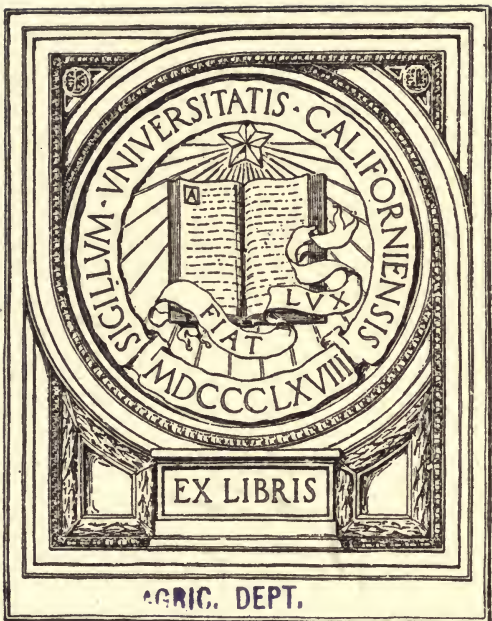


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CONSERVATION of Resources,



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STATE OF CALIFORNIA
OFFICE SUPERINTENDENT OF PUBLIC INSTRUCTION



CONSERVATION OF NATURAL RESOURCES

It is safe to say that the prosperity of our people depends directly on the energy and intelligence with which our natural resources are used. It is equally clear that these resources are the final basis of natural power and perpetuity. Finally, it is ominously evident that these resources are in the course of rapid exhaustion.

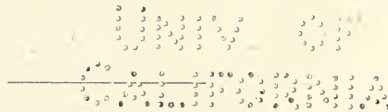
FROM THE

TWENTY-THIRD BIENNIAL REPORT

OF

EDWARD HYATT

SUPERINTENDENT OF PUBLIC INSTRUCTION



SACRAMENTO, CALIFORNIA

1909

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TO THE
AGRICULTURE

1

CONSERVATION OF NATURAL RESOURCES.

Introductory by the Superintendent of Public Instruction.



WORD TO THE PEOPLE OF CALIFORNIA.

My friends, during the past year I have become possessed by the idea that the largest, the most truly patriotic, the most vitally important movement in this nation to-day is the one looking to the Conservation of our Natural Resources. This has been large enough to call together a Conference of Governors, to cause the appointment of a National Commission, and to engage the earnest attention, the gravest concern of the greatest and most brilliant minds of our continent. It is patriotic, for it looks to the preservation of our fatherland into the future with its power and glory undimmed.

It is vitally important, for without it our nation is doomed to go down to poverty and weakness. It is unselfish, for it looks forward to the welfare of those who come after us, rather than for our own little personal benefit now. It is a vital and a worthy thing, however we view it.

I have become possessed by the idea, too, that it is highly important for the *school people* of this State to join in this movement; for them to grasp its significance, appreciate its momentum, take hold of it strongly and intelligently. Such a movement as this must fail unless it can be projected into the future. It can only be projected into the future through the *children* of the nation. If it would really get permanently into the hearts of the People, it must filter through the Children.

I conceive it to be a patriotic duty resting upon every teacher, every superintendent, every school officer, to take his share of responsibility in this thing; to read, to talk, to think, to inform himself about this great movement for Conservation—and then to pass the spirit of it all along to the Children. In no other state or country is such variety and wealth of natural resources to be found as in California. Nowhere else is it being squandered with such careless hand, nor is there elsewhere such necessity for wise and thoughtful and far-seeing School People.

These reasons impel me to collect from letters, talks, newspapers, magazines, this little handbook of Conservation. It is meant to be read. It is meant to give a notion of what people are thinking and saying about the subject. It is meant to attract the attention of the school people of California, to give them some means for measuring the importance of the movement, some materials for shaping the sentiments of themselves and their children. It is only a start. I hope it can be accepted as a start in the right direction, and that it may lead toward good citizenship and the general weal.

Very truly yours,

EDWARD HYATT.

THE CASE OUTLINED.

What Does It Mean?

Just what does it mean—this Conservation of Natural Resources? Why, it means simply the wise care and use of our forests, our mines, our water, our soil. These are the fundamental sources of wealth that have been given to us by nature.

Why Are We Great?

Why is our nation one of the greatest in all the world? Is it because we are stronger people, better people than the rest of the world? Not at all. It all rests upon the wonderful, the amazing natural resources of North America. The great fortunes, the great cities, the great achievements of this nation, past and future, all depend upon our natural resources.

Where Does Our Money Come From?

Whence comes the money of the thousands of rich Americans who set all Europe agape? Whence come the funds to construct the great sky-scrappers, to rebuild ruined cities, to make fleets of warships, trans-continental railroads, interoceanic canals and the other titanic undertakings that we are continually carrying out?

From Our Natural Storehouses.

It all comes from American copper, or wheat or lumber or coal or oil or gas or iron; or from the railroads or ships hauling these things; or from trading with the people who work in these things; or from the utilities of the cities that grow upon these things. Everything in all our power and civilization and luxury goes straight back to our natural storehouses of wealth. And we got them so easily that we do not even appreciate them as yet.

Suppose They Were Gone?

But suppose these storehouses were gone, or nearly empty? What would American enterprise amount to if it had nothing to exploit? What figure does a poverty-stricken nation cut in the world? What rich and populous nations in history have not gone down into groveling insignificance by squandering their natural resources?

Unthinking Babes.

Up to date we have been careless, heedless children with all our resources, giving them away, destroying them, wasting them with lavish hands, and with no thought of the morrow. He who can destroy most

of our public property in the shortest time most excites our childish admiration. We have been busily playing our little games, paying no attention while some of the boys have set the house afire.

Something Is Doing.

But now an awakening seems to be coming. Its first tangible appearance was a Conference of Governors of the states and territories of the United States at the White House in Washington, presided over by President Roosevelt. Very many of the wisest and ablest men of the United States took part in this Conference—statesmen, philosophers, captains of industry. The Conference was followed in June by the formation of a National Conservation Commission of forty-eight members, appointed by the President.

The General Plan.

This National Commission is now at work. It is the plan that many commissions and associations throughout the states of the Union shall be formed to work with it, either upon Conservation as a whole or upon some phase of the subject vital to the particular locality. The results of this work are to be reported from time to time to the state legislatures and to the United States Congress; and made the basis for a wide and harmonious system of laws governing our Natural Resources.

But this wise and patriotic plan will fall down utterly, will come to naught, will turn to ashes in our grasp—*unless it can be backed up, supported, urged on by a strong, stern, unsleeping Public Opinion.*

Therefore It Is.

Therefore it is that the matter must be carried to the people, to the teachers, to the children. They must learn the facts and form their sentiments and see their duty. Commissions and legislatures will accomplish nothing unless we can wake the patriotic spirit of the people. The movement for Conservation can go no further than public opinion will carry it; but it will go fully as far as public opinion will go. [E. H.]

Aristotle says, "All who have meditated on the art of governing mankind have been convinced that the fate of empires depends on the education of youth."

THE NATIONAL CONSERVATION COMMISSION.

This body is composed of forty-eight eminent men of the United States. California is represented by Senator Frank P. Flint and Ex-Governor Pardee. Others are familiar names, as Senator Burton of Ohio, Dolliver of Iowa, Beveridge of Indiana, Champ Clark of Missouri, Nelson of Minnesota, John Mitchell, Andrew Carnegie, President Van Hise, John Hays Hammond. The headquarters is at Washington. The President and the Secretary have examined the plan and purpose of these pages and have expressed approving sentiments in the following letters:

WASHINGTON, Nov. 6, 1908.

To the Superintendent of Public Instruction,
Sacramento, California.

My dear sir:

I hasten to express my gratification over the excellent way in which you have worked out your idea of devoting a part of your biennial Report to Conservation. It is thoroughly admirable, and I am sure will do a great deal toward making the volume a very effective agency for good. You have discovered a new, and, I am convinced, extremely powerful channel for the advancement of the movement. I congratulate you upon having perceived this opportunity to promote education, and again congratulate you on being able so effectively to put your idea into execution. I shall appreciate any opportunity to assist you in the project.

Very truly yours,

GIFFORD PINCHOT,
Chairman.

WASHINGTON, Dec. 18, 1908.

The Supt. of Public Instruction,
Sacramento, Cal.

My dear sir:

You are the first State officer, of whom I have any knowledge, to take up Conservation in the way you propose to treat it, in your Report. I believe that your action will be the opening wedge in this great movement among the teachers of the whole country. I congratulate you on your conception of the idea, and I hope you will feel perfectly free to call upon the Commission for any additional assistance which you may desire. Will you not kindly keep me in touch with the progress of your Report, and believe me,

Very sincerely yours,

THOMAS R. SHIPP,
Secretary.

WHAT PEOPLE ARE THINKING.

THIS movement is so new that many of us do not yet appreciate its momentum. Most of us never even heard of it until within the last few months. Nothing can give us a better idea of it, perhaps, and nothing can be more interesting than to see what other people are really thinking and saying about it; particularly so if the other people are ones we respect or ones who have had unusual opportunity to know what they are talking about. With this in view the following expressions of individual opinion have been collected.

These can be used by a clever teacher in many ways. For instance, in the morning exercises, one can be read aloud by a pupil, or explained by the teacher. Another may be given as a declamation or a reading at some entertainment or patriotic celebration. Still another, perhaps, will yield quotations and strong points for debates, essays and other similar school activities.

Of course, if the spirit does not move the teacher to *use* these things, they all fall flat. But California teachers never lack for spirit.



A bit of our forest.

The President of the United States.

“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 in navigable streams, the retention of the undisposed of coal lands of the Government from alienation, all will properly claim from the next Administration earnest attention and appropriate legislation.

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.

The truth is that the overwhelming necessity for our doing something to conserve our natural resources is going to put us to a new test of the practical character of our system of government. It is going to involve the question of whether, with the changing conditions, with the closer relations and the interdependence of the various parts of this country, our National Constitution will furnish the means of meeting that necessity. Now, I have no doubt that it will.”

WM. H. TAFT.

A Famous Churchman.

“No policy of our National Government is more in keeping with those democratic principles upon which our Republic is founded than the conservation of our natural resources, and none is to have a greater influence upon the future prosperity of our land. Our fertile soils, our inland waters, our mines, and our forests are God-given heritages which belong no more to the present generation than to generations that are to come. It is our duty as American citizens to regard these resources as sacred trusts, to preserve them, and to use them wisely and with moderation, that we may, as far as possible, provide against the days of want that are surely approaching; and that when these days are at hand they may not come as a crushing retribution, but as a wholesome discipline by which we shall be taught the great lessons of thrift and foresight.”

CARDINAL GIBBONS.

The Great Commoner.

“It should be our purpose, not only to preserve the nation’s resources for future generations by reducing waste to a minimum; we should see to it that a few of the people do not monopolize that which in equity is the property of all the people. The earth belongs to each generation,

and it is as criminal to fetter future generations with perpetual franchises, making the multitude servants to a favored faction of the population, as it would be to impair, unnecessarily, the common store.

Money spent in care for the life and health of the people, in protecting the soil from erosion and from exhaustion, in preventing waste in the use of minerals of limited supply, in the reclamation of deserts and swamps, and in the preservation of forests still remaining and the planting of denuded tracts—money invested in these and in the development of waterways and in the deepening of harbors is an investment yielding an annual return. If any of these expenditures fail to bring a return at once the money expended is like a bequest to those who come after us. And as the parent lives for his child as well as for himself, so the good citizen provides for the future as well as for the present.”

WILLIAM JENNINGS BRYAN.

The President of the University of California.

“This small revolving globe we dwell upon has been used as a home by us humans, by us and our ancestors, for a goodly row of centuries. But we were too few and weak to master it and put it clean beneath our feet. It mostly got the best of us. Of late we have come to get the best of it. It used to thwart us, and steer us, and tell us what we must do. Now we tell it what we want to do, and make it do it for us. We have fettered its strengths with steel and made them work for us. We force its down-hill waters to carry us up hill. We use its own treasures of fuel to belittle its size and dignity; to curb it and humble it, and even to reshape it.

This is all very well, but of late men have been finding this robbing and humiliating of the prostrate body of nature so easy and so interesting as to make it a form of sport. They rob and exploit without reference to any present need, just to show what they can do. It is like the killing of the buffaloes for the fun of shooting, until all at once it appeared they were practically exterminated.

This generation will have for one thing at least a great name in history. Men of the future centuries will surely call it the generation of the great destroyers, and historians and economists will write of the riotous days of nineteen hundred, when the people used up all the petroleum, all the natural gas, all the anthracite and most of the other coal, and most of the handy iron. It will be the period when the forests were cut down or burnt up, the lands stolen, and the waters given away. We are sure to be the subject of earnest remark.”

BENJAMIN IDE WHEELER.

The Secretary of the Interior.

“Why should a great resource, which is owned by the people at large, be used by private interests, by somebody that is looking only to his own benefit, and not to the benefit of the people of the country? The people as a whole own these natural resources. They are not divided. But the people as a whole, as I say, own them, and it is for them to determine whether those resources shall be used for the benefit of all, or shall be turned over to be used unregulated for the benefit of those who may perchance first get a foothold in any special locality. In any law that is passed, in any theory of disposition that is adopted, we must look not only to their conservation and use, but we must look to the prevention of their monopolization in the hands of a few favored interests.”

JAMES R. GARFIELD.

A Great Labor Leader.

“In our mad rush for spoils and profits we not only waste and destroy those material resources with which God has so bountifully endowed us, but we press forward in the race, sacrificing, unnecessarily, the lives and the comfort of our fellow-beings. It seems to me that the time has come when we should stop for a moment and think—not alone of those inanimate things that make for comfort and prosperity, but also of the men, and the women, and the children, whose toil and deprivation have made and will continue to make our country and our people the most progressive and the most intelligent of all the nations and of all the peoples of the earth.”

JOHN MITCHELL.

A California College President.

“The greatest results of the administration of President Roosevelt have been twofold: the awakening of the civic conscience in our country, and the movement towards the conservation of our natural resources. These two results are closely connected, and each movement strengthens the other. There is now nothing in American politics of greater practical importance than the preservation of our national domain, with all that it contains, and all this developed to the highest point of efficiency.

Of these elements, that of forest preservation now stands first in pressing importance and deserves the constant support of all good men. Very important is also the preservation of the birds, to which the Audubon societies are dedicated. The saving of the fisheries is likewise a matter of large moment to the future and in this I am giving personally all the help I can.

As for the waters, soils and all such matters, our many centers of investigation and instruction in agriculture are giving splendid pledges for the future.”

DAVID STARR JORDAN.

The Ex-President of the United States.

“In utilizing and conserving the natural resources of the nation the one characteristic more essential than any other is foresight. Unfortunately, foresight is not usually characteristic of a young and vigorous people, and it is obviously not a marked characteristic of us in the United States. Yet assuredly it should be the growing nation with a future which takes the long look ahead; and no other nation is growing so rapidly as ours or has a future so full of promise. No other nation enjoys so wonderful a measure of present prosperity which can of right be treated as an earnest of future success, and in no other are the rewards of foresight so great, so certain, and so easily foretold. Yet hitherto as a nation we have tended to live with an eye single to the present, and have permitted the reckless waste and destruction of much of our natural wealth.

The conservation of our natural resources and their proper use constitute the fundamental problem which underlies almost every other problem of our national life. Unless we maintain an adequate material basis for our civilization, we can not maintain the institutions in which we take so great and just a pride; and to waste and destroy our natural resources means to undermine this material basis.”

THEODORE ROOSEVELT.

A Famous Ex-President.

“Those most proudly happy in their sanguine Americanism, and most confident of our ability to accomplish all things, must confess that our national life has been habitually beset with careless wastefulness, and that a palpable manifestation of this wastefulness is seen in the destruction of tree growth and the denudation of watersheds on our Western lands. Laws passed with the professed intent of protecting our forests have been so amiably construed as to admit of easy invasion; and their execution has too often been lax and perfunctory. In the mean time, public opinion on this subject, which might be as effective as legal enactment, has comfortably slumbered.

Even if we now abjectly repent of our sins of omission and commission in our treatment of the forests and streams which nature has given us, and reproach ourselves for the neglect of a trust imposed on us for the benefit of future generations, we must at the same time humbly confess that the punishment we have suffered by flood, by drought, by tornado, by fire, by barrenness of soil, and by loss of timber value, is well deserved.

In these circumstances it is exceedingly gratifying to have an appropriate opportunity to congratulate those who have constantly labored in the cause of forestry and forest preservation, as well as those interested in the cognate subject of irrigation, upon the prospect that these topics are to have more prominent places in governmental care.

Through the teachings of intelligent forestry it has been made plain that in our Western localities ruinous floods and exhausting droughts can be largely prevented, and productive moisture in useful degree and at needed periods secured, by a reasonable and discriminating preservation of our forest areas; the advocates of irrigation have been led to realize that it is useless to provide for the storage of water unless the sources of its supply are protected; and all those who, in a distinterested way, have examined these questions concede that tree growth and natural soil on our watersheds are more valuable to the masses of our people than the footprints of sheep or cattle.

The opportune time has arrived when effective public interest in forestry and forest preservation should be persistently aroused and stimulated.”

GROVER CLEVELAND in 1904.

A Famous Mining Engineer.

“The ever-increasing rapidity of exploitation consequent upon the exigencies of modern engineering and economic practice inevitably leads to an alarming diminution of the lives—if I may use that term—of our mineral products. The culmination of our mining industry is to be reckoned by decades, and its declension (if not practically its economic exhaustion) in generations, not in centuries.”

JOHN HAYS HAMMOND.

An American Political Economist.

“If we want to prolong American prosperity and maintain the high level of American wages, our wage being double that of the other nations of the earth, we must protect our facilities and enlarge our ability to produce and manufacture the things that we manufacture at the lowest cost. * * * If we had no advantage in the marketing of our goods, either in excellence or quantity or cheapness of production, it simply would mean that American labor would be reduced to the labor of all other nations of the world, and if we want to maintain its high level we must protect the facilities that will enable us to produce our goods at the very lowest possible cost.”

WILLIAM S. HARVEY.

The State Geologist of West Virginia.

“Just as sure as the sun shines, and the sum of two and two is four, unless this insane riot of destruction and waste of our fuel resources which has characterized the past century shall be speedily ended, our industrial power and supremacy will, after a meteor-like existence, revert, before the close of the present century, to those nations that conserve and prize at their proper value their priceless treasures of carbon.”

I. C. WHITE.

A Captain of the Steel Industry.

“We are nationally in the position of a large family receiving a rich patrimony from thrifty parents deceased intestate. * * * Now, the first duty of such a family is to take stock of its patrimony; the next to manage the assets in such manner that none shall be wasted, that all be put to the greatest good of the living and their descendants.”

ANDREW CARNEGIE.

The Governor of California.

“Certainly this great nation must conserve the foundations of its prosperity if it would continue great. And certainly no state is more interested in the matter than California. Resources of every kind have been richly given to us—great forests, splendid soils, plentiful waters, valuable mines. It is no more than ordinary business prudence for us to take stock of our inheritances and find out the best way to handle them in future. Our children have a right to demand that we pass this great property on to them unimpaired, so that they and their children’s children may continue to live and to prosper.”

J. N. GILLETT.

The Governor of Utah.

“The great, broad principle underlying the subject of conservation is whether or not each succeeding generation can be sustained on the land without impoverishing it in any respect. Stated as a question it is, ‘Will each generation have the land as rich as the preceding one?’ It seems a simple question, and yet the safety and the lives of our children and our children’s children will depend upon the answer. The forests, the streams, the soil, the minerals, and all the other natural elements of wealth should remain as nearly as possible undiminished as the centuries pass. All of this is in the hands of the people, with the possible exception of the preservation of the mineral wealth.”

CUTTER.

The Governor of New Jersey.

“A lumber famine is dangerously near. Steep mountain sides are deforested for a few poor years of farming, and then abandoned, and their native fertility goes to choke the rivers and form bars in every harbor along the coast. The streams themselves become inactive and a large part of their power is wasted. The ills that come from this condition can be remedied by Government action alone, but that action must be taken now or we shall be staggered by the cost.”

STOKES.

The Governor of Oregon.

“The conservation of the water supply is absolutely dependent upon the preservation of the upland forests. Opposition to the policy comes not from those interested in the development of the country and the

perpetuation of our institutions, but from the predatory classes, who care for naught but temporary gain.”

CHAMBERLAIN.

The Governor of Idaho.

“We have built here a great nation, without a thought of to-morrow. We will grow still greater, even if we follow the same old methods that we have followed in the past. But we can not reach our full share of greatness as a nation unless, before it is too late, we throw safeguards around those resources that have made us the mightiest nation on the earth, so that they can be preserved and protected, that they may be developed to the greatest extent for the benefit of this and future generations.”

GOODING.

The Governor of New York.

“The question of preserving our forests is of vital importance, and I am most anxious that all proper measures to this end shall be taken.
* * * I am in hearty sympathy with the object.”

HUGHES.



