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## CONSERVATION AND NATURE EDUCATION

F. A. WILDES

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*"To him who in the love of nature holds communion  
with her visible forms, she speaks a various language."*

As our knowledge of nature increases, the value of her gifts to us increases. The problem before the people of the nation and particularly the state of Minnesota is to sell to the people the idea of conserving our natural resources. This is no small task for the greater portion of our adult citizens have an imperfect or undeveloped idea of what constitutes conservation. This lack of full appreciation is due to the fact that we were not led while young to understand the full value of the things about us. The duty then is to start at the beginning and with patience and perseverance build into the minds of the coming generations a love of nature and an appreciation of its full value to mankind, if such resources are used with care and foresight. This is the province and the field of duty of the Department of Education. The Department of Conservation must cooperate but does not assume to formulate a course of study.

We as a nation are said to be the most wasteful people on the face of the earth, and it would be a difficult undertaking to refute such a charge before a jury of old world citizens. The reason for our shortcomings along this line goes back to the day when Colonists first came to our shores. The many precious things of nature, denied them over there, were found in abundance here. There was no reason for the exercise of restraint for, as far as human foresight could reach, there was an inexhaustible supply of all things. No greater gifts had nature bestowed upon any land, yet, within the space of scarcely two centuries, unparalleled waste has brought us in many sections to dire need.

It has been well said:

*"Waste is the child of abundance and the mother of want."*

While Europe was awakening at an early date to the need of rebuilding the fertility of the soil, reclothing the hills and sand dunes with forests, protecting fish and bird life, we were destroying our forests, polluting our streams, slaughtering our bird and animal life, and "mining" our fertile farms. In Minnesota from the earliest days there has been a contest between the forest fire and the lumberman to see which should secure the greater part of our timber. It now appears that, over a period of a century, the award should go to the "red demon."

Thoughtful men, like watchmen on the tower, have been telling the people of the dawn of a new day. A few heard the call of

Theodore Roosevelt in the first years of this century and have worked diligently through organized groups to bring about a well balanced conservation program. We have been dealing largely with the adult. This work now demands the attention of our schools, colleges of agriculture, forestry, and state institutions.

As the task of conserving our natural resources involves a matter that is not susceptible of mathematical certainty, it is perfectly reasonable that many schools of thought along this line should have developed. Patience and tolerance are needed in working out an all-around plan. The zeal and sincerity of each group is unquestioned, but each must be willing to take Benjamin Franklin's advice, given to the contending elements in the Continental Congress. He stated that a carpenter, in order to make a good joint, was under the necessity of cutting a little from each board. This rule is urgently needed when those put in authority are endeavoring to carry out a plan of conservation. Constructive criticism is always in order and at all times welcomed. A program that cannot stand constructive criticism is not one to advance the cause of conservation.

Rome was not built in a day nor can any great program for the advancement of human needs be accomplished or permanently advanced by hysteria. Genius and specially endowed natural ability are great factors in progress, but their relative influence may be illustrated by a definition said to have been given for genius by Thomas A. Edison: "Genius is made up of one part inspiration and nine parts perspiration." Most of us may better stick to the larger factor in Mr. Edison's definition.

To the writer all conservation plans will prove inadequate if our efforts are confined to the activities of our nature-loving groups of adults, important as these are. The work must begin with the children and be continued throughout life. The schools from the kindergarten to graduate schools are the training shops. From such schools men and women will go out with a well-balanced idea that all things must be taken together to make up a full life. Emerson expressed this idea admirably in his poem, "Each and All."

Forty years ago nature study had a prominent place in all the grades of schools in the larger centers. The children were taught to see the beauty and to observe the wonders of nature unfolding themselves before their eyes. These little city children found the world in which they lived grow into something of absorbing interest to them. The trees, grass, flowers, and birds began to call out to them in a language they could understand. As the plants began to appear in the gardens and fields, each student was urged to gather them sparingly for they were little plant children, friends of theirs.

Arbor Day was looked forward to for there was to be a special program and flowers and trees were to be planted. As the children advanced the course was enlarged to botany, zoology, agriculture and even elementary geology in the form of physical geography or



physiography. An insight into the nature, possibilities and use of the things about us makes us more careful in dealing with them and this is the beginning of our interest in conservation. In later years the teaching of nature study seems to have been discontinued in many schools. One of the reasons for this appears to have been the lack of training of teachers along this line. Its revival is of the utmost importance if we are to realize fully the continuing value of nature's gifts.

The work on the part of the teacher must be a labor of love. Nature study cannot be taught as an abstract science. The teacher must enter into the spirit of the work if she is to inspire in the pupils the love and a sympathetic understanding of nature.

An appreciation of the things of nature about us, whether animate or inanimate objects of the mineral kingdom, repays us many-fold. One need not be lonesome who communes with nature's visible forms. She has industriously written a story that all may read. Longfellow expresses this beautifully in his poem written on the fiftieth birthday anniversary of the great Louis Agassiz:

“And Nature, the old nurse,  
Took the child upon her knee,  
Saying, Here is a story book  
Thy Father has written for thee.

