

Colorado state forestry assoc.

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COLORADO STATE

FORESTRY ASSOCIATION.

ORGANIZED NOVEMBER 19TH, 1884.

Papers ... 2

OFFICERS.

PRESIDENT,

EDGAR T. ENSIGN, COLORADO SPRINGS.

VICE PRESIDENTS,

<i>Arapahoe County</i> -----	G. G. MERRICK-----	Denver.
<i>El Paso County</i> -----	GEO. H. PARSONS-----	Colorado Springs
<i>Larimer County</i> -----	JAMES CASSIDY-----	Fort Collins.
<i>Weld County</i> -----	RALPH MEEKER-----	Greeley.

SECRETARY,

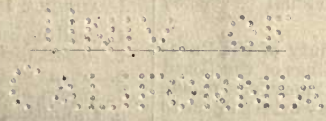
WILLIAM E. PABOR, FRUITA.

TREASURER,

A. E. GIPSON, GREELEY.

BOARD OF MANAGERS,

W. N. BYERS, W. W. PARDEE, WM. DAVIS, W. D. ARNETT,
And the President, Secretary and Treasurer.



DENVER, COLORADO:
THE REPUBLICAN PUBLISHING COMPANY, PRINTERS.

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CONSTITUTION AND BY-LAWS.

ADOPTED NOV. 19-20, 1884.

Article 1. This association shall be known as the Colorado State Forest y Association.

Art. 2. Its object shall be the preservation and cultivation of trees in this State.

Art. 3. Its membership shall consist of annual members, paying an annual fee of one dollar, in advance, of life members paying a fee of ten dollars at one time, and of honorary members, who shall be persons of distinguished merit in forestry, and shall be elected to membership by a vote of the association.

Art. 4. It shall hold an annual meeting on the second Tuesday of January, in each year, at Denver, unless otherwise ordered, at the regulur meeting of the association.

Art. 5. The officers of the Association shall be a President, a Vice President from each county, a Secretary, and a Treasurer. With the exception of the Vice Presidents, they shall be elected at each annual meeting of the association, and shall hold their office for one year, or until their successors shall be elected. The Vice Presidents shall be appointed by the President.

Art. 6. The affairs of the Association shall be under the control of a Board of Managers, consisting of the President, the Secretary, the Treasurer, and four other members of the Association, who shall be elected at each annual meeting, and shall hold their office for one year, or until their successors shall be elected. They shall have the power to fill any vacancies occurring in the Board between the annual meetings of the Association, and any officer so appointed shall hold his office until the next succeeding annual meeting, or until a successor shall be elected by the Association.

Art. 7. It shall be the duty of the President to preside at all meetings of the Board and Association, call special meetings, decide all points of order there may arise subject to customary laws, and have general supervision over the affairs of the Association.

Art. 8. It shall be the duty of the Vice-Presidents, in alphabetical order of their

counties, to preside at all meetings of the Association during the absence of the President or his inability to act; to call conventions in their counties; to form associations for the purpose of carrying out the objects of this Association, and to report at each annual meeting.

Art. 9. It shall be the duty of the Secretary to record the proceedings of the meetings of the Board and the Association, and to take charge of all documents and papers belonging to his office as Secretary; to audit the accounts of the Treasurer, certify to the correctness thereof, and present the same to the association annually; to transact all business of the association requiring transmittal by mail and make an annual report to the Association.

Art. 10. It shall be the duty of the Treasurer to receive and disburse all moneys of the Association under the direction of the Board, and to submit his accounts, with proper vouchers in writing at least ten days previous to each annual meeting to the Secretary, to be audited and approved by him.

Art. 11. If, at any meeting of the Board, it shall appear that the President is absent, then the meeting may choose a President *pro tem*, as also in the absence of the Secretary, a Secretary *pro tem* may be chosen.

Art. 12. A resolution signed by a majority of the members of the Board of Managers shall be considered valid and in full force, the same as though passed at a regular meeting of the Board.

Art. 13. This Constitution may by amended at any annual meeting of the Association by a two-thirds vote of the members present.

ARTICLE 14—ORDER OF BUSINESS.

1. Reading and approval of minutes.
2. Report of the President.
3. Report of the Secretary.
4. Report of committees.
5. Unfinished business.
6. New business.
7. Election of officers and members of the Board of Managers, new members and honorary members of the Society.

FIRST DAYS SESSION.

The meeting for the purpose of forming a State Forestry Association, was convened November 19th, at 10 a. m. at the State House. The attendance was not so large as was expected, but there were a number of enthusiastic and energetic men present—just such men as are needed in launching, and perfecting such an organization.

Colonel E. T. Ensign called the meeting to order, read the call, and made a few remarks on the general subject of forestry.

Mr. W. E. Pabor, of Fruita, moved that Hon. W. N. Byers be chosen temporary Chairman, and the motion prevailed. Mr. Pabor was then made temporary Secretary, and on motion of Mr. Ensign, the temporary organization was made permanent.

The meeting was then declared ready for business, and Mr. G. H. Parsons offered the following resolution:

Resolved, That a Colorado State Forestry Association be formed, and that a committee of three be appointed by the Chair to draw up a constitution and by-laws, and report at the afternoon session.

The resolution was adopted, and the Chair appointed the following gentlemen on the committee: Messrs. George H. Parsons, W. D. Arnett and W. W. Pardee.

The following committee was then appointed on order of business: Messrs. E. T. Ensign, G. G. Merrick and E. G. Perkins.

A recess was taken for ten minutes, pending the report of the Committee on Order of Business, and when the meeting was again called to order, the committee submitted the following report:

1. Reading of minutes of last meeting.
2. Reports of committees.
3. New business, resolutions, etc.
4. Unfinished business.

The report was adopted and the meeting then adjourned until 2 o'clock p. m.

Afternoon Session.

At 2 o'clock the meeting was again called to order by Chairman Byers and, for the edification of those who were not present at the morning session, the minutes thereof were read.

Mr. Parsons, Chairman of the Committee on Constitution and By-laws, read his report, which was adopted seriatim, with few changes.

The committee having failed to provide by-laws, was instructed to prepare such as were necessary, and submit them at this morning's session.

OTHER BUSINESS.

Mr. J. M. Clark of the State Horticultural Society, offered to furnish cloth-bound copies of the report of the State Horticultural Society for the years 1882, 1883 and 1884, to members of the Forestry Association, and a vote of thanks was tendered the gentleman for the courtesy.

A letter from Mrs. A. L. Washburne, of Fort Collins, containing some suggestions concerning the formation of the Association, was read by Mr. E. T. Ensign and was referred to the Board of Managers.

Mr. A. E. Gipson was appointed temporary treasurer of the organization, and received the initiation from those who wished to become members of the organization.

MEMBERS OF THE ASSOCIATION.

The following persons paid their initiation and were enrolled as members of the association: George H. Parsons, Colorado Springs; William N. Byers, Denver; W. E. Pabor, Fruita; E. T. Ensign, Colorado Springs; W. W. Pardee, Denver; Wm. Davis, Highlands; G. G. Merrick, Denver; E. G. Perkins, Colorado Springs; Ralph Meeker, Greeley; A. E. Gipson, Greeley; James Cassidy, Fort Collins; Mrs. Olive Wright, Denver; W. D. Arnett, Morrison.

The Association proceeded to the election of officers with the following result:

President—E. T. Ensign, of Colorado Springs.

Secretary—Wm. E. Pabor, of Fruita.

Treasurer—A. E. Gipson, of Greeley.

Board of Managers—W. D. Arnett, of Jefferson county; Wm. N. Byers, of Grand county; Wm. Davis, of Bent county; W. W. Pardee, of Arapahoe county.

All the above officers were elected by acclamation.

On taking the chair Mr. Ensign thanked the members for the honor which had been conferred upon him, and spoke of the legislation necessary to forward the objects of the Association.

On motion of Mr. Meeker the Association tendered a vote of thanks to Mr. Byers for the satisfactory manner in which he had presided.

Mr. Pabor stated that an arrangement had been made with THE TRIBUNE-REPUBLICAN to publish the proceedings at a very small cost. He suggested that some one be empowered to attend to the matter for the Association.

On motion of Mr. Meeker, Messrs. W. E. Pabor, W. N. Byers and Ralph Meeker were appointed a Committee on Printing for this purpose.

Mr. Pabor moved that the consideration of the bill, which it was proposed to submit to the Legislature, be made the first order after the reading of the minutes at the session to-day, which begins at 9 o'clock a. m.

The motion prevailed and the Association then adjourned until 7:30 o'clock at night.

The bills, which it is proposed to consider, provide for the appointment by the State authorities, of Forest Commissioners, to look after the forest trees in the State.

Night Session.

The night session of the Association was called to order by President Ensign about 7:45 o'clock. The reading of the minutes was suspended.

President Ensign announced that if there was any matter of business that was to be attended to, it would be well to take it up the first thing.

Mr. W. N. Byers said that as he was compelled to leave the city to-day, he would like, if the Association would indulge him, to say something on the subject of the bills which are to be presented to the Legislature and which are to be the subject of discussion to-day.

No objection being offered, Mr. Byers said that the bills apparently contemplated only the preservation of the timber on State and United States land. He alluded to the manner in which timber was wasted upon the public domain, and said that he thought the land should be divided into 160-acre tracts or some suitable body, and individuals allowed to purchase the right to use the timber upon the land and to work the surface,

but leave all the title to mineral deposits in the Government, so that the public might have access to them, and when mineral was located the damage done to the owner of the surface was to be made good by the miner. He did not think the present bill would serve the purpose intended, but if this individual ownership was established timber would be protected.

"TREE PLANTING IN COLORADO."

Following the remarks of Mr. Byers, Mr. George H. Parsons read a paper on "Tree Planting in Colorado." He addressed himself to the trees best adapted to growth in this State, and described the character of twelve trees which had been found to grow rapidly, and which were exceedingly serviceable, not only as factors in climatic conditions, but in manufactures. These trees were, taking the common name, the Western Catalpa, the White Ash, the White Elm, the Cottonwood, the Balm of Gilead, the Ash Leaved Maple, the Honey Locust, the Yellow or Black Locust, the Russian Mulberry, the White or Silvery Maple, the Red Cedar, the White or Gray Willow.

The paper was listened to with great interest and at its close Mr. W. E. Pabor read an essay on "Forestry in Colorado." The paper dealt with the uses of forests in making the country habitable and showed the blighting effects of denuding land of its woodland growth. The influence of forests on the rainfall in this State was noticed and it appeared from statistics that the rainfall had decreased since the wanton and wholesale destruction of forests began.

"THE USE AND BEAUTY OF FORESTS."

Mr. Ralph Meeker, editor of the Greeley *Tribune*, followed with a well-written essay on "The Use and Beauty of Forests." The essay considered the manifold uses to which timber is put in civilized lands and dwell at length on the beauty which a fine growth of trees gave to the landscape. For these reasons he urged the preservation of the forests.

Following this Prof. James Cassidy, of Fort Collins, read a long paper on "Forestry." It was an exceedingly interesting document, showing great scientific research and thorough knowledge of the action of the various civilized nations concerning their forests.

Mr. W. D. Arnett, of Morrison, spoke of the various processes which would make timber more lasting, and said this was a fact which should be agitated. This, he thought, would be a move to preserve the forest trees.

The meeting then adjourned.

SECOND DAYS SESSION.

The second day's session of the Colorado State Forestry Association began Thursday morning at 10 o'clock at the rooms of the Supreme Court. Quite a number of persons interested in the subject were present and the session was very interesting.

President Ensign called the meeting to order, and it was decided to dispense with the reading of the minutes of previous sessions.

Mr. G. H. Parsons, from the Committee on Constitution and By-Laws, reported an order of business, which was incorporated as part of the Constitution and By-laws.

At the session on Wednesday it was decided to make the consideration of a forestry bill, to be submitted to the next Legislature, the special object of the meeting after the reading of the minutes, but this order was suspended so as to permit of the reading of papers which had been specially prepared for the meeting.

INTERESTING PAPERS.

The first paper read was by Mr. W. W. Pardee, on the subject of "Suggested Legislation Concerning Forestry." The paper related solely to appropriate legislation to preserve the forests.

Mr. Pabor, the secretary, read a paper contributed by Mrs. A. L. Washburn, of Loveland, on "A Woman's View of Forestry."

This was followed by a paper read by President Ensign and written by Posey S. Wilson, of Fort Collins.

The following excellent papers were then read by Secretary Pabor, "Tree Planting on Farms," written by J. H. Berry of Fruita; by the President, a letter commenting on the proposed bill for presentation to the General Assembly, written by R. Q. Tenny of Fort Collins; by the Secretary, "Nut Trees," written by H. B. Snyder of Colorado Springs; by the President, letters from David Boyd and Valentine De Vinney on the subject of forestry legislation. This concluded the reading of papers and communications.