Wasteful lumbering. Wreckage of a Western forest after logging. The fire has already begun on it. What a boon a few square feet of this ground would be even now to many a family. The time is coming when every splinter of it will be keenly needed; its waste bitterly regretted. Millions upon millions of acres like this go up in smoke.

The Governor of Massachusetts.

“Not merely the lumber supply, but water power and water supply are alike vitally connected with this movement, and no State can afford to ignore it.” * * *

GUILD.

The Governor of West Virginia.

“The matter is of such urgent importance that it can not be further delayed without great detriment to the best interest of the country.”

SWANSON.

The Governor of Connecticut.

“I believe that we of the present generation owe it to posterity to conserve our natural resources in this direction.”

WOODRUFF.

The Governor of Maryland.

“There is to my mind no waste of resources more appalling than the destruction of our forest wealth—wealth that came to us by inheritance with the soil.”

WARFIELD.

The Governor of Virginia.

“Not only are we wasting our forests, but most of our other natural resources as well. But forest preservation seems to be of first importance—indeed, it is a subject of pressing importance.”

DAWSON.

SOME CURRENT LITERATURE.

THE following longer selections from magazines, addresses, newspaper articles, will give more complete and well rounded views of the conservation idea as a whole. Why would not this collection be just the thing for a reading circle or an improvement club to use? It is up to date, interesting, and vital to our State, to our Nation. The material has not before been brought together. It has cost a good deal of labor.

Is it not strange that our schools, preparing for citizenship, do not take up in some way this Conservation of Resources, so vital to every one of us, so necessary to the very existence of the nation?

Our boys and girls spend hours and days and weeks in studying intently the virtues and the defects of the Articles of Confederation, dead a hundred years! But they can not discover in their school that men are throwing away and giving away the land and the water upon which the real life of the nation is builded.

They toil and moil at length over the animosities of the Civil War, which were better forgotten; but they do not learn that their birthrights of soil are being swept out to the sea and that their birthrights in water are being seized by those who will thereby become their masters and their rulers in all time to come.

Is there not something here for schools to gladly learn and gladly teach?

WE ARE ALL RESPONSIBLE.

When expressing our indignation at the wicked waste of the people's heritages it is well to remember that it is the people who are to blame for it. You and I and all of us are the criminals, not merely the men and the corporations who have so largely profited by the wasted resources. It is easy to work up wrath and blow off steam about them; but we must remember that they have played the game according to the rules, and that we, the people, make or consent to the rules of the game—the laws. The big boys often try to change the rules and use them unfairly doubtless, as in smaller games; but if all the other children attend to it, take an interest in it, stick together, they can make the rules right and keep the big fellows within bounds.

It is well to remember this: most of us, if we could, would do just what the "predatory rich" have done.

One of the worst things that have been done, probably the very worst, has been the taking away of the timber lands from the people. But how has this been done? By buying out small owners for small prices. Our careless and reckless law gives to any one 160 acres of timber land if he or she will make oath that it is for his own use, not to be used for the benefit of some one else. In my travels I find many people, nice people, school teachers, ministers, ladies and gentlemen, locating timber claims—and selling them as soon as title is complete, for a few hundred dollars—three hundred, five hundred, perhaps; yet the timber itself is really *worth* many thousands of dollars, to say nothing of the land on which it stands.

Thus, for an insignificant sum for our own selfish immediate use do we nice people sell the birthrights of our children's children. Thus the great timber corporations acquire empires of land and princely fortunes in timber. Thus does our country lose its heritage for all time. Wherefore remember that we, the people, have our share of responsibility in this thing. We accept these laws and help to make them. We take a small share of the swag ourselves when we can get it.

The reason for the wasting and plundering and going to smash of this vast and splendid estate of ours is not hard to find. It is from a simple and natural cause, a universal law—*because we, the owners, have neglected it*. Any property, any enterprise goes to wreck and ruin if it is not attended to, guarded, watched over, by its owners. What would happen to a great store or a mill or a mine if it were abandoned to whomever happened along? How would a farm prosper if none of its owners took the trouble to look after it? Why, even a \$500 house in a little

village will soon be damaged beyond repair, broken, run down, carried away, when it is not cared for by its owners! And who gets the blame in such case? Not the boys who throw stones through the windows nor the petty thieves who carry off the fence for kindling wood—but the people who own it and are responsible for it. WE ARE ALL RESPONSIBLE.

[E. H.]

TEACHING CONSERVATION.

But how can a teacher teach Conservation? By exuding it through the pores! If it gets in it will come out!

A wise teacher will find a hundred ways to drop good ideas into the hearts of her children.

For instance, in the careful use of the school supplies. Economy and wise care are virtues greatly to be desired in all our citizenry. The teacher is not working for the sake of saving a few cents for the school fund; but for the *habits* of the children, their way of looking at things, during all their future lives. Carelessness, extravagance, recklessness, are dangerous to the nation. The difference between conservation and reckless waste may be taught in the use of such a common thing as *paper*, for example. Indeed, paper is really one of our national resources, as it is made of wood pulp, and wood pulp is made from trees. A big edition of a Sunday newspaper requires perhaps a dozen acres of woodland. Every sheet of paper, every desk, every box, every splinter of wood that we see or use, represents trees, trees that were chopped from our forests. Every one of our eighty million people uses more than seven times as much wood per year as do the people all over Europe. Every big city fire destroys a great and splendid forest. Millions upon millions of acres of woodland continually go into the ties along our railroad lines. Countless other forests are rotting away deep under ground in the coal mines and gold mines.

The teacher who goes into the subject with interest himself will find no lack of striking and interesting and valuable things to pass along to his flock; things that point to civic patriotism; things more vital to their fatherland than the waving of battle flags and defiance of the foreign foe! [E. H.]

THE CONSERVATION OF OUR NATURAL RESOURCES.

This article will well repay thoughtful reading. It is by Gifford Pinchot, the United States Forester, and was delivered as an address to the National Geographic Society a few months ago. Note its simplicity and its strength.

A Story With a Moral.

The conservation of our natural resources is a subject which has received little attention in the past; but the facts in the case are so simple, the principles so elementary, and our duty so clear, that they might be fitly presented in a story like one of the old fairy tales that we all loved when we were boys and girls. Such a story would run like this:

Once upon a time there was a young man who had been given a great property in a distant region, and who left home to take possession of it. When he reached his property he first made himself acquainted with it. As he explored it and studied its value he began to think how he would make his living out of it. The problem was not a hard one. He found that his property was wonderfully rich, and supplied his needs at the cost of far less exertion than he would have had to make at home, for it was a fair land, well watered, well timbered, abounding in game and fruits, with broad meadows for cattle and horses and sheep, and with no small store of rare and curious minerals and an outcrop of excellent coal. Life was easy, and he lived lavishly and joyously, after the initial hard work of moving in and building his house and raising his first crops was over. He had far more land than he could use, far more game, and what he lacked he was able to buy from home with furs, with timber, with minerals, and with the surplus of his crops.

By and by he saw and liked a girl, and finally married her. Together they prospered on the property, which seemed too rich to make it necessary for them to trouble about the future. Game was still plenty, though less so than at first; the timber, though growing less, was still abundant enough to last longer than they could hope to live; by breaking new land they could always count on marvelous crops; the coal was a little harder to get at, but still close to the surface, and besides the man only dug out the easiest to reach, and when the earth began to cave in he merely started again at a new place. His stock, grazing on the meadows, had trampled out some of the grass, but there was still no lack. That some day strangers would possess their property when they had done with it, and would find it somewhat run down, did not trouble these two good people at all.

But children came to them with the years, and by and by these children began to grow up. Then the point of view of the man and his wife changed. They wanted to see their sons and daughters provided for and settled on this property of theirs, and they began to see that

what was enough and to spare for them would not support all their children in the same comfort unless they themselves used it with better foresight. Through thinking of their children they were led to live more in the future.

They looked forward and said to themselves: "Not only must we meet our own needs from this property, but we must see to it that our children come in for their fair share of it; so that after a while the happiness we have had here may be carried on to them." So the family established itself. The man became respected, and his children grew up healthy and happy around him; and when in the fullness of time he passed away and his children took the place in which he had stood, because of his foresight and care they enjoyed the same kind of prosperity he had enjoyed.

It is a perfectly simple story; we all of us can name scores of men who have done this same thing. The men and the women who do it are not famous, are not regarded as remarkable in any way; they are simply good, everyday, average citizens, who are carrying out the duties of the average citizen.

What Have We Done With Our National Resources?

Once upon a time there was a young nation which left its home and moved on to a new continent. As soon as the people who formed the first settlements began to examine the value and condition of this new continent, they found it marvelously rich in every possible resource. The forests were so vast that, in the early days, they were not a blessing, but a hindrance. The soil was so rich and there was so much of it that they were able at first only to cultivate the edges of their great property. It was quite plain to these people in the early times that, however much land they might cover, however much they might waste, there was always going to be plenty left. As time went on they discovered greater and greater resources. They found wonderfully rich deposits of metallic ore; great oil and gas fields, and vast stretches of the richest bituminous and anthracite coal lands; noble rivers flowing through broad expanses of meadow; rich alluvial prairies; great plains covered with countless herds of buffalo and antelope; mountains filled with minerals; and everywhere opportunities richer than any nation had ever found elsewhere before.

They entered into this vast possession and began to use it. They did not need to think much about how they used their coal, or oil, or timber, or water—they would last—and they began to encroach on the supply with freedom and in confidence that there would always be plenty. The only word with which they described what they had, when they talked about it, was the word "inexhaustible."

Let us see for a moment what the course of development of this young nation was. First of all they needed men and women to settle on the land and bring up children and have a stake in the country. That was absolutely necessary before there could develop the great nation which some of them saw ahead. As the population spread there arose a need that great systems of transportation should be built to knit the country together and provide for the interchange of its products. These railroads called for iron, coal, and timber in great quantities. Then began an unprecedented demand upon the forests. They could not build those transcontinental railroad lines without millions upon millions of railroad ties cut from the forests of the country; and they could not mine the iron and coal except as the forests gave them the means of timbering their mines, transporting the ore, and disposing of the finished product. The whole civilization which they built up was conditioned on iron, coal, and timber. As they developed their continent, richer than any other, from the east coast to the west, new resources became revealed to them, new interests took possession of them, and they used the old resources in new ways. In the East, the rivers meant to them only means of transportation; in the West they began to see that the rivers meant first of all crops; that they must put the rivers on the land by irrigation before they could grow wheat, alfalfa, fruits, sugar beets, and other crops that make the West rich. They found that to feed the vast population which had grown up in the East they must have the vast ranges of the West to grow meat. They found that the resources of soil and water which produced the wheat, the cotton, and the meat—of iron and coal, and of timber, together made up the working capital of a great nation, and that the nation could not grow unless it had all of these things. In taking possession of them our nation used with greater effectiveness, greater energy and enterprise, than any other nation had ever shown before. Nothing like our growth, nothing like our wealth, nothing like the average happiness of our people can be found elsewhere; and the fundamental reason for this is, on the one side, the vast natural resources which we had at hand, and on the other side the character, ability, and power of our people.

Now what have we done with these resources which have made us great, and what is the present condition in which this marvelously vigorous nation of ours finds itself? The keynote of our times is "development." Every man from New York to San Francisco looks to the development of the natural resources to produce the advantages and the opportunities he wants for his neighbors and his friends. Any one who questions the wisdom of any of the methods we are using in bringing that development to pass, because he believes we are making mistakes that will be expensive later on, is in danger of being considered

an enemy to prosperity. He is in danger of having it thought of him that he does not take pride in our great achievements, that he is not a very good American. But in reality it is no sign that a man lacks pride in the United States and the wonderful things our people have done in developing this great country because he wants to see that development go on indefinitely. On the contrary, real patriotism and pride in our country make it the first of all duties to see that our nation shall continue to prosper. In sober truth, we have brought ourselves into a condition in which the very serious diminution of some of our most necessary resources is upon us.

What We Face.

Forest Resources.—A third of the land surface of this country was originally covered with what were, all in all, the most magnificent forests of the globe—a million square miles of timberland. In the short time, as time counts in the life of nations, we have been here we have all but reached the end of these forests. We thought it unimportant until lately that we have been destroying by fire as much timber as we have used. But we have now reached the point where the growth of our forests is but one third of the annual cut, while we have in store timber enough for only twenty or thirty years at our present rate of use. This wonderful development, which would have been impossible without the cutting of the forests, has brought us where we really face their exhaustion within the present generation. And we use five or six times as much timber per capita as the European nations. A timber famine will touch every man, woman, and child in all the land; it will affect the daily life of every one of us; and yet without consideration, without forecast, and without foresight, we have placed ourselves, not deliberately, but thoughtlessly, in a position where a timber famine is one of the inevitable events of our near future.

Canada can not supply us, for she will need her timber herself. Siberia can not supply us, for the timber is too far from water transportation. South America can not supply us, because the timbers of that vast continent are of a different character from those we use and ill adapted to our need. We must suffer because we have carelessly wasted the forest, this great fundamental condition of success. It is impossible to repair the damage in time to escape much suffering, although not too late to work hard to reduce it as much as we can.

Minerals, Oil, and Natural Gas.—But forests only begin the story of our impaired capital. Our anthracite coals are said to be in danger of exhaustion in fifty years, and our bituminous coals in the beginning of the next century; some of our older oil fields are already exhausted; the natural gas has been wasted, burning night and day in many towns until the supply has failed. Our iron deposits grow less each year.

Our ranges in the West, from which we first drove the buffalo to cover them again with cattle and sheep, are capable of supporting but about one half what they could under intelligent management, and the price of beef is raised accordingly. Nearly every one of our wonderful resources we have used without reasonable foresight or reasonable care, and as each becomes exhausted a heavier burden of hardship will be laid upon us as a people.

Now what is our remedy? The remedy is the perfectly simple one of common sense applied to national affairs as common sense is applied to personal affairs. This is no abstruse or difficult question. We have hitherto as a nation taken the same course as did at first the young man who came into possession of his new property. It is time for a change.

It is true that some natural resources renew themselves while others do not. Our mineral resources once gone are gone forever. It may appear, therefore, at first thought that conservation does not apply to them since they can be used only once. But this is far from being the fact. Methods of coal mining, for instance, have been permitted in this country which take out on the average but half of the coal. Then in a short time the roof sinks in on the other half, which thereafter can never be mined. Oil and natural gas also have been and are being exploited with great waste and as though there never could be an end to them. The forests we can replace at great cost and with an interval of suffering.

Soil Waste.—The soil which is washed from the surface of our farms every year to the amount of a billion tons, making, with the further loss of fertilizing elements carried away in solution, the heaviest tax the farmer has to pay, may in the course of centuries be replaced by the chemical disintegration of the rock; but it is decidedly wiser to keep what we have by careful methods of cultivation. We may very profitably stop putting our farms into our streams, to be dug out at great expense through river and harbor appropriations. Fertile soil is not wanted in the bed of a stream, and it is wanted on the surface of the farms and the forest-covered slopes of the mountains. Yet we spend millions upon millions of dollars every year removing from our rivers what ought never to have got into them.

Waste Through Piecemeal Planning.

Besides exhausting the unrenewable and impairing the renewable resources, we have left unused vast resources which are capable of adding enormously to the wealth of the country. Our streams have been used in the West mainly for irrigation and in the East mainly for navigation. It has not occurred to us that a stream is valuable, not merely for one, but for a considerable number of uses; that these uses are not mutually exclusive, and that to obtain the full benefit of what

the stream can do for us we should plan to develop all its uses together. For example, when the National Government builds dams for navigation on streams, it has often disregarded the possible use, for power, of the water that flows over those dams. Engineers say that many hundred thousand horsepower are going to waste over Government dams in this way. Since a fair price for power, where it is in demand, is from \$20 to \$80 per horsepower annually, it will be seen that the Government has here, developed, yet lying idle, a resource capable, under the right conditions, of adding enormously to the national wealth. So also in developing the western streams for irrigation, in many places irrigation and power might be made to go hand in hand.

Danger of Monopoly.

If the public does not see to it that the control of water power is kept in the hands of the public, we are certain in the near future to find ourselves in the grip of those who will be able to control, with a monopoly absolutely without parallel in the past, the daily life of our people. 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 to market 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. In every activity of his life that man and his family and his neighbors will have to pay toll to those who have been able to monopolize the great motive power of electricity made from water power, if that monopoly is allowed to become established. Never before in the history of this or any other free country has there existed the possibility of such intimate daily friction between a monopoly and the life of the average citizen.

It has not yet occurred to many of our people that this great power should be conserved for the use of the public. We have regarded it as a thing to be given away to any man who would take it. We have carried over our point of view derived from the early conditions when it was a God-send to have a man come into the country to develop power and we were willing to give him anything to induce him to come. We have carried over that point of view into a time when the dread of

monopoly of this kind ought to be in the mind of the average man everywhere. That is an instance of a resource neglected from the point of view of the public.

A New Point of View.

But this is a time to consider not one resource, but all resources together. Already here and there small associations of citizens have become possessed of certain facts, and have begun to work at certain sides of what is fundamentally one great problem. We have a drainage association, whose object is to make habitable millions upon millions of acres now lying waste in swamps all over the country, but capable of supporting in comfort millions of people. We have forestry associations, waterway associations, irrigation associations, associations of many kinds touching this problem of conservation at different points, each endeavoring to benefit the common weal along its own line, but each interested only in its own particular piece of the work and unaware that it is attacking the outside, not the heart of the problem. Now a greater thing is opening out in the sight of the people. This problem of the conservation of natural resources is a single question. Each of these various bodies that have been working at different phases of it must come together on conservation as a common platform. By the joining of these units we shall have a mass of intelligent, interested, public-spirited citizens anxious to adopt a new point of view about this country of ours.

That is the crux of the whole matter—a new point of view about our country. We have been so busy getting rich, developing and growing, so proud of our growth, that we have let things go on until some intolerable abuse has driven us to immediate action. It is time that we put an end to this kind of opportunism, of mere drifting. We must take the point of view taken by the average prudent business man, or man in any walk of life who has property and is interested in it. What the average man does in his own affairs is to foresee trouble and avoid it if he can. What this nation of ours is doing in this fundamental matter of natural resources is to run right into trouble head down and eyes shut, and so make that trouble inevitable before taking any step to prevent it. But it should not take long to reach the stage of national thought where we shall deliberately plan to avoid the difficulties which can be foreseen, if only we can bring together all who have already begun to concern themselves with one or another aspect of the conservation problem.

The Problem Before Us.

This nation has, on the continent of North America, three and a half million square miles. What shall we do with it? How can we make ourselves and our children happiest, most vigorous and efficient, and our

civilization the highest and most influential, as we use that splendid heritage? Ought not the nation to undertake to answer that question in the spirit of wisdom, prudence, and foresight? There is reason to think we are on the verge of doing this very thing. We are on the verge of saying to ourselves: "Let us do the best we can with our natural resources; let us find out what we have, how they can best be used, how they can best be conserved. Above all, let us have clearly in mind the great and fundamental fact that this nation will not end in the year 1950, or a hundred years after that, or five hundred years after that; that we are just beginning a national history the end of which we can not see, since we are still young." In truth we are at a critical point in that history. We may pass on along the line we have been following, exhaust our natural resources, continue to let the future take care of itself; or we may do the simple, obvious, common-sense thing in the interest of the nation, just as each of us does in his own personal affairs.

On the way in which we decide to handle this great possession which has been given us, on the turning which we take now, hangs the welfare of those who are to come after us. Whatever success we may have in any other line of national endeavor, whether we regulate trusts properly, whether we control our great public service corporations as we should, whether capital and labor adjust their relations in the best manner or not—whatever we may do with all these and other such questions, behind and below them all is this fundamental problem. Are we going to protect our springs of prosperity, our sources of well-being, our raw material of industry and commerce, and employer of capital and labor combined; or are we going to dissipate them? According as we accept or ignore our responsibility as trustees of the nation's welfare, our children and our children's children for uncounted generations will call us blessed, or will lay their suffering at our doors. We shall decide whether their lives, on the average, are to be lived in a flourishing country, full of all that helps to make men comfortable, happy, strong, and effective, or whether their lives are to be lived in a country like the miserable outworn regions of the earth which other nations before us have possessed without foresight and turned into hopeless deserts. We are no more exempt from the operation of natural laws than are the people of any other part of the world. When the facts are squarely before us, when the magnitude of the interests at stake is clearly before our people it will surely be decided aright.

CULTIVATE THE FORESTS.

This is a clipping from a fine article upon the **STATESMANSHIP OF FORESTRY** by Author W. Page in the *World's Work Magazine* for January, 1908. A number of the pictures in this volume are from the same source.

Many people consider the approaching timber famine with the same feeling of regret and helplessness with which they listen to the story of the extinction of the buffalo. They feel that both are wild things which must inevitably perish before the advance of civilization. But the forests, unlike the buffalo, thrive in captivity. A large proportion of the trees in a wild forest are not best suited to our use. They are of the wrong species—like weeds in a garden—are too old or crooked and have a variety of other blemishes; and, while doing us little good themselves, they prevent the growth of better timber. To destroy all the original growth and then plant a new forest on the devastated area seems illogical, but it is neither impractical nor unprofitable, as the experience of Germany and experiments in this country show. It is much easier, however, and more profitable, gradually to turn the wild forests into cultivated ones.