Come, wander with me, she said,  
Into regions yet untrod;  
And read what is still unread  
In the manuscripts of God.”

While this poem deals more particularly with geology, the fact remains that to the thoughtful observer, nature has a story written in the trees, flowers, and all life as well as in the rocks and waters.

Persons who understand the things of nature are not likely to destroy or injure them. It is usually the unthinking boy or man who kills a bird or animal just for the sport of taking life. Great lovers of the outdoors are rarely, if ever, destroyers. So the coming citizens must be taught the value of conservation in order that the things of nature may be safe in their hands when they become the custodians of our resources. It is also important that they be shown the value of conserving all natural things while enjoying their recreation among them, so that, in turn, their children may not be deprived of their inheritance.

Man's hours of leisure are rapidly lengthening. It is natural and altogether proper and desirable that he spend them in the great out-doors. If he be not taught to conserve these gifts, there will be nothing left for future generations. This is also an important reason why we must bring to the children a realizing sense of the importance of conserving such gifts for recreational purposes as well as for economic reasons.

A principle of education is that we learn to do by doing. A program of this sort may be in the establishment and care of school forests. Many cities have added small tracts of land in which trees, shrubs and flowers are planted and cared for on field days. The county superintendent of schools in St. Louis County is establishing a number of these at the consolidated schools in his county. The pupils are to be given instruction in classifying trees, shrubs and wild flowers, in planting and caring for them, in protecting the plots from fire and insects. To be sure, it must be but elementary forestry, but it is a beginning. The Department of Conservation, by cooperating with the Department of Education, many high school and college students could be employed each year in planting trees and doing other work in our state parks and forests on a subsistence basis only.

Much damage has been done by the destruction of the forest cover of our watersheds, hence some time should be spent in stressing the value of such covers and in showing the young the history of disasters contributed to by the destruction of such forest cover. Among the notable ones of recent years are those of the Mississippi Valley, the recent Connecticut River rampage in Vermont and New Hampshire, and the disastrous floods in China. Shifting sand dunes in northwestern Indiana have been stopped by planting shrubs and using them as a "mother crop" to protect the trees planted later. Along the Baltic province of Prussia, sand dunes were a menace to farms for generations until Frederick the Great ordered them to be planted to fir. The dunes were controlled, and the lands have ever since been growing forest products.

Too much stress cannot be placed upon the importance of forestry in the study of conservation. Trees and shrubs produce and hold the humus in place. This in turn holds the moisture from rapid run-off, permitting a proper share of it to sink into the soil. A moist soil furnishes the trees the moisture that they give back to the air. The forest and thicket afford cover for birds, animals, plants, and flowers. All these are incidental to providing man with fuel, timber, shelter, and recreation.

Through elementary studies in schools, the need for maintaining the fertility of the soil for the production of food may be clearly fixed in the minds of the children. To protect these growing crops from insects, the value of our song birds must be shown. In turn, these little feathered creatures must be protected from the predatory cat and other vermin and provided with a shelter for their nests. And again the growth and maintenance of suitable cover for the song and game birds calls for the growth of trees and timber. The lakes and streams must be kept clean so that the waters may remain wholesome and fit for use for all living things. "All is needed by each one, nothing is fair or good alone," as Emerson says.

The full importance of all phases of conservation of our natural resources in all its possible aspects, must be instilled into the minds of the young during the formative period of their lives, so that when



they become men and women the lessons of youth will become a part of their make-up. They will then comprehend the full meaning of saving what nature has given us and will be trained to make the best use of all things. All this is not an impossible task for the young are eager to learn about things. The first task is to train the teachers so that they too may commune with nature and be able to inspire in the pupils a love for the great out-doors with all its creatures. All teachers need not be trained for this purpose, but from the kindergarten to college the essential elements of conservation should be kept before the pupils. Every child will be found to respond to some phase of nature study, and this interest will continue through life. Even the remnants of our past meagre instruction along this line may be seen by visiting almost anyone's yard and home. Some make flowers their hobby, others trees and shrubs, while still others collect rock specimens; nearly all provide some shelter for their feathered friends. Of late we have seen and read about full-grown men and women hunting with nothing more destructive than a camera. The results of the chase will thus be preserved for them and their friends' enjoyment for years without destruction or pain to a living thing.

The whole civilized world is passing through a period of change. The old order may be discarded abruptly if those who guide the destinies do not correctly read the handwriting on the wall and put forth every effort to make the change gradually rather than by revolution. As has been previously stated the hours of labor are growing shorter and consequently those of leisure or recreation are growing longer. It is patent to all thoughtful persons that what is done during these hours of ease will determine in a large measure the destiny of civilization. There is no such thing in this world as a standstill. Things must go forward or fall behind. Therefore, it is of the utmost importance to us that a proper use be made of our leisure.