The President announced the appointment of the following Vice-Presidents: G. G. Merrick, Arapahoe County; G. H. Parsons, El Paso County; James Cassidy, Larimer County; Ralph Meeker of Weld County.

The Society then took up the proposed bill to be submitted to the General Assembly and it was fully discussed by Messrs. Ensign, Pa-

bor, Gipson, Merrick, Pardee and others. The draft of the bill as finally adopted is as follows:

TEXT OF THE BILL.

AN ACT Relating to Woodlands and Forestry; to Establish the Office of Forest Commissioners of the State of Colorado, and to Provide for the Expense thereof.

SECTION 1. All lands now owned or controlled, or which may be hereafter owned or controlled by the State of Colorado, and which were originally, are now, or shall hereafter be covered with forest growth, or devoted to forest uses are, for the purposes of this act, declared to be woodlands.

SEC. 2. No such lands shall, after the passage of this act, be leased. They shall not be sold except by the authority of the General Assembly, upon a two-thirds vote of the members elected to each House. Subject to such laws and regulations as may be provided therefor by the Forestry Commissioners, such timber and wood as can be taken from said lands, consistent with forest preservation and growth, may, at a fair valuation, be sold, and the proceeds of such sales be immediately converted into the State Treasury.

SEC. 3. By and with the advice and consent of the Senate, the Governor shall appoint as Commissioners three suitable persons skilled in matters relating to forestry, all of whom shall be residents and citizens of this State, and who shall constitute and be known as the "Forest Commissioners of the State of Colorado." The said Commissioners shall be taken respectively from different locations in the State, in a manner to best subserv the public interests, and they shall hold office for two, four and six years respectively, and until their respective successors shall be duly appointed and confirmed. Hereafter there shall be appointed in the same manner, every two years, one Forest Commissioner, whose term of office shall be six years; due regard being had to the place of residence of the appointee, as above indicated.

SEC. 4. Each Forest Commissioner shall receive a compensation of \$5 for each day actually employed in service as Commissioner, and his reasonable and necessary traveling expenses. [Such Commissioner shall, at the expense of the [State, be pro-

vided with an office at the Capital, where their official records shall be kept.

SEC. 5. The said Forest Commissioners shall have the care and custody of all woodlands now owned or controlled or which may be hereafter owned or controlled by the State. They shall cause all such lands to be located and duly recorded, and shall make and publish reasonable rules and regulations for the prevention of trespass upon said lands, for the prevention and extinguishing of fires thereon, and for the conservation of forest growth. They shall also, so far as possible, promote the gradual extension of the forest area, encourage the planting of trees, and preserve the sources of water supply. They shall attend to the selling of timber and wood from such lands, whenever such selling shall be deemed expedient, and shall make due account of such sales and the proceeds arising therefrom. On or before the 15th day of December in each year, they shall report to the Governor their official action during the preceding year, and such information as may be useful in preserving the forests of the State and maintaining the supply of water.

SEC. 6. In addition to the powers and duties attaching to the offices of County Commissioners and Road Overseers in the counties of this State, such Commissioners and overseers shall act as conservators of woodlands in their respective localities, and shall enforce the laws and regulations made for the protection and preservation of such woodlands. Said County Commissioners shall, also, to the extent of their power, encourage the planting of trees along water courses and irrigating ditches and in other proper places; shall furnish information to the Forestry Commissioners as they may from time to time require, and report their official acts to them on or before the first day of December of each year.

SEC. 7. It is made the special duty of all forest officers of the State to exercise the utmost care and vigilance in the prevention and extinguishment of fires within the State likely to endanger or destroy forest growth, and to apprehend any persons who may be guilty of causing such fires; and in the performance of their duties, such officers may call to their aid such person or persons, within the State, as they may deem necessary. All forest officers and all peace officers within the State are empowered and required to arrest any and all persons found trespassing upon the woodlands of the State, or by unlawful cutting or destroying timber thereon, or setting fire in a manner to endanger such woodlands; and shall cause actions to be instituted in courts of proper jurisdiction to punish violators of the forestry laws of the

State. In all matters pertaining to woodlands and forests, the district officers shall be subject to the county forest officers of their respective counties, and all shall be subordinate to the Forest Commissioners of the State, in their individual or collective capacity.

SEC. 8. For the time actually occupied in the performance of duties imposed by this act, the said County Commissioners shall receive additional pay in the same manner and at the same rate per diem as is allowed by existing laws. The said Road Overseers, for services rendered under this act, shall be paid by their respective counties at the rate of \$3 per day.

SEC. 9. No person who is directly or indirectly engaged in the manufacture of lumber, or railroad ties, or telegraph poles, or any business which requires a large consumption of growing timber or wood, shall be qualified to serve as a Forest Commissioner under this act.

SEC. 10. The sum of _____ dollars, or so much thereof as may be necessary, is hereby appropriated for the purposes of this act.

SEC. 11. All acts and parts of acts inconsistent with the provisions of this act are hereby repealed.

SEC. 12. It is the opinion of the General Assembly that an emergency exists, therefore this act shall take effect and be in force from and after its passage.

The Association then adjourned until 2 o'clock p. m.

Afternoon Session.

The Association was convened again at 2:30 o'clock, President Ensign in the chair.

Mr. Parson's moved that the bill drafted by the Association be referred to the Board of Managers, with the following instructions, proposed by Mr. Pardee: "That the Board of Managers be instructed to present to, and urge upon the next General Assembly of the State, the adoption of the Forestry Act proposed by this Association this day, and the passage of such other act or acts as will subserve and carry out the objects of this Association; and to also urge upon Congress the enactment of such laws as will give Colorado the control of the woodlands in Colorado belonging to the General Government, or such legislation by Congress as will protect the forests of the public domain in Colorado from destruction and waste, and will encourage the planting and cultivation of trees in this State."

FORESTRY DOCUMENTS.

The Secretary announced that he had

written to Senator Hill for documents on forestry, published by the Department of Agriculture, and the Senator had secured a quantity of these documents which he would furnish to members who would call on him at his office, in the Cheesman block.

A communication from a German Forester was referred to the Secretary for incorporation in the minutes as he saw fit.

Mr. Pardee moved that when the Association adjourn, it be to meet in Denver on the second Tuesday in January, 1885.

The motion was adopted and Messrs. Pardee and Davis of the Board of Managers were instructed to make such arrangements for the meeting as were necessary.

COUNTY ORGANIZATIONS.

Mr. Merrick introduced a resolution requiring the Secretary to prepare instructions for the guidance of persons organizing Forestry Associations in the various counties in order to secure uniformity in these organizations. The resolution was adopted.

Mr. Parsons introduced a resolution which was adopted, requiring the Vice Presidents appointed in each county to circulate petitions urging the Legislature to pass the forestry bill drafted by the State Association.

On motion of Mr. Meeker, a vote of thanks was tendered to Secretary of State Edwards and Superior Court Clerk Miller for the use of the court room for the sessions of the Association.

The body then adjourned until next January.

PAPERS READ BEFORE THE SOCIETY.

CONCERNING TREE PLANTING.

[By Geo. H. Parsons, of Colorado Springs.]

The science of forestry is divided into two branches—forest preservation and tree culture. Of these divisions the former is without doubt the most important, and of vital importance to the people of Colorado. The most generous planting of trees will never compensate for the hundredth part of the forest that is now being destroyed by accident or for commercial purposes. At the same time forest preservation is a most complex problem, difficult of solution, and has practically baffled all efforts heretofore made to carry it to a successful issue. At the American Forestry Congress, held last September at Saratoga, it might well have been expected that some practical method for preserving the forests would be suggested. But there was not. In fact, very little of value was contributed to human knowledge on this subject. Tolerably familiar facts were well emphasized, but no remedy suggested. There

may be no remedy. The United States Government may not be able or willing to take any action, and the State Governments may be too ignorant or indifferent. The people themselves may lack sufficient intelligence or be unwilling to stir themselves in matters which do not directly affect their pockets and comforts. But I am more hopeful.

WHAT CAN BE ACCOMPLISHED.

The people can be educated to see the necessity of decisive action, and can force their Legislatures to frame suitable laws and carry them out faithfully. The States can so unite as to compel the central Government to adopt energetic measures for the preservation of their forests. All this will require much work and many years, but it must be always remembered as the main object of this Association, whose efforts should be continually exerted to this end, until the plains are dotted with groves and the mountains covered with forests.

Until this great problem of forestry is solved, the only means of making good our losses to any degree is by tree-culture. This is a subject plain, straightforward and simple, easily understood and practiced by all. It has attracted much attention in all the States, but less in Colorado than any other, although its need is perhaps greater on our plains and mountains than anywhere else. Trees are needed here to check the rapid evaporation from the ground, and to protect it from the dry scorching effect of the sun at this altitude; to increase the humidity of the atmosphere; to break the force of the heavy destructive winds that sweep over the plains, and to keep up the flow of our streams in the dry season. Our climate would be warmer in the winter and cooler in summer, and crops more easily raised, if the plains were well supplied with trees. I believe nothing can be now done which will benefit Colorado more than tree culture; and, in the furtherance of this good cause, each land owner can do his part, and has his duty to perform. I say duty, because that is the highest prompter of any action; to forget, and even sacrifice, our own interests, that our children, and our children's children, may be benefited. Government, as the trustee of future proprietors, is bound to take all action, which may be necessary, to secure them their rights, among which is the enjoyment of their inheritance, with its productivity wholly unimpaired. But the people are primarily the Government of this country, and it is their duty—it is the duty of each individual, in the highest sense—to so employ his stewardship, that future generations may bless, not curse him.

Besides this duty that rests heavily upon each landholder, there are also the more self-

ish motives of profit and pleasure. Of these little need be said here. Much has he lost who never felt the pleasure of watching the growth or sat under the shade of a tree he has planted. Many are the proofs of the great economic and hygienic value of trees, as shown and published in various ways.

PROFIT IN TREE PLANTING.

The direct profits of tree planting may be easily and conclusively shown to be 10 to 20 per cent. per annum. It is as profitable as any crop of farm or garden, but has the one objection insurmountable to most people of tying up capital without returns for many years. These three great reasons for tree planting, duty, pleasure and profit, cannot be gainsaid. But some will say: I want all my irrigable land for agriculture; I cannot afford any for the slow returns of trees." Look about carefully. Are there no wet places or water holes which are too wet to crop, but where trees will grow? Are there no corners where a tree can be planted and irrigated? Is every foot of your land utilized? It is an old commandment: "Seek and ye shall find."

Plant masses around your dwellings and out buildings. Plant rows along each side of your irrigating ditches; plant trees along your fences, and on the edges of your fields, wherever water can be carried for them. In this way, no extra irrigation is needed, and the cost of their growth is nothing, while the good they do is incalculable.

One of the greatest uses for trees is for wind breaks, especially on the prairies, where the winds are sudden and devastating, doing more harm to all vegetation, with their dry, scorching effect, than is generally credited. It is a settled fact that the only corn raised in Central Kansas, in the year 1874, was grown where it had the protection of forest shelter.

CLIMATIC EFFECTS.

In this peculiar dry climate and at this great altitude all vegetation is subject to many vicissitudes. The chief obstacle to the growth of trees is not the lack of water. If it were we could grow all hardy trees with irrigation. It is rather the altitude. The rare atmosphere, with scarcely any humidity, and presenting little obstruction to the scorching rays of the sun, produces so great an evaporation from all parts of the tree, that often the machinery cannot keep up the circulation necessary to a healthy condition. On the plains in winter the cold dry winds, with a hot scorching sun often draw all the life from the tree. The thawing of a tree during some of our warm winter days is more injurious than the greatest amount of freezing. In the parks and canons among the mountains the same obsta-

cles to vegetable growth are found, but to a less degree. The trees are there more sheltered from sun and wind, and the atmosphere is moister.

To overcome these evil effects a tree must possess, besides hardiness, strong, rapid and robust growth. It must have machinery accustomed to sudden calls upon it for rapid action and will run smoothly without friction. It must have the power of pushing out its roots with rapidity and vigor, penetrating for its food, and quickly assimilating the food and moisture in the ground.

Trees may be divided into two classes—for use and for ornament. In making these divisions I do not wish to be understood as representing that any tree is not ornamental; but some trees are of economic value, while others have no reason for being planted besides that of their beauty. In choosing a tree for either purpose we would have different objects in view. I will confine myself to trees for use.

The selection of trees strictly for use is governed by three objects—profit from the wood, value of the fruit, and their use for protection and windbreaks. Tree planting in this State has been as yet little practised, and the comparative value of trees for forest culture has not been well established. For this we sorely need forestal experimental stations throughout the State, and I trust in some way they may soon be established. On account of this lack of knowledge the following list of trees may be much changed by further experience. In preparing it I have been governed chiefly by my own observation and that of others in this State. I have chosen twelve trees, which I consider best suited for successful and profitable growth in Colorado, and will name and describe them in the order of their merit.

BEST TWELVE TREES FOR USE.

