

Without trees and kindred vegetation Man must perish

An address in Congress by Hon. MARTIN L. DAVEY of Ohio, given in the House of Representatives March 3, 1921

"And yet the tree lives—it breathes. It has a real circulation. The tree digests its food and assimilates it. It has sexual processes that are just as real and beautiful as in any other form of life. It has the power to adapt itself to its environment. To be sure, it lacks intelligence and a nervous system and the power of locomotion. But in all the other elemental processes the tree functions just as truly as man himself."

"This question of reforestation is of monumental importance. America can not continue to exist as a virile, forward-moving Nation unless we protect what we have and start to build up that which we have so ruthlessly destroyed. We can not afford to be a Nation of vandals much longer. America must reforest, or America must drink the bitter dregs of national decline and impotency."



providence. The little springs that come from water held in check and feed the lakes and streams must gradually diminish and, I greatly fear, cease to exist in large part. This question of reforestation is of monumental importance. America can not continue to exist as a virile, forward-moving Nation unless we protect what we have and start to build up that which we have so ruthlessly destroyed. We can not afford to be a Nation of vandals much longer. America must reforest, or America must drink the bitter dregs of national decline and impotency.

Mr. M. L. DAVEY, GENERAL MANAGER, The Davey Tree Expert Company, Kent, Ohio:

Dear Mr. Davey:

Many thanks for your letter of April 23, and the copy of your speech delivered in the National House of Representatives on March 3, 1921. I am impressed with your strong statements about the vital relation of our forests and human life, and I stand right with you in your condemnation of forest devastation. The lumber situation of our country is really serious, when only 15 states out of a total of 48 states produce more lumber than they consume. You are right in saying that:

"America can not continue to exist as a virile, forward-moving Nation unless we protect what we have and start to build up that which we have so ruthlessly destroyed. We can not afford to be a Nation of vandals much longer. America must reforest, or America must drink the bitter dregs of national decline and impotency."

I feel sure that your speech will help in the development of a sane and strong policy of forest restoration, which is one of the most vital economic questions before our country at this time, and I am glad that you are helping shape public sentiment to a fuller appreciation and better understanding of our forest conditions.

Sincerely yours,
(Signed) Gifford Pinchot, Commissioner of Forestry

J. BERNARD WALKER, Editor, Scientific American:

"I beg to thank you for sending me your excellent speech dealing with the tree as a living thing. It has a strong personal appeal for me, for although I am more of an engineer than a botanist, I have an affection for trees which borders on reverence. I think a Connecticut elm, for instance, is one of the most dignified, graceful and appealing objects of the many with which God has graced this earth of ours. Also, down through the years, I have occasionally written an editorial in the SCIENTIFIC AMERICAN appealing to the people of this country to stop the slaughter of our magnificent forests. Unfortunately we are a willfully wasteful people—or is it that we squander our wealth with a kind of naive childishness? Perhaps a little of both or an alternation of the two."

WALDEMAR KAEMPFERT, Editor, Popular Science Monthly:
"I am very much obliged to you for your speech on 'The Tree as a Living Thing.' This interested me so very much that I am asking you to place my name on your mailing list, so that I may receive other expressions of yours."

JAMES N. YOUNG, Editor, Leslie's Weekly:

"Leslie's Weekly is tremendously interested in the subject of forest preservation and allied topics, and I assure you that the members of the staff have read what you had to say with a great deal of interest. From time to time editorials supporting you will appear. I thank you for writing to us."

HARFORD POWELL, Editor, Collier's Weekly:

"Thank you very much for your letter and your very interesting speech, 'The Tree as a Living Thing.' I am very glad to have it. I understand that considerable attention will be brought to this subject, so vital to the publishing industry as well as to all Americans, in the week ending May 28th. Collier's would like to do its share editorially."

HERBERT KAUFMAN, Editor, McClure's Magazine:

"I have received your letter of April 29th, and appreciate your thoughtfulness in sending me a copy of your very interesting speech, 'The Tree as a Living Thing.' It contains a good suggestion for an editorial."

The Editors of Atlantic Monthly Magazine:

"Thank you for the copy of your brief, but interesting, speech. If we ever have need of a paper dealing with tree life, we shall be glad to turn to you for information."

HAMILTON HOLT, Editor, The Independent:

"I have read your brief speech, delivered in the House of Representatives, with a great deal of interest. Surely if the American people realized as you do the value of trees it would save them many, many dollars in the years to come."

The Editors of the Outlook Magazine:

"Thank you for your letter and for the accompanying copy of your speech. This is an interesting matter and we hope that we may be able to say something about it in the Outlook."

For GEORGE HENRY PAYNE, Editor, The Forum:

"I am desired by Commissioner Payne to thank you for your note and say that he has read your speech with great interest and believes that the work you have undertaken is not only necessary, but an ennobling task."