The French began to do this in the fourteenth century. * * * France, as thickly settled as it is, has maintained its cultivated timber for five hundred years, while the West with its scattered population is about to make an end of its wild forests in seventy-five years. In contrast to the forestry conditions of France are those of southern Tunis. It was once a very fertile country, but the Arab conquest destroyed all the trees and now the ruins of its old capital, Suffetula, stand in an uninhabitable desert. "Not long after the conquest," says M. Jusseraud, "an Arab chronicler recalled in his book the former times of prosperity and added: 'But in those days, one could walk from Tripoli to Tunis in the shade.'"

CONFESSION TO NEXT GENERATION.

Clipping from a graduating address to the Fresno High School by Dr. Frederic Burk.

"We dislike to go on with these embarrassing confessions, but you will learn the whole wretched story yourselves sometime, and we may as well tell you. As for the coal and iron, our fathers left us enough to last for two or three thousand years if it had been economically mined according to some system established by law. We regret to tell you, upon the authority of Andrew Carnegie and John Mitchell, that we've wasted in getting out what we could use what should have lasted eighteen hundred or two thousand years. The coal may hold out

another two hundred years and the iron one hundred years, but both will come high in your time. We wish we did not have to mention the oil and the natural gas, but we may as well tell you that we've sucked them out of the earth almost completely and wasted them.

Dear next generation, such is part of the shameful explanation truth compels us to make to you concerning the waste and loss of your patrimony. We've skimmed the cream and have led jolly lives—we do sincerely hope you like skimmed milk, and little of it. When you are shivering with the cold in a coalless country, when you are nursing one blade of grass to grow for you where two grew for us, when you have ceased automobiling on account of the high price of oil, then you'll remember us in our riotous plenty. Don't be too angry with us. We robbed you. We took the bread out of your mouths, you our babes, and fed it to the vultures who were fattening upon our national dishonor. But our sins have been the sins of ignorance rather than of willfulness. Your fathers were happy, devil-may-care fellows, whose courage, as war patriots, you must in justice honor, but who never had any comprehension of the meaning of a civil patriot nor the slightest realization that it required any of the qualities of courage, self-sacrifice for the common good, and intelligence which in war patriotism we have exemplified."

OUR WATER LAWS.

Pointed Statement from a letter by Allison Ware, of the San Francisco State Normal School.

"Worst of all, the water running in our streams has been so carelessly handled by our laws, (patterned as they are after the laws of England, where water is a pest and the only thought is to get it off the place as quickly as possible,) that most of it is now in private ownership, much of it many times over, with results that have produced widespread discomfort and that clearly throttle the growth of the State as a land of farming.

A few things, it seems to me, the people of California must speedily come to understand. First, the wonderful value of water; what it means to the farmer, to the manufacturer, to the main sources of wealth of all sorts. Second, the endless litigation, fearful waste of water wealth, harsh water-lordism, an uneconomic application of streams to production; all the results of our foolish laws. Third, that there is a remedy, partial because we have been slow to seek it, but still a remedy that will save to the future the possibility of sustaining an agricultural community of two million prosperous homes in California.

As to this great subject of water in relation to agriculture in California, Bulletin 100, Department of Agriculture, contains the whole story and shows us our tardy remedy."

LAST OF THE BIG TREES.

Extracts from a notable article in Collier's Weekly under the above title by Arthur Ruhl. Doubtless a good deal of this will seem merely sentimental to a hard-headed business man who deals in trees and lumber. Nevertheless, it is well to remember that the mightiest things are started by sentiments. Every great movement that has affected the destinies of mankind had its beginning in a mere sentiment that somehow found lodgment in some one's heart. The wise man harkens carefully to the drift of sentiment.

They rise up two hundred, two hundred and fifty, three hundred feet sometimes, the trunks bare of branches for seventy-five or a hundred feet, fluted, gray-brown columns like pillars of stone. Far overhead, the delicate tracery of their foliage weaves a roof which shuts out the direct sunlight and gives to everything below the soft twilight radiance of a cathedral. Like a Gothic cathedral, indeed, is the natural aisle



Redwood monarch on the way to the mill.

with the fluted, columnar trunks rising side by side toward the mountain background, the mellowed light filtering through the arching roof far above.

Even the curious fluted trunks and the color—a cinnamon turned stone-gray by age and weather—seems exotic and to belong to an older age, when strange and monstrous animals roamed the forests. And well they may look so, for they—and more especially their near relatives, the giant Sequoias of the Sierras—are the oldest living things in our world. The latter have conquered fire and snow and the other enemies that have attacked them through the centuries, and stood there, lofty and silent and serene, while wars have raged and been forgotten and religions grown up and fallen to decay. The redwoods proper, as these trees in the Bohemian grove are called, are not quite so ancient, but they were mighty trees, at any rate, before the Roman Empire fell, and they and their brothers may still be standing when the solitary New Zealander looks upon the ruins of St. Paul's—those at least which haven't been cut up into fenceposts and shingles.

To an outsider, the spell they cast necessarily overshadows the doings of the little humans playing at their feet. In the cool, fragrant interior of the grove, the hectic bustle of the ordinary world seems trifling and unimportant. Voices come pleasantly across the great spaces; even the humor of the street, provided it has a basis in reality, is mellowed and enriched and merged into the region of art. The grove becomes a world in itself—a more radiant world; you walk out into the open and are conscious of leaving some enchantment behind, of entering a more difficult, harsher, more material universe. Voices sound as from very far away through the trees, men lounging in groups here and there are listening and laughing carelessly—it is as though the blessings of



A redwood forest in California in its natural state. Observe the shrubs and ferns that flourish in the cool aisles of the woodland.

humor and grace and happy insight belonged to all who breathed that air.

An Easterner, a young poet and playwright, was a guest at the camp. He had never been West before, never seen the big trees. And it was into this pagan temple that he was led. The day before, he and some of his friends went to another forest nearby, the Armstrong grove. Here were the same trees, only a little wilder, with more of the natural undergrowth between. And that same day, in a newspaper, he read that the Armstrong grove had been sold to a lumber company. It was about midnight that night when I first caught sight of him on the opposite side of the circle that surrounded the huge club campfire. He came over to our side. He was like some one who had just seen innocent men condemned to death and knew that if he could not get help they would be executed the next morning. His voice shook as he spoke.

“Why, I’ve *seen* them,” he said. “They are all numbered—61-73-87

—ready to cut. They are just like these’—he motioned upward where the dark roof of the forest closed in far above the light of the fire. “And they’re going to cut them down. Why, it seemed to me when I saw those numbers—you go over to-morrow morning and you’ll understand—if a man could only prevent that destruction, could only save those trees! * * *”

The Giant Tree proper lives only in the thin, dry air of the Sierras, rarely below 5,000 feet altitude, climbing thence up to the 8,000-foot level and even higher, so that it may look, with little hindrance, to the bare peaks and the glaciers above. It is found in much less homogeneous forests than the redwood, sharing the dominion of these sunny plateaus with mighty sugar and yellow pines and spruces and firs.



Here is the redwood forest after it has been “developed” by our wasteful methods.

In the southern portions of the belt, along the Kaweah and Tule rivers, there are Giant-Tree groves that deserve to be called forests—vigorous young trees and saplings, growing beside their ancient, storm-stricken sires, but more often the Giant Trees bear much the same relation to the forest as a whole as is borne by the occasional primeval oaks found among the common second-growth timber in the “woods” of the East and Middle West.

The largest tree known is probably the “General Sherman,” in the Giant Forest Grove in the Sequoia National Park, about forty miles east of the town of Visalia, in the central southern part of the State. It has a circumference of 103 feet; 200 feet from the ground it is not less than 70 feet around, and even with its crown broken off it is 280 feet high.

It was of such trees as this, which, scarred by fire, broken off by

storms or lightning, yet tower aloft in a majesty and beauty almost undimmed, as if gifted with eternal life, that John Muir wrote:

“So exquisitely harmonious and finely balanced are even the very mightiest of these monarchs of the woods, in all their proportions and circumstances, that never is anything overgrown or monstrous looking about them. * * * No other tree in the Sierra forest has foliage so densely massed, nor presents outlines so firmly drawn and so steadily subordinate to a special type. A knotty, ungovernable-looking branch, five to eight feet thick, may be seen pushing out abruptly from the smooth trunk, as if sure to throw the regular curve into confusion, but as soon as the general outline is reached, it stops short and dissolves in spreading bosses of law-abiding sprays, just as if every tree were growing beneath some huge, invisible bell glass, against whose sides every branch was being pressed and molded, yet somehow indulging in so many small departures from the regular form that there is still an appearance of freedom. * * *

“As soon as any accident happens to the crown of these Sequoias, such as being stricken off by lightning or broken by storms, then the branches beneath the wound, no matter how situated, seem to be excited, like a colony of bees that have lost their queen, and become anxious to repair the damage. Limbs that have grown outward for centuries at right angles to the trunk begin to turn upward to assist in making a new crown, each speedily assuming the special form of true summits. Even in the case of mere stumps, burned half through, some mere ornamental tuft will try to go aloft and do its best as a leader in forming a new head. * * *

“I never saw a big tree that had died a natural death; barring accidents, they seem to be immortal, being exempt from all the diseases that afflict and kill other trees. Unless destroyed by man, they live on indefinitely, until burned, smashed by lightning, or cast down by storms or by the giving way of the ground on which they stand. * * * The colossal scarred monument in the Kings River forest is burned half way through, and I spent a day in making an estimate of its age, clearing away the charred surface with an axe, and carefully counting the annual rings by the aid of a pocket lens. The wood rings in the section I laid bare were so involved and contorted in some places that I was not able to determine its age exactly, but I counted over four thousand rings, which showed that this tree was in its prime, swaying in the Sierra winds when Christ walked the earth. No other tree in the world, as far as I know, has looked down on so many centuries as the Sequoia, or open such impressive and suggestive views into history.”

And it is monarchs like these, who have seen the sun rise on a million crystalline Sierra mornings, who have fought their centuries of battle against fire and winter snows and thunderbolts and winds, who must now fall before tiny scrambling humans with ravenous axes and be

turned into posts and grapevine stakes. At the close of the same chapter quoted above is Muir's prophecy that "*unless protective measures be speedily invented and applied, in a few decades, at the farthest, all that will be left of the Sequoia gigantea will be a few hacked and scarred monuments.*"

Yet all through the belt these wonderful monuments are being destroyed. They are not felled to make pillars for temples. No unusual or beautiful service is performed through their destruction. They are first chopped down, then, with enormous waste, blown to pieces with gunpowder, and then ironically split up into fence posts and grapevine stakes. That is about as low a task a good wood could be put to—only a step higher than the splinters from old boxes which elderly ladies stick into flowerpots to hold up geraniums.

The only grove thoroughly safe from destruction is the Mariposa, which is owned by the State of California. In the Sequoia and General Grant National Parks, which, theoretically, are owned by the nation, there are about 1,200 acres in private ownership. Captain Young secured options on the Sequoia National Park holdings a few years ago, and the Government could have bought them then, it is said, for the very reasonable sum of \$86,000. However the owners may have acquired title, it is only fair to say that they have made no attempt to hold up the Government for an unreasonable price. As usual, however, Congress did not see fit to act. There is nothing to prevent the destruction of these trees, should the owners choose to cut them down, except the fact that there is no lumber road out of the park, and the Government has thus far declined to grant a right of way. If the owners chose to force their claim, however, it is extremely doubtful if the Government's position could be legally upheld.

The preservation of giant trees is a question for the people themselves. How much are these trees worth to them, not as lumber, but as monuments, as wonderful and beautiful relics of a vanished age? For they are relics and monuments—the world has no other Sequoias. They are either to be preserved or destroyed forever—like the Pyramids or the Parthenon. And although there are several groves, the number of trees which, in comparison with the majestic pines and firs and spruces round them, can properly be called "giant" trees is probably not more than five hundred.

Just what methods Government, State, and individuals should adopt is rather beyond the purpose of this article, which merely undertakes to explain what and where the giant trees are. To be sure, one can't help thinking of California millionaires. Some of them have public spirit and wish to do something for their country. Any man who saves one of these groves, or even one giant tree for the people bestows a gift which not only will do him honor during his lifetime, but will still be

standing, as it is to-day, hundreds, possibly thousands, of years after all the vain little human structures of our day have crumbled to pieces or been pounded up into macadam streets.

DREDGER MINING.

Our laws are stupid, too, in regard to the dredger industry. They allow capitalists to come into our fertile valleys, pay big prices for fields, orchards, vineyards, and convert them into barren piles of rocks. This makes a temporary prosperity. The owners of the soil get a lot of money, work is plentiful, prices are good—and the capitalist carries away large profits, perhaps. But the brief prosperity passes away in four or five years—and what of the land? It is no more! It would have otherwise been producing food, supporting people and paying taxes for four or five hundred years or four or five thousand—but now it is gone. It is a hideous desolation for all time to come.

There is something wrong in this. It is legal at present, but it is not moral. No one should have a right to destroy the Homes of the future. It is against the general good. We have a right to *use* the land—but not to *destroy* it. [E. H.]

THE LOSS OF OUR SOIL.

This striking statement is from that splendid journal *The Outlook*, edited by Lyman Abbott.

We are in the habit of speaking of the solid earth and the eternal hills as though they, at least, were free from the vicissitudes of time, and certain to furnish perpetual support for prosperous human life. This conclusion is as false as the term “inexhaustible” applied to other natural resources. The waste of soil is among the most dangerous of all wastes now in progress in the United States. In 1896 Professor Shaler, than whom no one has spoken with greater authority on this subject, estimated that in the upland regions of the states south of Pennsylvania three thousand square miles of soil had been destroyed as the result of forest denudation, and that the destruction was then proceeding at the rate of one hundred square miles of fertile soil per year. No seeing man can travel through the United States without being struck with the enormous and unnecessary loss of fertility by easily preventable soil wash. The soil so lost, as in the case of many other wastes, becomes itself a source of damage and expense, and must be removed from the channels of our navigable streams at an enormous annual cost. The Mississippi River alone is estimated to transport yearly four hundred million tons of sediment, or about twice the amount of material to be excavated from the Panama Canal. This material is the most fertile portion of our richest fields, transformed from a blessing to a curse by unrestricted erosion.

THE LARGEST NATIONAL TASK.

From the address of President Roosevelt at the meeting of the Conservation Conference held in Washington, D. C., December 8, 1908.

I welcome you 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 that we shall 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 largest national task of to-day, and I thank you for making ready to undertake it.

I am especially glad to welcome the coöperation of the States, through their Conservation Commissions and otherwise. Such coöperation gives earnest of mutual assistance between states and nation, and mutual benefits to follow. Without it the great task of perpetuating the national welfare would succeed, if at all, 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. We are concerned with the people's rights; if this means national rights, well and good; if it means states' rights, well and good; we are for whatever serves the cause of the people's rights.

The results of the inventory of resources will be laid before the present conference by the National Conservation Commission. I shall not attempt to review these results further than to say that the more striking facts brought out at the conference last May are amply confirmed. These facts are sobering. 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 no man is a good American if he does not think of future Americans, any more than a man is a good citizen if he does not think of his children's welfare; for there isn't any man whom we despise more than the man who has a good time himself and whose children pay for it. So with the nation; that nation is contemptible that riots in abundance by wasting the heritage it should leave to the citizens that are to come afterwards. Needless waste must stop. The time to deride or neglect the statements of experts and the teaching of the facts has gone by. The time to act on what we already know has 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 apply them in dealing with the foundations of our prosperity.

THE WASTE IN MUD.

This article is from *The Saturday Evening Post* of March 27th. It is a fine example of modern American newspaper English. It tells the story in a deliciously whimsical, humorous way. Yet the grim facts stick out boldly all through it, in spite of its quips and jests. It is by Emerson Hough.

With the exception of that certain wicked uncle, of whom nothing ever was expected and of whom no good could be predicted, all your family, like the average American family, no doubt regularly went to church. Probably the majority stayed over for Sabbath-school in the little church with white walls and black walnut pews. You could not have been in a better place. At church or Sabbath-school you all stood in a row and sang that easy, lilting old hymn which says :

Little drops of water, little grains of sand,
Make the mighty ocean and the pleasant land.

You could not have sung a better song. We all used to sing that song with cheerfulness, indeed with enthusiasm—*Lit*-tle drops of wa-a-a-ter, *lit*-tle gra-ay-ins of sand, make the mighty *o-o*-shun, *an'* the pleh-heh-sent la-a-a-nd! That was the way it ran. After we had sung it we all went home and forgot all about it. The next Monday morning Dad went back to farming, just the way his Dad had, and the Dad who antedated that one, world without end; and not one of those Dads was ever wise enough to know the hymn was right, or to figure out what the hymn meant or ought to mean. It is a splendid hymn, full of vast elemental truth, and it has a lot to do with farming.

Heretofore, your folks and mine hadn't thought that geology had much to do with farming, any more than religion had. As a matter of fact, they both do. The only trouble is, the average American, like you and me, does very little thinking in religion, politics or business. The farmer knows the country immediately around him. The city man does not even know all of the city where he lives, only a little corner of it. It is this carelessness in religion, politics, business and geology which gives the sad-eyed Mr. James J. Hill still further opportunity to grieve over the future of this country.

What Mr. Hill sees is the time when five hundred millions of Japanese and Chinamen will be making all our manufactured goods under a scale of living so much cheaper than the American standard as to crush out all American competition. This means not only the fiercest struggle ever known for trade, but the fiercest struggle ever known for a mere living. It is the war between the Oriental standard of living and the American standard as we now know it. The decisive battle of that war must be fought on the American farm, not in the California legislature. The American standard of living is based on the theory of an exhaustless

bank account. Our account has never been overdrawn, and we have never had our bankbook balanced. It is only now that a few of our wiser men begin to see that it is time for us to get a balance from the clerk at the desk. We have been checking out, like inebriated mariners, what we had or thought we had in this rich bank of America, land of the free, country of endless opportunity. Now we have used up our forests, are exhausting our mines at fearsome speed, have exterminated most of our wild game, endangered the food supply which comes from the waters, and, in general, done all we could to put an end to our great resources, recklessly spending not only our interest but also our princi-



A hundred acres of good land made worthless by flood. Orchards smothered and fence posts covered by sand.

pal. We have not even left unscathed the pleasant land. Not only are we using up at mad speed the natural products of the soil, but also are using up *the soil itself*.

If you think that the soil is exhaustless, or that it can be replaced, it might behoove you to take a homœopathic dose of geology and also take another guess. Mr. Roosevelt and most of the Congress of the United States would like to have us all take the trouble of studying the ground we stand on. Mr. Roosevelt's recent message asked us to pass our bankbooks in at the window for a balance. It is an unpleasant thing to do. There are always so many more vouchers out than we thought. The balance is always so much smaller than we thought, and the bank has

such an unpleasant way of being right in its figures. Yet the time has come for a show-down between the American people and America itself.

Out on the Blackfoot Reservation there stands a tall, lone mountain, rising like a monument above the surrounding plain, and nearly detached from the Rockies, which lie behind it. This peak the Indians call Chief Mountain. Here the Blackfoot sometimes comes to pray. In his mysticism his prayer runs:

“O Thou, at whose feet the buried years lie fallen!” That is to say, there is in his mind the thought of the slow forces of Nature. He reverences the idea of erosion. He would understand and not forget that hymn if he sung it, which in effect tells us that all we have in this world comes of the relations of soil and water. There will be a few million American farmers who will learn that same truth some time. The somewhat mad and drunken American people have ignored and inverted that truth heretofore. They have done all they could to go bankrupt, to ruin one of the richest portions of the earth’s surface, one of the pleas-



Wasted country, caused by removal of forest cover. Heavy rains wash the soil away, down to naked rock. The river channels are clogged and this region is useless, lost to the world.

antest lands ever taken over for human habitation, one obviously intended by the Great Forces as the place for the development of the highest form of civilization and the most splendid flowering of human endeavor.

What is the pleasant land, and where does it come from? Of course, the average man supposes that the soil was always there, like Uncle Joe Cannon, Niagara Falls and the tax deficit; but, as a matter of fact, the soil grew. In that vast story the action was rather more deliberate than

that of a vaudeville sketch. Geology is not dramatic in that neurotic sense of the word which customarily we employ to-day. Yet you and I, and this country and other countries, are figures in the great drama. It might not harm us to note what a leading scientist says as to the time of the action of the play:

“For average rock, under ordinarily favorable conditions in our range of climate, the usual estimate has been a foot of waste in four thousand to

As a result of deforestation of the hills above a little stream swells to a torrent like this. The rich bottom land is carried away, leaving only rocks and gravel behind.

six thousand years, which includes the channel cutting and bank undermining. These are too rapid for ordinary soil-waste under our normal natural conditions. Without any pretensions to a close estimate, I should be unwilling to name a mean rate of soil formation greater than one foot in ten thousand years on the basis of observation since the glacial period. I suspect that, if we could positively determine the time taken in the formation of the four feet of soil next to the rock



Farm land destroyed by gullies and sandbars from freshet. The farm was abandoned in consequence.

over the average domain where such depth obtains, it would be found above rather than below forty thousand years. Under such an estimate, to preserve good working depth, surface wastage should not exceed some such rate as one inch in one thousand years. When our soils are gone we too must go, unless we shall find some way to feed on raw rock or its equivalent."