Catalpa speciosa (Western Catalpa)—Height 60 to 80 feet, with trunk 2 to 4 feet in diameter. Growth very rapid, especially when young. Wood light but close-grained, of a beautiful color, and susceptible of a fine polish; very durable, and valuable for fence posts, railroad ties and similar purposes. In the Government stockade at San Antonio it is perfectly sound, after being in the ground, it is asserted, 200 years. It is easily grown from cuttings, should be planted close, and is entirely exempt from insects. Its great durability, its tenacity of life, and the ease with which it is propagated and transplanted, make it the most profitable tree for forest growth on the plains south of latitude 43 degrees. It was much used by the Indians for canoes because of its

durable quality, and because it is not liable to crack. It is very ornamental with its round head, warm colored foliage, large, fan-like leaves, and showy clusters of flowers in spring, somewhat like those of the horse-chestnut. It must not be confounded with the more tender Eastern catalpa, *Catalpa bignonoides*, which has a less erect habit of growth, and smaller flowers, appearing earlier in the spring.

Fraxinus Americana (White Ash)—Height, seventy to eighty feet, with straight, clean trunk, growth rapid, wood light, but very tough, hard and elastic, and in great demand for agricultural tools, machines, carriages, oars, barrels, tubs, etc. It is also much sought for by cabinet makers, and is coming into use quite extensively for the interior finish of dwellings; it is called for wherever strength, stiffness and lightness are desirable. Very ornamental with its broad, round head and handsome foliage. The Green Ash (*Fraxinus viridis*) is of slower growth and forms a smaller tree, but is valuable on the plains.

Ulmus Americana (White Elm)—Height, 80 to 100 feet, growth medium, wood brown, very tough in young trees, light and moderately strong in old; always difficult to split; extensively used in the manufacture of hubs and ship blocks; bears well exposure to the atmosphere, and is of high fuel value. One of the most ornamental of trees, with its lofty sweeping gothic forms of great elegance and grace. The red or slippery elm (*Ulmus fulva*) is a smaller tree than the white elm, but of a more rapid, vigorous growth, with reddish, hard, exceedingly durable wood, much used for fence posts and rails. It may do better in this climate than the white elm.

Juglans nigra (Black Walnut)—Height 70 to 90 feet, with a very erect, straight stem, 4 to 6 feet in diameter; growth slow for the first three or four years, but rapid and vigorous afterwards; wood of a dark, rich brown color, rather hard and firm, but susceptible of a high polish, and probably more extensively employed for first-class cabinet wood than any other. It is also extensively used for gunstocks, handrails, floors, stairs and inside furnishing generally. It has a long tap root, which is an advantage in this country, helping it to find water at a great depth, but makes it difficult to transplant. Therefore it should only be grown from seed planted where the seed is to grow, in good rich soil. The nuts are gathered in the fall, mixed in soil or sand, and left in heaps exposed to frosts during the winter. In the spring they are planted in rows and covered with an inch or two of soil. The black walnut may be considered the most valuable tree we have, though of rather difficult

growth in this climate. It should be planted with soft-wooded trees to shelter it. It forms a noble tree, very ornamental with its round spacious form spreading grandly with age, and of marked beauty.

Populus Monilifera (Cottonwood)—Height, 80 to 100 feet, with trunk 4 or 5 feet in diameter. Growth most rapid. Wood soft, light, burning rapidly when seasoned, and much used in manufacturing brick. It makes excellent lumber, particularly for inside purposes, not exposed to weather; for shingles, only pine, cedar and walnut are superior. It is stated that old steamboat and mill men prefer half-seasoned cottonwood to any other, claiming they can get more steam by it. It grows well from cuttings. Although it is a short-lived tree, and the wood is comparatively poor, this native tree is so well adapted in every way to this climate that it is more profitable than many other trees of much finer qualities. As a nurse tree it is peculiarly valuable, and should always be planted in a grove with slower growing sorts and gradually cut out as the other trees mature. It is quite ornamental, with its large, glossy foliage, but is too coarse to plant on the lawn or near the garden. All the poplars are very valuable for planting in this climate because of their rapid, robust vigorous growth. Besides other native species there is the silver poplar or Abele tree (*Populus Alba*), which is large and very ornamental, with silver foliage, and *Populus grandidentata* a large tree with handsome large foliage, also *populus balsamifera*, balsam, tacamahac or balm of gilead, a tall tree much planted on account of its odoriferous buds. *Acer negundo*, ash-leaved maple or box elder, height 40 to 60 feet, with trunk two feet in diameter; growth very rapid especially when young; wood, moderately fine, white and makes good fuel when well seasoned. It has a saccharine sap, from which syrup and sugar are made, and in this can be made a substitute for sugar maple, which does not grow well here. A very ornamental tree of irregular spreading form and light green foliage. One of the most desirable of lawn trees for this climate, *gleditschia triacanthos*. Honey locust or three-thorned acacia, height 40 to 60 feet; growth, very rapid; wood, heavy hard and rather coarse-grained, and valuable for many purposes; equal to either catalpa or black walnut in construction requiring strength, and for fuel and railway ties; it shrinks but little in seasoning, and contracts and expands but little under atmospheric influences of moisture or dryness. Its clean, healthy, vigorous condition is conspicuous, and it adapts itself readily to any soil or altitude. Thorns appear on all parts of the tree, and very large ones protrude from the main

stem and the large branches; these, when they fall off, become dangerous to animals and persons frequenting the ground. Because of these thorns it is specially adapted for hedges and live fences, but in forest culture it is better to use the thornless variety (*Gleditsia croseanthos mernus*) which, however, cannot be grown from seed with certainty; valuable for ornament on account of its elegant foliage and long racemes of white and very fragrant flowers.

Robinia pseudacacia (Yellow or Black Locust)—Height 60 to 80 feet, with trunk 2 to 3 feet in diameter; growth rapid; wood white or greenish yellow, very hard and close-grained, very durable, especially when raised on rather poor land; no other wood will bear a greater strain; especially valuable for fence posts, resisting decay better than any other wood except cedar and catalpa; much sought after for tree-nails for ships, and for floors of vessels. Owing to its peculiar foliage, grass will grow under its shade more freely than any other tree, and cattle may be pastured in locust woods. It stands the drouth, and will succeed under careless management better than perhaps any other tree. In some localities it cannot be grown on account of the borers which infest it, but in this climate no fear of insects may be entertained. Very ornamental with its soft, graceful foliage and abundant racemes of white, fragrant pea-blossom flowers.

Morus alba tartarica (Russian Mulberry)—Height 50 to 60 feet, with trunk 3 to 5 feet in diameter. Growth rather slow in light, sandy soil, but very rapid in heavy, low, wet places; in Nebraska it makes a better growth than cottonwood. Wood hard, elastic, close-grained and susceptible of a fine polish, used largely in the arts and in cabinet work, musical instruments, farming implements, building, etc. As a fence-post it is almost equal to catalpa and red cedar. It can be grown from cuttings, is easily transplanted, and has proved very valuable for fuel, windbreaks and hedges. Its fruit is large and very abundant, appearing on very young trees. The leaves are also valuable for silkworms. Ornamental with its handsome foliage and spreading top. The original species, *morus alba* or white mulberry, is also very valuable for timber and extensively planted; also the red mulberry (*morus rubra*) of which the wood is yellow, very heavy and durable, and much used for tools.

Acer dasycarpum—(White or Silver maple.) Height eighty to 100 feet with trunk three to four feet in diameter. Growth very rapid in almost any soil. Wood white, fine grained, rather light and soft, but takes a fair polish,

and is used much for purposes where a very hard surface is not required; occasionally a tree yields the accidental form known as curled or birds-eye maple. The sap is sweet and sugar can be made from it. It makes good fuel, and forms a good windbreak with its abundant flexible branches. Very ornamental with large spreading top and silvery foliage.

Juniperus Virginiana (Red Cedar)—Height thirty to fifty feet. Growth medium. Outside wood white and heart wood of reddish color and very durable. Largely employed for cabinet work, pencils, fence posts, etc. Its dense growth renders it valuable for windbreaks. This coniferous tree is found in almost every State in the Union and is one of the most valuable of all forest trees for timber, windbreak or ornament. It is abundant on the foot-hills of this State. Its tapering and symmetrical form and bright rich evergreen foliage make it very ornamental. The White Cedar (*Jo Communis Alpina*) is a smaller tree, native of our mountains, especially on the western part and makes a very valuable wood, but not so desirable as red cedar, being less durable.

Salix Alba (White or Gray Willow)—Height, sixty to eighty feet with trunk three to five feet in diameter under favorable conditions. Growth very rapid. Wood light, tough and elastic and does not split easily; it is much used for house and ship floors and for carriage and cart bodies; also for bowls, trays and other vessels and for turned goods of various sorts; it has a great durability under water and when much exposed to its action, and is therefore very valuable for the floats of paddle-wheels and the buckets of mill wheels. It is very useful for fuel and can be specially recommended for windbreaks. All willows have very large masses of fine fibrous roots that penetrate the soil to a great depth, and will push to a great distance in search of moisture. The yellow-twigged willow (*salix alba vitulina*) is very valuable for baskets, and also very ornamental with its yellow twigs. The diamond willow (*salix cordata vestita*) is a variety lately found on the Missouri River north of the Yellowstone, and is said to be as desirable for posts as red cedar.

PROCESSES OF PLANTING.

And now a few final words about planting. The processes of planting here are not different from those required in any other part of the world. It should be done in the spring, and if possible only those trees should be planted which have grown a year or two here and have become acclimated. They are much more sure to succeed than those brought a long distance from a totally different cli-

mate. Young trees should be invariably planted, the younger the better. They are less expensive and more sure to live. In transplanting from the shady canons, great care is required, and the tree protected from the sun as much as possible for some time after it is planted. One of the most important parts of the successful growth of trees is fall and winter watering; often trees are lost from want of water during the winter. They should be thoroughly watered just before the ground freezes up in the fall and again during the dry, warm spell that generally comes in the early part of February.

It is better for the inexperienced to plant at first only a few of the better-tested sorts of trees. The work is thus simplified and better performed. When experience is gained and an intelligent interest in trees established, the planter may, at his own pleasure, experiment with less common trees, testing their value and adding them to his plantation as he finds them to serve his purpose. His tree-planting now becomes a source of constant enjoyment. The trees are his friends and he delights to widen his acquaintance among them.

I will conclude with the words of Sir Walter Scott to his forester: "Be aye stickin' in a tree; it will be growin' when ye're sleepin'."

FACTS ABOUT FORESTRY.

BY WM. E. PABOR, OF FRUITA.

Only a tree!

But think of it—something that Nature takes peculiar pride in and endows with a longevity equal sometimes to seventy generations of mankind. What solemn and strange thoughts must enter the mind of a pilgrim who, traversing the island of Ceylon, stands at last in the shadow of that sacred fig tree whose age, historically determined, fixes the date of its planting 288 years before the Christian era dawned upon the world. In the year 414 this same tree was seen and described by a Chinese traveler, who found it an object of adoration and worship. In later centuries the earliest Europeans who visited the country gave testimony as to its venerable age. It still flourishes, a holy tree in every sense of the word to the Buddhists who worship about its rugged trunk and under its gnarled limbs. Even in our own land, among the redwood forests of California, there are trees whose size indicate an age equal and perhaps superior to the fig tree of Ceylon. What, then, is the life of man compared to the life of a tree? Well might this noble object of Nature have had a peculiar sanctity in

Egypt and Greece, which feeling was fostered by imposing and impressive rites and ceremonies connected with their Deities. The oak was consecrated to Jupiter, the joy to Bacchus, the olive to Minerva and the laurel to Apollo. As Kendrick says in his Ancient Egypt: "Their susceptibility to atmospheric influence may have invested them with a prophetic virtue in regard to changes of weather." Their longevity may have caused them to be regarded as emblems of divine power and duration and to be invested with something of that mysterious awe which attaches to everything that has witnessed ages and generations long passed away.

But man can be cruel, though his life be so brief, and the ax in the sturdy workman's hand can destroy in a day the beautiful temple that the earth and the air, the sunshine and the rain have combined to build into a lofty structure whose roots penetrate deep into the very heart of nature, and whose brow is lifted high into the arcana above us.

It is because man has been, and still is, thus cruel, that we have met to take counsel together to devise some means by which the trees of the forest may be spared from wholesale destruction. We learn from the census reports that the consumption of wood as fuel for the census year of 1880 amounted to 140,537,439 cords, valued at \$306,950,040. In addition to this use of wood for domestic purposes, railroads, steamboats, mines and manufactories used 145,778,138 cords, having a value of \$321,962,273. So that, in one year only, have the startling figures of over six hundred million cords of wood consumed, representing a value of over seven hundred million of dollars, about one-third of the national debt of the United States. This use is domestic and industrial and therefore legitimate and justifiable; but what shall we say when we come to consider the area of forests that the igniting of a single match in the hands of a careless hunter or tourist may sweep out of existence? Can language too strong be used in condemnation of such carelessness or maliciousness? Can our words be too plain or too loud in our appeal for some measure of restraint strong enough to stay the destroying touch?

