,000,000.

Naturally, friends of the waterways project are disappointed. One Chicago paper, hostile to the governor, sharply criticises him for appointing commissioners who would thus alienate the state's property and embarass his own policy.

The water-power question, it may be observed, is involved.

Governor Deneen has been proposing to utilize the water-power of the state of Illinois for the benefit of the state. In explaining his project to the governors on the trip down the Mississippi, he said:

"The state proposes to connect all navigable streams by a series of canals, to be paid for by the revenue from the sale of the water-power afforded."

A portion of this waterway, however, is now in the hands of the Economy Company at Dresden Heights, and this company evidently does not propose that it shall pass again into the hands of the state.

The counsel for the corporation is quoted as saying that the company, if so disposed, could force the condemnation of the property involved before allowing the construction of a Federal waterway; but that the company would grant the right of way without compensation *if no attempt were made by the state to take over the water-power,* and would also allow a Government lock on the dam.

All of which is interesting for several reasons.

It shows, for one thing, how a private corporation can get in the way of a great state or national enterprise.

It shows, again, how public officials, from lack, either of judgment and discernment, or of loyalty to the public interests, can permit a corporation to get the whip-hand over government, state and national.

And, finally, it shows how the courts can support the corporation in so doing.

The reader may be interested in placing this case along with some others that have occurred in Illinois in recent years.

One of these is that of the Beef Trust, in which, to the disgust of the President, Federal Judge Humphrey decided in favor of the trust and against the Govment.

Another, and more recent case, is that of Standard Oil, where Judge Grosscup decided that the fine of $29,240,000 against the trust could not hold.

And there are others—several of them.

Up to date, corporations and trusts in Illinois—not to mention other states—have fared reasonably well at the hands of the courts. Perhaps, some day, the tide will turn.

The Cost of Waterways Improvement

TO PROVIDE a nation with waterways is a task for statesmen. Unhappily, statesmen do not grow on trees, nor descend by night like manna in the wilderness.

Herbert Spencer used to say that, as it is impossible to insert a normal, five-fingered hand into a glove of but two or three fingers, so it is equally impossible to put a big, more or less complicated, idea into an imperfectly developed mind.

To every one with eyes to see, and leisure and opportunity to contemplate the facts, it is obvious that the internal waterways of the United States must be rehabilitated and made available for the uses of commerce.

However, like the lion which, in Bunyan's allegory, obstructed the path of the pilgrim, a huge barricade rears itself before the eyes of a certain type of statesman when the question of waterways development is broached.

This barrier is the problem, to him apparently insoluble, of finance — the problem of "where to get the money."

Formidable, however, as this question may appear to some, is is not possible that its size is, roughly speaking, inversely proportional to the size of the statesman?

It may be noted first that money, wisely used in waterways development, represents not an expenditure but an investment. Let a single corroborative fact be here adduced.

In the *Wall Street Journal* for November 13, a publication not overly friendly to the waterways movement, may be read from a leading editorial:

"C. W. Macara, recently president of the Manchester Cotton Association, says that the value of the Manchester Canal as measured by reduction in the cost of conveyance of raw cotton and of cotton goods manufactured therefrom, has been at least $2,500,000 annually to the cotton trade alone."

The same editorial points out that this canal has yielded advantages in three ways; it has reduced the cost:

1. Of accumulating raw materials from various parts of the world for manufacturing purposes;

2. Of handling food supplies, imported largely by the manufacturing districts of Manchester and adjacent points;

3. Of distributing manufactured produce.

Again, as Poor Richard taught our great-grandfathers, "A penny saved is a penny earned." The waterways development now proposed coupled, as it necessarily must be, with forest conservation, will involve a prodigious saving.

To succeed, the waterways movement must adopt measures that will minimize overflows and floods. To appreciate the significance of this factor alone, let the pecuniary damage resulting from floods be compared with the amounts of past waterways appropriations.

The appropriation made by Congress for waterways for the year 1909 was $18,097,945, an amount equaling about eighty-three per cent of the average annual appropriation for this purpose for the last ten years.

The United States Senate, in its report of April 11, 1906, said: "From April, 1901, to April, 1902, floods in the South, fed from the Southern Appalachian region, did a damage estimated at $18,000,000."

Note, again, the loss from erosion, estimated to amount, annually, for the United States, to one billion of dollars. While waterways improvement would not wholly stop this waste, it would aid materially in so doing.

Again, when sources of revenue are sought, it should be remembered that, in the United States, the real sources, like the coal beds of China, have been, as yet, practically unopened. In the recent special session, suggestions were made as to scratching the surface of some of these, but little of a practical nature was accomplished.

The bond proposition is now at once the most popular and practical device for immediate use. However, as stated before in these columns, to expend as much annually in interest on a loan as would be covered by an ordinary lump appropriation would involve no economy; its chief advantage, apparently, being in avoiding the risk of future progress "by jerks," and ensuring a reasonable continuity of policy.

A proposition of extraordinary interest is that made by Governor Deneen to his fellow governors on their recent trip down the Mississippi.

In a word, his plan involves the retention by the Government, whether National or state it matters not, of water-powers on the several rivers, and the utilization of these powers for purposes of public revenue.

Says a newspaper correspondent who heard the proposal:

"It has been estimated that the electric power which could be made by controlling the floods of the Ohio, the upper Mississippi, and the Missouri would suffice to pay for the entire cost of the improvements within a decade.".

Which brings us again to the question of statesmen and statesmanship.

On the one hand, we have the school which stands for donating the people's wealth and wealth sources, water-powers included, to corporations in perpetuity, and then raising the public revenues by indirect taxes paid chiefly by those in moderate circumstances.

On the other hand, we have the new school, discussed in our last issue, which believes that the property of the whole people should be made to inure to the advantage of the whole people.

In direct line with the creed of this second school is the proposal of Governor Deneen. It will, of course, arouse no enthusiasm among the representatives of the old regime.

But between these two schools it is the privilege of the American electorate to choose.

The "Expense" of Conservation

AN EXCHANGE comments editorially upon the danger of the great and growing "expense" liable to result from "conservation and waterway schemes." It points to the "annual increase of $50,000,000 in the appropriations," and says that the President is "advising the curtailment of all expenses."

This advice, it thinks, may be followed with the result of largely wiping out the Treasury deficit.

Our enthusiasm, however, over such economies may, it believes, well be restrained in view of the menace of "fixed charges."

Congressman Tawney is quoted as having declared that these, "in very large measure the consequences of war," are eating into the Nation's revenues and leaving no trace behind.

Furthermore, along with existing fixed charges for war and a growing military establishment, the exchange points to another prospective fixed charge, that, namely, from "conservation and waterway legislation."

This "has already been started," and "unless the utmost care is taken," may result in "another series of fixed charges." The "difficulty," we are told, "is that when these movements are given Government aid, they go forward to an extent that is very uncertain."

"The saving of $50,000,000 in appropriations this year," it is said, "will be a very good thing, of course. But if, while applauding ourselves for this triumph of economy, we allow the Nation to become involved in other great obligations that will cling to us, our triumph will be barren."

That the fixed charges resulting from wars, past and prospective, are preposterously large, CONSERVATION freely concedes, and deplores.

But note the issues thus yoked up together—*War and conservation!*

The ancient Hebrew was forbidden to "plough with an ox and an ass together." Could the lawgiver have foreseen, through the ages, so unequal a yoking as has above been made by our contemporary, in what language, we wonder, would he have couched the terms of his prohibition?

War and conservation; waste and saving; destruction and production; tearing down and building up; wrecking a world and saving it—all to be classed together and equally condemned!

The human mind is fearfully and wonderfully made, and to follow its workings in every case has baffled the wisest. To fathom the processes whereby war and conservation could be grouped in a single pair were, indeed, a task for the alienist.

The astounding conclusion under consideration has resulted, evidently, from the failure to distinguish between expenditure which subtracts from and that which adds to the wealth of the Nation.

To be sure, the making of such distinctions is economic kindergarten work; yet not all, unfortunately, who fill space in economic discussions have mastered the requirements of the economic kindergarten. To meet the needs of such, the subject must be presented in an elementary way.

One may point out, for example, that the battleship which costs millions of dollars and, in a few years, rusts out or goes out of date, is, during the entire period of its existence, producing not a penny's worth of wealth. The best that can be said for it is that, in extreme cases, it may protect the Nation from invaders who would themselves destroy wealth and hinder production.