So there is something in the story of the pleasant land. Search all the dictionaries through, comb out all the rhetoric books, and you couldn't get a happier phrase than that: "The pleasant land." It is excellent. It is perfect. Like any other savage, you feel a deep thrill of delight when you see the vast pictures of the unhurt out-of-doors. You have delight in the sight of green trees, of growing grasses and nodding flowers. This panorama of hill and dale, of rolling lands and forest-covered valleys and lofty mountains pleases you. Why? It is because all this was laid out in the intent of Nature to *produce* you and me and *support* us. It is beautiful in the beauty of utility. It is laid out on precisely the right lines to keep up the balance of the aforesaid little drops of water and little grains of sand, of which the one supports the other in the making of this pleasant land. It got its contours out of that balance. We grew out of the contours. This vast and splendid landscape is the portrait of our mother. We forget the hymn about it. Like a weak, irritable, nasty-tempered child, we strike the great Mother in the face, presuming on her vast indifference or her vast pity. And all the while Man is only the last animal that has been invented, and some time there will be a successor for him. If we destroy the soil we hasten that day when the successor shall come. Now the undeniable truth is that we are spending more than our inch of soil per thousand years.

Civilized man, money-mad business man, crazed man, average man, is doing all he can to destroy the balance between the little drops and the little grains. Not only is he doing all he can to invite the successor of man in the scheme of life, but he is hastening all he can that incidental intermediate thing—to give it, perhaps, the only interesting form into which the statement can be put in the terms of commercial To-day—the show-down between the American standard of living and that of other peoples who never had so big a bank account as ours, and who, therefore, learned to save.

This hymn of the soil is the one great hymn. It sings of the one great heritage of life. We speak of this or that man "owning" thus or so much of the earth's surface. That, of course, is impossible. He takes it or borrows it, perhaps, but he can own no more than six feet of it, and that only for a short time. The soil belongs to Life. The "buried years" resent any embezzlement of our great heritage. The soil is owned by plants, by animals, by men of this or that nation, this or that

age, that past, yonder future. If we sin against the soil, ours will be the Great Punishment—which is to say, extinction, oblivion. If you plow badly, it is you for the star-dust!

Even before Wall Street was invented there was more water than anything else in the world. Finally, on the little crust of land some tiny plant began to grow, no one knows just when. Perhaps at one time the plant could not have told whether it was a plant or an animal, but, anyhow, in time it turned into some green thing which looked tempting to some old Ichthyosaurus, and the latter, of a pleasant spring morning, while tired of eating salt stuff and canned goods, crawled up out of the water and made a meal on the first recorded salad. It looked good to



The soil of a whole valley washed away by a freshet. Observe the little island of good land left in the midst of a hopeless waste of cobbles.

him and he came back. Other members of the Saurus family got on to the snap and also came up out of the water, all sorts of long-tailed and long-billed creatures, which, to make the story short, in time became land animals. All these animals in the original balance of things not only used that land, but helped to extend its total salad-producing acres. They trampled, they spread seeds, they increased the soil products. Vegetable mould increased. The little drops of water fell on it, and plants grew again on the pleasant land. The Saurus family moved in and permanently frequented the head lettuce, cabbage and turnip greens of that day.

All went merry as a marriage bell, until, in time, Man came along. The old ways did not suit him. He began to farm, at first by means of a

crooked stick, and at last by means of the Harvester Trust. Incidentally, he forgot all about the buried years, and, with a skill and speed and malice which would have caused any self-respecting Saurus to blush with shame, did all he could to wreak destruction upon the forests of the earth, on the mines, on the waters, and on the soil itself. He overdrew his bank account, more in America than ever has been known in all the long, slow history either of the world or of the earth.

It would not be worth while to make here merely a series of sweeping general statements, or to make statements not definitely understandable. As it happens, the chapter and verse are ready at hand. It is entirely feasible not only to recognize the waste in American soil, but to measure



What happens when the wooded cover is removed from the land. Erosion sets in; and the land turns a bare, unsmiling face toward the sky. Vegetation can get no foothold. The world has lost some of its power to feed its people.

it. The late Professor N. S. Shaler estimated the destruction of agricultural lands, chiefly through old-field erosion, in the southern Atlantic and Gulf States at several thousand square miles; and in portions of this regions the waste involves a complete removal of a superficial geologic deposit, well adapted to forming a productive soil, from underlying older formations ill suited to the development of fertile soils and sub-soils; in which case the loss is irremediable.

Other estimates of soil-waste rest on the determination of soil-matter transported by our running waters. The most extensive measurements of this kind were those of Generals Humphreys and Abbott, made on the Mississippi over half a century ago. These showed that the Mississippi then carried annually into the Gulf something over four hundred million

tons of solid matter, in addition to great quantities of earth-salts, carried in solution, and of sand or other coarse material rolled or swept along the bottom.

At the time of these determinations settlement in the Mississippi Valley was comparatively limited, and, as shown by local observations on different rivers, the effect of extending agriculture has been to *increase* the soil-matter carried by the Mississippi *fully twenty-five per cent*; while comparative determinations made on several other streams indicate that the rivers of the country outside of the Mississippi basin carry into the sea about as much soil-matter as the great river itself—that is, that the annual soil-wash of the United States aggregates fully one billion tons! Our balance of trade is going some, isn't it? Also, unfortunately, our soil, which raised that balance of trade, is going some.

A fraction of the matter transported by the waters is coarse (sand and gravel), but fully ninety per cent consists of rich soil-stuff washed from the surface or leached from the subsurface of fields and pastures and (in less degree) of woodlands. Reckoned on the basis of value as fertilizer, the material could hardly be appraised at less than one dollar per ton; so that the annual loss to the agricultural interests of the country can hardly fall short of a billion dollars—equivalent to an impost as great as most other taxes combined, and one yielding *absolutely no return*. It is worse than that. Most of us have known stocks to pass a dividend. How would we feel if the whole stock and everything back of it were wiped out? What would we think of the management that allowed such an event to happen? But this is happening, and under our own management.

The foregoing are estimates made by a United States soil expert. Other competent Government authorities can offer us definite food for additional thought, if we care to hearken. The greatest loss of our soil, we are told, is from *preventable* erosion. The total soil-wash of the country is a billion tons a year. This would make a pile of adobe as high as the Washington Monument and a *mile long* on each of the four sides! Cleared and plowed lands, the source of food products, are the ones which suffer.

Most of the soil-wash—at least seven hundred and eighty-five million tons every twelve months, probably—is dumped into the ocean and lost forever. This would fill four channels as big as the Panama Canal, according to the original specifications. So says the cold-eyed soil expert.

Four hundred million tons of soil are washed from the borders of the Mississippi and Missouri rivers and their tributaries every year and poured as mud into the Gulf of Mexico. So says the wild-eyed Washington statistician.

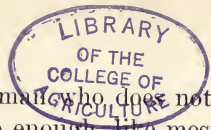
Muddy waters carry more impurities than clear, and so endanger health more. They have greater power for cutting away the banks of streams. Deposits in the channels, drifting sand-bars and changing courses are caused entirely by *silt in muddy streams*. Had you ever thought of that? Read the hymn backward. Thrown out of balance, water and sand *un-*make the pleasant land.

From the State of Missouri alone enough soil is carried away annually to make a prism one mile square and six hundred feet high. The Missouri River bears into the Mississippi every twelve months enough earth to make a mud-pile a mile square and four hundred feet high. The billion tons of soil which are washed away every year would spread a layer like Nile mud over Indiana, Illinois or Iowa. But what good does it do buried in the depths of the mighty ocean? It may help some future Saurus family, but it won't help yours.

Whole towns have been washed away by the change of currents in silt-laden streams. In some neighborhoods an entire farm has been taken up and carried across to the other side of a river. Within the past year the town of Pine Bluff, Arkansas, was threatened with destruction, many of the buildings toppling over into the turbid flood.

Bad plowing is the cause of a great deal of soil-waste. The farmer of America each year digs a Panama Canal with his little plow. Each year he digs out of the heart of his little forty, eighty or one hundred and sixty acres of land a block of dirt really bigger than the entire cut of the whole Panama Canal. The riches of his farm take wings. He did not see them go. He does not understand that he is literally plowing his farm into the mighty ocean. Not only do we waste, *but that waste accelerates each year*. That is the horrible feature of all these resource-wastes—they increase geometrically with awful swiftness. The buffalo went “all at once.” The trees, the fish, the ore, will go “all at once.” We do not like high prices, but higher prices than we now can dream are coming to us Americans unless we can get down to a practical basis on religion, politics and business—unless we can understand that little old hymn we used to sing.

When ax and plow work together as agents of destruction and not as creative influences, then we are not using good business sense. Yet that is what we have done—ripped the covering from the soil, and then ripped off the soil itself. In that way we destroyed a primary value. In that way, also, we raised the price, cut down the supply of food, of clothes, of habitation, for the average man. The average American has let a few men steal him blind, and now he is stealing himself blind. The soil is the connecting link between organic and inorganic life. It is the foundation of organized society and of all civilization. It is not only our bank account, but more—it is the place where all the bank accounts come from.



Any man who touches the soil, and even the city man who does not, ought to understand it. The main truths are simple enough, like most big things. It is easy to see that depth of soil, and therefore richness in product, is inverse as to slope, because the soil washes thin on the hill-sides and runs thicker on the flat. Therefore, on the flats it raises more vegetation, which in turn furnishes more mulch, which in turn holds more moisture, which in turn produces more vegetation. The great circle of the conservation of forces is a simple and beautiful thing.



A truck garden ruined by flood. The fertile soil carried away, leaving gullies in some places and great piles of driftwood and gravel in others.

Slope, water supply, organic action, all these govern soil as in the days of the Saurus family. That is the Hymn of Life. Good plowing is good religion. Good politics is good religion. Good business is good religion. Good geology is good religion, too, and the circle runs around and around, beautiful and complete, if only we care to look at it in that way.

When the Government gets the little drops of water regulated in Wall street, and when we begin to understand the relation of those little drops and little grains on our farm, we shall begin to see in America the arrival of a golden age, one of growth in art, in beauty, in mentality, in altruism. Even at this stage of our development we ought to have

intelligence equal to that of the average Ichthyosaurus. What Uncle Sam is trying to show us is, that without water there is no civilization, and that without proper relation of water and soil there is industrial anarchy. Bad handling of water means less crops, less soil, more polluted streams, more choked up channels, more floods, more waste and ruin, the balance of things thrown out of plumb, and the world literally turned upside-down. The Hymn of Life is one which in time the great Teacher of the Universe is going to force us to remember, whether we



A rich, alluvial farm, destroyed by a freshet.

wish to remember it or not. It is not Washington, but the Universe, which is handing a message to us.

What, then, ought we to do to get out of the Ichthyosaurus class and to give our beneficent protective tariff something to protect? In the first place, it is not up to Uncle Sam, but up to us. Louis XVI. said, "The State, it is myself!" That was in France, and some time ago. The State, it is ourselves, here in America. The remedy does not begin with your neighbor, but with yourself, and with you it begins as soon as you realize that no bank account will stand perpetual checking against it. Uncle Sam is willing to help any one of us begin the study of the soil to-day.

The soil experts of the Government are no more able to classify farms than the average farmer—every farmer knows that there may be heavy, sticky soil; thin, light, sandy soil; clay soil; open and friable mould. Any farmer knows that the great idea is to retain the natural moisture under the soil and not let it run off on the surface. The experts show that deep plowing is a good thing in certain soils, to get the water down into the earth. If the land is very flat, deep tilling may be necessary to get this surplus water out, so that the soil may drain dry and disintegrate. Most farmers know that, in a general way; but Uncle Sam can teach the average farmer a wrinkle or so as to the right balance of the little drops and the little grains.

On the hillsides which wash so badly, the soil expert says, we ought to study contour farming, as it is called. A vertical or slanting furrow will soon become a vertical gully. The horizontal furrow at the same elevation all around the hill has, on the other hand, a tendency to stop the running off of water. Great benefit, also, comes from using strips of grass land, lying in bands of the same elevation around the sides of a dangerous hill. Terracing of farms is new in this country, where we have always just gone West instead. We see the terraces of Chinese and Japanese lands, and suppose they must have been made at the expense of great labor, but in reality it was Time and Nature that made them. The soil which is washed out of the horizontal furrow is in part or in whole stopped when it strikes the edge of the grass land. In many years it banks up more and more. If not controlled it would not bank up, but simply run down the hill and fly away into the mighty ocean.

In rolling lands the canny farmer plants crops toward the tops of the hills to produce cover and mulch, and so to stop wash. He reserves some of his bottom lands for grass, to catch the soil-wash and use it. If he did not, some of his farm would run away, and not only impoverish him, but, perhaps, work injury to his neighbor. It is not good farming to farm every inch of a rich bottom. A few bands of trees would break the driving force of rain. The roots would stand against soil-wash and regulate the flooding which make bottom farming so risky in some localities. The average farmer may not believe in the sense of this, any more than the average lumberman would hesitate to cut away the forest; but the fact remains. Of course, in any very broken country, so says Uncle Sam, there should be forestry mixed with farming; otherwise, the rainfall goes off in torrents. Even Uncle Sam sometimes forgets this, for, after establishing forest reserves, he very often leases them out as sheep or goat ranges. These animals trample little paths, which soon become gullies, which, in their time, become great avenues of waste. I have seen mountains in New Mexico ruined by goats.

For fuller particulars, any anxious inquirer might do much worse than refer to the Department of Agriculture, where many of these great, slow problems are now under careful consideration. As to actual remedy, however, nothing can be done so long as we ourselves remain ignorant or careless in politics, religion and business. We must see higher than the walls of our little grooves. Also, we must see about us in our own little grooves. Waste begins on your own forty acres, right at your door. You are the unit, the individual citizen. From you it is a step up to your hundred, under the old Saxon law. Thence you go to your town, your State, your National Government. Your wish can prevail, if you like, at each and every step of that advance. You can say to that legislator who thinks of himself and not of you, that you would rather have in his place a man who stands for guarded resources, for large reserves of forests, rich soil, a proper water flow, an unimpeded navigation, for fair play all along the line. It all begins with you and me. We have a good country and a good government, but they won't run themselves. The reform of a great many things begins away this side of Washington, District of Columbia. Some of it can begin in the caucus, or the primary, or the forty-acre field. Common-sense and enforced laws now, or the piper to pay after a while—which is better?

At our present nice little industrial gait, here in America, we are burning the candle at both ends, quite regardless of the fact that when it is burnt out, it can never be renewed. Such American fortunes as were made out of theft of America's common resources must surely, one day and in some way, pay the price. But let us little fellows who have not "succeeded" in the world see to it that we keep our own hands clean.

This was a very wonderful and beautiful country. Having seen it before civilization took it all over, perhaps, some of us do not care so much for civilization as we might.

Perhaps some of us would rather be Indians and pray to Chief Mountain, or would rather have been members of the Saurus family, before there was any such thing as taxes and when potato salad was free. Yet here we are, each in his little groove, and, if we have to play the game, we ought to understand the game and know what the game is about.

At least one truth is, we don't own the soil. We borrow it. We ought to hand it over to the successor of our species in as good condition as when we asked the loan. The Saurus family played the game as fair as that with us; and the finest Sauri in the world were raised right here in the United States. Perhaps they didn't forget the hymns they sang.

OUR WATER POWER.

Unquestionably California's greatest asset is her water power.* Every year the big, round sun lifts millions of tons from the waters of the Pacific, to be carried eastward by the winds and sprinkled upon ten thousand hills and valleys in the highlands of the Sierras. Slowly it trickles downward, returning to the sea. It is gathered into rivulets, brooks, torrents, that dash faster and faster down the deep canyons and steep gorges in the western flanks of the mountains. More and more we are learning to use the power of these millions of tons as they descend from highlands to lowlands. This power is destined to be the greatest single element in the future development of the State. It is destined to turn the wheels of industry, transport people and products, light and warm the homes of the whole State. It will be an absolute necessity to life and prosperity when oil and coal are gone. Those who control it will be the lords and rulers of mankind.

Up to date our stupid laws give away this precious power forever to any one who wants it, and give him all that he wants, however much—for nothing! Thus we part with our great-grandchildren's birthright, and do not even get a mess of pottage in return. The descendants of us who foolishly part with this power now will pay tribute for centuries to the descendants of the men who get it. These Power Lords will rule over the lives and fortunes of the millions of vassals who must have the Power in order to live.

This Power should be leased, never permanently disposed of. Its title is not rightly vested in us at all. It belongs to the Future. It should never be granted to any one in perpetuity, but for a term of years, a century, if need be; but in perpetuity, never. [E. H.]

“BLIND MOUTHS.”

An editorial from *Century Magazine*, November, 1907. It is a very fine example of scholarly modern English.

Literature is full of trenchant expressions of the recklessness of greed, such as “After us, the deluge!” “Devil-may-care” and “Out of sight, out of mind”—but none of them compares with the lightning-like revelation of selfishness made by these two words of Milton's. Conveying, as they do, the sense of an all-consuming appetite, the very maw of darkness, they would seem to have come from the poet's vituperative prose, rather than from the flowing elegy of the gentle Lycidas.

“What has posterity ever done for us that we should do anything for posterity?” is a saying as striking for the falsity of its suggestion as for the edge of its wit. The most obvious material and natural reasons impel us to work for posterity. Our happiness consists largely in procuring the happiness of our children and our grandchildren, whose happiness in turn will consist in the happiness of *their* children

and grandchildren. However attenuated this altruistic sentiment may become with further extension, it is enough for practical purposes if it shall reach forward four generations. We bless our ancestors for the building of roads and the planting of trees, and it is what posterity will do for us in the way of benediction that rightly animates any one above the beasts. Indeed, it is hardly too much to say that civilization itself lies in the fact—and to the extent—that “out of sight” is *not* “out of mind.”

* * * * *

It is with the conservation of the forests that we are here concerned, for without them there would be far less range to administer. Until 1890 our land policy was all steam and no brake. Under a false individualism, due to consideration for the bona fide settler and the Civil War veteran, the larger interests of the region, which included their interests, were forgotten. Recklessness and waste were rampant. By false entries, bribery, and local terrorism millions of acres were acquired and held by individuals and corporations, and what was intended for the homemaker fell into the grasp of commercial exploiters, whose operations have not only left trails of devastation, but have poisoned the politics of many states.

During Mr. Harrison's administration * * * came a new policy. By a legislative provision, passed March 3, 1891, the President was authorized to withdraw from public entry and set apart and reserve in any state or territory such portions of the public lands as might in his opinion be desirable for the preservation of the forests and waters. Then began a campaign of education throughout the country so continuous that he must be ignorant indeed who does not know the impressive reasons why the upland forests must be preserved. The lingering tragedies of those Mediterranean countries—Greece, Italy, France, Spain, and the African coast—which permitted wholesale destruction of their forests, have been rehearsed for our warning

Till old Experience do attain
To something of prophetic strain,

while the success of the present far-sighted policies of Germany, France, and other countries have been cited for our encouragement.

* * * The walnut and white pine of the Lake States are virtually exhausted; the leather trust is everywhere decimating the hemlock for tanbark, while the soft woods, saplings as well as larger growth, are being indiscriminately devoured by the pulp mills. Meanwhile, the senseless tariff on lumber tempts the rich companies to further depletion of our resources, rather than permit the builder to buy in the cheaper and inexhaustible market of Canada. Could folly further go?

Reversing the witticism, let us ask, What has posterity ever done to us that we should do such things to posterity?

WHEN THE FORESTS ARE GONE.

Teachers of geography and others interested in such matters will find a wealth of good material in a large volume by George P. Marsh entitled **THE EARTH AS MODIFIED BY HUMAN ACTION**. The following paragraphs give a vivid idea of conditions in certain parts of France. It is the part of wise people to profit by the experience of others, to take warning from others' misfortunes.

“When the forest is gone, the great reservoir of moisture stored up in its vegetable mould is evaporated, and returns only in deluges of rain to wash away the parched dust into which that mould has been converted. The well-wooded and humid hills are turned to ridges of dry rock, the débris from which encumbers the low grounds and chokes the watercourses, and—except in countries favored with an equable distribution of rain throughout the seasons, and a moderate and regular inclination of surface—the whole earth, unless rescued by human art from the physical degradation to which it tends, becomes an assemblage of bald mountains, of barren, turfless hills, and of swampy and malarious plains. There are parts of Asia Minor, of northern Africa, of Greece, and even of Alpine Europe, where the operation of causes set in action by man has brought the face of the earth to a desolation almost as complete as that of the moon; and though, within that brief space of time which we call “the historical period,” they are known to have been covered with luxuriant woods, verdant pastures, and fertile meadows, they are now too far deteriorated to be reclaimable by man, nor can they become again fitted for human use.”