A few years ago Dr. E. E. Edwards, then President of our Agricultural College, prepared an address on the Utility of Trees, and delivered it at different institutes held by the farmers in various parts of the State. In January, 1880, he delivered this lecture at Monument, on the Divide, in a section where the trees, for the last twenty years, have suffered most from the destroying hand of man. Here are some of the significant words he

used: "We want these trees in the valleys and on the plains, along our water-courses and on our mountain slopes. Once destroyed, ages will not replace them. They are already passing away. A few years ago, when I first visited the State, their death-fires gleamed like the camp-fires of an avenging enemy along the eastern slopes of the snowy range, and every year they are burning. What the fire spares the ax destroys. Whoever makes war upon these forests, makes war upon our civilization, our prosperity, our happiness. They are cutting off our supply of water, drying our fountains, blighting our forests. * *

"The mountains are our strong and mighty friends. From them proceed all fertility of soil, and all healthfulness of climate. Their red granite and gray limestones, and sandstones, crumbling, make the soil of these plains. They are a shelter from storms. In their sunset shadows, we find rest. They temper the heat of our summers, moderate the cold of our winters. They are camped along our western horizon, like the white tents of an army. Their banner is the cloud. They are the breastworks of our land. They are full of treasure, rich in silver and gold. But there is a treasure as great as these, in the snow, folded, like a mantle, around their shining summits. Put for this, all of the land would be as desolate as a field of death. In the snow are the wheat, and the corn, and the fruit of the vine. It holds the golden harvests that are to wave on the plains below. And the trees are the protectors, the guardian spirits, of the snow. Therefore, we repeat, protect the trees."

Could Doctor Edwards be with us here, today, there would be no more earnest advocate in behalf of a State society for the protection of our forests.

Years ago a President of the New York State Agricultural Society, in an address before that body, said: "Has the wholesale destruction of forests nothing to do with this sweeping over and beyond us, of the heavy rain clouds? Can we continue to sweep away all our growth of timber in every arable district and even denude our rocky hillsides and mountain tops without incurring the penalty? Can we expect to escape the operations of a universal law that has produced uniform results in all countries and in all ages? Wherever this law has been violated, sooner or later, the lands have become desolate and the cities have perished. Palestine and Syria, Egypt and Italy and Spain and even France, have seen their most fertile and prosperous regions turned into forsaken wildernesses and their most productive lands into arid, sandy deserts." Well may we echo the question put in 1868

to the California State Horticultural Society by a speaker who quoted the above language: "If New York, which has naturally a moist climate, is so soon beginning to experience the deleterious effects of a destruction of her forests, what will we be, years from now, if our people go on as they have for the past fifteen years, recklessly sweeping the timber before them as they settle up the country or even in advance of such settlement?"

Let us, here in Colorado, heed the lesson before it is too late. Let our newspapers take up the subject and discuss it in the interest of the general welfare of the State and not be doing, as did a Boulder County paper four years ago, be boasting of the 20,000 acres of mountain sides in one vast forest, whose tall trees were being cut down for a saw-mill, and extolling the enterprise of the men who were doing what at the same time Dr. Edwards was so severely condemning. The editor forgot, in his pride of local enterprise, that he was nursing a viper to sting the community in the years when the St. Vrain and the Boulder and the Big Thompson Creeks were to run dry in summer because this very 2,000 acres of forest had been destroyed. Nature gives us enough to contend with here, without our own hands adding to the burden. We have dry and rainless summers. We have hot winds that drain our valley soil of moisture, that sponge out of existence the water of mountain streams, and the admonition comes to us, in language that we cannot mistake, that we must arrest the destruction of our forests or be ourselves destroyed.

It is the theory of many persons that the natural rainfall of Colorado is increasing, and that the time is coming when but little irrigation will be required for the growth of crops. Never was theory so fallacious, and he who builds upon it builds upon the sands of error. What are the facts, taking the rainfall of the last ten years in Colorado, in the vicinity of Denver, as a basis? Here is the record:

	<i>Inches.</i>		<i>Inches.</i>
1874	13.45	1879	10.86
1875.....	17.25	1880	9.58
1876.....	20 12	1881	12.79
1877.....	16.38	1882	14.49
1878.....	15.51	1883	19.49
Total.....	82.71	Total.....	67.21
Average inches...	16.54	Average inches...	13.44

Does this not show an average decrease of over three inches yearly? To what can we look as the cause, unless it be in the denuding of our vast timber ranges.

The rain record of Idaho tells a similar story. From 1873 to and including 1877, the

average rainfall was 22.63 inches. For the five succeeding years, ending with 1882, the average yearly rainfall was 22.63 inches, showing a loss per year of over four inches.

In Utah the decrease is still more plain. During these same periods an average of 22.63 has dropped to 14.85, showing a loss of one-third.

In Arizona the 13.85 average for the first five years is lowered by two inches annually for the five that follow.

To what are these attributable at a time when General Hazen, in his Signal Service notes on variation of rainfall west of the Mississippi River, announces as one of the conclusions arrived at during three years of observation, that "the gradual increase in rainfall during the years 1880, 1881 and 1882 is noticeable over a large extent of country."

The question then comes back to us, What shall we do to preserve our forests? Not only to preserve what we already have, but to increase their area?

It may be of interest to know what action foreign nations and some of the States of the American Union have taken in the interest of forestry, before presenting our own. The forest codes of the Old World are extensive, and various governments exercise almost arbitrary control over private estates by right of eminent domain. In some instances they own immense bodies of land over which they exercise the strictest surveillance. Schools of Forestry abound in the German empire, some of them over 100 years old, where forestry is made a study equal to agriculture under university organization. Austria has its High Schools of Forestry, maintained at State expense. Switzerland supports a Forestry division in its Federal Polytechnic School. France has a school of Forestry at Nancy, established for the sole purpose of preparing agents for the State Forestry service. During the last fifty years it has educated over a thousand persons for this special work. Italy created a school of Forestry by royal decree in 1869 upon the plan adopted by France. Spain has its special school of Forest Engineers under the direction of the Ministers of Agriculture. The General Institute of Agriculture of Portugal embraces in its course Sylviculture and Forest Engineering. Russia has its Forestal school, and Sweden its Forest Institute aided by government under the management of directors appointed by the King. Others might be named, but these will answer to show that the protection of forest trees, not alone for their supply of timber, but for the climatic influence they exert, is world-wide in its work.

Nearer home, in our sister Republic of

Mexico we find that particular attention is at present being paid to tree planting; not alone by the owners of estates, but by the Government, which has lately entered into contract with parties for the planting of 2,000,000 trees in the Valley of Mexico within four years. These trees are to consist of such varieties as ash, willows, poplar, eucalyptus, cedars and acacias, and are to be in plantations of from 50,000 to 100,000 each. These groves, in the years to come, cannot fail to have a beneficial effect upon the climate of Mexico.

Concerning State laws upon the subject, I have grouped together, very briefly, some of the laws upon the statute books, as follows:

California—A penalty of not more than \$1,000, or a term of imprisonment not more than one year is imposed for willfully setting fire to any wooded country or forest belonging to the State or the United States, or to any place where fire would communicate to such forests.

Dakota—Parties planting trees along public highways may occupy and use one rod in width of such highways for the purpose of cultivating the growth of timber and trees thereon.

Illinois—Counties are allowed to offer as bounty to persons planting forest trees and caring for them three years, any sum not exceeding \$10 per annum for three years for each acre so planted.

Iowa—Exempts from taxation the real and personal property of each taxpayer who plants and cares for one or more acres of forest trees, the sum of \$100 per acre for ten years.

Kansas—In 1868 had a law giving a bounty of \$2 per acre for planting any kind of forest trees except black locust, to continue for twenty-five years. This was amended in 1872 requiring at least 160 trees to the acre. Two years later this act was repealed, and one enacted providing penalties for kindling fires upon lands not owned and occupied, leaving the same unextinguished.

Maine—Exempts from taxation for twenty years lands from which the primitive forests have been removed, that are reset to trees.

Minnesota—An annual bounty of \$2 per acre and a like annual bounty for every half mile of trees along the public highway, to be paid out of the State treasury.

Missouri—A similar law exists, except that the bounty is paid by the county in which the trees are planted.

Nebraska—An exemption of \$100 per year for five years on each acre planted and a further provision that the increased value of lands by reason of live fences, fruit and forest trees grown thereon shall not be taken into account in the assessment thereof.

Nevada—An annual bounty of \$10 per acre and \$10 per half mile, along a public highway, for twenty years, paid by the county, and such planting not to add to or increase the taxable value of said land. This act does not apply to willows or cottonwoods planted along canals for the protection of the banks.

New York—Allows overseers of highways to give a rebate of \$1 for every four trees set out along the highways.

Wisconsin—Exempts from taxation lands set to belts of trees until they attain a height of twelve feet; afterward the owner of such tree belts is entitled to an annual bounty of \$2 per acre. These tree belts, it is provided, shall be on the west and south side of tracts of land, and not less than thirty feet wide for each five acres of land.

Colorado—Our State Constitution contains sections giving the General Assembly power to enact laws in order to prevent the destruction of, and to preserve the forests, upon the lands of the State; and to provide that the increase in value of lands by reason of orchards, hedges, etc., shall not be taken into account in assessing for taxation. In 1881 an act was passed providing that for ten years such exemption should exist, dating back from 1876, so that this expires in two years. Also, providing a bounty for tree-planting along public highways. Fines are also imposed for the careless setting on fire of timber. But no laws have as yet been enacted covering the preservation of the forests within the borders of the State. These being the property of the United States Government, are not legitimately the subject of legislative action, save by memorial to Congress; and this Convention should see to it that such a memorial, asking, in the language of the State Constitutional Convention in its memorial of 1875 upon the same subject, that Congress "put the respective forests and waste forest grounds in regions where irrigation has to be used for agricultural purposes, under the control of the respective Territorial and State governments." The reasons that existed for such a memorial ten years ago are more clear and decisive now than then; and here let me quote from Mr. F. P. Baker's preliminary report on the "Forestry of the Mississippi Valley," published by the Department of Agriculture in 1883, in which he comments upon the spoliation of Government lands in Colorado in the following vigorous language: "In regard to the forest lands still the property of the United States, the question has arisen, shall they be protected for the benefit of the country and of generations yet to come, or shall they be reduced to desert wastes for the private benefit of speculators and corporations? Take the

case of the Government forest lands in Colorado. Twenty-four years ago the slopes of the Rocky Mountains were covered with the untouched forests sufficient, if properly cared for, to supply the reasonable needs of the settler and miner, as contemplated by the law, till the end of time. In the shadow of these forests rose the headwaters of the Rio Grande, Platte and the Arkansas, and the snow in the deep woods melting slowly, the rise in the streams was gradual and uniform for a long period. To-day these mountains are being left peeled and bare. The mountain side is being converted into a bald, bleak desert; the springs are drying up, and the Rio Grande, Platte and Arkansas now rise with sudden violence, and then sink as suddenly in their dry and diminished beds. In other words, the people of Colorado, New Mexico and Kansas are having inflicted upon them incalculable injury, and a wrong is being done which, if not arrested, will disastrously affect generations yet unborn."

Mr. Baker advocates Government Foresters, schools of forestry and experimental farms where the methods of irrigation as applied to forest culture should be thoroughly tested. But we can hardly expect National legislation of such character as yet. If, by concert of action we can secure some law by which the States and Territories of the great Rocky Mountain range most directly interested in the preservation and enlargement of the forests that are now so rapidly being destroyed under the "liberal" interpretation of the "domestic use" privilege in the law now existing, we shall be accomplishing much and making rapid strides toward the end we aim at. The State of Colorado is entitled to and is now selecting through its Board of Land Commissioners, about 90,000 acres to complete the quota of its various grants. If, in selecting lands wholly agricultural, it could be allowed to select wood-lands, these might be secured in localities where it would be desirable to make efforts to preserve forest growth, or at least to carry on experimental work whose value to future generations we are not able now to properly estimate. This is thrown out merely as a suggestion. We are so much in the dark as to our ability to act, and in what direction, that any faint gleam of light thrown on our path may lead to clearer vision. At least, and surely, we can have a Memorial Committee, representing various sections of our State, whose duty it shall be to prepare and circulate an appeal to our General Assembly, convening next January, for a memorial to Congress; securing signatures in such numbers as shall convince both the General Assembly and Congress that we are in earnest in this matter, as indeed we need be if we do not desire drouth, desola-

tion and disaster to follow upon this wholesale destruction of the forests of Colorado.

THE USE AND BEAUTY OF FORESTS.

BY RALPH MEEKER, OF GREELEY.