Over against the battleship, however, let us place, for example, the great Roosevelt dam across the Salt River Canyon in Arizona.

Here we have a gigantic Government-built structure which will make one of the largest artificial lakes in the world —a body of water twenty-five miles long, 1,200,000 acre-feet in capacity, and capable of irrigating 200,000 acres of fertile soil.

Now, in two respects the battleship and the Roosevelt dam are exactly alike; each costs a mint of money, and each is paid for, in the first instance, by the whole American people.

But here the similarity stops. For their expenditure on the dam the American people will be repaid by those who use the irrigated land; for their expenditure on the battleship the people will be repaid by nobody.

So long as it floats, the ship will continue to cost the money of the whole people; when once turned over to the water users' association, the dam will cost the whole people nothing whatever.

The function of the battleship is to destroy wealth; the function of the dam is to create wealth.

In a few brief years the battleship will go on the scrap-heap or to the bottom of the sea; the dam, however, we may rest assured, will continue to produce wealth for generations and centuries.

Now, the whole conservation policy, rightly handled, is typified by the Roosevelt dam. It will multiply wealth for ages to come; its entire cost may be paid out of a fraction of its product, and its sole end is to bless the race.

And yet we are gravely warned that "unless the utmost care is taken another series of fixed charges," analagous to those from "increased armaments," "will be provided through conservation and waterway legislation!"

Let the Reclamation Service Suffer No Harm

IN A Washington paper a sensational article has just appeared. It sets forth, in substance, that the Senate Committee on Irrigation may be expected to favor a reversal of the policy of the Reclamation Service.

The plan supposed to be favored requires that the Government shall do only the difficult and unremunerative work and leave to individuals and corporations the simpler and more profitable projects.

From time to time in recent months broad hints have been dropped that influences looking to this end were at work.

The Reclamation Service is proving that irrigation pays. Whatever pays, private enterprise is anxious to enter.

It goes without saying that private enterprise has a great field in connection with the irrigation of our western arid and semi-arid lands; the important question, however, is whether Governmental activities are to be curtailed, and restricted to unprofitable operations, while the plums are to be thrown to private irrigation concerns.

Inquiry seems to indicate that, whatever private individuals may desire, there is little danger that the Senate committee will make such a recommendation.

The statement from Mr. Newell, Director of the Reclamation Service, found in our news columns, would not bear out such a conclusion. Nevertheless, as eternal vigilance is the price of liberty, so, likewise, is it the price of the proper safeguarding of the people's interests in general.

The Reclamation Service has abundantly demonstrated its right to live and greatly to extend its operations.

Criticism has been made that it has undertaken too much. A Senator, quoted as favoring private as against public irrigation, says that no blame should attach to the Reclamation Service because of the number of enterprises undertaken.

Local demands voiced in Congress, together with the law itself, seemed to leave the Service no recourse.

It was forced into work which its present funds do not permit it promptly to complete. The question now is whether Congress will enable it to complete these works and likewise to undertake others.

This same Senator bears testimony to the widespread popularity of the Reclamation Service in the West and the protest which may be anticipated should any attempt be made to impair its usefulness.

Let no backward step be taken in the work of Governmental reclamation. Whatever private concerns may do, the Reclamation Service must lead. Its business is to serve the people at cost. It works not for individual profit, but for the general welfare. The people are for it.

The President recommends, as does the Secretary of the Interior, that bonds should be issued to enlarge its funds. Let Congress act upon this recommendation.

Rally for the Appalachian Bill

THE session of Congress is almost here. The fight for the Appalachian bill must be renewed.

We need not repeat the history of this legislation.

Note that the work began in the South. Now it includes New England, and its friends are scattered from sea to sea.

Again, it began in esthetics; now it is rooted in economics.

It was instituted to save the magnificent scenery of the Southern Appalachians. Now it is sought primarily to save the forests and streams of New England and the South, with the tremendous interests dependent upon wood and water.

As to wood: It is well known that our chief hardwood supply is in the Southern Appalachians. But, with the slaughter now on, these hardwoods, in another twelve or fifteen years, will be practically gone.

As a writer suggests, hardwood products may soon be expected to bear the label, "Made in Germany."

But important as is the question of wood, the question of water is more so.

To blink the connection between forest and stream is futile and fatal. For waterways men to do it is for them to follow the example of the ostrich which, to ensure its safety, hides its head in the sand.

Yet some waterways men are doing this very thing. Waterways men of prominence are denying all connection between wood and water; between forests and floods; between timber-clad slopes and the control of streams.

One of the waterways leaders in the House voted against the Weeks bill; another has recently denied categorically all faith in forests as a protection to streams, and has demanded that the forest and waterways propositions be kept absolutely separate and distinct.

This man pins his faith to the teachings of the army engineers.

The chief of these is Colonel Chittenden. As CONSERVATION readers know, his paper was riddled by Prof. George F. Swain in this magazine for August and September.

Military men are models of courtesy; they are delightful friends and companions; but, as a class, they have one weakness.

The bane of militarism is conventionalism, conservatism, adherence to

the old, both in idea and practise, till actually driven to the new.

This has been proved a thousand times. Largely because it was true, Napoleon for years scattered the armies of Europe like chaff.

The modern, scientific view of the connection between forests and streams is represented by the Forest and Reclamation Services and the Geological Survey; the old-fashioned view is represented by the army engineers.

Because, like the Chinaman, he believes that the teachings of the fathers must control the children to all generations, the military engineer of necessity repudiates the doctrine of these modern bureaus.

But if military advice on these questions is followed by America, this Nation will go down before up-to-date competitors like Germany or Japan as the old regime in Europe went down before Napoleon, or as wind-power goes down before steam and electric power.

Galileo taught that a heavy body falls no faster than a light one of the same bulk. The savants of his day laughed him to scorn. He proved his contention by dropping balls from the Tower of Pisa, but the pedants were still unconvinced.

Columbus proved the terrestrial globe to be a sphere; but the wiseacres of his day tapped their foreheads and smiled.

Descartes believed that the universe is developing through evolution; Copernicus taught that the earth moves round the sun; Kepler formulated the laws of planetary motion; Dietrich Flade repudiated witchcraft; Roger Bacon taught that man may learn by experimental methods; John Barillon interrogated nature by means of chemical appliances; Harvey taught the circulation of the blood.

Every one of these men flew squarely in the face of the dominant sentiment of his time, supported by the accepted "authorities" in the field of truth.

Yet in every instance the dominant sentiment and the accepted authorities were wrong, and the advocate of the new view was right.

The viewpoint of the military engineer to-day corresponds with the viewpoint, in their days, of the "authorities" above referred to. It is the viewpoint of the man wedded to the past, and refusing to change his position.

In contending with such men, facts count for little; otherwise they might again be piled mountain-high.

The statistics published by Mr. Leighton and the Forest Service might again be massed.

Mr. Pinchot's illustration before the House Judiciary Committee might be repeated when, by pouring water upon an inclined blotter, and then upon an inclined photograph, he showed the difference between the action of a forested slope and that of a denuded one.

Up to the point of saturation, the blotter absorbed the water; the photograph absorbed not a drop.

But our waterways man says that when the forest cover has been saturated the water runs off. Who denies it? When the mulch is full, it is full, as much so as is a barrel.

But does this admission disprove the fact that, until the mulch is full, much water is absorbed, and thus kept back from an otherwise possible flood?

Again, the full blotter and the full mulch can be supplemented. For the latter, we need the reservoir.

Further, the waterways man contends that the second growth, sprouts, and brushwood found on the deforested slopes restrain the water as well as the original forest would have done.

It is admitted that such a cover exercises a restraining influence; it is not admitted that this influence is equal to that of the well-kept forest.

But suppose it were; shall we hold, therefore, that with a timber famine in sight a ragged coppice, burned over and practically worthless as a wood-producing area, is as desirable as the splendid forests which adequate protection ensure?

Our waterways friend apparently concedes that the second growth restrains the waters; will he then deny that the first growth restrains them in at least equal measure?

If not, how does he choose between the splendid forests which the Appalachian legislation will ensure and the wreck which its failure must necessitate?

Again, as is well known, Old-world countries, long indifferent to government ownership or control of forests, were at last driven to it, but after fearful loss.

Years ago, the United States Senate informed the country that the price of Appalachian lands was rising like that of the Sibylline books. Now the fact is indisputable.

When the Southern Appalachian Park bill was first introduced into Congress large areas of uncut timbered lands of average quality could be bought for from $1 to $3 per acre.