“The Alps of Provence present a terrible aspect. In the more equable climate of northern France, one can form no conception of those parched mountain gorges, where not even a bush can be found to shelter a bird, where, at most, the wanderer sees in summer here and there a withered lavender, where all the springs are dried up, and where a dead silence, hardly broken by even the hum of an insect, prevails. But if a storm bursts forth, masses of water suddenly shoot from the mountain heights into the shattered gulfs, waste without irrigating, deluge without refreshing the soil they overflow in their swift descent, and leave it even more seared than it was from want of moisture. Man at last retires from the fearful desert, and I have, the present season, found not a living soul in districts where I remember to have enjoyed hospitality thirty years ago.”

“It is certain that the productive mould of the Alps, swept off by the increasing violence of that curse of the mountains, the torrents, is daily diminishing with fearful rapidity. All our Alps are wholly, or in large proportion, bared of wood. Their soil, scorched by the sun of Provence, cut up by the hoofs of the sheep, which, not finding on the surface the grass they require for their sustenance, gnaw and scratch the ground

in search of roots to satisfy their hunger, is periodically washed and carried off by melting snows and summer storms.”

“I will not dwell on the effects of the torrents. For sixty years they have been too often depicted to require to be further discussed, but it is important to show that their ravages are daily extending the range of devastation. The bed of the Durance, which now in some places exceeds a mile and a quarter in width, and, at ordinary times, has a current of water less than eleven yards wide, shows something of the extent of the damage. Where ten years ago, there were still woods and cultivated grounds to be seen, there is now but a vast torrent; there is not one of our mountains which has not at least one torrent, and new ones are daily forming.

“In the days of the Roman Empire the Durance was a navigable, or, at least, a boatable, river, with a commerce so important that the boatmen upon it formed a distinct corporation.

“Even as early as 1789 the Durance was computed to have already covered with gravel and pebbles not less than 130,000 acres, which but for its inundations, would have been the finest land in the province.”

BEFORE AND AFTER.

Last summer I went back to visit my boyhood home in Ohio, after an absence of thirty years. One of the most striking changes in the landscape was in the *roofs* of the buildings. They were nearly all of slate instead of shingles. A shingle roof was a sign that the house was a very old one. Even the chicken houses and barns and woodsheds were roofed with slate.

For why, wooden shingles had grown so high priced that slates could be brought from a distant state to compete with them; and the shingles were all made of such knotty, brash, inferior lumber that they rotted away in a short time and were not worth putting on.

Looking further, it was plain that in thirty years the state had changed from a country of wood to a country of clay. Bricks were the universal building material. Tiles were used where bricks were impossible or undesirable. Ceramics was the most important industry of the state. The lumber is gone! The wood is no more! The trees are gathered to their fathers!

I gazed in astonishment at a vast old oaken barn that had been in the scenes of my childhood; and talked with the gray-headed patriarch who owned it. Its sills were beams of solid oak, 24 and 26 inches square, 30 and 40 feet long, and there were scores of them. Away up, high above the tall haymows, were plates and beams by hundreds, all of sound old oak and each big enough for the foundation of a great building. The whole state now would be raked in vain to find the timber

for that one barn. The lumber in it would be worth a huge sum now. But the old man told me it had all been cut from the choicest trees of one field, right there—and I looked afar over a bare and treeless plain.

And all Ohio was one great, shaggy forest, only a hundred years ago—dense forests of splendid hardwoods, walnut, hickory, oak, ash, maple, beech, sycamore, poplar. It was *inexhaustible*. The strong and hardy pioneers worked like slaves early and late to cut, burn, clear the land. They were sure the forests would last till the crack of doom.

Only a hundred years have passed; yet the country is bare; and every springtime now we read of the devastating floods of the Ohio; and the soil of the fertile farms continually goes to feed the yellow tides.

[E. H.]

A NEW PATRIOTISM.

This article from the World's Work Magazine is certainly worth thoughtful reading by all Americans. Don't fail to note its fine, patriotic spirit. It is by Gifford Pinchot, who has had every opportunity for twenty years to know whereof he speaks. It is said that he accepts no salary for his work as chief forester of the United States, but turns it back into the treasury for the good of the cause, and devotes the best years of his life to a labor of love.

The people of the United States are on the verge of one of the great quiet decisions which determine national destinies. Crises happen in peace as well as in war, and a peaceful crisis may be as vital and controlling as any that comes with national uprising and the clash of arms. Such a crisis, uneventful and almost unperceived, is upon us now, and unwittingly we are engaged in making the decision that is thus forced upon us. And, so far as it has gone, our decision is wrong. Fortunately, it is not yet final.

The question we are deciding with so little consciousness of what it involves is this: What shall we do with our natural resources? Upon the final answer that we shall make to it hangs the success or failure of this nation in accomplishing its manifest destiny.

Few Americans will deny that it is the manifest destiny of the United States to demonstrate that a democratic republic is the best form of government yet devised, and that the ideals and institutions of the great republic taken together must and do work out in a prosperous, contented, peaceful, and righteous people; and to exercise, through precept and example, an influence for good among the nations of the world. That destiny seems to us brighter and more certain of realization to-day than ever before. It is true that in population, in wealth, in knowledge, in national efficiency generally, we have reached a place far beyond the farthest hopes of the founders of the republic. Are the causes which have led to our marvelous development likely to be repeated indefinitely in the future, or is there a reasonable possibility, or even a probability, that conditions may arise which will check our growth?

Danger to a nation comes either from without or from within. In the first great crisis of our history, the Revolution, another people attempted from without to halt the march of our destiny by refusing to us liberty. With reasonable prudence and preparedness we need never fear another such attempt. If there be danger, it is not from an external source. In the second great crisis, the Civil War, a part of our own people strove for an end which would have checked the progress of our development. Another such attempt has become forever impossible. If there be danger, it is not from a division of our people.

Our Third National Crisis.

In the third great crisis of our history, which has now come upon us unawares, our whole people, unconsciously and for lack of foresight, seem to have united together to deprive the nation of the great natural resources without which it can not endure. This is the pressing danger now, and it is not the least to which our national life has been exposed. A nation deprived of liberty may win it, a nation divided may reunite, but a nation whose natural resources are destroyed must inevitably pay the penalty of poverty, degradation, and decay.

At first blush this may seem like an unpardonable misconception and over-statement, and if it is not true it certainly is unpardonable. Let us consider the facts. Some of them are well known, and the salient ones can be put very briefly.

The five indispensably essential materials in our civilization are wood, water, coal, iron, and agricultural products.

We have timber for less than thirty years at the present rate of cutting. The figures indicate that our demands upon the forest have increased twice as fast as our population.

We have anthracite coal for but fifty years, and bituminous coal for one hundred.

Our supplies of iron ore, mineral oil, and natural gas are being rapidly depleted, and many of the great fields are already exhausted. Mineral resources such as these when once gone are gone forever.

We have allowed erosion, that great enemy of agriculture, to impoverish and, over hundreds of square miles, to destroy our farms. The Mississippi alone carries yearly to the sea more than 4,000,000,000 tons of the richest soil within its drainage basin. If this soil is worth a dollar a ton, it is probable that the total loss of fertility from soil-wash to the farmers and forest owners of the United States is not far from a billion dollars a year. Our streams, in spite of the millions of dollars spent upon them, are less navigable now than they were fifty years ago, and the soil, lost by erosion from the farms and the deforested mountain sides, is the chief reason. The great cattle and sheep ranges of the West,

because of over-grazing, are capable, in an average year, of carrying but half the stock they once could support and should still. Their condition affects the price of meat in practically every city of the United States.

These are but a few of the more striking examples. The diversion of great areas of our public lands from the home maker to the landlord and the speculator, the national neglect of great water powers, which might well relieve, being perennially renewed, the drain upon our non-renewable coal; the fact that but half the coal has been taken from the mines which have already been abandoned as worked out and in caving-in have made the rest forever inaccessible; the disuse of the cheaper transportation of our waterways, which involves but little demand upon our non-renewable supplies of iron ore, and the use of the rail instead—these are other items in the huge bill of particulars of national waste.

The Disregard of the Future.

We have a well-marked national tendency to disregard the future, and it has led us to look upon all our natural resources as inexhaustible. Even now that the actual exhaustion of some of them is forcing itself upon us in higher prices and the greater cost of living, we are still asserting, if not always in words, yet in the far stronger language of action, that nevertheless and in spite of it all, they still are inexhaustible.

It is this national attitude of exclusive attention to the present, this absence of foresight from among the springs of national action, which is directly responsible for the present condition of our natural resources. It was precisely the same attitude which brought Palestine, once rich and populous, to its present desert condition, and which destroyed the fertility and habitability of vast areas in northern Africa and elsewhere in so many of the older regions of the world.

The conservation of our natural resources is a question of primary importance on the economic side. It pays better to conserve our natural resources than to destroy them, and this is especially true when the national interest is considered. But the business reason, weighty and worthy though it be, is not the fundamental reason. In such matters, business is a poor master but a good servant. The law of self-preservation is higher than the law of business, and the duty of preserving the nation is still higher than either.

The American Revolution had its origin in part in economic causes, and it produced economic results of tremendous reach and weight. The Civil War also arose in large part from economic conditions, and it has had the largest economic consequences. But in each case there was a higher and more compelling reason. So with the third great crisis of our history. It has an economic aspect of the largest and most perma-

nent importance, and the motive for action along that line, once it is recognized, should be more than sufficient. But that is not all. In this case, too, there is a higher and more compelling reason. The question of the conservation of natural resources, or national resources, does not stop with being a question of profit. It is a vital question of profit, but what is still more vital, it is a question of national safety and patriotism also.

We have passed the inevitable stage of the pillage of natural resources. The vast wealth we found upon this continent has made us rich. We have used it, as we had a right to do, but we have not stopped there. We have abused, and wasted, and exhausted so much that there is the gravest danger that our prosperity to-day will have been made at the price of the suffering and poverty of our descendants. We may now fairly ask of ourselves a reasonable care for the future and a natural interest in those who are to come after us. No patriotic citizen expects this nation to run its course and perish in a hundred, or two hundred, or five hundred years; but, on the contrary, we expect it to grow in influence and power and, what is of vastly greater importance, in the happiness and prosperity of our people. But we have as little reason to expect that all this will happen of itself as there would have been for the men who established this nation to expect that a United States would grow of itself without their efforts and sacrifices. It was their duty to found this nation, and they did it. It is our duty to provide for its continuance in well-being and honor. That duty it seems as though we might neglect. Not in willfulness, not in any lack of patriotic devotion, when once our patriotism is aroused, but in mere thoughtlessness and inability or unwillingness to drop the interests of the moment long enough to realize that what we do now will decide the future of the nation. For, if we do not take action to conserve the natural resources, and that soon, our descendants will find them gone.

Let me use a homely illustration: We have all known fathers and mothers, devoted to their children, whose attention was fixed and limited by the household routine of daily life. Such parents were actively concerned with the common needs and precautions and remedies entailed in bringing up a family, but blind to every threat that was at all unusual. Fathers and mothers such as these often remain serenely unaware while some dangerous malady or injurious habit is fastening itself upon a favorite child. Once the evil is discovered, there is no sacrifice too great to repair the damage which their unwitting neglect may have allowed to become irreparable. So it is, I think, with the people of the United States. Capable of every devotion in a recognized crisis, we have yet carelessly allowed the habit of improvidence and waste of resources to find lodgment. It is our great good fortune that the harm is not yet altogether beyond repair.

The profoundest duty that lies upon any father is to leave his son with a reasonable equipment for the struggle of life and an untarnished name. So the noblest task that confronts us all to-day is to leave this country unspotted in honor, and unexhausted in resources, to our descendants, who will be, not less than we, the children of the founders of the republic. I conceive this task to partake of the highest spirit of patriotism.

LEARNING FROM HISTORY.

The following is an extract from a paper by A. B. Benton, before the Tri-counties Reforestation Committee, in Southern California. It certainly affords food for thought.

The editor of one of our great weekly journals has written: "Probably the works for which President Roosevelt will be longest remembered are his efforts for the conservation of our national natural resources."

The fountains must be renewed, the field must be planted, the fire must be checked, and by us or we will justly merit the contempt of mankind. We are not the first, but the last of the nations who have squandered their birthright. The splendid nations of old time, Egypt, Babylonia, Asia Minor, Greece, India, China; where our race began its career, where the arts and letters and commerce and architecture were born and flourished in glorious achievement for centuries and centuries—do you think their lands were sterile then? Do you conceive them as poorer in lavish gifts of nature than is our land? Do you suppose the teeming millions of their inhabitants so prospered in the deserts which we find there now? Believe me, the deserts there are of men's making, and their desolation was brought about by their own hands. We look on the poor ruins of these once mighty empires with a complacent pity, but I have little doubt that the spirits of the men of old, if they are cognizant of our doings, have greater reason for a scornful pity than have we, for they began civilization and had little before their time to take warning, while we, latest of all, I verily believe have been as reckless as any of the great nations, ancient or modern.

There are many, even in this day, who can learn nothing from history for their own profit. The world of men for thousands of years has been experimenting with civilization of higher and lower types. Enough of their experiences have been written to teach us every lesson we need to learn had we the wit to read them aright. The treasures of ancient and medieval research, their economics and philosophy have been opened to this age a thousand fold more widely than to any age whatsoever before us. If it, with the histories of the good and bad of all ages before it, not in dead languages, nor locked in secluded temples and cloisters, but in its living tongues, and in multiplied libraries—if, with all this

before it, it follows the blunders and mistakes and follies of the old ages because it will not see, and seeing learn, then our civilization deserves not only to perish as miserably as the most miserable failure of them all, but will richly merit the epitaph of Justice Dogberry to "be written down an ass!"

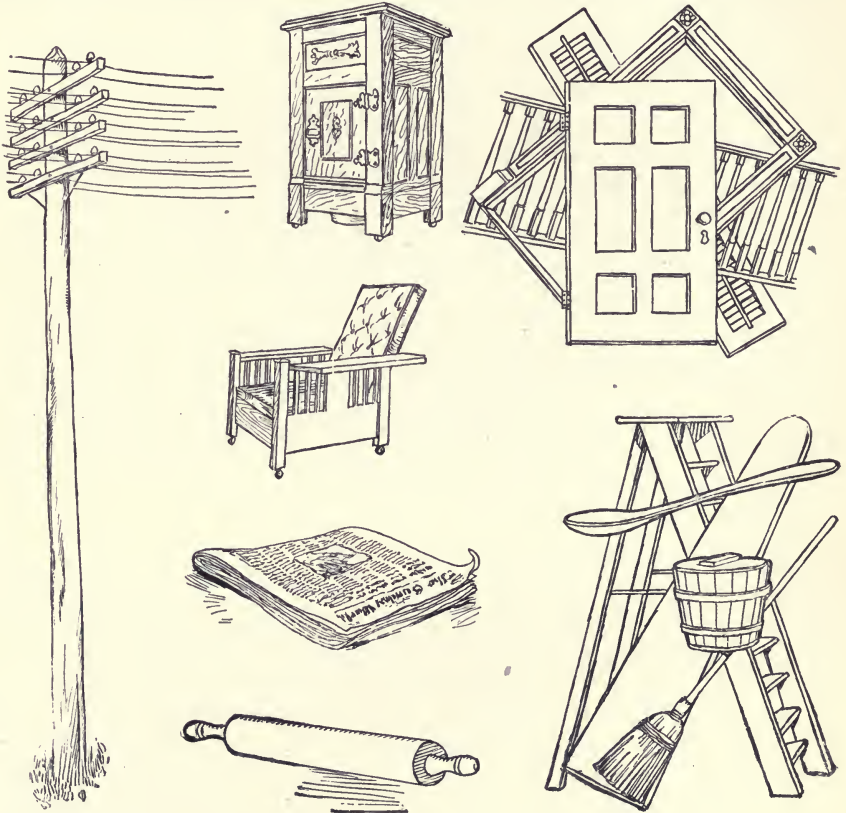
We voters of America are the bankers of the nation's resources. Infinitely more valuable is our trust than that of money, stocks or bonds, because once dissipated, it may not be replaced. If we are to preserve for our children the heritage we received from our fathers, we must alarm the people out of their thoughtless indifference. Public thieves must be punished, fires must be checked, individual rights must be purchased when demanded for the public good. Wantonness of waste by careless owners and destructive greed for immediate gain by selfish owners must be controlled. This is a mighty task, more difficult than some of the greatest our ancestors performed in the old days. But if it be not accomplished, the shame of defeat will rest on this generation, for this is preëminently our battle. We may not throw its burden backward to our fathers, or forward to our children. The former could not see its swift coming, the latter will have little to fight for if we fail in preserving for ourselves and them the resources by which only we or they can win continued prosperity.

THE CITIES, TOO.

The following appeared only a few days ago, an editorial in a San Francisco newspaper. The accompanying pictures show some of the common articles that must double, treble, quadruple in price as wood grows scarce.

The Government's efforts to save the country's forests are impeded by the fact that the city man, who holds the balance of political power, is apt to think that the woods have nothing to do with him. This is a mistake, of course, and is worth pointing out.

It is true that spinach and spring chickens do not grow on forest trees, and that such things come to the city market without much regard



to political opinions. But the preservation of the country's great natural resources of wood and stream is a political issue. And at this point our cockney ignorance and complacency need to be pierced by sane rays of light from the rural world.

In point of fact, the wood supply is next in importance to the food supply. It is probably more indispensable than the supply of iron or coal.

The cost of living—and consequently the standard of living to which city people of ordinary incomes can aspire—is seriously affected by the state of the wood supply.

In view of such considerations no San Franciscan should read with listless eyes such statements as those contained in a recent bulletin of the National Forest Service.

We learn by this document, for example, that an average American citizen uses up in a year seven times as much wood as a citizen of Germany. And we are told that Americans produce on an acre of woodland only a quarter as much as the Germans do.

We are assured by our Government experts that there is no natural reason why we shouldn't grow as good crops of trees in this country as are grown anywhere in Europe. And it is plain that the improvement and perpetuation of the wood supply is a matter of public education—in which city people are bound to bear a leading part.

SOME ASPECTS OF FORESTRY.

From Circular No. 140 of the United States Forest Service, by Treadwell Cleveland, Jr.

Many people in this country think that forestry had never been tried until our Government began to practice it upon the national forests. Yet forestry is practiced by every civilized country in the world, except China and Turkey. It gets results which can be got in no other way, and which are necessary to the general welfare. Forestry is not a new thing. It was discussed two thousand years ago, and it has been studied and applied with increasing thoroughness ever since.

The principles of forestry are everywhere the same. They rest on natural laws, which are at work everywhere and all the time. It is simply a question of how best to apply these laws to fit local needs and conditions. No matter how widely countries may differ in size, climate, population, industry, or government, provided only they have forests, all of them must come to forestry some time as a matter of necessity.

* * * * *

The countries of Europe and Asia, taken together, have passed through all the stages of forest history, and applied all the known principles of forestry. They are rich in forest experience. The lessons of forestry were brought home to them by hard knocks. Their forest systems were built up gradually as the result of hardship. They did not first spin fine theories and then apply those theories by main force. On the contrary, they began by facing disagreeable facts. Every step of the way toward wise forest use, the world over, has been made at the sharp spur of want, suffering, or loss. As a result, the science of

forestry is one of the most practical and most directly useful of all the sciences. It is a serious work, undertaken as a measure of relief, and continued as a safeguard against future calamity.

Roughly, those countries which to-day manage their forests on sound principles have passed through four stages of forest experience. At first the forests were so abundant as to be in the way, and so they were either neglected or destroyed. Next, as settlements grew and the borders of the forest receded farther and farther from the places where wood was needed and used, the question of local wood supplies had to be faced, and the forest was spared or even protected. Third, the increasing need of wood, together with better knowledge of the forest and its growth, led to the recognition of the forest as a crop, like agricultural crops, which must be harvested and which should therefore be made to grow again. In this stage silviculture, or the management of the forest so as to encourage its continued best growth, was born. Finally, as natural and industrial progress led to measures for the general



In the Sierra National Forest. The ranger's horses are waiting for their master. Notice the boards nailed on the trees high overhead. They mark the depth of the winter snows, and show which way to go when the landscape is smothered by its wintry blanket.

welfare, including a wiser and less wasteful use of natural resources, the forest was safeguarded and controlled so as to yield a constant maximum product year after year and from one generation to another. Systematic forestry, therefore, applied by the nation for the benefit of the people, and practiced increasingly by far-sighted private citizens, comes when the last lesson in the school of forest experience is mastered.

* * * * *

China holds a unique position as the only civilized country which has persistently destroyed its forests. What forestry has done in other

countries stands out in bold relief against the background of China, whose hills have been largely stripped clean of all vegetation, and whose soil is almost completely at the mercy of the floods. Trees have been left only where they could not be reached. Almost the sole use for lumber is the manufacture of coffins. The heavy two or three inch planks for this purpose are so scarce, and the cost of transporting them by coolies is so high, that they sell for \$2 or \$3 apiece.