It has been said that the earth would be uninhabitable were it not for its trees. However true or false this may be, it is a fact that no product of the soil enters so largely into the industries of the world as timber. The table on which we eat, the bed on which we sleep, the floor on which we walk, the roof that shelter us, the chest that contains the relics of a generation, the car on the railway, the ship on the ocean, the house, the barn, the plow, the reaper, the fence—in fact nearly everything made with tools for the use of mankind is more or less indebted to our forests for its existence.

Coal mines may become exhausted, oil wells may cease flowing, but trees will grow and flourish while the earth remains habitable. Practicably considered, our forests are necessary to civilization. *Æsthetically* considered, trees in their way are as beautiful as the ocean or the mountains or the sky.

The man who rears his family in the center of a township of black prairie, six miles from a school house, and sells corn for ten cents a bushel, may see no benefit in the beauty of the forest, which all the poets from Homer to Shakespeare have immortalized. Byron says, "There is pleasure in the pathless woods;" and Bryant speaks of the groves as God's first temples.

But we need not go to the poets for authority on this subject. Our trees speak for themselves. The Cedars of Lebanon, that bowed their heads in ancient Palestine, so deeply impressed the people with their solemn grandeur and stately magnificence, that their names were used as figures of speech in all the great writings of that day.

Any object of nature that purifies a man's thoughts or awakens his reverence is of as much benefit as a teacher, a poet or an evangelist, so far as its influence extends. There can be no doubt that beautiful groves and long shaded avenues soften rugged natures as they modify the climate in which men live. A great writer has said that "Imagination rules the world." Inhabitants of a wooded country are undoubtedly more given to sentiment and imagery of a higher character, than those living in mud-flats and low countries.

It is fashionable in this age of machinery to speak lightly of schemes for expending money in beautifying land that one does not own. It is with difficulty that the Yellowstone Parks were set aside for public uses.

The Adirondacks have been the subject of legislative discussions for years, but still the work of destruction goes on. Niagara Falls, that marvelous combination of the sublime and beautiful, is treated as if it were a circus to be viewed for so much a head, while its trees and lovely natural shrubbery are mutilated and destroyed. In our own State of Colorado, we see the mountains robbed of their green covering every year. Careless hunters and woodsmen leave their fires to blacken and deface the finest scenery in the world. The spirit of vandalism is becoming a characteristic of the American people, and the literature (the dime novel literature) most read by our young people, is in keeping with this vandal spirit. A reverential regard for the beautiful things on earth exists only in sentiment among comparatively few people. In Germany, where the strongest feeling is for the Fatherland, trees literally cover the great Empire. Groves crown every hill-top, and shadow the humblest dwellings. The phrase ("Unter der Linden") "Under the Linden" has become a household word throughout Europe. All the parks and gardens which are open to the public are as much respected as if guarded by soldiers. The flowers and trees of Germany are the themes of song and poetry. A child is taught from its youth to revere the forests; and the same is true, to a great extent, of France and England, both countries celebrated for the beauty of their wooded parks. What is the result? Every line of Chaucer and Wordsworth breathes a spirit of affection for the trees of that land. In Germany the love of country amounts to a passion. It is there and in Switzerland (similar in all respects to Germany), that patriotism is most heroically defined. The best of literature is read and every boy is familiar with Schiller and Goethe, while the common music sung in the schools and around the hearthstone is recognized as classic throughout the world. Large appropriations of money have been made by the governments of those countries for the protection of their forests. It is generally true the best laws and the deepest patriotism are founded on sentiment. In the old countries wanton destruction of timber is punished by law and condemned by all good citizens. In this country the great forests are looked upon as public property, and every man who can wield an ax does not hesitate to chop a tree. In fact, the most popular event in the life of Washington was the cutting down of his father's cherry tree. The story has been repeated to every child, until the ruling ambition in life is to destroy a tree without lying about it. Of course we must have lumber and trees to make it from; but there is no reason why other trees should not be planted to take their places.

A few years ago Clear Creek, Boulder and the other canons were filled with forests. To-day their naked rocks present melancholy pictures of desolation. On the west side of the range it is different. There one imagines he is in another country. The scenery is the most beautiful in Colorado. Lofly trees cover the mountains, and the traveler can easily believe himself in the loveliest portion of Switzerland. Colorado has sixty-three million acres of land. A few years ago it was said that three million acres could be irrigated. Now the estimate is reduced to two million acres. Fully one-half the entire State, especially that portion devoted to mining, can never be cultivated nor used for stock raising except to a limited degree. The timber now on it should be protected. If the mountain timber were burned and all the trees growing along the rivers and foothills destroyed precious few tourists would remain here beyond a few weeks. The hunting would be of little value, the rainfall would decrease, and the mountain districts would become as unattractive as the broken wastes of Syria. Visitors to Colorado cannot make any visible use of trees. They cannot eat them nor carry them away as souvenirs. They can only admire their beauty, and appreciate their usefulness in breaking the monotony of the landscape, and in shading the water-courses. The Great American Desert can be made as beautiful as any of the Eastern countries. With alfalfa to keep the soil moist, comparatively little irrigation will be required to nourish trees. The groves of Greece, and those lovely wooded parks of England, can be reproduced here in Colorado. If the trees in Denver and Greeley were burned their real estate would depreciate 10 per cent.

It is not claimed that the cottonwood shade trees in Colorado towns add to the length of human life, or the healthfulness of the climate. It is their beauty that is prized. The man who walks to his friend's house, under arching trees, is conscious of a charm that neither architecture nor imposing walls can give. The tired traveler, who has seen nothing more inviting than the shade of his mule, during his journey across the plains, at last reaches the bank of some swiftly-flowing river, where, weary, and begrimed with dust, he throws himself on the ground, beneath the overhanging trees. Does he stop to consider whether they are maples, or elms, or cottonwoods? He only looks at the blue sky, through the fringes of their foliage, and, closing his eyes, in grateful repose, thanks Heaven for the beauty and shade around him.

In regard to the uses and influence of

beauty there ought to be but one opinion. Beauty is one of the elements of civilization. There is an indescribable charm about trees that awakens the best side of one's nature. We instinctively associated beautiful faces with beautiful surroundings. The well-kept lawn and deep-shaded avenue generally betokens a man of intelligent refinement. The drapery which clothes the earth is as beneficial to mankind as the decorations and carvings in our houses. A shiftless, worthless man, always in debt, with a swarm of ignorant, sore-eyed children about him, lives in bare walls, with no vines around his gate, no grass in his yard, no shade to welcome the visitor who comes to his door. What is a tree to such a man? Corn and pork are his life.

How beautifully Bret Harte writes of the forests of California. It was the poet-spirit of reverence for trees that made the early fathers worship in the groves of Britain and Germany.

It was this spirit that lead the masters of the artistic centuries to make cathedrals like the aisles of the forests. In this way we know that Gothic architecture was created, and those who have walked with uncovered head under the arches of Westminster Abbey realized the sacred beauty of the place. Man does best when he follows most closely after nature. Who has not been moved by the eloquence of the trees. What a history have the pines on our mountains. The rings date them back to the French Revolution. What august events have transpired since their young boughs first swayed in the wintry storms. The contemplation of beautiful nature is medicine for the mind. Philosophers and poets have found inspiration beneath their favorite trees.

What lessons of innocence and beauty come on the wings of the whispering winds from the trees. Columbus was in despair until he saw drift-wood floating on the tide. It was a branch of the olive tree that brought joy to the ark.

In the far-away land of Circassia and Georgia, where the lofty peaks of the Caucasus lift vast forests above the clouds, the world is as beautiful as a dream. Such scenes would make Colorado a paradise. The beauty of the people is celebrated, and their costumes an admiration of Paris to-day. Even the imperial garments of the Czar's household are fashioned after the wardrobes of Circassia. It is there that beauty in nature and beauty in the human face blend like imagery of a poem. Here in Colorado we have mountains, plains, rivers, valleys, and the skies of fair Persia. All we need is verdure. "With verdure clad," sings the chorus in the oratorio

of the Creation. "With verdure clad" shall be these everlasting plains and mountains, and then the beauty of the thoughts within us shall agree with the beauty of our centennial heritage.

THE LAWS ON TREE CULTURE

BY POSEY S. WILSON, OF FT. COLLINS.

It having been granted that our rivers and rainfall and forests are, within certain limits independent, and that legislation to preserve the latter is needed, it is next in order to consider the limits and bearing of the question as indicated by our State Constitution, and by the land laws of the United States; and with them in view, to deliberate upon what laws may be practicable or capable of being administered in the case.

It occurs to me, as I survey from where I write, the traces of a recent destructive forest fire, that little good might be done by adding to enactments against setting fires, a penalty for leaving unextinguished camp fires. A policy that will force the timber cutter to first use the fallen timber will do much to save living trees, especially from fire. Slight additional good may be derived from a total repeal by Congress of the duty on unplanned lumber—\$2.00 per "M." Also, appeals might be made to railroad companies to grant the lowest rate of freight on Eastern lumber that is consistent with their own present and particular interest considered with reference to their general interest in the public welfare, and so render us independent of our own forests so far as possible.

To induce the absolute prohibition of fencing public lands, save in cases where actual settlers have filed on homestead or pre-emption claims; to forbid the destruction of young trees, and perhaps to secure the withdrawal from settlement, sale, or use of all the living timber within a given distance from the banks of every living stream.

Because of the strong currents of air which move in all this elevated region, it is possible that actual rainfall is influenced, in a minimum degree, by our forests; but there can be no doubt that their benefits are boundless, in storing snow, and preventing its too rapid melting, and flowing away in freshets, at a time in advance of the farmers' needs.

So much am I radical in the matter of preserving the forests, that I would go so far as to endeavor to secure for the State of Colorado, temporarily, at least, and as an experiment, complete control of the forests within her borders, or the most necessary part of them, without the power either of conveying

them, or the exclusive use of any part of their area as such. Then I would provide for a permit system, involving the officials of the several counties, preventing the citizens the use at will of forests, and discriminating between dead and living trees (wholly preserving the young trees), according to the citizen's need, or as the officials might deem best for the general welfare.

We must not expect too much resignation of privilege on the part of a living generation in behalf of unborn generations, but there may be a golden mean which we can follow, to the good of both ourselves and posterity.

The action of other governments in preserving their forests, as well as in encouraging the planting of groves, should teach us the limitless value of our forests. The zeal of the German Government in behalf of its forests and groves is carried to the degree of forbidding the owners of trees to cut them down without its consent. Only within the last thirty years was the method of preserving forests through the organization of Forestry associations proposed. The first, I believe, at least the first in England, was held in 1851, at the suggestion of the Prince Consort. The Queen herself, as well as other members of the Royal Family, was among the leading patrons of the International Forestry Exhibition held at Edinburgh in July last.

The British Secretary of State sent circular letters to all of that nation's representatives in foreign countries, asking them to secure the co-operation of foreign powers.

There were in attendance representatives from the governments of France, Japan, Denmark, Sweden and Norway, Germany, the United States, Belgium, Holland, India, Siam, Morocco and most of the British colonies.

It is for us, also, in our humble way, to consider the question in all its bearings, both the conserving of our groves and the founding of new ones, and to recommend, perhaps, that a School of Forestry be added to the Agricultural College at Fort Collins.

It is possible that control of the timber lands within the State may be secured, as an experiment, from the General Government, and so managed to obtain revenue from it equal to the minimum price of Government land, and so enable the State to pay the Government at least all that it is likely to realize from them.

It should be the aim of Forestry to husband the resources of the forest, and yet not stand in the way of the great mining industries, and to render, so far as is possible, the benefits of our woodlands permanent.

In the subjoined newspaper scrap is pointed out the possibility of income from the forests. Not yet, perhaps, but still—so rapid is the forward sweep of settlement—not far off, in time, the waste of forests may be made to yield a return equal to the cost of caring for the trees:

"A paper prepared by a M. Mathieu, a French chemist, who has made a success of an apparatus devised by himself for the distillation of wood, appeared to offer a practical solution of the vexed question of what to do with the debris of logging. The device consists of a number of iron retorts set in a brickwork frame in such a way that they can conveniently and safely be filled with wood, chips, sawdust, etc. The products obtained from a cord of hard wood are reported to be on the average:

62 bushels charcoal at 6c.....	\$ 3 72
4½ gallons wood alcohol at 85c.....	3 82
160 pounds acetate of lime at 1½c.....	2 40
10 gallons tar at 4c.....	40

\$10 34

Deduct for labor, lime, use of material and interest..... 3 00

Balance.....\$ 7 34

From yellow pine the results are per cord:

63 bushels charcoal at 6c.....	\$ 3 78
12 gallons pine tar at 7c.....	84
11 gallons turpentine at 35c.....	3 85
1 gallon wood alcohol at 85c.....	85
40 pounds acetate of lime at 1½c.....	60

\$ 9 92

Deduct for labor, lime, etc..... 2 50

Balance.....\$ 7 42

"Norway pine yields less turpentine than yellow pine, and white pine more alcohol and less turpentine. The charcoal is valuable for blast furnaces, rolling mills, gas, etc. The volatile products are in demand in a vast variety of arts and mechanical processes, and new use for them is constantly arising. Wood alcohol, *e. g.*, is used in many kinds of varnish or for any use for which common alcohol is used, except for a beverage, and its unfitnes for the latter purpose exempts it from the excise tax. The acetate of lime is used in making acetic acid for employment in white lead manufacture, in print works, dyeing, tanning, paint, etc.