Now the Secretary of Agriculture, in his report on the Southern Appalachian and White Mountain watersheds, tells us that "even cut-over lands with no prospect of a timber crop inside of ten or twenty years will cost as much now as virgin lands ready for the saw would have cost eight years ago."

Such already is the price our procrastination has cost. How much higher shall we, by further procrastination, permit that price to rise?

The Glavis Case

THE expected has happened. Mr. L. R. Glavis has stated his case.

The statement is a strong one: strong in what it says and in what it omits; strong in its self-restraint.

To attempt to brush such a paper aside as "a tissue of falsehoods" and as "shreds of suspicion" is vain.

As well might King John have attempted to brush aside the document handed him by the barons at Runnymede. As well might King George have dropped the Declaration of Independence into the wastebasket, or with equal profit might the present House of Lords flout the Lloyd-George budget.

Nor will it avail to quote "the President's" letter as a final rebuttal.

The suspicion is too widespread that the President had very little to do with that letter. It bears too many earmarks of another office, and its phraseology and arguments are too familiar to those who have discussed the subject with another highly interested official.

The country now demands the facts. They should come from no biased or interested source. And, as a generation ago, the motto should be, "Let no guilty man escape."

It is said that a well-known Senator will call for all the papers in the case.

This report is encouraging. But it must be remembered that there are investigations and investigations.

The object of an "investigation" is sometimes to find the truth and sometimes, apparently, to conceal it.

In a matter of such gravity, no pains should be spared to protect the country against a "whitewash."

For it must be remembered, and never forgotten, that it is the country's interests which, in this matter, weigh most heavily.

An official here or there, or a subordinate more or less, are not, in and of themselves, the issues at stake.

Officials come and go, but the people's interests are permanent. The vital question is, "Are these interests being conserved or betrayed?"

And it is this question which renders important the incontinent removal of Glavis.

Suppose Glavis were right. What effect must his discharge, without benefit of clergy, have upon the public service?

And suppose he were not right in his conclusions, but were right in his impulses and desires—and nobody, apparently, denies the latter—what then?

Here we have a public servant convinced that important public interests are imperiled. He endeavors to protect them and is thwarted at every turn.

Finally he makes the supreme effort, and, acting on high advice, lays the facts before the highest official authority. For his pains, he is discharged by telegraph.

How, in the light of this case, may other public servants be expected to govern their actions?

A citizen applies for admission to the public service.

Before entering upon his duties he must first register an oath.

He swears that he "will support and defend the Constitution of the United States against all enemies, foreign and domestic;" that he "will bear true faith and allegiance to the same;" that he "takes this obligation freely, without any mental reservation or purpose of evasion;" and that he "will well and faithfully discharge the duties of the office on which he is about to enter." Following which, he utters the solemn objuration, "So help me God."

To whom or what does this man pledge his fealty? Specifically, to the Constitution of the United States.

This means, of course, to the people of the United States and their highest interests.

Yet, in this Glavis case, we are given to understand that the obligation of the public servant is not, after all, to the Constitution of the United States, not to the Government, not to the people, but to his superior officer.

Should such an interpretation hold, what, we repeat, would be the effect upon the public service?

Suppose an interested or corrupt official should obtain control of a Government bureau. Every employee in that bureau must then feel bound by his oath, as well as by his economic need, to obey his chief, however detrimental such obedience might be to the public good.

A corrupt department head would, in like manner, corrupt the force of his entire department; and a corrupt or interested or ambitious President, should we ever be so unfortunate as to have one, would vitiate the entire public service from top to bottom.

And, in so doing, he would find the civil service oath, combined with the dread of discharge, his most effective engines.

Is this the object of the oath; and is such a possibility or prospect attractive?

Is it the sworn duty of the public servant to serve his master, good or bad, or to serve the people's interests, as he understands them?

This Glavis case involves more than may appear at first blush. Let Congress do its duty in the premises.

ALL THINGS DECAY

By HERRICK

All things decay with time; the forest sees
The growth and downfall of her aged trees;
That timber tall, which three-score lustres stood
The proud dictator of the state-like wood—
I mean the sov'reign of all plants, the oak—
Droops, dies and falls without the cleaver's stroke.

NEWS AND NOTES

Waterways and the National Defense

In speaking of the Lakes-to-the-Gulf Waterways, Mr. Frederic J. Haskin says:

"The United States can well afford to consider the question of constructing a deep waterway from the Gulf to the Great Lakes, for the national defense is destined to require it as much as national commerce demands it. Canada is now engaged in building a system of canals, the completion of which will permit the English navy to send its fleets into the Great Lakes themselves. For many years there has been a treaty between the United States and Great Britain providing that there should be no war vessels built on the Great Lakes by either nation. But if Canada is to extend her seaboard into the Great Lakes by canals the United States would be placed at an enormous disadvantage in case of war."

The Swiss Water-power Legislation

Several years ago the Swiss federal railroad management, finding itself menaced with a large surplus, decided to engage in the business of developing the immense water-power resources of the country, with the view to electrifying the railroads. Switzerland has no coal, but almost unlimited water-power. Engineers surveyed the situation and found that after the railroads were supplied with electrical power there would be a surplus big enough to supply the cheapest power in Europe to a vast system of industries.

The railroad administration went ahead with plans for this development, but found presently that more legislative authority was necessary. Appeal was made to the national assembly, but meanwhile the possibilities of private profit in water-power had impressed statesmen and business men alike, and both classes had become interested in the development of projects. With legislation hopelessly dragging and private interests grabbing for the best things, Switzerland could hardly have figured how it was any better off than the United States, with a precisely parallel condition.

But note how the Swiss redeemed their situation. The parliament showing no disposition to act, the people circulated petitions initiating a piece of legislation on the subject, which would precisely cover the points in issue. The initiative and referendum system gave the people the right to do this, and they set about it with the purpose of correcting the shortcomings of their congress.

Results were prompt and highly satisfactory. The national legislature saw that the people meant business, and would pass the legislation without so much as a "by your leave" from parliament. So the statesmen got down to business, forgot their stockholdings in water-power enterprises, and passed the sort of legislation the people needed and were demanding. The water-power trust in Switzerland has ceased to give worry to anybody.

Wherein there may be found rather more than one lesson worthy of thoughtful contemplation by the people of these United States.—*Washington Times.*

Economical Water Supply

There are hundreds of locations where it is desired to elevate water for haciendas, railroad tanks, irrigation, etc., where the cost of fuel and attendants is prohibitory, and where there is ample running water with two or more feet of fall to furnish the power to operate a Rife Ram.

The Colombian government engineer, Mr. Maximo Gonzalez, commissioned by the government to make an examination of the plant installed for the Rife Engine Company of New York City, by Guillermo A. Jones, the government engineer there, reports:

"All of this work has been very carefully executed, and I cannot help expressing my admiration for the competence, constancy, and devotion of Mr. Jones in view of the difficulties that had to be overcome in carrying on the undertaking. In this installation there are three large American rams, manufactured by the Rife Engine Company of New York City, which deliver from 210 to 230 liters of water per minute, raising it to a height of sixty-five meters through an iron pipe six inches in diameter and 4,200 meters long. The minister of the government has decided to distribute the water in the town in accordance with a plan that has already been made. There will also be fountains and public baths."

Secretary Ballinger's Recommendations

From a bulletin containing abstracts from the annual report of the Hon. Richard A. Ballinger, Secretary of the Interior, the following passages are quoted:

POWER SITES

In anticipation of new legislation by Congress to prevent the acquisition of power sites on the public domain by private persons or corporations with the view of monopolizing or adversely controlling them against the public interest, there have been temporarily withdrawn from all forms of entry approximately 603,355 acres, covering all locations known to possess power possibilities on unappropriated lands outside of National Forests. Without such withdrawals these sites would be enterable under existing laws, and their patenting would leave the General Government powerless to impose any limitations as to their use.

If the Federal Government desires to exercise control or supervision over water-power development on the public domain, it can only do so by limitations imposed upon the disposal of power and reservoir sites upon the public lands, the waters of the streams being subject to state jurisdiction in their appropriation and beneficial use. I would, therefore, advise that the Congress be asked to enact a measure that will authorize the classification of all lands capable of being used for water-power development, and to direct their disposal, through this department, under substantially the following conditions:

1. That the title to such lands be reserved in the Federal Government, and only an easement granted for the purpose of developing and transmitting electrical power for private and public use, and for the storage of waters for power, irrigation, and other uses;

2. That such easement be granted for a limited period, with a maximum of at least thirty years, and the option of renewal for stated periods upon agreed terms;

3. That entry shall be accompanied by plans and specifications covering the works sought to be installed, and covering the maximum horsepower capable of development at such site; also that a substantial entry fee be paid to show good faith, and that a transfer to the United States of the necessary water rights to permit of the estimated power-development be made;

4. That the construction period allowed entrymen for the development of at least twenty-five per cent of such power shall not extend beyond four years, or such further time as may be granted by the Secretary of the Interior upon a proper showing.