"In several trips he has made recently, he has noticed himself the necessity of preserving the trees and in his future speeches he intends to refer to your speech."

PAUL O. OAKES, Editor, Current History Magazine of The New York Times:

"I thank you for your letter of the 28th ultimo, enclosing the address which you delivered in Congress, dealing with the tree. I have had a chance to hastily scan it, and wish to congratulate you on the earnest, eloquent and vivid manner in which you have presented this question and to commend you in the very strongest terms on the splendid work you have undertaken."

KENNETH M. GOODE, Editor, Hearst's Magazine:

"Thank you very much indeed for your kindness in sending me your very interesting speech about 'The Tree as a Living Thing.' The subject is certainly one of vital interest, and I do not see how your interesting presentation can fail to awaken a keener realization of its importance."

J. A. M'GUIRE, Editor, Outdoor Life:

"I am sorry I cannot reproduce the whole story in OUTDOOR LIFE, as it is indeed very instructive, but I hope, however, to at least make an extract from it for some future number."

"With best regards and assuring you of my deep appreciation, a feeling that I believe you deserve from every sportsman in the country."

EDWARD J. WHEELER, Editor, Current Opinion:

"I am sending to the printer your speech on the tree, nearly complete, with a brief editorial introduction. I hope to use it in the May number of CURRENT OPINION. It is an unusual thing to come out of Congressional proceedings, but it is a classic of its kind and I am much obliged to you for sending a copy to me."

M

R. SPEAKER, it is my desire during the time at my disposal to speak of the tree as a living thing, to show something of its vital relation to human life. To the man who is familiar with tree life it might seem almost superfluous to emphasize the fact that a tree lives, and yet the average man, unfortunately, looks upon the tree as an inanimate and more or less useful accident on the face of the earth.

And yet the tree lives—it breathes. It has a real circulation. The tree digests its food and assimilates it. It has sexual processes that are just as real and beautiful as in any other form of life. It has the power to adapt itself to its environment. To be sure, it lacks intelligence and a nervous system and the power of locomotion. But in all the other elemental processes the tree functions just as truly as man himself.

The tree breathes through the leaves chiefly, and to a small extent through the tiny lenticels in the young bark. The air is taken into the leaf in just as real a sense as it is taken into the human lungs. It enters through the many microscopic openings on the underside of the leaf. There on the inside of the leaf the elements of the air are separated. The carbon is absorbed and is used in the building process. The oxygen is given off again to enrich the air for the benefit of all animal life.

The circulation in the tree is just as real as in the human body. It does not move so fast nor move round and round in response to heart action. Yet it does move and goes from the tiniest root hairs way down underground up to the leaves and back again all the way to the roots again. On the upward flow the circulation proceeds through the sapwood, traveling from cell to cell, from the small roots to the large ones, into the trunk, and from there to the large branches, and then through the smaller ones to the leaves. From the leaf, where it undergoes the necessary chemical changes to transform it into tree food, it travels downward through the cells of the inner bark all the way to the smallest roots, building the cambium layer as it goes.

The digestive processes of the tree take place in the leaf. There the crude food material, brought up from the roots in the sap, is spread out among the tiny cells of the marvelous leaf structure, and, under the influence of the sunlight, is combined with the carbon extracted from the air and is transformed into tree food—digested, as we call it in animal life. This digested tree food is assimilated into the entire growing parts of the tree in the downward flow through the cells of the inner bark, from which the cambium layer is built and all growth takes place.

The sexual processes of the tree are fundamentally the same as elsewhere in living things. The male and female exist as positive factors. Sometimes the male and female exist in the same flower. Many times they exist in different flowers in the same tree. In a few cases all the flowers of a tree are entirely male or entirely female. The pollen is created in the male and is carried by insects or birds and in a vast number of cases by the wind to the female portion of the flower or to the female flower. There it fertilizes and produces the seed which nature designed to reproduce its kind.

The tree adapts itself to its environment to an amazing degree. Where trees are thick they grow tall to reach the sunlight. Where two or more trees grow close together, it grows on one side to accommodate its fellows. When it grows in rocks, it sends its roots into almost impossible places in search of food and anchorage. It often sends its roots hundreds of feet in search of water, and the roots travel back and forth among the many obstacles toward their destination.

All life has two primal purposes of existence—one is self-preservation and the other is reproduction. The tree subscribes to both and is governed by both. It undergoes a constant battle for life from the time of its advent until the end. It must battle against the tremendous winds, against drought, against insect enemies, and deadly diseases, and now it must battle against man himself, who is the most destructive, the most thoughtless and inconsiderate enemy that the tree has encountered. Indeed, it has a lifelong struggle for self-preservation. Its scheme of reproduction is the same elemental plan of sex attraction that makes possible the continuity of all life.