Nowhere in the world is the forest cleaned off down to the very soil as it is in China. When the trees are gone, the saplings, the shrubs, and even the herbage are taken. Slender poles are used to build houses; inconsiderable shrubs are turned into charcoal. In the lower mountains of northeastern China, where the stripping process has reached its

extreme phase, there is no trace of anything worthy of the name of forest. In the graveyards and courts of the temples a few aged cedars have been preserved by the force of public opinion, and poplars and fruit trees planted about dwellings are protected as private property by the peasant owners.



In the Tahoe National Forest. The mountain meadows afford continuous pasture for many thousands of cattle under proper regulation. Thousands upon thousands of acres of the splendid pine forests about the lake have been cut down and carried down into the bowels of the earth in the mines of the Comstock Lode.

In the province of Shantung, where deforestation is practically complete, fuel and

fodder for cattle are literally scratched from the hillsides by boys who go out from villages with their iron rakes in autumn to secure winter supplies. Grazing animals, searching every ledge and crevice, crop the remaining grass down to the very roots.

A dearth of wood is not the only forlorn result of forest devastation; a dearth of water and the ruin of the soil follow in its train. In western China, where forest destruction is not yet complete, enough vegetation covers the mountains to retard the run-off of the rains and return sufficient moisture to lower levels, where it can be reached by the roots of crops and where springs are numerous. But on the waste hills of eastern China the rains rush off from the barren surfaces, flooding the valleys, ruining the fields, and destroying towns and villages. No water is retained at the higher levels, so that none is fed underground to the lower soils or to the springs. As a result, even on

the plains the water level is too far beneath the surface to be used. Without irrigation and the ingenious terracing of hillsides, by which the rains are made to wash the soil into thousands of miniature fields whose edges are propped up by walls, agriculture would be entirely impossible. Even irrigation calls for the immense labor of drawing the needed water from wells.



Logging under proper principles of forestry. The young trees are uninjured, the brush is piled for burning, some heed is taken to the future.

In a word, the Chinese, by forest waste, have brought upon themselves two costly calamities—floods and water famine.

WHY IS THIS?

As these words are written (January, 1909), the richest agricultural region of California is being devastated by flood. The Sacramento River stands over twenty-nine feet above low-water mark at the Capital of the State—the highest that it has ever been. The fertile islands in the vast delta of the Sacramento-San Joaquin river system are one by one going under the waves, although their levees are higher than ever before, although they were built up and patrolled and fought for with all the determination, enterprise, devotion that human nature is capable of. Tens of thousands of acres already are lost.

Why is this? Why should the waters be higher than ever before?

Is the rainfall greater? Is there more snow than in bygone years? No. The reason lies in the folly and improvidence of man. We cut and burn away the forest cover on the Sierras so that they can no longer hold back the waters for the summer streams. We wash the soil upon which our future prosperity depends into the channels of our rivers, choking them and raising them above the level of the land. [E. H.]

THE VITAL TRUTH.

Stewart Edward White, the noted writer of camping and outdoor stories, lives in Santa Barbara. Even his honeymoon was spent in the open, in a horseback trip through the high Sierras round about Mount Whitney. He has written a fine article for the American Magazine for January, 1908, under the caption THE FIGHT FOR THE FORESTS, from which the following is extracted, by permission.

“When a man makes his camp in the wilderness he hunts first of all two requisites. If they exist in abundance, he is happy and comfort-

able; if they lack, he must take his rest, and move on to more favored localities. These two requisites are wood and water.

And, curiously enough, these two necessities of man's abiding depend absolutely one on the other. Without rainfall the forests will not grow. Without the forests the rainfall is destructive, rather than beneficent. In a naked country—whether artificially or naturally so—the water comes in great torrential floods followed by droughts. A covering of forest, on the other hand, retains the rainfall as would a sponge, distributing it slowly through regulated streams, holding it back



How the forests hold back the water and check the floods and keep the streams from washing their banks away.

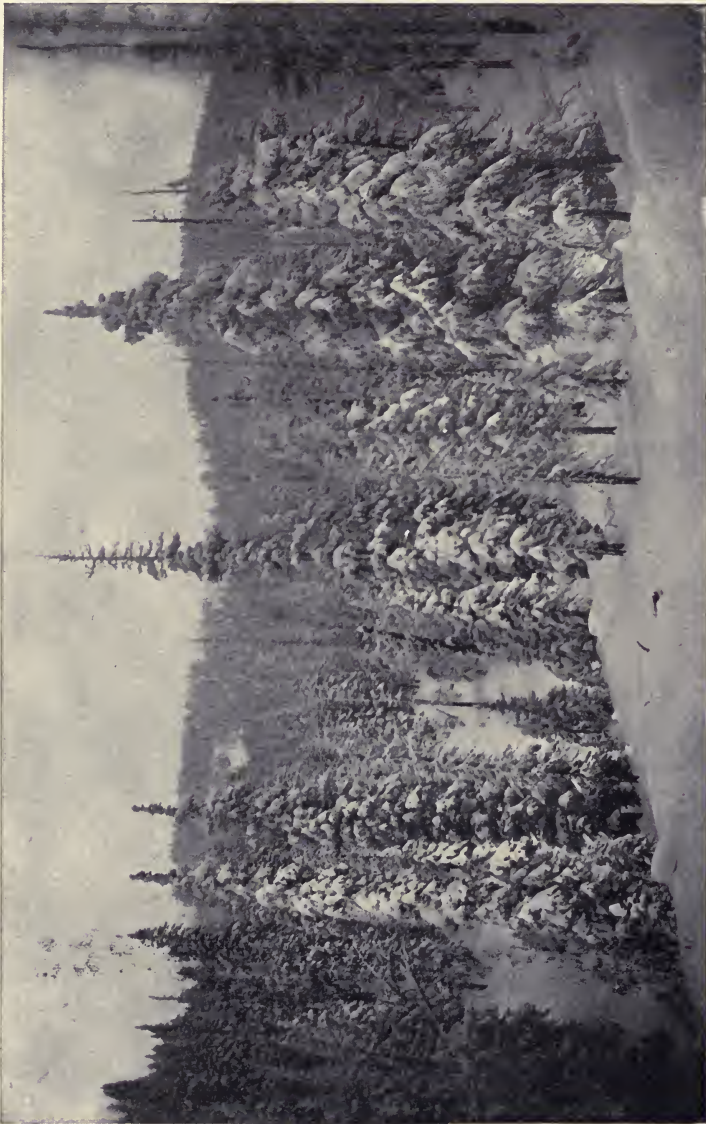


A hill that has lost its wooded cover, and is therefore losing its soil by erosion. Nothing here to check the floods, or hold back the life-giving water.



This mountain slope was logged over many years ago. Observe that it does not reproduce forest cover, but remains a bare, parched region, at the mercy of sudden flood and summer heat.

against the needs of the dry season. Wherever the forests have been cut away, we are treated each spring to destructive floods, as has been many times proven in the valleys of those great rivers draining the sites



How the forests of our high mountains hold the snow fall, preventing its sudden melting, to the destruction of the country below by flood.

of the old pine forests in the East. Contrariwise, in California, where the necessities of irrigation cause the people to pay great attention to such matters, it has been found by actual measurement that the stream-flow has increased twenty-five per cent since the establishment of efficient protection for the forest cover.

Since these things are so, it follows naturally that sooner or later nations would see through the haze of immediate expediency to the vital truth, forced home boldly on the individual camper. From this realization would come a system of forestry.

In Switzerland we find the earliest intelligent treatment of the question. Switzerland's mountainous situation would have rendered her peculiarly liable to complete extinction by flood, avalanche and the erosion of the agricultural soil, once the natural protection was removed. But to-day Switzerland is prosperous and very much alive. Over one thousand years ago she possessed a forest system, and had developed a scientific forestry by the fifteenth century. As early as Louis XIV. France awoke to the fact that her forests and her life were draining away together. But it was too late. To-day she is spending \$34 an acre to reforest her watersheds. The same experience is costing Italy \$20 an acre. Italy is not a wealthy nation; yet she is appropriating cheerfully this enormous sum in the realization that on it depends the question as to whether or not she will have to strike her tents. If we of the United States were called upon to replace at even Italy's figure the trees now growing on the watersheds protected by our reserves, we should have to spend about three billion dollars!

Only a few years ago the forest was our enemy here in America. Every step of the way must be cleared by the pioneer's axe and guarded by his rifle. A tree was a foe to be got rid of as expeditiously as possible. To ingrained and inherited hostility succeeded indifference, which is but just beginning to yield ground to a more enlightened sentiment. This enlightened sentiment further encounters determined and unscrupulous opposition from the land-grabbers, the lumber stealers, the candidates for free grazing, and all the rest of the various pirates and parasites that prey upon and cling to the rich spoils of our public domain.

OUR NEIGHBOR'S FORESTS.

The Government of British Columbia has put into forest reserves at one stroke a hundred and fifty million acres—five eighths of all the land in the province. In British Columbia the lumberman who wishes to cut trees must deal with the Government, whose enlightened policy, giving the people the control of their timber resources, is carried out by the local government of the province, unlike some of our Western States, which hang back in sullen protest while salvation is forced upon them by a distant national authority.

CALIFORNIA TAN OAKS.

One of the most shocking sights in the waste of the fuel resources of this State is the method of harvesting tanbark. Thousands of square miles of our north coast region were covered by fine oak trees. To get the bark the trees are first cut down and then peeled. The bark is taken out by wagons or pack animals and sold by the cord. But the trees themselves—the massive trunks and limbs—are left to rot unseen in the undergrowth or to feed a forest fire. Millions of feet of solid oak timber were thus destroyed every year. The lumber corporations, in buying up timber land, figure the oak trees in *cords of tanbark*—the trees themselves count as nothing. The profit on the bark is not large, as it takes a deal of labor to get it out. [E. H.]

A CONTINENT DESPOILED.

Rudolf Cronau is a well-known artist and writer, of German ancestry. Under the above title he has written a vivid article in the *American Magazine* for April, with the following introduction.

On my writing-desk lies a pile of photographs, some taken with my own camera, some obtained from friends or through the courtesy of the United States Forest Service and the Geological Survey. Besides, there are maps and papers covered with statistic figures.

If you look over this collection, you will be struck with horror, for these views disclose scenes so repulsive, that, if they were not photographs, you would believe them products of the sickly brain of some artist like the famous Belgian painter Wuerz, or the Russian Werschagin, who, with cruel pleasure, indulged in portraying only the most unpleasant and disgusting scenes of this world.

Let us take up a few of these photographs.

Here we have the gloomy view of a forest destroyed by fire. As far as the eye can penetrate the picture, you see hundreds and thousands of straight black trunks, pointing as so many big needles toward heaven. There is not a limb left on one of the trees. Every branch is eaten away. And not a living thing is seen in this dreadful wilderness, nor will anything flourish there for years to come.

This second picture discloses another scene of devastation; a primeval forest as it was left by lumbermen after they had taken out the choice timber. What reckless barbarians these men have been! Everywhere we see the unmistakable evidences of frightful waste. The ground is covered with fragments of noble trees, and with young saplings crushed to pieces by fallen timber.

The next photographs show deforested hillsides and farm-lands, damaged by rain-storms which gnawed deep gullies into the naked ground

and carried away all fruitful soil. And here we have villages and cities suffering by the flood of rivers. The water reaches into the first and second stories. Mills and houses have been swept away and landed on distant places.

After that we look into a bird's nest, in which we see a heap of young birds, dead from starvation. Another of these ghastly photographs affords a glance over rocky shores, strewn with the putrid bodies of thousands and thousands of seal pups, who perished while waiting in vain for the return of their slain mothers.

And then we see horrible views showing long rows of human corpses, distorted by explosions, burned by fire, crushed by fallen rocks, or maimed by railway engines or street cars.

There are dozens and dozens of such repulsive photographs. If thrown as lantern slides upon a screen and explained by a lecturer, this collection of views, maps, and figures would cause a cry of terror among the panic-stricken audience, and many, shocked to the bottom of their hearts, would leave, never to forget that horrible exhibition.

You ask where these photographs have been taken and what the whole collection means. As an American citizen, I feel ashamed to say that all these views, without exception, were made from actual scenes in the United States, and that, together with the maps and statistic tables, they are incontrovertible and convicting evidences of grave sins of which our nation is guilty. Some of the material has been used in preparing my little book, "Our Wasteful Nation," which is not an outcome of yellow journalism, dealing in sensations, but the honest work of a man who loves this country fervently as any native-born American, and who is inspired by the wish to help it along, that it some day may gain the proud title, the best among all lands.

Perhaps native-born American writers are so accustomed to the extravagance of American life, that they fail to see the amazing amount of our prodigality, which to the stranger becomes evident at once.

THE WATERFOWL.

Another of California's resources that is being rapidly gathered to its fathers is the wild game, particularly the waterfowl. A few years ago they seemed as "inexhaustible" as the leaves on the trees. But now 100,000 licenses to hunt are taken out in a year. If each of these guns should bring down the limit for only one day, it would mount up to a total of millions. In the Sacramento Valley four men have killed 700 geese in a day. The "bull hunters" of Merced County often kill over a hundred ducks at a single discharge. Nearly every day during the hunting season at Los Banos a dray load of ducks goes away by express, packed in gunny sacks, the legal limit—35 ducks—in each sack.

Of course, this valuable resource will soon disappear under such onslaughts. Of course, the "Game Hogs" should be suppressed, the game commission should be upheld, the laws should be enforced, so that wild fowl will not entirely disappear from our inland waters.

The same things may be said of our fishes. It does not seem possible that so delicious and valuable a fish as the salmon would be killed and



A SINGLE GUNNER AND HIS KILL

In the lowlands of California it is often said that a man can kill so many birds he "can't get them all in one pile."

used for such gross purpose as fertilizer; yet in the early days of the northwest the farmers planted a splendid salmon under each hill of their hop fields, to enrich the soil. In 1906 the Alaska Guano Company converted 18,000 barrels of salmon and 33,500 barrels of herring into fertilizer and sold it.

The heroic efforts of the Fish Commissioners can hardly hope to keep pace with the reckless and illegal fishing of the fish hog and the market fisherman. [E. H.]

FUTURE OF MAN IN AMERICA.

One of the wisest and best informed men of our country is President Van Hise of the University of Wisconsin. Since this work has been in press (June, '09) he has printed in the *World's Work Magazine* a comprehensive article on Conservation, which closes as follows:

“It would be interesting, but idle, to prophesy as to the changes in our social structure which will result when people begin to be pinched by meagre soil, by lack of sufficient coal and wood. The people of that time will doubtless solve their problems as best they may, and any speculations we might make at this time would certainly be far from future realization, but that the problems of pinching economy will confront our descendants is beyond all question; and, therefore, the paramount duty remains to us to transmit to our descendants the resources which nature has bequeathed to us as nearly undiminished in amount as is possible, consistent with living a rational and frugal life. Now that we have imposed upon us the responsibility of knowledge, to do less than this would be a base communal crime.”

A PRACTICAL VIEW.

From an article by H. Von Schon, a hard-headed working engineer, in *Engineering Magazine*, October, 1908.

“A bare, hard-baked surface absorbs but little water; a forested area with its deep layer of leaves, brush and humus is a sponge which becomes saturated with the water; it is a natural storage reservoir. The rapid storm surface run-off erodes the top soil and carries it in suspension, dropping it somewhere in the lower channels; timbered slopes obstruct this surface run-off; it gathers force but slowly; it finds no loose earth or gravel to carry along; the foliage canopy of the trees breaks the force of the downpouring rain, which reaches the ground gradually; finally, the snowfall on the open hillsides melts quickly under the influence of the wind and the sun, while that in the forest remains to melt gradually and then to sink into the ground.

“That water waste with its collateral flood destructions of life and property, the constantly increasing erosions of the fruitful top soil, and the consequent impoverishing of what remains, and the sedimentation of river channels, are primarily caused by the cutting away of the forests in the headwater regions of rivers, was recognized and acted upon by some of the European peoples hundreds of years ago; little Switzerland enacted a forest-conservation statute as early as 1680, which has been enforced in a most business-like manner since; 20 per cent of the mountain republic's area is in conserved forests, some

2,000,000 acres; the cost of maintenance and supervision is \$1.32 and the net revenue, \$2.25 per acre annually.

“Germany’s forest area is 35,000,000 acres; its system of forest preservation was inaugurated one hundred and fifty years ago. France has 23,000,000 acres of forests, all under admirable preserve laws. The combined population of these two countries exceeds that of the United States about 15,000,000. They now expend annually on forest preservation some \$11,000,000 and enjoy a net revenue of about \$30,000,000, while the United States forestry expenditures last year aggregated \$1,400,000 and the revenue \$130,000.”

THE SLAUGHTER OF THE TREES.

[Copyright, 1908, by the Ridgeway Company.]

Part of a striking and vivid article by Emerson Hough in the May number of *Everybody's Magazine*. Its startling statements appear to be substantially correct. *Everybody's* has kindly given permission to use this article and several of the pictures accompanying it.

In fifty years we shall have whole States as bare as China. The Appalachians will be stripped to bedrock. The Rockies will send down vast floods, which can not be controlled. The Canadian forests north of the Great Lakes will be swept away. Our Middle West will be bare. The Yazoo Delta will be ripped apart, because no levee will be able to stand the floods of those days. We shall be living in crowded concrete houses, and at double the rent we now pay. We shall make vehicles of steel, use no wood on our farms. We shall pay ten cents for a newspaper, fifty cents for a magazine, as much for a lead pencil. Cotton will be immensely higher. Beef will be the privilege of the few. Clothing will cost twice what it costs to-day. Like Chinamen, our children will rake the soil for fuel or forage or food. We shall shiver in a cold, and burn in a heat, never before felt in this temperate zone, meant by God as a comfortable growing place for splendid human beings—**UNLESS WE WAKE UP.**

My friend, yesterday a man took the meat from your table. To-day a man burned down your house. Do you care?

My friend, yesterday this was America, a rich and beautiful land. To-day much of it is a waste and a wilderness. Is that anything to you and me?

My brother, in ten years a man is going to force you to rent a house of him, and to pay double what you do now. In twenty years very few of us will be able to afford even rented houses. In thirty years America will no longer be able to build houses of wood—unless you shall meantime remember that you own America, you who found it, fought for it,

and who ought to have a pride in it, if only for the sake of what it might have been. Does this cause you any personal concern?

My friend, before a certain great revolution, the peasants who could not own timber of their own, gleaned firewood in the forests of nobles, who swept their backs with the lash of insolence. In England men once prized the scant right to reap with peasant's billhook or shepherd's crook as high as they could reach among the dead branches of the trees. Soon you will perhaps fight among your kind and kin for the right to glean in another man's forest by hook or crook—you, who but now owned the widest and richest forests in the world. Do you care?

In Europe one may not fell a tree without paying, without asking. As Americans, we laugh at such restrictions. We are fools. Do you care? We call this the land of the free. It is not such now. We boasted of our land of opportunity open to all the world, but opportunity has been taken from the average man. Do you object?

Do you think such statements as these sensational, brutal, coarse? My brother, what pen shall be so bitter and abominable as shall make you writhe and say, "This is not true," and then make you look around and find that it all is true, and more is true?

When we first owned this country, one half of its total area was covered with the grandest forests that ever grew in any portion of the world—the richest, the most useful, the most valuable for the building of a civilization. Yes, we had trees. We had forests that set the first writers who saw this country wild with admiration, men who came here from reforested Europe. They were all ours. Now they are gone. Are they reared in lasting structures of a great civilization? No; at least one half of them are ashes or rotted mould. Half of what we have left to-day also will be ashes or rotted mould. They will never rest in the beams and walls of abiding homes.

Had we gone on across this continent and left the remnants of our standing woods, we still should have abundance; but we have gone back a second and a third time, gleaning more exactly each little bit of wood, until we have reaped our forests as sheep reap the grass lands, leaving nothing behind to grow. We have used ever-increasing appliances for speed and thoroughness, to supply an ever-increasing demand, at an ever-increasing price. We are converging in ever-increasing numbers, with an ever-increasing zeal, upon what is left; and in our haste to get it all, we are permitting an ever-increasing waste and ruin of the original supply.

Our very classification shows how sweeping has been the devastation. We now classify as "pine" all sorts of pine—Norway pine, Jack pine, pitch pine—although we know that true white pine, once the only wood dignified with the name, is, as a great lumber tree, practically an extinct species. As to the hardwoods, twenty years ago we used only

oak, walnut, hickory, cherry, maple, birch; now we add cottonwood, beech, sycamore, all sorts of gum trees, anything that will saw into a board. The desolation in the hardwood forests of the South is as unspeakable as in the pine forests of the North. Stave-makers, tie cutters, vehicle and machinery makers, have ripped open the hardwood regions of Tennessee, Mississippi, and Arkansas, until the end is as close there as it is in the vaster pine woods.

On the Pacific coast we used not long ago only the finest of redwood, gradually then the Douglas fir or spruce. Now we cut in the West hemlock, cedar, lodge-pole pine, anything that will hold a saw blade. For a long time we thought these great Western stores exhaustless, just as not long ago we thought the forests of Michigan and Wisconsin exhaustless, where now remains in great part only a horrible wilderness.