"M. Mathieu has devised an apparatus for use in logging camps, which would be portable. There are several large plants already at work; one of fifty-six retorts at St. Ignace, Michigan, in connection with the Martel furnace; one of fifty-six retorts at Newberry, Michigan, connected with the Vulcan Works; another of twenty-four retorts is at Port Leyden, in Northern New York, connected with an iron company. There are others in

Ontario, Ohio, Maryland, Pennsylvania and Alabama."

SUGGESTED LEGISLATION CONCERNING FORESTRY.

BY W. W. PARDEE OF DENVER, COLORADO.

Even in a country where the rainfall is sufficient to produce abundant crops, the protection of the forests is for the public good; but in a country like Colorado, where agriculture can only be carried on by means of irrigation, the question of preserving the natural forests and cultivating artificial ones, is of paramount importance to the public, because the mountain forests are the great natural generators of moisture, which gives birth to our mountain streams, and these streams afford means of irrigation.

Agriculture in Colorado has grown to its present proportions only by means of irrigation, and we seek to extend it; and yet, while we seek to extend it, we are, by denuding our mountains of their natural forests, gradually but surely cutting off our water supply. Either the wholesale destruction of our mountain forests must be stopped, or agriculture in Colorado will be stopped. The combined industries of Colorado are rapidly stripping our mountains of our timber. If this course is pursued for a generation, our forests will be gone, our mining interests will be seriously depleted, and our agricultural interests will be cut off. Stock raising on our plains may prosper to some extent, but the home market for that industry will be largely lost.

It is the work of this association to modify the destruction of the forests, and to encourage their growth and preservation; to point out ways and means whereby new and artificial forests may be created.

The woodland of Colorado is owned in part by the State, by private individuals and corporations, but largely by the General Government. To accomplish the objects sought by this association, we must secure legislation by the State and the National Government. The State and National Government should only allow the large and mature forest trees to be used, and should afford every means to encourage the growth of the smaller trees. Irrigating ditch companies should be held to be common carriers of the public water, and the State should stipulate on what terms and conditions they should be operated.

Large reservoirs for storing irrigating water should be constructed among the foothills or on land sufficiently high for the purpose of irrigating the farm land below. When

there is a scarcity of water, ditch companies should be required to only let water flow when and where needed.

Said ditch companies should be required to plant and maintain a row of forest trees along the line of such ditches. The State should, by suitable laws, grant substantial and adequate inducements to all persons within the State who will plant and cultivate forest and other trees. The State could afford to reward such persons, because by cultivating trees, they assist in maintaining artificial forests, and hence become public benefactors. The General Government was wise in providing the Timber Culture Act—the only fault with it is that it does not offer sufficient inducement to those who take public land under it. The person who takes public land under said act, gets no more land than he who takes a homestead; and yet the government asks him to expend in time, labor and money, in cultivating ten acres in timber trees more than \$1,000 before he gets a patent to said land. And yet said ten acres of newly made forest, to be kept up and maintained by him, by expensive irrigation and cultivation, is in fact for the benefit of the general public. The law should be so amended as to set apart a certain portion of the public domain—that can be irrigated—to be planted and cultivated in forest and other trees, at the public expense. Then the whole country would be benefited. The attempt by Congress last session to repeal the timber culture act was unwise, to say the least. The General Government has expended large sums of money in sinking artesian wells, to no purpose. Now let it enact wise and liberal laws which will protect and preserve the forests of the Rocky Mountain range and thus maintain the present water supply for the arid plains. This matter should be urged upon our representatives in Congress.

A WOMAN'S VIEWS OF FORESTRY.

BY MRS. A. L. WASHBURNE OF LOVELAND.

I regret exceedingly that circumstances over which I have no control (a polite name for "hard times") prevents my attendance at this your first convention. I hope to be present at your first annual meeting in 1885, for I foresee a great work before you, and one which calls for a permanent organization.

There is certainly "cause for action." Already our mountain sides present a bare and uninviting appearance compared to the dark wooded slopes of twenty years ago; and destruction of their beauty has, as is almost

always the case, kept pace with that of their utility. The beautiful pines which once formed for the eye of the lonely emigrant and settler so agreeable a contrast to the gigantic rocks which lifted their seamed and scarred surfaces to the sunlight have been mostly destroyed by fires wantonly set or carelessly neglected.

The use of the house-logs and fencing of the scattered settlers are but as a drop in the bucket to the loss by fire. But lamentations are vain; the question now is how best to repair the damage of the past and to replace our beautiful and useful forests. While to many minds this question will present itself in a purely financial light, involving the loss and the replacement of millions of dollars' worth of lumber, cordwood, ties, fencing and charcoal, to me there is also a moral aspect to be considered, reminding us of the Golden Rule, and the perpetual obligations of moral beings to work for the "greatest good to the greatest number." The higher law, which keeps each within the sphere of his own personal rights and teaches us to as carefully abstain from infringing on those of others, must be applied in daily practice to the timber question, and would do much to put an end to the terrible conflagrations which have denuded our hillsides of their verdure, for even a mountain fire of six weeks' duration, extending over many miles of forest, began somewhere in a tiny flame which might in most cases have been extinguished in a moment if the unselfish will were present. The love of trees and the intimate knowledge of their individual characteristics should be taught to the young. There is no study of nature more enchanting. It is a study which lures one on and on after the attention is once directed to it. I have seen a class charmed and interested while a teacher spoke of the different trees in their school yard—their habits of growth, their smooth, shiny leaves or those beautifully notched or scalloped, all so similar that each tree was recognized at a glance, and yet so diverse that of the thousands or millions of leaves on one tree, no two were alike.

And from their own trees to those in their neighbor's yards, from the hill to the river bank, from the plain to the mountain, each native tree fitted to its own location, and each one of foreign origin adapting itself, as best it may, to its new surrounding. An occasional question brings forth surprising replies from the children, some of the bright ones showing unusual powers of observation and original thought. From their appearance, natural situation and habits, children are easily led to consider the uses of trees,

whether as ornaments in a rural landscape, for shade or for application in the thousand and one arts where wood is used; and thus, as we cherish what we love, the rising generation will for love of the trees and of each other's welfare preserve the forests. And, further, as we cannot truly love even a tree or bush without becoming more gentle and refined, the improvement of character and consequent multiplication of kind acts and the amenities of life will be in time the work of this association, and future beneficiaries of your present wise and unselfish action will murmur: "They builded better."

TREE-PLANTING ON FARMS.

BY J. H. BERRY OF FRUITA.

The preservation of the timber on the mountains will no doubt require State or national legislation, but if tree-planting in the mountains is to be a success, which in course of time it may be, a great point will be gained by having the lower valleys planted first. To gain this end it would be very necessary to get the farmers to understand that it would be to their interest to grow trees on their farms. Why should not the farmers in the valleys have a belt of trees round their farms, and where the fields are divided have a row of trees? If they don't want to plant forest trees such as ash, elm, maple, sycamore and such large trees, why let them plant fruit trees, such as apples, pears, apricots, peaches, etc. They will beautify the country and at the same time help to fill their own pockets, besides supplying the family with all the fruit they want to use. These rows of trees spread across the valleys will act as a shelter to the field by breaking the force of the strong, dry winds that at certain seasons of the year sweep over the valleys and carry away the last particle of moisture there is in the ground. Everyone who has lived for a few seasons in these valleys knows how drying these winds are. Now, if those valleys were protected by rows of trees stretched across their whole breadth, evaporation would go on much more slowly, and consequently there would be less necessity for so much irrigation with cold water, and the crops would be all the better, as the water in the early part of the season is apt to chill the ground and consequently retard growth.

To keep the trees growing there is always an abundant supply of water running in the ditches at all necessary seasons, so that irrigating them would be no extra labor or expense. If this plan were carried out as far back towards the moun-

tains as the highest ditch, of course time would be required, but if only once fairly started and a little patience exercised, these valleys could be made to look lovely and more than pay for all the expense incurred, and be an ornament to the State and form a splendid contrast to the mountains in the vicinity. Such will be the result in a few years if each farmer will lend a hand; every little town shows a good example. The streets are scarcely laid off when up start rows of trees as soon as a drop of water can be had, even if it has to be hauled from the rivers. Why should the country people be so far behind where shelter and shade is so much wanted?

The quantity of cottonwood seed annually carried down by the water in the main ditches will soon have the banks one mass of these trees, but what is wanted is a better class of timber; could not some of the enterprising owners of these ditches see that it would be their interest to plant some of the hundreds of miles of the banks of their ditches with some good forest trees, say catalpa, ash, elm, maples of different kinds, sycamore, tulip poplar, and hickory and Walnuts. Cedar, spruce and pine would also grow there, and by so doing in a few years they would save enough on evaporation alone to pay for the work, and strengthen their banks and have the timber getting ready for use.

As far back as this the planting and growing of trees would be comparatively easy and sure from the first start. Now we come to the foot-hills, where irrigation is necessary as a rule, but where water is scarce when wanted. Of course in early spring there is plenty rainfall most seasons, and trees planted as early as possible in spring may get enough moisture to keep them growing till July, at which time they can have a good hold of the ground. After that time the rains are uncertain, and success would depend mainly on the hold the roots had got in the ground and whether there was any vegetation to shade the ground. Higher up in the mountains, with the exception of the moist valleys, success would be very uncertain, as the quantity of seeds that annually fall from the trees and find no place to vegetate amply shows.

ABOUT NUT TREES.

BY H. B. SNYDER OF COLORADO SPRINGS.

As fall is coming on leaves and nuts will begin to fall; and this reminds me that something may profitably be said on the subject of planting nut trees. It seems to me that an effort should be made to supply that which has been denied this section of the

country for perhaps a million of years, when palm trees, Brazil nuts and other tropical growths flourished in this section—a fact of which there is abundant evidence.

Undoubtedly the best way to procure good seed is to send to friends in the East for walnuts, butternuts, chestnuts, hazelnuts, also black oak, white oak seeds, etc. Have the nuts gathered with the hull on and packed in moss or damp leaves, and sent by express and immediately planted where they are wanted to grow. Cover the seeds with leaves, which can be gathered when the cottonwoods shed their foliage. The nuts can be had of seedsmen, but few of them will have been properly cared for, and the balance will not grow. When they fall from the trees, nuts are immediately covered with leaves. The frost and sun burst them open during the winter and they shoot up in the spring. Young trees can be obtained from the nurserymen, but these have the tap-root cut back, which makes them undesirable for our dry climate. All nut-bearing trees throw down into the earth a taproot as deep as the tree grows, unless in very moist places. The chestnut grows well in rough places and mountainous regions.

These nut trees are more desirable for wood or lumber than the cottonwood, are cleaner, and bear something for the benefit of man. It requires a much longer time for the nut-bearers to mature, but it pays on the long pull.

The writer of this planted walnut four years ago, in hard abode ground, and the trees are now four feet high. After the first year they commenced growing in good earnest.

FOREST CULTURE IN COLORADO.

BY ALBERT BORCHERT OF DENVER.

In regard to the importance of the matter to be deliberated to-day by your honorable Board, I take the liberty of presenting my opinion about forest culture, being as well a theoretical as a practical forester.

Through science and literature we learn that the character of a land, being deprived of its trees, changes entirely, the climate becoming a rougher one, the fogs getting scarcer, the springs of the rivulets drying up; thus a once fertile country is turned into a desert; further we read, that a tree of middle size evaporates from ten to twenty tons of moisture per year, which we receive as rain, snow or dew. The rainspouts taking place from time to time excepted, no fog will be

perceived in a country where there are no trees, and in such region the avalanches prove to be exceedingly disastrous, as no stems weaken their vehement course.

It is the highest time for the citizens of the State of Colorado to stop the nefarious devastation of timber, that takes place unmolested, or it will be impossible to nurse any more trees, because the rain-spouts mentioned above are bound to wash away the stratum where formerly the wood stood.

We cannot deny that *pinus picea* and *pinus abies* yet thrive at a high altitude, but we must take into consideration that the roots of the older trees get their nourishment through the crevices of the rocks, young plants needing positively a stratum.

The Spanish Government tried several times to nurse young forests on the strata of the Pyrennes cleared from wood; this proved no success, as the rain-spouts and storms had removed the stratum from the rocks. We are bound to witness the same result in our country, if the culture of forests should be neglected, further on.

For a rational culture of forests, to start with, nurseries have to be established, well fenced, so that they are protected against cattle as well as against great game. The seed is put in rills, having an interval of three inches the one from the other. Should any weeds make their appearance within a nursery, they ought to be removed at once. After a period of three or four years, the young plants may be moved and replanted there where they have to form a forest later on. Pines especially have to be treated thus. In saying more about the culture of forests, I would lay claim in too high a degree on your patience, anyhow let me state that the culture of forests cannot be carried on except by an expert.