The leaf is probably the most wonderful, and is certainly the most vital and indispensable factor in the world of living things. Without the leaf all life must perish. It is the one and only connecting link between the organic and inorganic worlds. It is the only thing capable of transforming the various mineral elements into available food material for both plant and animal. The only minerals that man can take into his system and use are water and salt, but he can use only a limited quantity of these. Every other element of food must come to him either directly or indirectly through the leaf.

Every grain, every fruit, every vegetable food product, every foot of lumber, and every other vegetable product that is used for the pleasure and profit of man is made in the leaf. And thus we see that the great God who created the world and the life that inhabits it, made of the lowly leaf the greatest and most wonderful instrumentality of that life.

Perhaps the most insidious and persistent enemy of the tree is the group of diseases called fungi, which attack any exposed portion of woody tissues and start to grow by consuming the wood cells. A fungus disease exists in a decaying tree—it produces the decay. At the proper time in the growing season the fungus produces a fruiting body or bodies. These produce their fruit in due time, which are called spores. These spores, light in weight and microscopic in size, are given off in myriads and are carried by the winds and sometimes otherwise to the adjacent vegetation. Most of them fall harmless, but some of them find lodgment in a wound where the protecting bark has been removed. There in the exposed woody tissues the microscopic fungus spore starts to grow, sending out little threadlike tentacles from cell to cell and breaking them down.

The fungus is a parasite—a low form of vegetable life. It lives by destroying some other form of life. That which attacks the living tree destroys the interior cells and persists until the tree is consumed. What we call decay is only the result of an active disease which consumes the woody interior that constitutes the structural strength of the tree.

The interior of a tree is often referred to as the heart or heartwood. This conveys an entirely wrong impression. The vital parts of a tree are the leaves and roots, the bark and cambium, and outer layers of sapwood. It is the outside layers of sapwood which are most active, and each succeeding layer inward toward the center becomes less and less active until those near the center become practically dormant.

This gives the reasons for the development of tree surgeons and the science of tree surgery. The disease creates decay against which the tree, unaided, is helpless. It is the function of the tree surgeon to do for the tree what the dentist does for the teeth and the surgeon does for the human body. In the practice of his art he must remove the decay, disinfect to prevent further decay, thoroughly waterproof to protect the exposed wood, put in place various kinds and forms of mechanical bracing, often complicated and always ingenious, prepare the cavity so that the filling will remain permanently in place, and then fill with skill and precision so that the filling will become a permanent part of the tree. Water and all foreign substance must be excluded. The filling must be cleverly built up in sections, somewhat like the backbone in the human body, in order to permit a

reasonable movement between the sections in the swaying and twisting of the tree in heavy winds. Nature rewards the skill of human hands by the gradual healing of the bark over the filling. I can not pass this interesting science of tree preservation without paying a little tribute to John Davey, the nature lover and creative genius who gave to the world an invaluable science, which he called tree surgery. It represents his love. It is the product of his life of service. It was born of his faith and determination. It is the result of his consecration to a great purpose; his contribution to the race of which he is happy to be a part.

But there is one more phase of the whole tree question that ought to be hit a smashing blow. America must wake up and reforest or America will rue the day of her spendthrift debauch. The early settlers sent back word that they had discovered a land of inexhaustible fertility. Americans of succeeding generations have proceeded on the theory that all the God-given assets of the Nation were inexhaustible. We have destroyed with prodigal waste more and more of the native woodlands—the timber supply. We have done exceedingly little replanting. We are consuming the principal of our inheritance just as fast as a reckless unconcern will permit.

Where will the future lumber supply come from? Where will we get the wood pulp for print paper? We are sweeping away the God-given forests and building great cities with breathless haste. We say we are creating wealth. We are merely transforming it on the one hand and destroying it on the other.

Take a daylight ride across the Alleghenies and look at the denuded mountains! Contemplate the devastation that man, selfish and thoughtless man, has wrought! And then, when you realize what all this prodigal destruction means to the future of America, let your soul shudder at the thought of the future condemnation that awaits us from generations yet unborn. We who revel in our false wealth and unpardonable profligacy must answer to the God of nations and the children whom we bring forth to struggle in an impoverished land.

Men and women of America, we cut down the great forests that blessed this country. We allow the remnants to be burned over and vegetation destroyed. The rains pour down, and, instead of being held in check by the loose and porous soil in the network of roots, it rushes down over the hillsides and carries with it the fertile soil, leaving in its wake barren hills and deep ravines.

Thus we have alternating floods and droughts. The fertile soil is gone, the product of hundreds of years of nature's

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