5. That a moderate charge shall be made on the capital invested, or upon the gross earnings of the project for the first ten years of operation, adjusted at each subsequent ten-year period, and equitably determined by appraisement;

6. That all rights and easements shall be forfeitable for failure to make development within the limitations imposed or upon entry into any contract or combination to charge or fix rates beyond a reasonable profit on the investment and cost of operation, or entry into any agreement or combination to limit the supply of electrical current, or failure to operate the plant; and,

7. That all books and accounts shall always be subject to the inspection of the department.

RECLAMATION SERVICE

The receipts from all sources do not give encouragement that the fund will be sufficiently replenished to enable an expeditious completion and extension of existing projects or to take up any new work. * * *

In view of the importance of a speedy completion of existing projects and their proper extension, * * * I believe an urgent appeal should be made to Congress to authorize the issuance of certificates of indebtedness, or of bonds against the reclamation fund, to an aggregate of not exceeding $30,000,000, or so much thereof as may be needed. These certificates or bonds should be sold by the Treasurer of the United States from time to time as may be required by the Secretary of the Interior and the proceeds placed to the credit of the fund. They should be redeemable on call within a period of not exceeding ten years after issuance. The proceeds should be devoted to the completion of feasible existing projects and the construction of any feasible extensions thereof, and so much thereof as may be needed should be devoted to the construction of new projects in the states and territories in which the expenditures have not met the requirements of section 9 of the act of June 17, 1902.

The Reclamation Outlook

Mr. F. H. Newell, Director of the United States Reclamation Service, has returned from his trip with the Senate Committee on Irrigation. Over fifty days of continuous travel have been consumed in this trip, and the Senators have viewed practically all of the projects. The report of the committee will probably be prepared at an early date. As to what it will contain, Mr. Newell, of course, has no information, but from the public expressions of the individual Senators in addresses to the water users' associations and other public bodies, the general attitude of the committee appears to be substantially as follows:

It is the expressed opinion of the Senators that it will be impossible to make any essential modifications of the Reclamation Act; that while imperfections are recognized, these are not vital, nor of sufficient importance to justify attempting new legislation, with the

risk of losing many of the advantages of the present law.

The Senators also emphasized, especially during the latter part of the trip, the fact that every dollar paid out of the fund must be returned, and that whatever may be the excuses offered, they would insist that the money be refunded to the Treasury in due course of time. It was recognized that, of course, there would be great inconvenience and in some cases actual hardship in requiring the repayment of the cost in ten annual installments; but it would be impossible to modify the law to favor certain deserving individuals or localities. The result of this declaration has been immediately manifest in the rapid increase in returns to the fund, telegrams having been received within a day after the announcement was made, showing that in one place $2,000 had been refunded.

The Senators also were practically unanimous in the belief that work should be expedited by securing additional funds, if possible, through the issue of bonds or other interest-bearing obligations.

The results already attained justify this action.

Mr. Newell expresses himself as greatly pleased with the results of the trip because many matters of policy which previously had been criticized are now unqualifiedly approved, and he felt that the Reclamation Service is endorsed by men well informed regarding its work, and while they might disagree on details, were fully convinced of the wisdom of the act, and the effectiveness of the administration.

Mr. Pinchot at the New Orleans Meeting

At the Lakes-to-the-gulf Deep Waterways Convention in New Orleans, Mr. Gifford Pinchot, United States Forester, said:

"Certain newspapers have said of late that the Forest Service has gone beyond the law in carrying out its work. This assertaion has been repeated so persistently that there is danger that it may be believed. The friends of conservation must not be led to think that before the Forest Service can proceed legally with its present work all the hazards and compromises of new legislation must be faced.

"Fortunately, the charge of illegal action is absolutely false. The Forest Service has had ample legal authority for everything it has done. Not once since it was created has any charge of illegality, despite the most searching investigation and the bitterest attack, ever led to reversal or reproof by either house of Congress or by any Congressional committee. Since the creation of the Forest Service the expenditure of more than $11,000,000 has passed successfully the scrutiny of the Treasurer of the United States. Most significant of all, not once has the Forest Service been defeated as to any vital legal principle underlying its work in any court or administrative tribunal of last resort. Thus those who make the law and those who interpret it seem to agree that our work has been legal.

"But it is not enough to say that the Forest Service has kept within the law. Other qualifications go to make efficiency in a Government bureau. A bureau may keep within the law, and yet fail to get results.

"When action is needed for the public good there are two opposite points of view regarding the duty of an administrative officer in enforcing the law. One point of view asks, 'Is there any express and specific law authorizing or directing such action?' and, having thus sought and found none, nothing is done. The other asks, 'Is there any justification in law for doing this desirable thing?' and having thus sought and found a legal justification, what the public good demands is done. I hold it to be the first duty of a public officer to obey the law. But I hold it to be his second duty, and a close second, to do everything the law will let him do for the public good, and not merely what the law compels or directs him to do.

"It is the right as well as the duty of a public officer to be zealous in the public service. That is why the public service is worth while. To every public officer the law should be, not a goad to drive him to his duty, but a tool to help him in his work. And I maintain that it is likewise his right and duty to seek by every proper means from the legal authorities set over him such interpretations of the law as will best help him to serve his country. * * *

"I believe in dividends for the people as well as taxes. Fifty years is long enough for the certainty of profitable investment in water-power, and to fix on the amount of return that will be fair to the public and the corporation is not impossible. What city does not regret some ill-considered franchise? And why should not the Nation profit by the experience of its citizens?

"There is no reason why the water-power interests should be given the people's property freely and forever except that they would like to have it that way. I suspect that the mere wishes of the special interests, although they have been the mainspring of much public action for many years, have begun to lose their compelling power. A good way to begin to regulate corporations would be to stop them from regulating us.

"The sober fact is that here is the imminent battle ground in the endless contest for the rights of the people. Nothing that can be said or done will suffice to postpone longer the active phases of this fight, and that is why I attach so great importance to the attitude of administrative officers in protecting the public welfare in the enforcement of the law.

"From time to time a few strong leaders have tried to unite the people in the fight of the many for the equal opportunities to which they are entitled. But the people have only

just begun to take this fight in earnest. They have not realized until recently the vital importance and far-reaching consequences of their own passive position.

"Now that the fight is passing into an acute stage it is easily seen that the special interests have used the period of public indifference to maneuver themselves into a position of exceeding strength. In the first place, the constitutional position of property in the United States is stronger than in any other nation. In the second place, it is well understood that the influence of the corporations in our lawmaking bodies is usually excessive, not seldom to the point of defeating the will of the people steadily and with ease. In the third place, cases are not unknown in which the special interests, not satisfitd with making the laws, have assumed also to interpret them through that worst of evils in the body politic, an unjust judge.

"When an interest or an enemy is entrenched in a position rendered impregnable against an expected mode of attack, there is but one remedy, to shift the ground and follow lines against which no preparation has been made.

"Fortunately for us, the special interests, with a blindness which naturally follows from their wholly commercialized point of view, have failed to see the essential fact in this great conflict. They do not understand that this is far more than an economic question; that in its essence and in every essential characteristic it is a moral question.

"The present economic order, with its face turned away from equality of opportunity, involves a bitter moral wrong, which must be corrected for moral reasons and along moral lines. It must be corrected with justness and firmness, but not bitterly, for that would be to lower the Nation to the moral level of the evil which we have set ourselves to fight.

"This is the doctrine of the square deal. It contains the germ of industrial liberty. Its partisans are the many, its opponents are the few. I am firm in the faith that the great majority of our people are square-dealers."