All the time poorer species and grades of timber are employed all over America, East and West. All the time the "estimates" of our remaining timber increase. But all the time the standing trees themselves decrease; all the time the fires rage; all the time the waste goes on, immense logs, the butts of giant trees, being left in the woods to rot because it does not pay to get them out of the woods "at the present price of lumber." All the time the loss to the people of America goes on, and the price to the people of America goes up; and all the time the people of America either do not know or do not care.

We ought to care, and if we know the facts no doubt we should care. What, then, are some of the facts? Plenty of facts, and very obvious ones, lie at hand for any one interested in any sort of building or manufacture requiring the use of lumber. What was \$8 or \$10 is now worth \$25 to \$30 a thousand. Ordinary clear building and finishing lumber costs from \$30 to \$125 a thousand. The price of all lumber has in five years risen over fifty per cent. We use lumber now that twenty years ago would have been rejected with scorn by any builder. Yet prices are going up, and still up; and the lumbermen wish these prices "protected," and ask that the Sherman law be revoked. In spite of these facts, the professional optimist in lumber attempts to soothe us with the assurance that there is plenty of timber "farther west"; that it will last "indefinitely" at the "present rate."

But the lumberman bases all his timber estimates on the present rate of cutting and on the present rate of demand. True, no one can prophesy or estimate the accelerated, the cumulative demand of the future. Decade after decade of our past has shown us that we could not dream big enough to cover the actual figures of this demand. Yet this unestimated factor is the element of danger for the future.

The lumberman does not figure on the million or more of immigrants we take in each year to house, not to mention an occasional American native born. Worst and most absurd of all, he figures on the timber

supply lasting on the basis of its all being used. Yet of all the timber now left standing in America, to represent our entire future supply, this lumberman, judged by his record, will use less than one half. The other half will never be taken out of the woods at all. Three fourths of that half may never even be cut, but may be set on fire and burned as it stands. Much as we had in forest resources in the past, we never could afford to have lumbering operations destroy as much as they sawed. But that is what they did. What should be our attitude to-day toward the threatening destruction of one half of our alarmingly small remaining supply?

Last year we cut nearly forty billion (40,000,000,000) feet of lumber, board measure. It may be interesting to know in what proportions the different states furnished this supply. In relative order a partial list is as follows: Washington, Louisiana, Wisconsin, Michigan, Mississippi, Arkansas, Minnesota, Texas, Pennsylvania, Oregon, California, North Carolina, and so down. To-day Washington furnishes 11.5 per cent of our lumber, and Louisiana 7.4 per cent. Let us look now at some of the demands for trees that at first might seem unimportant.

Our railroads are said to use one third of the industrial timber cut. They require, on the basis of present demand, 100,000,000 ties per year, and they are always wondering where they are going to get them. The demand is for better ties, not poorer. Bad ties mean wholesale murder, forfeiture of mail contracts, reduced dividends. A tie contains about thirty-five feet of wood. All sorts of wood are now being used for ties, from hemlock at twenty-eight cents to white oak at fifty-one cents, an average of forty-seven cents per tie. Suppose we could cut one hundred ties to the acre; we should require a million acres a year for ties. Hardwood grows, under favorable conditions, a little more than forty cubic feet per acre per year. Not a very fast crop, is it? Railroad men sincerely wish it might be faster. The Santa Fe road has recently arranged to plant a few thousand acres with eucalyptus, from which it will some time make ties. Each road now has its tie lands. These lands no longer furnish a public supply of lumber.

Alongside the ties run the telegraph poles, not so perishable, but requiring continual renewal. Two years ago we cut 3,526,875 poles over twenty feet in length. Three fifths of these were cedar, 28 per cent chestnut. We cut hundreds of thousands of smaller poles, also, not to mention vast quantities of what is called lodge-pole pine, for other uses. We annually reap for telegraph and telephone poles somewhere between three and four million acres of land.

Our tanneries two years ago required 1,370,000 cords of bark. In the same year we cut 11,858,260 shingles and 3,812,807 laths. This represents one of the real savings in lumber manufacture—the utilization of material much of which otherwise would go to waste. Then we

had to timber our mines, and for that we used 165,000,000 cubic feet, not board measure, much of which was the best of hardwood.

If you stood on the top of a tower in the greatest hardwood forests of the South, one sweep of the scythe of civilization would mow it farther than you could see, for one month's use in vehicles, manufactured furniture, and farm implements. Prices for this kind of wood have risen from 25 to 65 per cent since 1899. In seven years the production of hardwood has fallen off 15 per cent; and those were the six years of its greatest demand.

There is absolutely no hope for vehicle and machine makers except a more careful use of the hardwood forests of the South and the South-

east; nor indeed can that be called a solution now. In these forests grow also many softer woods, once scorned. Continually we adjust, compromise, become European and not American. Tight-barrel cooperage is a heavy drain on white oak. In 1906 we made 267 million tight-barrel staves. We sent to Europe last year about five million dollars' worth of white oak staves. Meantime, California can not get casks for her wine, because white oak now costs too much to ship to



Waste of timber in the Yellowstone Park. Our descendants will bitterly rue this loss.

California. She is trying redwood for wine casks now, and grumbling mightily. Slack-barrel cooperage in elm, gum, beech, basswood, and fourteen other woods not long ago thought worthless, cut 1,097,063,000 staves in one year. All these little demands foot up an enormous and menacing total in acreage.

The highest estimate of our remaining hardwood is four hundred billion feet. For lumber, ties, posts, manufactures, fuel, etc., we use twenty-five billion feet per annum or more. At that rate it will take us sixteen years to use up all the rest of our hardwood—if we do not burn it, and if the demand remains the same! A pleasant prospect, is it not?

Some one has figured that a big Sunday newspaper needs twenty acres of pulp wood to make the paper for one edition. The Chicago

Tribune, a chance instance, uses 200,000 pounds of paper each Sunday, or 400,000 each week. Do your own multiplying. We used of domestic spruce alone for pulp wood in one year 1,785,680 cords. The average stand of spruce pulp wood in the regions where it is cut is probably about ten cords per acre; so that of such spruce land we require at least 178,500 acres annually. A ton of paper takes about two cords of spruce in the making—to be exact, about 1,750 pounds of paper pulp.

We use other woods for pulp now, hemlock, balsam, pine, poplar;



Slaughter of the forest. An old burn. Picture the frightful waste of good wood when a great forest region is reduced to this by repeated burnings. It has never been cut.

3,661,176 cords was our total for 1906. We used in that year 2,327,844 tons of pulp. Since each ton probably cost on the average two cords of some sort of wood, not allowing anything for waste, there were over four million cords cut somewhere, mostly in the United States; which means something like a million acres a year for pulp. Call it a half million for close measure. Do some figuring. If it costs twenty acres a Sunday, or forty acres a week, or 2,080 acres a year to print one daily newspaper, what does it cost in acreage to print all the newspapers in all the cities and towns of America? Add to this the enormous editions of our magazines. Add to this the paper used in books. The total staggers the imagination, and yet the amount of timber cut for pulp

in the United States annually is less than 5 per cent of what is cut for lumber.

It would seem that we can not afford much longer to read. Neither shall we long be able to write. Last year we made more than 315,000,000 lead pencils. A lead pencil is not very large, but the total number of lead pencils required 7,300,000 cubic feet of cedar. We have cedar enough to last us just twelve years.

More than 100,000 acres of timber in the whole United States are cut



Slaughter of the forest. The trees are chopped down, peeled, and then the whole surface of the forest is burnt to the bone, so that the logs may be easily and cheaply dragged out.

over every working day. We use many times more timber per capita than any other nation.

We have left not over 450,000,000 acres bearing commercial timber. Cast up in your mind some of the small demands of industry noted above. Multiply this by three or four to represent the total, including all sorts of sawn lumber. Remember that you are dealing in terms of millions of acres. Divide 450,000,000 by your total number of millions of known demand. What is the result? Do you find it pleasant? Do you remain willing to listen to the charming of those who are either ignorant or hypocritical in their "estimates?"

THE CONVENTION OF GOVERNORS.

THE first conference of the Governors of the United States and Territories was held at the White House, in Washington, D. C., during the three days beginning May 13, 1908.

The East Room was prepared for the occasion, its severe simplicity somewhat brightened by draperies of green velvet on the walls, about the platform on which were seated the presiding officer, the speakers, the Supreme Court, and the President's Cabinet. Two great maps, the largest ever made by mechanical means, hung on the east wall. One showed the timber resources of the United States, while the other showed the mineral deposits. Between these maps was an arrangement for illustrating the different phases of conservation by means of superb transparencies. On the floor special chairs were arranged in semi-circles for the Governors; while to the rear and at the sides were seats for the Governor's advisers and the guests.

Practically all the states and territories were represented; it was a historic occasion; nearly every speaker laid stress on the declaration that the meeting was an epoch-making one, that from it would spring an organization of the Governors that through its deliberations and the weight of its opinions would exercise through the years to come a tremendous influence over the destinies and the affairs of the nation.

Some extracts from the most notable of the many addresses delivered at this famous conference will be appropriate here as a fitting close to our handbook on Conservation:

SIGNIFICANCE OF THE MEETING.

The savage knows and confesses his dependence upon the forces of nature. His whole life is circumscribed by the resources of forest, field, and stream. Indeed, he feels himself a part of nature, and scarcely separates his fate from that of his surroundings. The game of the prairie, the forest, and the river, the berries and herbs in their season, and the living waters supply him with food and drink. With the changing seasons he moves from place to place, pursuing plenty. He winters in rude huts filled with smoke from fires of fallen wood, hardly less at the mercy of the cold than are the hibernating animals. In the spring he wakes with nature, and his summers are prosperous and happy only as the wild crops of field and forest are plentiful. He rises and lies down with the sun. He survives only as he observes nature and fits himself to her ways.

But as savagery gives place to civilization, man frees himself more and more from those bonds which bound him so closely to nature. Slowly and painfully at first, and then far more rapidly and easily, he learns to control his material surroundings. He breaks the prairie with the plow, makes the beasts of the field his servants, strikes the pick into the mountain and the axe into the veteran of the forest. He now no longer waits upon the seasons. He builds himself a house against the cold and warms himself to the point of comfort in the midst of the winter blast. Instead of passively accepting the wild fruits as they ripen he compels the soil to yield a harvest a millionfold more abundant, and this harvest he stores up against days of want. Instead of migrating with the birds he fixes his home where he will, and pursues his work and his pleasure in his own time.

Discovery and invention place new implements in his hands. With his intelligence quickened and his body trained by new experience and new occupations, he continues to increase his mastery over time, temperature, and place. New material riches become available. He is able to satisfy his wants more readily and more certainly than ever before. The standard of his living is raised. He now possesses and enjoys, besides all that his fathers required, a host of things of which they knew nothing. Wants multiply with prosperity, till his life becomes highly complex. He is lord of nature, because he has learned how to appropriate her resources.

But if the resources of nature should fail, where would be his mastery then?

This is the point which we commonly overlook. Man has laid nature under tribute, and has become powerful because nature was rich. Impoverish nature and her tribute stops. Ingenuity, capacity, labor.

are incapable of extracting wealth from the gutted mine, from the fire-scorched brush land, from the sun-baked stream bed, from the impoverished soil. Civilization is achieved by the use of the resources of nature; it can endure no longer than the resources upon which it depends.

Living as we do to-day in the midst of conveniences which give us apparent independence of nature, it is almost inevitable that we should lose sight of this truth. It is difficult for us to realize that we, standing at the height of western civilization, are in fact vastly more dependent upon tributary nature than is the savage of the South Seas. Suppose the coal supply should give out in the middle of winter? Suppose a huge conflagration should sweep our forests from the hillsides? Suppose sudden floods should lay waste our fertile farm lands, scoring them with gullies or heaping them with sand? Would not any single one of these calamities bring upon us incalculable losses and suffering?

And yet these suppositions are not imaginary. We need to look only a very little way ahead, as things are going now, in order to see them realized, in effect. True, the failure of our resources will not come suddenly, and such of our resources as can be renewed need never fail if we use them wisely. But the exhaustible resources, chief among which are the mines, are coming to an end as certainly as if the end were to-day, while those resources whose exhaustion is due not to necessity, but to folly, have no future unless we insure it by our own provision.

It is clear, therefore, that the question how we shall make the best use of our natural resources, renewable and not renewable, is a pressing question of the hour. Where renewal is impossible, there is need of the strictest economy; and where renewal can be secured by prudence and foresight, the very existence of the nation demands that prudence and foresight be exercised.

This is the significance of the Conference of Governors on the Conservation of Natural Resources held at the White House, May 13-15, 1908, which took up for the first time the problem of conservation in all its details.

TREADWELL CLEVELAND, JR.

A NEW PATRIOTIC IMPULSE.

The *World's Work Magazine* summed up the Governor's Conference in its editorial correspondence as follows.

It was the most notable company of men that has come together in our country in recent times. The official head of the nation, the Cabinet, the Supreme Court, certain members of Congress, the heads of the states, and, besides these, many of the most distinguished scientific men that we have and men of a sound grasp of public subjects who

came as "advisers" to the Governors—two or three of the most noteworthy citizens of every state—among them the presidents of many of our foremost universities and schools of science; and, besides these, representatives of all the most important national organizations of scientific and commercial bodies.

About the general proposition that this extraordinary meeting was called to emphasize there was no difference of opinion. And the wealth of facts that were presented put the subject in every mind in a new way, and aroused every man to an arguent purpose. When one subject was put into every mind as the foremost subject of public action that this generation can have, and was so presented and emphasized as to win universal assent and to arouse a patriotic purpose, then all the machinery of publicity, of exhortation, and of public action that a democracy can have was put in action at one stroke.

The scientific papers presented to the Conference, giving exact data about agriculture, streams, forests, coal, and all similar subjects, were the most practical and helpful literature of waste and of methods of conservation ever put together. They will become a classic description of our great resources as they now are.

The brief speeches by many of the Governors were in the nature of an "experience meeting." They told of the work that the state governments are doing to save and to reclaim. And the resolutions adopted called on the government, local and national, and on the people to preserve our national wealth.

Every man came away from the most noteworthy gathering that he ever attended, with a new love of his country, a new attitude toward it, a new conscience about the land, the trees, and the streams; and we entered then on a new era in our national thought and in our attitude toward our land.

ANDREW CARNEGIE.

The ironmaster of Pittsburg, who has scattered libraries over this continent like the sands of the sea, delivered a striking address from which only a few extracts can be given.

In view of the sobering facts presented, the thoughtful man is forced to realize, first, that our production and consumption of minerals are increasing much more rapidly than our population; and, second, that our methods are so faulty and extravagant that the average waste is very great, and in coal almost as great as the amount consumed. The serious loss of life in the mines is a feature that can no longer be overlooked. Nor can we fail to realize that the most useful minerals will shortly become scarce, and may soon reach prohibitive cost unless steps to lessen waste are taken in the interest of the future.

I have for many years been impressed with the steady depletion of our iron ore supply. It is staggering to learn that our once supposed ample supply of rich ores can hardly outlast the generation now appearing, leaving only the leaner ores for the later years of the century. It is my judgment, as a practical man accustomed to dealing with those material factors on which our national prosperity is based, that it is time to take thought for the morrow.

We are nationally in the position of a large family receiving a rich patrimony from thrifty parents deceased intestate; the President may be likened to the eldest son, and the Governors to younger brothers, jointly responsible for the minors; the experts assembled may be likened to the family solicitors. Now, the first duty of such a family is to take stock of its patrimony; the next to manage the assets in such manner that none shall be wasted, that all be put to the greatest good of the living and their descendants. Now, we have just begun to take stock of our national patrimony; and it is with the deepest sense of responsibility imposed upon me by the invitation to this meeting, to the nation, and to coming generations of all time, that I speak as one of the junior solicitors. In my opinion, we should watch closely all the assets and begin both to save and to use them more wisely.

Let us begin with iron: We must in all possible ways lessen the demands upon it, for it is with iron ore we are least adequately provided. One of the chief uses of this metal is connected with transportation, mainly by rail. Moving 1,000 tons of heavy freight by rail requires an 80-ton locomotive and twenty-five 20-ton steel cars (each of 40-ton capacity), or 580 tons of iron and steel, with an average of, say, ten miles of double track (with 90-pound rails), or 317 tons additional; so that, including switches, frogs, fish-plates, spikes, and other incidentals, the carrier requires the use of an equal weight of metal. The same freight may be moved by water by means of 100 to 250 tons of metal, so that the substitution of water-carriage for rail-carriage would reduce the consumption of iron by three fourths to seven eighths in this department. At the same time the consumption of coal for motive power would be reduced 50 to 75 per cent, with a corresponding reduction in the coal required for smelting. No single step open to us to-day would do more to check the drain on iron and coal than the substitution of water-carriage for rail-carriage wherever practicable, and the careful adjustment of the one to the other throughout the country.

NATURAL GAS.

Dr. White, the State Geologist of West Virginia, presented in vivid fashion a picture of the waste of our purest form of fuel. This is of interest to us in California, because we, too, have great fields of petroleum and natural gas being used in similar ways.

A great geologist once said, "The nations that have coal and iron will rule the world." Bountiful nature has dowered the American people with a heritage of both coal and iron richer by far than that of any other political division of the earth.

It was formerly supposed that China would prove the great storehouse from which the other nations could draw their supplies of carbon when their own had become exhausted, but the recent studies of a brilliant American geologist in that far-off land, rendered possible by the generosity of the world's greatest philanthropist, tell a different story. The fuel resources of China, great as they undoubtedly are, have been largely overestimated, and Mr. Willis reports that they will practically all be required by China herself, and that the other nations can not look to her for this all-important element in modern industrial life.

A simple glance at a geological map of the United States, will convince any one that nature has been most lavish to us in fuel resources, for we find a series of great coal deposits extending in well scattered fields almost from the Atlantic to the Pacific, from the Lakes to the Gulf, while even over much of New England and the coastal plains, vast areas of peat, the primal stage of coal, have been distributed. But coal of every variety from peat to anthracite is not all of nature's fuel gifts to fortunate America. Great deposits of both petroleum and natural gas occur in nearly every state where coal exists, and in some that have no coal. What greater dowry of fuels could we ask when we find them stored for us within the bosom of our mother earth in all three of the great types—coal, petroleum, and natural gas—only awaiting the tap of the pick and drill to bring them forth in prodigal abundance?

What account can we as a nation give of our stewardship of such vast fuel treasures? Have we carefully conserved them, using only what was necessary in our domestic and industrial life, and transmitting the remainder, like prudent husbandmen, unimpaired to succeeding generations? Or have we greatly depleted this priceless heritage of power and comfort, and source of world-wide influence, by criminal waste and wanton destruction? The answer should bring a blush of shame to every patriotic American, for not content with destroying our magnificent forests, the only fuel and supply of carbon known to our forefathers, we are with ruthless hands and regardless of the future applying both torch and dynamite to the vastly greater resources of

this precious carbon which provident nature has stored for our use in the buried forests of the distant past. The wildest anarchists determined to destroy and overturn the foundations of government could not act in a more irrational and thoughtless manner than have our people in permitting such fearful destruction of the very sources of our power and greatness. Let me enumerate some of the details of this awful waste of our fuel resources that has been going on with ever increasing speed for the last forty years.

First, let us consider how we have wasted natural gas, the purest form of fuel, ideal in every respect, self-transporting, only awaiting the turning of a key to deliver to our homes and factories heat and light and power. Partial nature has apparently denied this great boon to many other lands. It is practically unknown in France, Germany, and Great Britain, our chief competitors in the world of industry. Even wood and coal must first be converted into gas before they will burn, but here is a fuel of which nature has given us a practical monopoly, lavish in abundance, already transmuted into the gaseous stage and stored under vast pressure to be released wherever wanted at our bidding. The record of waste of this our best and purest fuel is a national disgrace.

At this very minute this unrivaled fuel is passing into the air within our domain from uncontrolled gas wells, from oil wells, from giant flambeaus, from leaking pipe lines and the many other methods of waste at the rate of not less than one billion cubic feet daily and probably much more.

Very few appear to realize either the great importance of this hydrocarbon fuel resource of our country, or its vast original quantity. Some of the individual wells, if we may credit the measurements, have produced this fuel at the rate of 70,000,000 cubic feet daily, the equivalent in heating value of 70,000 bushels of coal, or nearly 12,000 barrels of oil. In my humble opinion the original amount of this volatile fuel in the United States, permeating, as it does, every undisturbed geologic formation from the oldest to the most recent, rivaled or even exceeded in heating value, all of our wondrous stores of coal.

Suppose that it were possible for some Nero, inspired by a mania of incendiarism, to apply a consuming torch to every bed of coal that crops to the surface from the Atlantic to the Pacific, and that the entire coal supply of the Union was threatened with destruction within a very few years, what do you think would happen? Would our State legislatures sit undisturbed panoplied by such a carnival of fire? Would the Governors of thirty states remain silent while the demon of flame was ravaging the coal resources of the republic? Certainly not; there would be a united effort by the Governors and legislatures of all the states in the Union to stay the progress of such a direful conflagration; even the

sacred constitutional barriers wisely erected between state and federal authority would melt away in the presence of such an awful calamity, and the mighty arm of the nation would be invoked to help end the common peril to every interest. And yet this imaginary case is an *actual one* with the best and purest fuel of the country, equal probably in quantity and value for heat, light, and power to all of our coal resources. This blazing zone of destruction extends in a broad band from the Lakes to the Gulf, and westward to the Pacific, embracing in its flaming pathway the most precious fuel possessions of a continent. No one can even approximate the extent of this waste. From personal knowledge of conditions which exists 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!

