

LEAFLET I.

WHAT IS NATURE-STUDY?*

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NATURE-STUDY, as a process, is seeing the things that one looks at, and the drawing of proper conclusions from what one sees. Its purpose is to educate the child in terms of his environment, to the end that his life may be fuller and richer. Nature-study is not the study of a science, as of botany, entomology, geology, and the like. That is, it takes the things at hand and endeavors to understand them, without refer-

ence primarily to the systematic order or relationships of the objects. It is informal, as are the objects which one sees. It is entirely divorced from mere definitions, or from formal explanations in books. It is therefore supremely natural. It trains the eye and the mind to see and to comprehend the common things of life; and the result is not directly the acquiring of science but the establishing of a living sympathy with everything that is.

The proper objects of nature-study are the things that one oftenest meets. Stones, flowers, twigs, birds, insects, are good and common subjects. The child, or even the high school pupil, is first interested in things that do not need to be analyzed or changed into unusual forms or problems. Therefore, problems of chemistry and of physics are for the most part unsuited to early lessons in nature-study. Moving things, as birds, insects and mammals, interest children most and therefore seem to be the proper objects for nature-study; but it is often difficult to secure such specimens when wanted, especially in liberal quantity, and still more difficult to see the objects in perfectly natural conditions. Plants are more easily had, and are therefore usually more practicable for the purpose, although animals and minerals should by no means be excluded.

* Paragraphs adapted from Teachers' Leaflet, No. 6, May 1, 1897, and from subsequent publications.

If the objects to be studied are informal, the methods of teaching should be the same. If nature-study were made a stated part of a rigid curriculum, its purpose might be defeated. One difficulty with our present school methods is the necessary formality of the courses and the hours. Tasks are set, and tasks are always hard. The best way to teach nature-study is, with no hard and fast course laid out, to bring in some object that may be at hand and to set the pupils to looking at it. The pupils do the work,—they see the thing and explain its structure and its meaning. The exercise should not be long, not to exceed fifteen minutes perhaps, and, above all things, the pupil should never look upon it as a “recitation,” nor as a means of preparing for “examination.” It may come as a rest exercise, whenever the pupils become listless. Ten minutes a day, for one term, of a short, sharp, and spicy observation lesson on plants, for example, is worth more than a whole text-book of botany.

The teacher should studiously avoid definitions, and the setting of patterns. The old idea of the model flower is a pernicious one, because it does not exist in nature. The model flower, the complete leaf, and the like, are inferences, and pupils should always begin with things and phenomena, and not with abstract ideas. In other words, the ideas should be suggested by the things, and not the things by the ideas. “Here is a drawing of a model flower,” the old method says; “go and find the nearest approach to it.” “Go and find me a flower,” is the true method, “and let us see what it is.”

Every child, and every grown person too, for that matter, is interested in nature-study, for it is the natural way of acquiring knowledge. The only difficulty lies in the teaching, for very few teachers have had experience in this informal method of drawing out the observing and reasoning powers of the pupil without the use of text-books. The teacher must first of all feel in natural objects the living interest which it is desired the pupils shall acquire. If the enthusiasm is not catching, better let such teaching alone.

Primarily, nature-study, as the writer conceives it, is not knowledge. He would avoid the leaflet that gives nothing but information. Nature-study is not “method.” Of necessity each teacher will develop a method; but this method is the need of the teacher, not of the subject.

Nature-study is not to be taught for the purpose of making

the youth a specialist or a scientist. Now and then a pupil will desire to pursue a science for the sake of the science, and he should be encouraged. But every pupil may be taught to be interested in plants and birds and insects and running brooks, and thereby his life will be the stronger. The crop of scientists will take care of itself.

It is said that nature-study teaching is not thorough and therefore is undesirable. Much that is good in teaching has been sacrificed for what we call "thoroughness,"—which in many cases means only a perfunctory drill in mere facts. One cannot teach a pupil to be really interested in any natural object or phenomenon until the pupil sees accurately and reasons correctly. Accuracy is a prime requisite in any good nature-study teaching, for accuracy is truth and it develops power. It is better that a pupil see twenty things accurately, and see them himself, than that he be confined to one thing so long that he detests it. Different subjects demand different methods of teaching. The method of mathematics cannot be applied to dandelions and polliwogs.

The first essential in nature-study is actually to see the thing or the phenomenon. It is positive, direct, discriminating, accurate observation. The second essential is to understand why the thing is so, or what it means. The third essential is the desire to know more, and this comes of itself and thereby is unlike much other effort of the schoolroom. The final result should be the development of a keen personal interest in every natural object and phenomenon.

Real nature-study cannot pass away. We are children of nature, and we have never appreciated the fact so much as we do now. But the more closely we come into touch with nature, the less do we proclaim the fact abroad. We may hear less about it, but that will be because we are living nearer to it and have ceased to feel the necessity of advertising it.

Much that is called nature-study is only diluted and sugar-coated science. This will pass. Some of it is mere sentimentalism. This also will pass. With the changes, the term nature-study may fall into disuse; but the name matters little so long as we hold to the essence.