Culture of forests wants a strict law for the protection of birds, as all kinds of them assist us in performing this useful work.

The birds feasting upon insects save many plants, because, besides various other scarabs, they devour the bark scaraf, the worst enemy of the forest to be found. Those taking the seed for nourishment are useful by planting trees, so we find often young plants where there is no tree in the neighborhood. The seed has been carried there by our winged friends. More useful a being than all others, the jay bird (*garratus onstatus*) proves to be in this regard.

The birds of prey, especially the owls, need protection. They are the ones that kill the moles, the common rats, etc., that undermine the fresh cultures and gnaw the growing plants.

If those birds do any harm on a farm-

yard, they ought to be shot, but on the fields they always will be useful to the farmer.

Hence the Legislature should protect the birds by ordering a bill, prohibiting the killing of any bird, grouse, prairie chickens, wild geese, ducks and snipe excepted, and by ordering a bill that forces every man willing to hunt to procure a license, and such license should not be issued for less than \$5, minors *per se* excluded, as they always have proved to be the birds' worst enemies.

FORESTRY IN COLORADO.

BY PROF. JAS. CASSIDY, OF THE AGRIC'L COLLEGE.

I cannot indulge in the hope that what I may say to you to-day will have the novelty of freshness, but I content myself with the reflection that it is often profitable to review again principles and facts in nature that may have been once familiar, and especially important I deem it, assembled as we are here in convention, for the purpose of impressing public attention with the importance of the Forestry question in its several aspects, to the citizens not alone of this State, but to the people of the United States at large. The word Forestry is as yet a new one to many people. This is but natural, inhabiting, as we do, a country wealthy in timber resources, to which, until recently, we felt there was no limit. Forestry is the application of science and skill to woodcraft. It is the result of long continued observation and study of all that relates to the planting, treatment, disposition and utilization of trees produced on lands especially set apart for them. Its subject matter is so voluminous and varied that it has been found necessary to classify and subdivide it into five separate divisions, i. e., sylvaculture, conservancy, utilization and organization—the history, laws and political economy of forest administration.

Without stopping to inquire into the relations forestry bore in earlier times to hunting and the chase, we may for the present assume that for us forestry has special reference to the conservancy, utilization and organization of existing public forest lands, by means of an efficient State Forestry Department.

Our tree-planting on the plains may be more appropriately termed woodlands than forests. Planted in lines of one or of several rows of trees, intended to break currents of air, they constitute hedge-rows, wind-breaks and shelter-belts.

In all ages of the world's history man has been a destructive agent rather than a conservator of the gifts of nature, in fitting the

earth for his continued occupancy on a high plane of civilization. The pages of history exhibit abundant evidence of this in the progress of man up to the present day, exhibiting as it does his ability and desire to investigate the physical condition of the earth, and to estimate the past, present and prospective result of his own labor, as it has helped shape these conditions to suit his own purposes.

As man multiplied and extended his agricultural industry, he naturally trenched on the forest, which once covered the greater part of the earth's surface. In the removal of the forests, with all their vast consequential influences, we are brought to realize man's ability as a transforming power, seen in the changed condition of earth and climate. Countries once densely peopled are now a vacant and bleak wilderness, brought about, we know, by the slow and sure result of man's own improvidence. And as we look at the evidences of a high civilization that showed once a dense population over the present thinly inhabited districts of Western Asia, Northern Africa and Southern Europe, we may apply to this vast region our present theory of cause and effect, and in the gradual diminution of the forest area, a corresponding change in climate, and a diminished productiveness of soil. Such physical changes in this once garden of the world extended over vast epochs of time, but owing to the advanced condition of science and art at this time, these people were enabled to conceive and execute gigantic works of irrigation, by which the mountain streams were spread upon the thirsty land and so prolonged man's occupancy of these fair fields. It is indeed lamentable to compare the present physical condition of these countries with the account given us by the ancient historians of their glorious agriculture of the past; their luxurious fields of cereals waved over hill and dale, and every accompaniment of a successful system of agriculture was theirs. All this wealth, however, the cumulation of ages of toil, has been surrendered to desolation, and extensive districts are now without commerce, art or agriculture. Their forests are a thing of the past; the virgin earth, the cumulations of ages, has disappeared, the once fruitful meadows are unproductive, because the water supply, the reservoirs, have dried up. Rivers like the Jordan fail to reach the sea and the trees that shaded and protected their banks have disappeared; the rivulets cease to exist in summer, but in spring are roaring torrents. And all this the result of man's selfish disregard of the laws of nature. While man may

for a time fight oppression and the destructive forces of inorganic nature, he eventually, however, after a contest more or less extended, yields the fields he has won from primeval nature to ruin and desolation. And so on down to modern times has man's evil abuse of nature been extended, until to-day a halt is called on this great continent that we may avert the threatened ruin. It is but a few years ago that this country awakened to a realizing sense of the situation, to the necessity of restoring the disturbed harmonies of nature, whose well-balanced influences are so propitious to all her organic offspring, repaying to our mother earth the debt which the improvidence of former generations has left us as a legacy. The value of forests must be measured solely by their usefulness to man in some form or other, and as the chief wealth of any nation is its population, so the forest, as well as many other things, has had to give way to that, but notwithstanding the recognized importance of the preservation of a due proportion of the land in forest growth, it is indeed but seldom that a civilized country has ever seen fit to preserve a proper proportion of its surface in forest growth.

The art of forestry must grow in importance as the world grows older and becomes more populous—the needs of a growing population must be met. Sylviculture here steps in and provides the remedy, for it aims at the culture in the smallest practicable area of the greatest number of the most desirable forms of trees, best adapted to our local wants. In earlier times, for obvious reasons, the removal of the forest caused no uneasiness. But in course of time unfavorable results began to manifest themselves, and led to the framing of many laws at an early period in the history of many nations; and even where no laws were passed, indications are not wanting to show that the waste of trees by ignorance or cupidity was not unnoticed. Among ancient nations we find the forests were placed under officers of high rank in the State. In Japan, an ancient law provides that where a tree was cut down another must be planted in its stead. The ancient Germans framed laws for the marking of trees to be felled, and in certain cases punished with death infractions of these rules. But in spite of all laws, man's ignorance, selfishness and want of forethought, combined to waste and ruin forests which should have been preserved as an inheritance for future generations.

So intimately connected are plants and animals, that if we interfere with a species we cannot tell what results will ensue. The mere enclosure of a piece of land to exclude

cattle from it, induces great changes, as was frequently noticed by Darwin. By cutting down our forests indiscriminately we destroy a number of species of plants that cannot live in a dry climate, and with these go a number of insects, which depend upon these plants exclusively for their food. Again, the change in the insect fauna effected by the abolition of the forest, will probably have a marked effect upon the birds of the district. The latter are the natural protectors of plants. Insects are Nature's checks upon plants to prevent their too rapid increase, for if the former were to increase too rapidly certain plants would disappear altogether. To obviate this contingency the smaller birds are given us as a check upon insects, and that the later shall not increase unduly, the smaller birds of prey hold them in check, and so all created things have an indirect connection with one another, and the result is that the most perfect harmony is the law of Nature. To man is given the power to modify these conditions, either for or against his interests, as he will; too often, indeed, the latter, due no doubt in large measure to his ignorance of those laws, by which the whole universe is governed, and by which the most perfect harmony in Nature, notwithstanding its diversity, is maintained. It follows, then, from the close inter-dependence that obtains throughout all Nature, that many plants, and animals, are dependent for their continued existence, upon circumstances created by trees, particularly when grouped as forests. In man's case, there is no necessity, there is no possibility, of exaggerating this obligation; for man himself is absolutely dependent upon plant life for his existence. Except salt, and water, and air, there is not a mineral substance which animals can use directly as food. Their food must be organic; and forest growth, in common with more humble vegetation, serves to link together the animal, the mineral, and man, the clod of the field.

But it is gratifying to know that a knowledge of the powers of Nature, its elements, and manifestations, so indispensable to the welfare of the whole people, is so rapidly gaining ground among us; as, upon a right use of this knowledge, so much is dependent. The health of the forests is the health of the people. Our Nation, after slumbering 100 years, is beginning to open its eyes. The reason of the profound sleep is that, till a little while ago, nobody knew what air, water, and earth were made of, how plants grew, or whether their growth had any relation to animal life, or not.

By promoting forests we shall preserve the streams. Fountains and purling brooks

can only gladden our summer by having a sufficiency of forest growth to protect the land from the pitiless sun. What does our civilization amount to if it cannot preserve and increase the conditions of the highest health for the human race and its auxiliaries? Truly "there are books in trees," and in every leaf a tribute to him who planteth them.

From the foregoing examples we may readily infer the gravity of the situation to ourselves. This country is no exception to the laws of nature. Why should it be? Many portions of this country already feel the first symptoms of that general deterioration of the earth, which is nature's retribution for the disturbance of her harmonies, evidenced in uncertain climate, floods ever increasing in number and direful consequences, streams no longer to be relied on, savage winds against whose violence there is no barrier, blighting vegetation, intensifying disease, inducing derangement of the seasons, and in the old, settled States ending in the abandonment of lands once fertile. It is, indeed, to be feared that we will not in this country recognize the value of the forests until the advent of calamities, which thoughtful consideration of the subject would avert. And as the Old World holds out the beacon light of danger ahead, so must we look to her for the remedy. The care of the forests in all European countries is now a matter of governmental concern. But six of them now possess more than 25 per cent. of land in forest growth, and only four of them, Norway and Sweden, Russia, Germany and Belgium, yield more than they consume. The leading governments of Europe to-day are tree-planting on an extensive scale, endeavoring to protect especially the forest growth at the head waters of the principal streams, and to introduce in every way possible the most economical management and reform. In some of the United States there is now less land in forest growth than the rule of the Duke of Burgundy required, one-third to the hunter, two-thirds to the husbandman. The rule of William Penn, one acre in woods for five acres in tillage, exclusive of the wooded hills and mountain forests, is not as yet, perhaps, materially lessened.

The feature most essential to the efficient working of these forest departments of State, as well as perhaps most striking to Americans, is the system of forest schools. There are thirty-five of these schools in Europe. In these continental schools the student may learn how to draw from the forest the quickest returns, and how to replace, in the most certain and quickest manner, what these forests should produce annually; he will

likewise learn how to build up the scarified hillside with a growth of trees and shrubs; how bare and desolate plains may be reclothed with verdure, and impoverished soils so treated as to support a successful system of agriculture.

England, owing to her insular position and a variety of natural advantages, has been enabled to destroy her forests with impunity to accommodate the wants of a growing population, and yet she feels no inconvenience therefrom. She has in their stead, however, all the accompaniments of a diversified agriculture. She has magnificent parks, every variety of tree growth, magnificently developed and arranged, her green valleys and leafy knolls are pleasing to the lover of natural and artistic beauty, but she has not a single forest in the continental acceptance of the term. The Britisher must look to England's Colonial possessions to learn how to manage forest property. But in India, Britain has the finest forestry system in the world.

In France and in Germany the care of the forests constitutes a department, the magnitude of whose operations may be inferred from the fact that besides the work in the Alps' provinces and elsewhere, a forest, 150 miles long and ten miles wide, has been formed along the sand dunes of the western coast, by which millions of acres were reclaimed and made arable. Looking at home, we find that very little has been done to preserve and restore forest lands; and worst of all that total ignorance of the interests involved is well nigh universal. The forest lands of the United States amount to less than one-fourth of the entire area. The proportion of wooded area is less than in Eastern, Northern and Central Europe, and is very unequally distributed. Norway has two-thirds of the area wooded, Sweden six-tenths, Russia one-third and Germany one-fourth. Spain is the only European country that makes no provision for its forests. The Spaniard's hatred of a tree is proverbial, and they have reduced their once beautiful and fertile country to one renowned for its extreme aridity. Generally speaking, the American views this question in one of two aspects: First, as affording means for great and rapid profit; and, second, as obstacles to the culture of the ground. Yet a broader knowledge of such matters is beginning to bear its inevitable result. We may diagnose two phases of growing interest in the matter. In the older States, the once-grandly wooded hills being deforested, and the people being awakened to the serious consequences resulting therefrom, considerable effort is being put forth

to make new plantations, and to save what already exists. In the treeless regions of the West different motives are at work. The pressing necessity for protection against wind, as well as the great difficulty of procuring fuel, has led Legislatures to encourage the planting of tree belts and groves by liberal grants of land, by remission of taxes, by payment of bounties, and by setting apart one day in each year for the purpose of tree planting. Arbor Day originated in Nebraska through the State Board of Agriculture petitioning the Legislature to set aside one day for tree planting.