From one well in eastern Kentucky there poured a stream of gas for a period of twenty years without any attempt to shut it in or utilize it, the output of which, it has been figured, was worth at current prices more than three million dollars. Practically the same conditions characterized the first twenty-five years of Pennsylvania's oil and gas history, and the quantity of wasted gas from thousands of oil and gas wells in western Pennsylvania is beyond computation. In my own state of West Virginia, only eight years ago, not less than 500,000,000 cubic feet of this precious gas was daily escaping into the air from two counties alone, practically all of which was easily preventable, by a moderate expenditure for additional casing. When it is remembered that one thousand cubic feet of natural gas weighs 48 pounds, and that 6,000 cubic feet of it would yield a 42-gallon barrel of oil when condensed, so that a well flowing 6,000,000 feet of gas is pouring into the air daily the equivalent of 1,000 barrels of oil, what would our petroleum kings think, if they could see this river of oil (for the equivalent of a billion feet of gas is more than 160,000 barrels of petroleum, and of practically the same chemical composition as benzine or gasolene) rushing unhindered to the sea? Would they not spend millions to check such a frightful waste of this golden fluid? And would they not be the first to appeal to the national government for aid in ending such great destruction of property? And yet because natural gas is invisible, and its waste is not so apparent to the eye as a stream of oil, or a burning coal mine, the agents of these oil magnates have not only permitted this destruction of the nation's fuel resources to continue, but they have prevented by every means in their power the enactment of any legislation to stop this frightful loss of the best and purest fuel that nature has given to man.

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 even, of this the best of all the fuels, and also that much more than half of this frightful waste could have been avoided by proper care in oil production and slight additional expenditures.

In justice to the great oil-producing corporations, it must be acknowledged that they have not permitted much waste of petroleum except what has been sprayed into the air by their awful waste of gas, and also that their handling of petroleum has been from the beginning a model of business economy and management. The great mistake of the oil producing interests has been in not properly apprehending the enormous fuel value of the natural gas they were destroying, and in not demanding legislation for its protection instead of successfully throttling and preventing it in every state of the Union except one—Indiana. When the people of that great state awoke to the fact that their richest mineral possession was being rapidly wasted, they rose to the occasion, and although it was largely a case of “locking the stable door after the horse had been stolen,” they effectually prevented any further useless waste of natural gas. This Indiana statute which has been declared constitutional by our highest courts, says in effect to the oil producers: “You can not take the oil from the ground where nature has safely stored it, until you provide a method of utilizing the accompanying gas, or volatile oil as well,” and it also says to both the producer and consumer of natural gas, that it is against “public policy to waste this valuable fuel, and that it will not be permitted to either party.” This Indiana statute for the conservation of petroleum and natural gas should be enacted into law in every state where this precious fuel exists; and why has it not been done?

JAMES J. HILL.

The railroad magnate of the Great Northern is recognized not only as a captain of industry, but as a high authority on the lands and resources of the United States. His thoughts are well worth weighing.

“Of all the sinful wasters of man’s inheritance on earth,” said the late Professor Shaler, “and all are in this regard sinners. the very worst are the people of America.” This is not a popular phrase, but a scientific judgment. It is borne out by facts. In the movement of modern times, which has made the world commercially a small place, and has produced a solidarity of the races such as never before existed, we have come to the point where we must to a certain extent regard the natural resources of this planet as a common asset, compare them with demands now made and likely to be made upon them, and study their

judicious use. Commerce, wherever untrammled, is wiping out boundaries and substituting the world relation of demand and supply for smaller systems of local economy. The changes of a single generation have brought the nations of the earth closer together than were the states of this Union at the close of the Civil War. If we fail to consider what we possess of wealth available for the uses of mankind, and to what extent we are wasting a national patrimony that can never be restored, we might be likened to the directors of a company who never examine a balance sheet.

The sum of resources is simple and fixed. From the sea, the mine, the forest and the soil must be gathered everything that can sustain the life of man. Upon the wealth that these supply must be conditioned forever, as far as we can see, not only his progress, but his continued existence on earth. How stands the inventory of property for our own people? The resources of the sea furnish less than five per cent of the food supply, and that is all. The forests of this country, the product of centuries of growth, are fast disappearing. The best estimates reckon our standing merchantable timber at less than 2,000,000,000,000 feet. Our annual cut is about 40,000,000,000,000 feet. The lumber cut rose from 18,000,000,000 feet in 1880 to 34,000,000,000 feet in 1905; that is, it nearly doubled in twenty-five years. We are now using annually 500 feet board measure of timber per capita, as against an average of 60 for all Europe. The New England supply is gone. The Northwest furnishes small growths that would have been rejected by the lumbermen of thirty years ago. The South has reached its maximum production and begins to decline. On the Pacific coast only is there now any considerable body of merchantable standing timber. We are consuming yearly three or four times as much timber as forest growth restores. Our supply of some varieties will be practically exhausted in ten or twelve years; in the case of others, without reforestation, the present century will see the end. When will we take up in a practical and intelligent way of reforestation of our forest? * * *

The exhaustion of our coal supply is not in the indefinite future. The startling feature of our coal production is not so much the magnitude of the annual output as its rate of growth. For the decade ending in 1905 the total product was 2,832,402,746 tons, which is almost exactly one half the total product previously mined in this country. For the year 1906 the output was 414,000,000 tons, an increase of 46 per cent on the average annual yield of the ten years preceding. In 1907 our production reached 470,000,000 tons. Fifty years ago the annual per capita production was a little more than one quarter of a ton. It is now about five tons. It is but eight years since we took the place of Great Britain as the leading coal-producing nation of the world, and already our product exceeds hers by over 43 per cent, and is 37 per cent

of the known production of the world. Estimates of coal deposits still remaining must necessarily be somewhat vague, but they are approximately near the mark. The best authorities do not rate them at much over 2,000,000,000,000 tons. If coal production continues to increase as it has in the last ninety years, the available supply will be greatly reduced by the close of the century. Before that time arrives, however, resort to lower grades and sinking of mines to greater depths will become necessary, making the product inferior in quality and higher in price. Already Great Britain's industries have felt the check from a similar cause, as shown in her higher cost of production. Our turn will begin probably within a generation or two from this time. Yet we still think nothing of consuming this priceless resource with the greatest possible speed. Our methods of mining are often wasteful; and we not only prohibit our industries from having recourse to the coal supplies of other countries, but actually pride ourselves upon becoming exporters of a prime necessity of life and an essential of civilization.

The iron industry tells a similar story. The total of iron ore mined in the United States doubles about once in seven years. It was less than 12,000,000 tons in 1893, over 24,000,000 tons in 1899, 47,740,000 tons in 1906, and over 52,000,000 tons in 1907. The rising place of iron in the world's life is the most impressive phenomenon of the last century. In 1850 the pig iron production of the United States amounted to 563,757 tons, or about 50 pounds per capita. Our production now is over 600 pounds per capita. We do not work a mine, build a house, weave a fabric, prepare a meal or cultivate an acre of ground under modern methods without the aid of iron. We turn out over 25,000,000 tons of pig iron every year, and the production for the first half of 1907 was at the rate of 27,000,000 tons. This is two and one half times the product of Great Britain. It is nearly half the product of the whole world. And the supply of this most precious of all the metals is so far from inexhaustible that it seems as if iron and coal might be united in their disappearance from common life.

We now turn to the only remaining resource of man upon this earth, which is the soil itself. How are we caring for that, and what possibilities does it hold out to the people of future support? We are only beginning to feel the pressure upon the land. The whole interior of this continent, aggregating more than 500,000,000 acres, has been occupied by settlers within the last fifty years. What is there left for the next fifty years? Excluding arid and irrigable areas, the latter limited by nature, and barely enough of which could be made habitable in each year to furnish a farm for each immigrant family, the case stands as follows: In 1906 the total unappropriated public lands in the United States consisted of 792,000,000 acres. Of this area the divisions of Alaska, Arizona, California, Colorado, Idaho, Montana, Nevada, New

Mexico, and Wyoming contained 195,700,000 acres of unsurveyed land. Little of Alaska is fitted for general agriculture, while practically all of the rest is semi-arid, available only for grazing or irrigation. We have (subtracting these totals) 50,000,000 acres of surveyed and 36,500,000 acres of unsurveyed land as our actual remaining stock. And 21,000,000 acres were disposed of in 1907. How long will the remainder last? No longer can we say that "Uncle Sam has enough to give us all a farm."

Equally threatening is the change in quality. There are two ways in which the productive power of the earth is lessened; first by erosion and the sweeping away of the fertile surface into streams and thence to the sea, and, second, by exhaustion through wrong methods of cultivation. The former process has gone far. Thousands of acres in the East and South have been made unfit for tillage. North Carolina was, a century ago, one of the great agricultural states of the country, and one of the wealthiest. To-day as you ride through the South you see everywhere land gullied by torrential rains, red and yellow clay banks exposed where once were fertile fields; and agriculture reduced because its main support has been washed away. Millions of acres, in places to the extent of one tenth of the entire arable area, have been so injured that no industry and no care can restore them.

Far more ruinous, because universal and continuing in its effects, is the process of soil exhaustion. It is creeping over the land from East to West. The abandoned farms that are now the playthings of the city's rich or the game preserves of patrons of sport, bear witness to the melancholy change. New Hampshire, Vermont, northern New York, show long lists of them. In western Massachusetts, which once supported a flourishing agriculture, farm properties are now for sale for half the cost of the improvements. Professor Carver, of Harvard, has declared, after a personal examination of the country, that "agriculture as an independent industry, able in itself to support a community, does not exist in the hilly parts of New England."

The same process of deterioration is affecting the farm lands of western New York, Ohio, and Indiana. Where prices of farms should rise by increase of population, in many places they are falling. Between 1880 and 1900 the land values of Ohio shrank \$60,000,000. Official investigation of two counties in central New York disclosed a condition of agricultural decay. In one land was for sale for about the cost of improvements, and 150 vacant houses were counted in a limited area. In the other the population in 1905 was nearly 4,000 less than in 1855.

Practically identical soil conditions exist in Maryland and Virginia, where lands sell at from \$10 to \$30 an acre. In a hearing before an industrial commission, the chief of the Bureau of Soils of the Department of Agriculture said: "One of the most important causes of

deterioration, and I think I should put this first of all, is the method and system of agriculture that prevails throughout these states. Unquestionably the soil has been abused." The richest region of the West is no more exempt than New England or the South. The soil of the West is being reduced in agricultural potency by exactly the same processes which have driven the farmer of the East, with all his advantage of nearness to markets, from the field.

Within the last forty years a great part of the richest land in the country has been brought under cultivation. We should, therefore, in the same time, have raised proportionately the yield of our principal crops per acre; because the yield of old lands, if properly treated, tends to increase rather than diminish. The year 1906 was one of large crops, and can scarcely be taken as a standard. We produced, for example, more corn that year than had ever been grown in the United States in a single year before. But the average yield per acre was less than it was in 1872. We are barely keeping the acre product stationary. The average wheat crop of the country now ranges from twelve and one half, in ordinary years, to fifteen bushels per acre in the best seasons. And so it is on down the line.

Not only the economic but the political future is involved. No people ever felt the want of work or the pinch of poverty for a long time without reaching out violent hands against their political institutions, believing that they might find in a change some relief from their distress. Although there have been moments of such restlessness in our country, the trial has never been so severe or so prolonged as to put us to the test. It is interesting that one of the ablest men in England during the last century, a historian of high merit, a statesman who saw active service and a profound student of men and things, put on record his prophecy of such a future ordeal. Writing to an American correspondent fifty years ago, Lord Macaulay used these words: "As long as you have a boundless extent of fertile and unoccupied land, your laboring population will be found more at ease than the laboring population of the Old World; but the time will come when wages will be as low and will fluctuate as much with you as they do with us. Then your institutions will be brought to the test. Distress everywhere makes the laborer mutinous and discontented, and inclines him to listen with eagerness to agitators who tell him that it is a monstrous iniquity that one man should have a million and another can not get a full meal. * * * The day will come when the multitudes of people, none of whom has had more than half a breakfast or expects to have more than half a dinner, will choose a legislature. Is it possible to doubt what sort of legislature will be chosen? * * * There will be, I fear, spoliation. The spoliation will increase the distress; the distress will produce a fresh spoliation. * * * Either civilization or liberty will

perish. Either some Cæsar or Napoleon will seize the reins of government with a strong hand, or your republic will be as fearfully plundered and laid waste by barbarians in the twentieth century as the Roman Empire in the fifth." We need not accept this gloomy picture too literally, but we have been already sufficiently warned to prevent us from dismissing the subject as unworthy of attention. Every nation finds its hour of peril when there is no longer free access to the land, or when the land will no longer support the people. * * * Far may this day be from us. But since the unnecessary destruction of our land will bring new conditions of danger, its conservation, its improvement to the highest point of productivity promised by scientific intelligence and practical experiment, appears to be a first command of any political economy worthy of the name.

If this patriotic gospel is to make headway, it must be by just such organized missionary work as is to-day begun. It can not go on and conquer if imposed from without. It must come to represent the fixed idea of the people's mind, their determination and their hope. It can not be incorporated in our practical life by the dictum of any individual or any officer of nation or state in his official capacity. It needs the coöperation of all the influences, the help of every voice, the commendation of nation and state that has been the strength and inspiration of every worthy work on American soil for 120 years. We return, for our gathering in council and for our plan of action for the future, to the model given us by the fathers. State and nation are represented here, without jealousy or any ambition of superiority on either side, to apply to the consideration of our future such coöperation as that out of which this nation was born, and by which it has won to worthy manhood. Reviving the spirit of the days that created our Constitution, the days that carried us through civil conflict, the spirit by which all our enduring work in the world has been wrought, taking thought as Washington and Lincoln took thought, only for the highest good of all the people, we may, as a result of the deliberations held and the conclusions reached here to-day, give new meaning to our future; new lustre to the ideal of a republic of living federated states; shape anew the fortunes of this country, and enlarge the borders of hope for all mankind.

THE SECRETARY OF AGRICULTURE.

Perhaps no one has had a better opportunity to know about the soil of this nation than James Wilson, the Secretary of Agriculture. He made the following remarks.

“The paper read by Mr. Hill this morning made a very deep impression upon me. The greatest asset we have in the United States is our soil; we are destroying that as rapidly as we can, and the oldest settled part of the United States has made the most progress in the destruction of our soil, of which we have a great variety. Down on the Gulf coast the land has been peopled longer than the upper part of the Mississippi Valley. The heavy rainfalls, and the perpetual cultivation and growing of crops have helped erosion, and the soil has been destroyed in that way. It is going off very, very rapidly. The cure is a system of agriculture that will keep the soil filled with plant food, organic matter, humus. That is the cure; that is the way to keep up the soil. Somebody once asked an English gardener how he got such a fine lawn. He had a beautiful grass lawn which attracted attention. He said, ‘We weeded, and we weeded; we manured and we manured, for eight hundred years;’ and that is the way they got it.”

IN WISCONSIN.

The Governor of Wisconsin graphically described the recent history of his own state.

“Great lumber companies,” said Governor Davidson, “inspired only by an enthusiasm and a greed which knew no bounds, attacked these forests, engaging in a mad race each to strip its territory, to market its lumber first, and then to move forward and continue the destruction. No tree was regarded as too small to escape cutting. Trunks six inches in diameter were cut for lumber. Millions of young trees and saplings, which were too small to have any commercial value, were crushed by falling timber, or were cut to make room for logging roads. Those that escaped the axe of the loggers fell victims to forest fires, the destruction by which can only be counted by the millions of dollars—a further melancholy evidence of the carelessness with which our forest tracts were guarded.

“To-day we are beginning to feel the penalty for this indifference. Our proud position as the greatest timber state of the Union has passed to others. Thousands of acres of land of no value for agriculture have been rendered bare and practically worthless; our swamps are drying up, and as a consequence many of our streams have shrunk to but a small proportion of their former size. The destruction of our forests

has taken from us that great regulator of the streams, for with no forests to protect the head water of rivers and to detain the water upon the soil, we have frequent freshets and floods, and are confronted with the problem of dealing with rapidly rising and falling stream volume—a condition which has already rendered many of our one-time valuable water powers practically worthless.”

A DISSENTING VIEW.

President James of the University of Illinois dissented from the ideas of the other speakers.

It was his optimistic opinion, that no such waste as had been alluded to by previous speakers had existed in this country; or, if it did exist, it was not really waste, but the simple methods that, instinctively adopted by the early settlers of the country, had proven themselves in the main correct. He said that the fact that farms of the East have passed out of cultivation is not necessarily an indication that those farms have lost their productive power, but, rather, that they have been abandoned because of the opening up of broader fields of usefulness in the regions beyond the Mississippi and the Missouri, and he said he believed that, after all is said and done, the greatest natural resources the country possesses is not its forests, its rivers, its mines, or its soil, but in the brains of its people.

DECLARATION OF PRINCIPLES.

Before adjourning, the Governors signed the following Declaration as embodying the results of the Convention :

DECLARATION.

We, the Governors of the States and Territories of the United States of America, in conference assembled, do hereby declare the conviction that the great prosperity of our country rests upon the abundant resources of the land chosen by our forefathers for their homes, and where they laid the foundation of this great nation.

We look upon these resources as a heritage to be made use of in establishing and promoting the comfort, prosperity, and happiness of the American people, but not to be wasted, deteriorated, or needlessly destroyed.

We agree that our country's future is involved in this; that the great natural resources supply the material basis upon which our civilization must continue to depend, and upon which the perpetuity of the nation itself rests.

We agree, in the light of the facts brought to our knowledge and from information received from sources which we can not doubt, that this material basis is threatened with exhaustion. Even as each succeeding generation from the birth of the nation has performed its part in promoting the progress and development of the Republic, so do we in this generation recognize it as a high duty to perform our part; and this duty in large degree lies in the adoption of measures for the conservation of the natural wealth of the country.

We declare our firm conviction that this conservation of our natural resources is a subject of transcendent importance, which should engage unremittingly the attention of the nation, the States, and the people in earnest co-operation. These natural resources include the land on which we live and which yields our food; the living waters which fertilize the soil, supply power, and form great avenues of commerce; the forests which yield the materials for our homes, prevent erosion of the soil, and conserve the navigation and other uses of the streams; and the minerals which form the basis of our industrial life, and supply us with heat, light, and power.

We agree that the land should be so used that erosion and soil wash shall cease; and that there should be reclamation of arid and semi-arid regions by means of irrigation, and of swamp and overflowed regions by means of drainage; that the waters should be so conserved and used as to promote navigation, to enable the arid regions to be reclaimed by irrigation, and to develop power in the interests of the people; that the forests which regulate our rivers, support our industries, and promote the fertility and productiveness of the soil should be preserved and perpetuated; that the minerals found so abundantly beneath 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; that sources of national wealth exist for the benefit of the people, and that monopoly thereof should not be tolerated.

We commend the wise forethought of the President in sounding the note of warning as to the waste and exhaustion of the natural resources of the country, and signify our high appreciation of his action in calling this conference to consider the same and to seek remedies therefor through co-operation of the Nation and States.

We agree that this co-operation should find expression in suitable action by the Congress within the limits of and coextensive with the national jurisdiction of the subject, and, complimentary thereto, by the Legislatures of the several States within the limits of and coextensive with their jurisdiction.

We declare the conviction that in the use of the national resources our independent States are interdependent and bound together by ties of mutual benefits, responsibilities, and duties.

We agree in the wisdom of future conferences between the President, Members of Congress, and the Governors of States on the conservation of our natural resources with a view of continued co-operation and action on the lines suggested; and to this end we advise that from time to time, as in his judgment may seem wise, the President call the Governors of States and Members of Congress and others into conference.

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 co-operate with each other and with any similar commission of the Federal Government.

We urge the continuation and extension of forest policies adapted to secure the husbanding and renewal of our diminishing timber supply, the prevention of soil erosion, the protection of head waters, and the maintenance of the purity and navigability of our streams. We recognize that the private ownership of forest lands entails responsibilities in the interests of the people, and we favor the enactment of laws looking to the protection and replacement of privately owned forests.

We recognize in our waters a most valuable asset of the people of the United States, and we recommend the enactment of laws looking to the conservation of water resources for irrigation, water supply, power, and navigation, to the end that navigable and source streams may be brought under complete control and fully utilized for every purpose. We especially urge on the Federal Congress the immediate adoption of a wise, active, and thorough waterway policy, providing for the prompt improvement of our streams and the conservation of their watersheds required for the uses of commerce and the protection of the interests of our people.

We recommend the enactment of laws looking to the prevention of waste in the mining and extraction of coal, oil, gas, and other minerals with a view to their wise conservation for the use of the people, and to the protection of human life in the mines.

Let us conserve the foundations of our prosperity.

FINAL WORD.

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