Southern Forestry and Conservation

An important conservation meeting was held in New Orleans on the 1st of November. The governors of the southern states were invited by Gov. J. Y. Sanders of Louisiana to meet in New Orleans with the conservation commissions of the several states for the purpose of discussing steps necessary for the further conservation of the natural resources of the South. The Louisiana Forestry Association met with this Congress. Governor Sanders presided and delivered an address of welcome at the morning session. This was followed by an address of welcome by Judge I. D. Moore, representing the mayor of New Orleans, and the reply to these addresses was delivered by the Hon. W. H. Milton, of Florida. At this session an address was delivered by the Hon. Henry E. Hardtner, president of the Louisiana Conservation Commission and the Louisiana Forestry Association, his subject being especially the forestry conditions of Louisiana and the South. He illustrated his arguments with a review of the forest experiences of foreign countries. Part of Mr. Hardtner's address will be published in the next number of this magazine. This was followed by an address on the conservation of our waterways by the Hon. J. E. Ransdell, president of the National Rivers and Harbors Congress.

In the afternoon Capt. J. B. White of Missouri, chairman of the Executive Council of the National Conservation Congress, spoke on the prevention of timber waste, his address being a broad, practical treatment of an extremely practical subject. At the conclusion of Captain White's address, President Hardtner introduced the Hon. Gifford Pinchot, National Forester, saying that the South owes him a debt of gratitude that cannot be measured either in words or in any material compensation. Mr. Pinchot's address was on the general subject of conservation. He was received with enthusiastic applause. Among other things, he said that this great work of conservation will be carried out by the joint earnest cooperation of men and women throughout the country. Men experienced in politics say that there are two things which must be conveyed to the people. One is to get clearly into the conscience of the American people that this is a great moral question, and the moral side will win. If a moral question anywhere exists it is certainly the conservation question. Another thing is that to ensure success you must keep the thing constantly before the people. With all the felicitations to ourselves for what we have done in this matter of conservation and what we propose to do, we should realize that public sentiment stands behind conservation, and that we must use every means in our power for the development of our ideas and that we must save always and see that the people get the benefit of our resources, not for the few, but for the many.

The next speaker was Dr. Herman Von Schrenck, chairman of the Missouri Conservation Commission, on some practical phases of the forestry question. Dr. Von Schrenck gave special attention to the topics of taxation, fire protection, education, and state reservations.

Hon. F. J. Grace, commissioner of forestry of Louisiana, delivered an address on forestry in Louisiana which will be published in this magazine next month, and this was followed by an address on constitutional law by the Hon. F. C. Zacharie.

In the evening there was a symposium presided over by Gifford Pinchot, with ten-minute addresses on the subject, "What Is

Conservation Doing in My State?" In this symposium the Hon. John Barrett spoke for North and South America, the Hon. D. W. Baker for Maryland, Hon. S. D. Redding for Arkansas, Hon. W. P. Lay for Alabama, Dr. J. Hyde Pratt for North Carolina, Commissioner E. J. Watson for South Carolina, the Hon. P. St. Julian Wilson for Virginia, Hon. Hugh Maxwell for West Virginia, Hon. W. H. Milton for Florida, Gov. E. F. Noel for Mississippi, Hon. H. P. Gamble for Louisiana, Hon. J. Pope Cowan for Kentucky, Dr. H. Von Schrenck for Missouri, Hon. W. Fleming Jones for New Mexico, and Hon. R. F. Burgess for Texas.

Republican Club for Conservation

The Republican Club of New York City—the largest club of its kind in the country—has unanimously declared for the conservation of natural resources and the Weeks-Lever bill.

At its regular meeting on Monday evening, November 15, the national committee—Hon. Warren Higley, chairman—made an extended and able report on the conservation of our natural resources, which report was read and received by the club with enthusiasm, and the proposed resolutions were unanimously adopted, as follows:

"*Resolved*, That the Republican Club of the City of New York declares in favor of the policy of the conservation of our natural resources as inaugurated by President Roosevelt and unanimously indorsed by the governors and representative citizens of the several states at the noted White House Conference in the spring of 1908, and approved by President Taft. And be it further

"*Resolved*, That this club urge upon Congress such legislation as will secure national control of the Appalachian and White Mountain watersheds, substantially as set forth in the 'Appalachian-White Mountain Bill,' as introduced into the last Congress."

Forestry Chairman, Federation of Women's Clubs

The present chairman of the Forestry Committee of the National Federation of Women's Clubs is Mrs. F. W. Girard, 44 Bay View Avenue, South Norwalk, Conn. About a year ago Mrs. Girard succeeded in that office Mrs. P. S. Peterson, of Chicago, who was inadvertently referred to in the October number of this magazine as the present chairman of the committee. Mrs. Girard is deeply interested in forestry, and is continuing with enthusiasm the work inaugurated and developed among the clubs of the federation by her predecessors.

The Corpus Christi Inland Waterways Meeting

The Inland Waterways Meeting at Corpus Christi, Tex., opened on October 21. One of the chief objects sought by the convention is the inter-coastal canal from the Rio Grande to the Mississippi, an important function of which is held to be the regulation of railway rates.

As an example of the effectiveness of water competition in regulating rates, Congressman Rufus Hardy mentioned a case in which cotton charges of $2.75 were levied from Corsicana to Galveston, a distance of 261 miles, against a rate of 85 cents from Memphis to New Orleans, a distance of 451 miles.

Congressman James L. Slayden described this project as an effort on the part of the people to become independent. He pointed to the example of New York, the Empire State, now expending $100,000,000 on the Erie Canal, which has already cost her fifty millions, which canal she expects to make available even for ocean-going vessels. Such work, he claims, asserts the dignity and right of a state in an impressive way that might well command the attention of other communities that talk a great deal more about state sovereignty.

Congressman Slayden referred to a steamer trading between Galveston and Liverpool, which took out a cargo of 26,000 bales of cotton requiring 486 cars to deliver the cargo to the ship. "That," he declared, "indicates why it is so much cheaper to send your produce to market by water."

President Taft attended the meeting, and urged that the country's waterways be improved, and at the earliest possible date, by the issuance of bonds, if necessary.

Governor Campbell of Texas expressed his belief that the canal would return to the pockets of the people of the state $3,500,000 annually.

Meeting of American Mechanical Engineers

The thirtieth annual meeting of the American Society of Mechanical Engineers will be held in the Engineering Societies Building, 29 West Thirty-ninth Street, New York, December 7 to 10.

A number of interesting professional papers will be read, to be followed by several valuable reports.

The Wonder of It All

Speaking of the Ballinger-Pinchot controversy, the *Minnesota Forester*, for October, says:

The wonder of it all is the vast wave of interest which has swept the entire country from sea to sea. This clash of officials which would ten years ago have had but an inch of space in the official news of a Wash-

ington paper has occupied column after column in thousands of papers scattered throughout the entire country. The strongest opposition to the order came from that portion of the country from which the Secretary haled, where the Forester was formerly most bitterly cursed. It was the growl of the people when the "trusts," through a branch of the National Government, reached for the bone which they had always held so cheaply.

That bone is the great reasources and natural wealth of the United States. It has always belonged to the people, but only in very recent years have they realized its value or taken the trouble to safeguard their rights.

The conservation of the natural resources is now a live question. The people have risen to claim them for themselves and posterity. The forests are the most important of these resources, the foundation on which many of the others rest.

Good Roads Propaganda

In the week of December, 6-11, the Southern Commercial Congress and the National Rivers and Harbors Congress meet in Washington City. During that time the Office of Public Roads, in Washington, will keep open house, thus enabling all who visit the city to come in contact with some of the most skilled road engineers in the country. Mr. Logan Waller Page, director of the Office of Public Roads, has requested Mr. J. E. Pennybacker, chief of road management, to give an illustrated lecture before the Southern Commercial Congress. In addition to the lecture the exhibit hall of the congress will contain enlarged photographs of bad roads and good from various southern states; and photographs showing the before and after of some roads that have been improved. In addition there will be models of different types of road construction. There will be also several films of moving pictures shown during the lecture illustrating the processes of road making in motion, and also illustrating the effect of automobiles on the road bed. The Southern Commercial Congress will print and distribute in Washington the latest information regarding road progress of the South so as to encourage effort in every county of the South and also to produce the conviction that road improvement pays the county that undertakes it. Over 2,500 invitations have been mailed to county commissioners throughout the South. The first county in all the South to pay the way of an official to this practical good-roads exposition is Woodward County, Oklahoma.

The Biltmore School Peripatetic

The Biltmore School, which Dr. C. A. Schenck has so long and successfully conducted on the Vanderbilt estate near Asheville, N. C., is about to become a peripatetic institution. Several months will be spent in study in the forests of Germany. The classes in the school have closed and the students have left for their homes to make final preparations for sailing in the party, November 9, on "The Potsdam" from New York.