Civilization has become entirely too artificial. At times we see strong evidence of a longing for the simpler things of life. Go into northern Minnesota and meet men and women of means and culture, especially from the large cities, living in the crudest of cabins or eating a picnic dinner under the most primitive conditions, and yet enjoying every minute of the time. Why? Because man is not far removed from the things of nature and to nature he must return on occasion. The children, however, are the strongest ties that bind us to nature, and they are also the coming custodians of her most precious gifts. Tired humanity now points a way even with an imperfect idea of how to use this time to their own best interests and so as not to trespass upon the rights of others. The automobile and the improved roads take hundreds to our parks, lakes, and wooded areas as soon as the cares of labor are lifted. Because some do not respect the rights of all, roadside trees and flowers are injured. The boy and girl scout movements, with others of similar purpose, are doing a great work, and it is the duty of all of us to aid.

One needs but ride along a highway in early spring to be impressed with the necessity for more recreational areas properly spaced as well as a better understanding of park and playground ethics on the part of an occasional tourist.

While the "manicured" park has its merits, the great mass of humanity still prefers nature more or less in the rough. Such areas are easily secured and economically maintained. At present it is necessary to police such areas as well as city parks. This task can be reduced if the coming generation be taught the value of all forms of recreation and thus tighten a curb upon the children that have grown tall.

More than a decade ago the writer, noting the lively interest taken by the school children in the exhibits of Minnesota's resources at the state and county fairs, wrote to a score or more of school superintendents, offering a set of samples of Minnesota iron ores, building stones, marl and peat, etc., in return for a statement of the principal natural resources of their district with a sample of rock from any quarry nearby. Answers were received but from two. Why were so few interested?

At the fair displays, special attention has been given to school children. Lately, requests have been coming to the office from teachers and school children over the state and as far east as Massachusetts for samples of iron ore, rock, marl, clays, and other minerals. Some letters show the training they have received, while others clearly mark an untrained longing for information concerning natural resources. They ask for bread. Let us not give them a stone. All of this means that the younger generation is wide awake and hungry for such information and points to the need of an increased study of conservation by the colleges and its extension to every grade in the public schools.

An abstract study of seeds, flowers, birds, etc., will avail but little, especially in the lower grades of school. The child likes to handle and examine things. By so doing several senses are coordinated, and hence a deeper impression is made on his mind. As he advances, more complicated details can be demanded of him, but at all times the beauty, symmetry, and economy of the structure of things must be carefully and diplomatically impressed on him. In this way only can he be led to respect the rights of all living things and see the necessity of conserving such gifts. It has been demonstrated time and again that classes in botany, zoology, geology and chemistry indicate a livelier interest in such subjects if the members are able to secure for themselves the specimens upon which they work. Field excursions are as much a part of a course in biology and geology as class room lectures. Few persons nowadays doubt the fact that children are our best teachers. As the gulf widens between us and the young, our conception of what is best for them and all concerned narrows, so in self defense we must not lose our contact with them.

To carry out the program of conservation and nature education,



there should be provided in the Department of Education a course of study for all grades of the public schools, and a call sent to the Department of Conservation for it to furnish specimens for object lessons for this course, if not for actual assistance on occasion.

Every citizen of the state is entitled to know what the resources of the state are and how they may be best conserved in order to bring the largest returns to the people, having in mind the rights of future generations. To meet demand for first hand information, the Department of Conservation has a division of publicity which issues a magazine, "The Conservationist." Its field of service in this line can be greatly enlarged by cooperation with the Department of Education.

In addition to this means of publicity, it is the plan to have the exhibits of all resources of the state to be displayed at the state and county fairs and all large public gatherings. It is the desire of many that each school of the state be provided with suitable exhibits for nature study. For general distribution, there will be prepared leaflets and pamphlets setting out in clear and every-day language occurrence, care, and use of the things of nature.

All this may at first glance appear to be a large order to deliver, but, while much care and consideration is needed to establish in our schools a comprehensive nature study program, the financial burden will be light, and the returns for this and future generations ample. With a will to undertake a task of this kind and a confidence in our children, we cannot and must not falter.

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### THE INTERRELATIONSHIPS OF BARK BEETLES AND BLUE-STAINING FUNGI IN FELLED NORWAY PINE TIMBER (Abstract)<sup>1</sup>

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A study of two species of bark beetle (*Ips pini* Say and *I. grandicollis* Eichh.) and the fungi associated with them has been made as the first part of a general investigation of the interrelations of insects and fungi in the deterioration of felled logs of Norway pine.

Experimental evidence is presented showing that these bark beetles introduce blue-staining fungi into the logs and that the fungi are rarely, if ever, introduced in any other way.

Two different blue-staining fungi were found associated with these bark beetles. The most prevalent of the two is *Ceratostomella ips* Rumbold, the fungus isolated by Rumbold from the galleries of *Ips calligraphus*, and *I. grandicollis*. The second apparently has not previously been reported. It is briefly described in this paper as *Tuberculariella ips*, n.sp.

<sup>1</sup>Complete paper published in Jour. Agr. Res. 49: 315-342. 1934.