This Board of Agriculture annually awards liberal premiums for the greatest number of trees, cuttings and seeds permanently planted on that day. Later the idea was taken up by the Forestry Association of Minnesota and later still by the people of Kansas, Iowa, Illinois, Michigan, Ohio and Dakota. The idea, too, has been looked upon favorably by some foreign countries, and lastly our own State has taken her position in behalf of this cause. Very much has been said and written about tree planting for posterity, and a capital sentiment it is, but I must record the fact that the average American citizen cares but little for the generations yet to come. What exercises him most in this connection is will the trees he plants benefit men in his time? Future generations he expects to provide their own shade. The forestry problem in this country is indeed a serious one. There now remains in the United States but one vast tract of timber yet untouched, that of Oregon and Washington Territory. The nature of our General Government precludes the possibility of such action as would be effective and possible under the paternal forms of European governments. In a republic it is an extremely difficult matter to secure the attention of the masses of the people in favor of any great and wholesome innovation. Our State Legislature readily concede the importance of the Fishery question and the water power, but they rarely recognize the importance of the forestry question, which underlies both those and all other industries. We believe this question of the protection of our Rocky Mountain forest resources comes exactly within the purview of legitimate legislation. Of course private ownership is and must ever be the rule, and we would not tolerate, much else would we desire, such interference with individual liberty as the fostering governments of Europe exercise. But it is to be regretted that monarchies alone are competent to guard and preserve physical nature, so that it may yield its sustenance in one unbroken round. Evidently our principle reliance is upon such

notions as appeal to individuals; of these the most powerful is self-interest. Let it be known that it pays a man to preserve his woodland, or to plant out trees for profit, and the future of our forests is assured and secure. Notwithstanding the importance which a philanthropist or general economist may give to the arboreal industries in a money getting country and among a mining people, there is still an argument more potent, in fact, all powerful—the argument of pecuniary interest. This argument successfully applied to any subject will commend it to the public ear, endear it to the public heart. The fact that more money is involved in the tree question than in any other interest in our country, should clearly enlist public sympathies in favor of arbor culture.

Here is work for practical horticulturists all over this land, and here is work, too, for the State, the Nation, and the municipalities. Our agricultural population is not easily convinced of the necessity for tree planting. Its benefits are too vague, the profits too prospective, to cause them to look with enthusiasm on what seems a doubtful undertaking. Still, in this respect, too, it is a pleasure to note that public opinion is fast changing, experiments in sylviculture are being made on a sufficiently broad scale to promise the most gratifying results, and it is highly probable that at no distant day, when its benefits are understood, this branch of agriculture will receive at the hands of farmers the attention its importance demands.

A great deal of influence has been ascribed to trees in relation to atmospheric moisture, but the opinion is now gaining ground that this influence has been much exaggerated. The truth probably is that trees favorably effect the earth's surface and the sub-soil. Forests may influence the rain-fall in two ways: First—By constant evaporation through their leaves they may have a tendency to bring air in their immediate vicinity, nearer to the point of saturation, and so induce a saturated air-current to yield its moisture, if any difference in temperature occur between the two currents. Second—The leaves being covered by evaporation of water present a surface that would readily attract moisture from passing air, and thus secure water for that portion so covered by forest.

But forest growth, if it doesn't influence the rainfall in a general or local way, has a marked influence in regulating in availability for the needs of agriculture. The foliage of the trees of the woodland certainly mitigate the force of the wind storm by breaking it up into currents of lesser force, compelling the rains to percolate gradually through the moss and leaf-covered humus, to be gradually

given off by retarded evaporation, the surplus finding its way to swell the volume of the great rivers. On the open plains the rain storm descends on a surface already impacted by previous rains and the fervid heat of the sun. Water will not penetrate such a surface, but rushes madly down its slopes to swell the brooks and rivers, and instead of being a blessing to the earth, is a very demon in scarrying and wasting it. In reflecting for a moment it is easy to see how forests are a preventive of floods. Practical foresters know that woods generate springs, and that the soil in woods is often dry when the same ground in the open would be swampy. Trees produce both these contradictory effects by means of their roots boring into the soil, and so enabling water to reach lower level whence springs take their rise, and again by continually absorbing quantities of water by their roots, they act as subsoil drains and keep the surface from becoming sodden. In forest countries the changes of temperature are greatly modified by the presence of timber, and the effect upon water and the development of the fish industries is even greater. Forests regulate the flow of water as well as purify it, which fact has been frequently noticed in Australia when streams have been polluted by the wool cleansing industry. Such streams, after passing through a dense forest, will appear as clear as it was above the wool wash.

The office of trees in relation to terrestrial and atmospheric moisture may be summarized as follows:

First—They help counteract the effects of long summer droughts, by the transpiration of water through their leaves, and by their foliage and branches protect decaying vegetation which acts as a mulch to the earth's surface.

Second—They prevent dangerous floods by holding the gentle rain in abeyance until it has had time to penetrate the earth's surface.

Third—The water thus reaching a lower level by means of the boring power of the roots, collects, and forms springs.

Fourth—Some trees absorb vast quantities of water, as the eucalypte, and thus act as sub-soil drains.

Fifth—By preventing the accumulation of bodies of water on the earth's surface the removal of valuable soil is prevented; and, lastly, as wind breaks and shelter belts, especially in large quantities, they equalize temperature, both in summer and winter, and at the same time add to the value of any farm so protected. And this is not all, much more can be said of the relation trees bear to the economy of nature. Trees are intimately associated with

the welfare of their fellow plants of the lower animals and of man. There is probably no way in which the farmers of this State could more easily or more rapidly increase its agricultural product than by planting shelter belts to the north and west of their farms. They would, of course, be too limited in extent and too widely scattered to have any general influence on our climate, or the flow of the water courses, but as a means of direct profit it does not seem unreasonable to predict that each protection to our fields would increase the profits of their culture fully 20 per cent. Orchards thus protected would have their conditions measurably improved, and all horticulturists know that plants generally supposed to be too tender for an open, airy situation will thrive when planted under the protection of a wall or among trees. What garden walls are to the horticulturist these plantations ought to be and would be to the farmer. The subject of the proper distribution of fruit trees in their relation to climate may well engage the attention of the agriculturist, for although in the main his success depends upon the action of forces which he cannot control, the distribution of moisture is dependent upon conditions which he may determine to a limited extent, according to his will. Excess of forest in some parts of our country and their entire absence in others are alike undesirable. The early explorers might well call these plains the American Desert.

It is susceptible of proof, however, that its limits are gradually receding with the advance of civilization, the breaking up of the prairie soil, and the gradual planting of timber trees and shrubbery. All the evidence that can be obtained goes to show that the grass covered area is getting larger; the cactus, artemisia and buffalo grass are surely disappearing. This very fact of the tall grasses taking the place of the short, crisp and dense buffalo grass, explains why our American Desert is so rapidly disappearing, and why grateful showers reward the labors of the husbandman. Small as this change in the herbage may seem to some, it is not without its significance to the observer of the phenomena of nature. As to general climatic changes that need not concern us at this moment, it is enough for us to know that we can measurably ameliorate our local surroundings by plantations of trees, and this is what is most desired, that every landholder may protect himself and his possessions from the untoward influences of wind and weather. The functions that the forests perform in the economy of nature are many and varied. They are the great fertilizers of the soil, while

their value to us for economic purposes cannot be overestimated; they are, in fact, the foundation of every industry. The ancient philosophers had an axiom which the progress of time and scientific thought has not disproved, that "Nature abhors a vacuum." Wherever man has adopted such agricultural methods as have resulted in the sterility of his land, and his own forced abandonment thereof is the consequence, we see Nature endeavoring by means of the humble lichen, the sedge and myriads of similar auxiliaries, which soon set in, and in their successive growth and decay, establish a nidus by which the development of the mighty oak is rendered possible. This is the round of organic life (if conditions be favorable) so often observed, and is suggestive to us of this much that in the successive growth and decay of plant life we must recognize the salvation of the soil from sterility. In respect to the profitableness of tree culture in most of the prairie States so many facts could be adduced, established by actual trial, as to convince the most skeptical. In this State we are too young in forest planting as yet to have determined more than a few years' growth, but even this is quite encouraging, as what has been done on a small scale may surely be accomplished on a much larger one. We know but little as yet of the possibilities of these plains for the production of tree growth under improved methods of culture. Yet it is worth much to us to know that we don't. Some men know it all in the various branches of human knowledge, though perhaps some may be sufficiently modest to admit that they are not quite thoroughly versed in matters that concern the pursuits of others. It will indeed have been happy for us in this new field of investigation if we can have progressed to this point safely; that there are some things in regard to forestry generally, but especially on these plains, that are as yet a sealed book to us; and further it is hoped that we shall set about finding out from this day on what that new field is about which we are so ignorant in the premises, and this can only be accomplished by the heartiest individual and collective efforts. First, there is work here for and by the people; second, there is work here too for and by the Agricultural Colleges; and third, there is work here for and by the State through the Legislature. Colorado is but a young State, but she has a full complement of young men who will follow your lead in this matter of tree planting, and thus early secure an interest in them; and we may thus rest assured of success. The best laws remain dead, the best counsels are preached to deaf ears if the youth of

the land be not enlisted in favor of every good and wholesome innovation.

Every person should be familiar with the appearance of trees under all circumstances, in summer and winter, standing erect or prostrate on the ground; or when worked up by the artificer into any of the secondary and ultimate forms to which trees may be applied. All trees and plants possess peculiarities of trunk, branch, stem, twig, buds and seeds, and we should know the by their peculiarities. There is a broad field here for investigation, through the intricate labyrinths of which we may wander at will, always finding something to excite our desire for knowledge. From the meanest weed to the gigantic eucalyptus there are influences at work upon the soil beneath us, and in the air above us, the silent working of which to us we never notice. Tree-planting, too, is fitted to give the juvenile mind a useful lesson in forethought. Living only in the present, and for the present, too often youth will only sow where they can quickly reap. Youth should learn to forecast the future as the condition of wisdom. Arboriculture is such a discipline.

We are but tenants of this beautiful earth, and so have no right to trench on the inheritance of others, but rather it is a duty incumbent on all patriotic citizens to have this earth better for our having occupied it our allotted time. The great lessons inculcated by the facts of history for the benefit of man is that he is endowed with ability to become an ametime agent of the earth; that he, within certain limits, can control the elements and make them minister to his welfare and happiness, by planting trees where they have been destroyed or where absent, and thus realize the truth of Mohamed's benediction: "Blessed is the man that planteth a tree." In an æsthetic point of view, trees cannot be too highly extolled, as they give an added charm and beauty to the landscape that nothing else in nature can bestow. There is no other agency of nature which is so intimately connected with all that is worth living for, so necessary to the continued fertility of the soil, as the trees of the forest. Says Washington Irving: "There is something nobly simple and pure in a taste for trees." It argues a generous nature to have this strong friendship for the hardy son of the forest. He who plants an oak looks forward to the future, and plants for posterity. He cannot expect to enjoy its shelter, but he exults in the consciousness of the fact that he has accomplished an unselfish act. It was the trees of his own planting more than the beauties of surrounding landscape that bound Irving to

the Hudson. It was the simple beauty that Webster created at Marshfield—the smooth lawns and shady approaches that bound him so strongly to that sequestered spot. The charm of Abbotsford, the grand Mecca of Scott, and comes mainly from its ivy clad walls, beautiful shrubbery, and the now majestic trees, planted by the hand of its illustrious owner. An American, whose thoughts drop like sparkling gems, has put in my way the words that so beautifully express the emotions that should animate every citizen of the State. "If I have no coaches and horses, I can at least have a tracery of vine leaves along my porch, so exquisitely delicate, that no sculptor can imitate it, and if I have no conservatory with their wonders, yet the sun and I together can build up a little tangled coppice of blooming things in my door yard, of which every tiny floral leaflet shall be a miracle. Nay, I may make my home, however small it may be, so complete in its simplicity, so fitted to its offices, so governed by neatness, so embowered by wealth of leaf and flower, that no riches in the world could add to it without damaging its rural grace and beauty, and my gardeners—sunshine, frost and showers are their name—shall work for me with no crusty re-

luctance, but rather with an abandon and a zeal that asks only gratitude for pay."

May the beautiful thought conveyed in the above words prove to be the monitor of every citizen of this State, that we may the more quickly realize the work before us to-day; so that the almost boundless expanse of prairie by which we are surrounded, and which is terminated only by the distant horizon, shall have its due proportion of tree growth, and this fair land clothed with fruitful farms, the abiding place of a grand civilization. The preservation and planting of forests is a duty we owe to posterity and to our ancestors who left us the picturesque elm, the mighty oak and other denizens of the forest.

May we in the future so perform that duty as to be qualified to utter the beautiful sentiment of the poet Whittier in the following lines:

"Give fools their gold and knaves their power,
Let fortune's bubbles rise and fall;
Who sows a field or trains a flower,
Or plants a tree is more than all.

"For he who blesses most is blest;
And God and man shall own his worth
Who toils to leave as his bequest;
An added beauty to the earth.

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