The plans include many trips to various parts of Germany, and adjacent countries. The party includes fifty-six, forty-five of whom are students. Four of the remaining eleven are instructors. The remainder are young ladies of the city who have joined the class. More students would have gone if permitted by the management.

The requests for membership for next year are equal to the number for this year. The course as now planned will give opportunity for study in every kind of forest. When the party returns in the spring, the work will be resumed at Pisgah forest. The school will not have its headquarters on the estate, but at the same time the forests of the Vanderbilt property will be the basis of much of the work.

Hurricane Destruction on the Mississippi Coast

Mississippi's coast is some seventy miles in length and is followed closely by the Louisville and Nashville Railroad. Says the New Orleans *Picayune:* "The recent hurricane which raged along that coast inflicted serious damage upon the railroad mentioned, stopping its operations for several weeks, but other quite considerable injury along that coast was the undermining and carrying away of much of the shore at several of the prominent coast resorts. At each of those places a broad and level driveway, which extended along the water front, was the delight and charm of life there, and in many places it was completely destroyed and obliterated, so that in order to restore it, the dwellers along the route must either move their houses farther back from the new line of beach made by the waves or a new road must be built out into the water.

"In view of the damage done and the losses suffered, there has been voiced a demand that the National Government shall give protection to that coast by building some sort of a breakwater to receive and fend off the fury of the waves."

Mr. Herbert A. Smith at Brattleboro

Mr. Herbert A. Smith, of the United States Forest Service, recently addressed the citizens of Brattleboro, Vt., on the subject of forestry. In closing his remarks on the National Forests, he said:

"This property of the Nation's is on the whole an undeveloped property. Its period of high productiveness will come later, when railroads and the increase in population have opened up the country and created a greater demand for the timber. In

foreign countries the governments which own forests make an annual profit of $2, $3, or even $5 an acre from their forest lands, but to get this profit they must also spend heavily. Our outlay is less than 2 cents to the acre and our national forest force supplies about one field man to every 125,000 acres of land to be cared for, yet even so they are doing magnificent work in protecting and developing these forests. Altogether our national forest force is a little but very effective army of about 2,000 men. I think you have a right to be proud of the work they are doing for you."—*Journal,* Montpelier, Vt.

Commercial Importance of New Hampshire Forests

The commercial importance of the White Mountains is the subject of a bulletin just issued by the Agricultural Department, the author of which is Philip W. Ayers, forester of the Society for the Protection of New Hampshire Forests.

Mr. Ayers makes five principal points in showing that the New Hampshire forests are of great commercial importance.

Because they contain a timber supply near the principal markets, where the high price of lumber is already working a hardship; because the White Mountains are the source of several important rivers and the preservation of their forests is neccessary to protect navigation, water-power and domestic water supply, and because the health of people from many states who seek rest and recreation in the White Mountains is a national asset.

Mr. Ayers quotes figures to show that the rise in the price of standing timber and lumber has been very great in New England during the last few years, due to the exhaustion of the forests. Only about one-tenth of the area of northern New Hampshire is agricultural land.

As a striking instance of the commercial importance of the New Hampshire forests, Mr. Ayers gives some facts and figures about the wood pulp and paper industry of New England. The total investment in these industries was $108,000,000 in 1905, and the paper mills of Massachusetts, Connecticut, and other states depend upon the New Hampshire forests for their raw material. Mr. Ayers dwells upon the wasteful methods of lumbering that are employed and the resulting loss from forest fires, which devastated 85,000 acres in 1903 alone.

The fires destroy the productive qualities of the soil, so that it will not support vegetation for many years. In this connection Mr. Ayers urges that fires would be largely a thing of the past if the White Mountain forests, similarly to the National Forests, were placed under the charge of the Federal Government.

Taking up the water-power question, Mr. Ayers says that the total investment in industries dependent upon the water of the Merrimac, Connecticut, Saco, Androscoggin, and Kennebec rivers is $250,000,000. These industries, with thousands of persons employed in them, cannot exist without water-power.

As regards navigation, Mr. Ayers shows that the combined navigable length of the streams in 146½ miles. This is interfered with by silt deposited in the stream beds. He quotes Prof. George F. Swain, of the Massachusetts Institute of Technology, C. C. Goodrich, of Hartford, and A. M. Schoen, of the American Institute of Electrical Engineers, to show that navigation is interfered with by destroying the forests on the watersheds of streams.

The object of Mr. Ayers' pamphlet is to show the necessity of Congress enacting legislation for the protection of New Hampshire forests. Mr. Ayers is a strong advocate of the Weeks forestry bill.—New Haven, Conn., *Palladium.*

Louisiana Forestry Association

Louisiana, as becomes the second state in the Union in lumber production, is awakening to the importance of forestry, and has a live state association well under way. The officers of this association are Hon. Henry A. Hardtner, president; W. O. Hart, vice-president; Mrs. A. B. Avery, secretary; Robert Roberts, jr., treasurer, and the executive council is composed of these officers and of two members at large: Mrs. J. D. Wilkinson and Harry T. Gamble, Hon. Charles P. Johnston from the first congressional district and Hon. F. J. Grace from the second. The annual meeting of the association will be held on the first Tuesday of January. The association is growing rapidly and deserves the support of every one who is interested in conserving and replacing the forests of the state. The address of the secretary is Mrs. A. B. Avery, 254 Stoner Avenue, Shreveport, La.

Practical Work for Minnesota Forestry Students

Forestry students of the Minnesota Forest School were given a fine opportunity the past summer to acquaint themselves with the actual conditions of a forester's life. Work was found in western states for all those who desired to put their vacation time to the best advantage in their chosen line of work. This work was not supposed to combine high salaries and practical experience, but on the average the students came out about even on the money question; and, besides, acquired a practical experience which no amount of school could get them.—*The Minnesota Forester.*

Fighting Moths with Searchlights and Fans

To use a Gatling gun to kill a sparrow would be considered a most shameful waste of energy.

In Germany, however, they are employing the great force of electricity to kill moths, and the results obtained have been so satisfactory that the plan may be followed in this country.

It was because the forests of Germany were being devastated by moths that it was finally decided to try electricity.

By the use of an electrical device these insects are being exterminated at the rate of nearly half a million a day.

The new method involves the use of electric light at night. It was tried first at Zittau, Saxony, where the moth known popularly throughout Germany as the "nun" was doing untold damage to the trees.

It was found that the insects were most active between the hours of 10 p. m. and 1 a. m., and that they were inevitably attracted to bright lights.

A little experimenting showed that the greater the light the greater the attraction. The flame of burning wood drew them slightly; acetylene or magnesium lamps proved more effective, and the electric arc light proved most powerful of all.

Where a gas lamp was located near an arc light, the former was found to be practically deserted, while the latter was infested by multitudes of flies and moths.

Near the forests of Zittau were the municipal electric works. The entire stock of arc lamps on hand was utilized, the lights being linked together so as to furnish the most powerful light possible.

The effect of this brilliant illumination was to attract the moths of the forest in swarms, although the forests were several miles away. Thousands fell to the ground with singed wings, the heat generated by the powerful electric arcs being considerable.

The success achieved in this way suggested amplifications. Instead of the arc lights alone, powerful searchlights with a current of forty amperes were mustered into service, the intense rays being directed upon the forests.

To each searchlight were linked two arc lamps, which served to concentrate the fluttering moths. Between the lamps was placed a powerful suction ventilator, in front of the outlet of which was stationed a piece of wire netting.

When this contrivance was operated the slaughter of the insects which is accomplished was beyond all expectations.

Attracted by the bright illumination, the moths advanced in great hosts, and were dashed against the wire screen as soon as they came within range of the powerful suction ventilator.

The suction was caused by an electric motor, which produced 1,200 revolutions a minute, and sucked through about 2,800 cubic feet of air in the same period.

About 141 pounds of moths, or 400,000 of them, were killed in a single night by the use of this device. The method has not yet been used in America, but it may be found necessary to adopt it in the near future.—Boston, Mass., *American.*

Forester Gaskill at Work

In a recent interview, Mr. Alfred Gaskill, secretary of the state board of forestry of New Jersey said in substance: An expenditure of about $9,000 in preventing forest fires has saved not less than $250,000 in New Jersey during the past year. By extinguishing one forest fire $20,000 worth of cranberries were saved. The forestry board is not only fighting fires, but cultivating trees. There are 2,000,000 acres of forests in the state, covering almost half the state's area. These forests, however, have been so abused that their value has been almost extinguished, being worth, on the average, to their owners less than $1 per year, while the forests of Wurtemburg, German, whose size, population, and conditions are similar to those of New Jersey, are worth $6 an acre net to their owners.

New Jersey now owns about 10,000 acres of forest reserves, and expects soon to purchase 4,000 acres more.

The state should protect itself against the gipsy and brown-tail moths from New England.

The elm-leaf beetle has already got into north Jersey and is killing hundreds of elm trees. An appropriation of $5,000, Mr. Gaskill thinks, would enable the commission to drive out these pests and prevent the threatened invasion. He says it is only a question of paying a small sum now or being compelled to pay a much large one later.

Maine Forestry Law a Success

The Hon. Edward E. Ring, state forest commissioner, says the law creating a Maine forestry district and providing for forest-fire protection in unorganized townships this season proved to be a great benefit.

Speaking of the law that provides for taxation in unorganized townships for the purposes of fire protection, Commissioner Ring says that of the $64,000 raised $10,000 remains unexpended. Fourteen new lookout stations were built and equipped; additional wardens were employed, and tools for fighting fires were distributed. The state has now a total of twenty-two lookout stations. More are to be erected next year.—*Christian Science Monitor.*

Germans Planting Forests in China

In a portion of the Celestial kingdom earnest efforts are now being made to reestablish a forest-cover by planting. Consul Wilbur T. Gracey, of Tsingtau, China, reports that the Germans in that region are making successful attempts at reforestation.

When Tsingtau was occupied by the Germans about eleven years ago the hills were found bare and barren, with only a sporadic growth of scrub pine and weeds. Plans for reforestation were at once made, and about 2,965 acres have already been planted. About half of this is planted in acacias, the balance in pine, larch, walnut, oak, ash, maples, and alders. So successful has this planting been that the point has already been reached where the sale of timber can be made. Small branches are sold for firewood, and some of the timber is used for mining purposes. The sale and exportation of acacia is expected to become a considerable source of revenue during the next few years.

The work of reforestation has been retarded by lack of moisture, but especially by insects. Caterpillars have been especially hurtful.

During 1908 over 7,000,000 caterpillars were gathered by hand, smashed, covered with lime, and afterward used as fertilizer. This method has been successful in protecting the greater part of the plantations, but on the mountains on the border of the territory the trees are eaten bare. Acacias appear to withstand the attacks of the insects better than any other species; and the summits of the mountains are now being planted with these trees in an effort to check future destruction. In addition to these enemies, Chinese thieves are another source of difficulty, and on one occasion a band of thirty-six thieves was captured in the act of stealing wood.

In spite of these drawbacks, however, the work has been so successful that the Chinese government is now undertaking forestry schemes in a number of places under advice from German experts. This work centers about Mukden, Manchuria.

The first Chinese forest school was established at Mukden two years ago. Six hundred and twenty-five acres have already been set apart for cultivation, and 24,710 acres are to be purchased for afforestation.

Three large mines in China, in the provinces of Chihli and Shansi, which are under the management of Europeans, are making plans for afforestation, and the Shantung Railway is planting acacias along 260 miles of its track. This, however, is simply a beginning of the work, and the Chinese government now has in contemplation the inauguration of extensive afforestation work in different parts of China.

Forester Hawes Utters a Warning

State Forester A. F. Hawes, of Vermont, says of the situation in that state:

"Lumbering in the old way is responsible for the conditions in Vermont. The mountainous, or central part of the state, and Essex County in the northwestern part, have been greatly injured by this method of stripping the land clear of forest and leaving it to take care of itself. The new growth can just as well be made to produce as valuable a crop of lumber as the one removed, or even a more valuable one.

"Not only does the thoughtless cutting of trees from the land without regard to the future detract from the wealth and future prosperity of the state, which has found lumbering one of its most profitable industries, but it takes money out of his own pocket. The floods which last week overflowed the banks of the rivers in that state and caused a large number of mills to shut down might not have occurred but for the stripping of the mountain sides, thus letting the snow melt quickly.

"One of the most important functions of the office of state forester is that of fire warden. The fire warden in each town is the local warden, and they are all under the direction of the state forester, who, with two assistants, last summer made a thorough investigation throughout Vermont as to forest fires, causes, amount of damage, and means of protection.

"The state forester will cooperate with lumbermen and farmers desiring to improve their lands and prevent them from going to waste."

To Merge Nova Scotia Timber Lands

Two Americans have been endeavoring to secure a merger of every acre of the timber-producing land in Nova Scotia Province. They state that they are representing American capitalists who are willing to invest $5,600,000, the idea being to bond the lumber properties, the requirement being that the properties must have an output capacity of 200,000,000 feet annually. They say that the output of lumber in the province to-day is 150,000,000 feet, but that this can readily be increased to the amount desired. The nucleus of this contemplated enterprise is already in operation on the Clyde River, in Shelburne County, where 94,000 acres have already been purchased, and 16,000 acres more near by. This company is now erecting mills and settlement houses in Shelburne County, and figure that they will cut 3,000,000 feet during the first year. A connecting railway will be built, also dams and sluices.—*Paper Trade Journal*, New York.

Preventing Adirondack Forest Fires

Lookout has been maintained at fire observation and signal stations located on Whiteface Mountain, Mount Morris, Blue Mountain, and Gore Mountain by the State Forest, Fish and Game Commission of New York during the past season. That the territory under observation has been free of any dangerous fire throughout the summer, something which has not happened before in years, is probably due to the fact that all forest fires originating this year were discovered in their incipiency by the mountain-posted lookouts, and extinguished by fire rangers before they gained enough headway to be destructive.

So successful has been the plan of preventing forest fires that the forest, fish and game commission has decided to build and equip about twenty more stations on minor peaks in the Adirondacks and Catskills, so as to more thoroughly protect the state and private lands which have heretofore been exposed to the danger of devastation by fires arising from chance sparks from locomotives or matches from careless hunters and campers. At a recent meeting of the four state fire superintendents with Commissioner J. S. Whipple, it was planned to extend the fire-protection system which has proved so efficient this year, so as to cover all the wooded territory of the northern part of the state.

The stations built and those planned have an equipment which includes a range finder, telescope, topographical map of the country within the watchman's range of vision, and quarters for the lookout to live in. Each observation station is connected by telephone with the superintendent of the fire district in which it is located, and the superintendent has at his command, by telephone, two fire rangers in each township throughout his district. The plan so far has worked very satisfactorily, enabling fires to be nipped in the bud.

The construction of the system in the Adirondacks involved the expenditure of a considerable sum of money. Nearly 100 miles of new telephone wires were strung, and the entire northern New York lines of a telephone company subsidized to complete the extensive connections required. New wires were strung into the very heart of the Adirondacks and upon mountain sides which previous to then had been climbed only by the most daring. Trails were blazed through the virgin forest and the century-long solitude of craggy mountain peaks was broken by the blast of station builders.

The commission contemplates an educational campaign looking to an amendment of the constitution which will permit cutting the fire line through state forests that firefighters may be more effectively used. A large part of the acreage burned over by the forest fires of 1908 are to be replanted with pine seedlings next year. A million young trees were this year planted on burned and waste lands in the Adirondacks by the state and by private land owners.—Condensed from *Boston Transcript.*

President Hill for Conservation

In the present instalment of the series, "Highways of Progress," now appearing in the *World's Work,* President James J. Hill says:

"Practically speaking, our public lands are about all occupied. Our other natural resources have been exploited with a lavish hand. Our iron and coal supplies will show signs of exhaustion before fifty years have passed. The former, at the present rate of increasing population, will be greatly reduced. Our forests are going rapidly; our supply of mineral oil flows to the ends of the earth. The soil of the country is being impoverished by careless treatment. In some of the richest portions of the country its productivity has deteriorated fully fifty per cent. These are facts to which necessity will compel our attention before we have reached the middle of this century. To a realization of our position, and especially to a jealous care of our land resources, both as to quantity and quality, to a mode of cultivation that will at once multiply the yield per acre and restore instead of impairing fertility, we must come without delay. There is no issue, in business or in politics, that compares in importance or in power with this."

Forestry on Private Estates

In point of variety and scope, the forest work done on the Biltmore estate in North Carolina is remarkable. The forests, which cover 130,000 acres, are made profitable by the production of various forms of material.

Four million feet of lumber, 5,000 cords of tannic-acid wood and fuel, a thousand cords of tanbark, and several hundred cords of pulp wood are cut every year. At the same time, the forest, through wise management, is bettered and is steadily increasing in value. Workmen employed along the boundaries of the forest do duty as fire-guards. Thus fire protection is secured at least throughout all the accessible parts of the tract.

In connection with all lumbering operations permanent logging roads are built. These minimize the present cost of transportation and will greatly reduce the cost of marketing future crops. Thus the extension of the roads is steadily adding to the investment value of the forest.—*Harper's Weekly,* New York.

RECENT PUBLICATIONS

"Wild Flowers and Trees of Colorado." By Francis Ramaley, Professor in the University of Colorado

This attractively published little volume is intended as an introduction to Colorado plants. It deals with the subject almost wholly from the point of view of the botanist, and probably will be of little interest or value to the forester.

No attempt is made to cover more than a few of the wild flowers of the state, which are briefly described in popular language and illustrated by photographs and drawings. The distribution of the flowers in altitudinal zones is taken up quite fully, however, with an ecological discussion as to the causes of this.

Forest formations and forest trees are taken up in some detail, but the author's discussion of the causes of the distribution of the different species and types is not very convincing. Professor Ramaley's desire to emphasize the necessity for proper forest protection unfortunately leads him to discourage forest management by making the very broad statement that if illegal cutting is prohibited and fires kept out the forests will take care of themselves. Exception must also be taken to his sweeping statement that, "Unless grown on bottom lands, all trees planted in Colorado must be irrigated or else well cultivated and protected during the first few years after being planted," which, if true, would of course make planting for commercial purposes on a large scale impossible.

The book contains a key to the identification of all trees found in the state with a description of each species, illustrated by photographs and pen and ink drawings, which will undoubtedly be helpful to those desiring to become acquainted with the flora of the state. A bibliography of the articles dealing with Colorado trees is also included.

S. T. D.

"Andaman Marble-wood or Zebra-wood (*Diospyros kurzii*, Hiern), by R. S. Troup, Imperial Forest Economist to the Government of India"

This publication is the first of a series dealing with some of the more important Indian timbers. It contains a sample of the wood and a description of the tree, but gives particular attention to a discussion of the structure of the wood, its weight, strength, seasoning qualities, and uses. The publication will be of especial interest to wood merchants, engineers, architects, and others interested in the utilization of Indian timbers.

S. T. D.

"National Hickory Association, Circular No. 3"

This circular consists of a report of the third annual meeting of the association, papers on "Forest Conservation," and the "Time Required to Grow Hickory," by Mr. Kellogg and Mr. Ziegler of the Forest Service, and a discussion of Eucalyptus as a suitable timber for vehicle stock. The President's address calls attention most forcibly to the rapidly decreasing supply of hickory and the necessity for prompt action by the association to determine the amount of standing timber and to inaugurate reforms in the method of cutting and utilizing the wood. Mr. Ziegler's paper is a partial summary of a bulletin on the commercial hickories of the United States to be issued by the Forest Service, and contains much valuable data concerning the growth of the different species under different conditions.

S. T. D.

"Practical Farm Drainage," by C. G. Elliott; New York, John Wiley & Sons, 1908

This little manual of drainage is a rewritten edition of a book which first appeared in 1882. It is intended "for the use of farmers and students," particularly those who have no experience in drainage and kindred matters. While many of the author's suggestions will prove very helpful to inexperienced workers, the book suffers from an unsatisfactory arrangement of material and from a certain lack of clearness in the descriptions of methods and processes. Whether the average farmer could, with the aid of this book, prepare a sketch map showing elevations, such as are illustrated on page fifty, or even accomplish the use of a plane table, as described in Chapter X, it is doubtful. Furthermore, many of the illustrations are poor, and the style shows signs of hurried writing.

Some chapters, however, should prove of great value. The chapter on special problems in drainage deals excellently with several difficult subjects; that on drainage of irrigated lands should prove very valuable to farmers in the arid West. The book is well printed and carefully indexed.

N. H. G.

"Transactions of the Royal Scottish Arboricultural Society, Vol. XXII, Part II, July, 1909"

The number is devoted mainly to a discussion of the report of the Royal Commission on Coast Erosion and Afforestation, which recommended the planting of the enormous area of 9,000,000 acres of land in the United Kingdom, at an annual cost of approximately $10,000,000. This proposal and the method suggested for carrying out the work are thoroughly discussed by such eminent authorities as Dr. Schlich, Professor Somerville, Dr. Nisbet, Mr. Ribbentrop, and others. The discussion takes up very thoroughly the question as to the adivisability of starting planting work on such a tremendous scale, and covers the economic aspects of the problem very fully. To those who are interested in the problem of state forest planting on a large scale, this issue will be of special interest and value.

There are also several articles on other subjects, such as afforestation of waste lands in Europe, trees of California, and the effect of smoke on trees, which are, as usual, of much interest. S. T. D.

Recent Books on Forestry, Written in English

Familiar Trees; G. S. Boulger. New ed., Vol. 1-3. 1906-7. Illus. Cassell & Co., London.

The Utilization of Wood Waste by Distillation; W. B. Harper. 1907. 156 pp. Illus. St. Louis Lumberman, St. Louis, Mo.

British Trees; R. V. Cole. Vol. 1-2, 1907. Illus. Hutchinson & Co., London.

Wayside and Woodland Trees; a pocket guide to the British sylva; E. Step. 1907. 182 pp. Illus. F. Warne & Co., London.

Seaside Planting of Trees and Shrubs; A. Gaut. 1906. 101 pp. Illus. Country Life, London.

The Pruning Book; L. H. Bailey. 1907. 545 pp. Illus. McMillan Co., N. Y.

North American Trees; N. L. Britton. 1908. 894 pp. Illus. Henry Holt & Co., New York.

Trees of Great Britain and Ireland; H. J. Elwes and A. Henry. Vol. 1-4, 1906-9. Illus. Privately printed.

Our Trees: How to Know Them; C. M. Wed & A. I. Emerson. 1908. 295 pp. Illus. J. B. Lippincott Co., Philadelphia, Pa.

Forest Entomology; A. T. Gillanders. 1908. 422 pp. Illus. Wm. Blackwood & Sons, Edinburgh and London.

A Concise Manual of Silviculture for the Use of Forestry Students in India. 1906. 240 pp. Supt. of Government Printing, Calcutta.

Indian Forest Utilization; R. S. Troup. 1907. 257 pp. Illus. Supt. of Government Printing, Calcutta.

A Manual of Forest Laws Compiled for the Use of Students at the Imperial Forest College, Dehra Dun. 1906. 100 pp. Supt. of Government Printing, Calcutta.

A Manual of Elementary Forest Zoology for India; E. P. Stebbing, 1908. 229 pp. Supt. of Government Printing, Calcutta.

Trees and Their Life Histories; P. Groom. 1907. 407 pp. Illus. Cassell & Co., London.

Wood: A Manual of the Natural History and Industrial Applications of the Timbers of Commerce; G. S. Boulger. Ed. 2, 1908. 348 pp. Illus. E. Arnold, London.

Wood Products, Distillates and Extracts; P. Dumesney and J. Noyer. 1908. 320 pp. Illus. London.

Our Wasteful Nation: The Story of American Prodigality and the Abuse of Our National Resources; C. Rudolf. 1908. 134 pp. Illus. M. Kennerly, New York.

Trees: A Handbook of Forest Botany for the Woodlands and the Laboratory; H. M. Ward. Vol. 1-5, 1904-9. Illus. The University Press, Cambridge, England.

Forest Finance; C. A. Schenck. 1909. 44 pp. Inland Press, Asheville, N. C.

The Study of Evergreens in the Public Schools; C. M. Weed. 1908. 30 pp. Illus. State Forester's Office, Boston, Mass.

Our Forests and Woodlands; J. Nisbet. 1909. 348 pp. Illus. J. M. Dent & Co., London.

The Practise of Forestry: Concerning also the Financial Aspect of Afforestation; P. T. Maw. 1909. 503 pp. Walter & Walter, Brockenhurst, England.

The Tree Book; M. R. Jarvis. 1908. 132 pp. Illus. John Lane Company, London and New York.

Indian Woods and Their Uses; R. S. Troup. 1909. 491 pp. Supt. of Government Printing, Calcutta.

An Analytical Key to Some of the Common Flowering Plants of the Rocky Mountain Region; A. Nelson. 1902.