All new things must be unduly emphasized, else they cannot gain a foothold in competition with things that are established. For a day, some new movement is announced in the daily papers, and then, because we do not see the head lines, we think that

the movement is dead; but usually when things are heralded they have only just appeared. So long as the sun shines and the fields are green, we shall need to go to nature for our inspiration and our respite; and our need is the greater with every increasing complexity of our lives.

All this means that the teacher will need helps. He will need to inform himself before he attempts to inform the pupil. It is not necessary that he become a scientist in order to do this. He goes as far as he knows, and then says to the pupil that he cannot answer the questions that he cannot. This at once raises him in the estimation of the pupil, for the pupil is convinced of his truthfulness, and is made to feel—but how seldom is the sensation!—that knowledge is not the peculiar property of the teacher but is the right of any one who seeks it. Nature-study sets the pupil to investigating for himself. The teacher never needs to apologize for nature. He is teaching merely because he is an older and more experienced pupil than his pupil is. This is the spirit of the teacher in the universities to-day. The best teacher is the one whose pupils the farthest outrun him.

In order to help the teacher in the rural schools of New York, we have conceived of a series of leaflets explaining how the common objects can be made interesting to children. Whilst these are intended for the teacher, there is no harm in giving them to the pupil; but the leaflets should never be used as texts from which to make recitations. Now and then, take the children for a ramble in the woods or fields, or go to the brook or lake. Call their attention to the interesting things that you meet—whether you yourself understand them or not—in order to teach them to see and to find some point of sympathy; for every one of them will some day need the solace and the rest which this nature-love can give them. It is not the mere information that is valuable; that may be had by asking someone wiser than they, but the inquiring and sympathetic spirit is one's own.

The pupils will find their regular lessons easier to acquire for this respite of ten minutes with a leaf or an insect, and the school-going will come to be less perfunctory. If you must teach drawing, set the picture in a leaflet before the pupils for study, and then substitute the object. If you must teach composition, let the pupils write on what they have seen. After a time, give ten minutes now and then to asking the children what they saw on their way to school.

Now, why is the College of Agriculture at Cornell University interesting itself in this work? It is trying to help the farmer, and it begins with the most teachable point—the child. The district school cannot teach technical professional agriculture any more than it can teach law or engineering or any other profession or trade, but it can interest the child in nature and in rural problems, and thereby join his sympathies to the country at the same time that his mind is trained to efficient thinking. The child will teach the parent. The coming generation will see the result. In the interest of humanity and country, we ask for help.

How to make the rural school more efficient is one of the most difficult problems before our educators, but the problem is larger than mere courses of study. Social and economic questions are at the bottom of the difficulty, and these questions may be beyond the reach of the educator. A correspondent wrote us the other day that an old teacher in a rural school, who was receiving \$20 a month, was underbid 50 cents by one of no experience, and the younger teacher was engaged for \$19.50, thus saving the district for the three months' term the sum of \$1.50. This is an extreme case, but it illustrates one of the rural school problems.

One of the difficulties with the rural district school is the fact that the teachers tend to move to the villages and cities, where there is opportunity to associate with other teachers, where there are libraries, and where the wages are sometimes better. This movement is likely to leave the district school in the hands of younger teachers, and changes are very frequent. To all this there are many exceptions. Many teachers appreciate the advantages of living in the country. There they find compensations for the lack of association. They may reside at home. Some of the best work in our nature-study movement has come from the rural schools. We shall make a special effort to reach the country schools. Yet it is a fact that new movements usually take root in the city schools and gradually spread to the smaller places. This is not the fault of the country teacher; it comes largely from the fact that his time is occupied by so many various duties and that the rural schools do not have the advantage of the personal supervision which the city schools have.

*Retrospect and Prospect after five years' work.**

To create a larger public sentiment in favor of agriculture, to increase the farmer's respect for his own business,—these are the controlling purposes in the general movement that we are carrying forward under the title of nature-study. It is not by teaching agriculture directly that this movement can be started. The common schools in New York will not teach agriculture to any extent for the present, and the movement, if it is to arouse a public sentiment, must reach beyond the actual farmers themselves. The agricultural status is much more than an affair of mere farming. The first undertaking, as we conceive the problem, is to awaken an interest in the things with which the farmer lives and has to do, for a man is happy only when he is in sympathy with his environment. To teach observation of common things, therefore, has been the fundamental purpose. A name for the movement was necessary. We did not wish to invent a new name or phrase, as it would require too much effort in explanation. Therefore, we chose the current and significant phrase "nature-study," which, while it covers many methods and practices, stands everywhere for the opening of the mind directly to the common phenomena of nature.

We have not tried to develop a system of nature-study nor to make a contribution to the pedagogics of the subject. We have merely endeavored, as best we could, to reach a certain specific result,—the enlarging of the agricultural horizon. We have had no pedagogical theories, or, if we have, they have been modified or upset by the actual conditions that have presented themselves. Neither do we contend that our own methods and means have always been the best. We are learning. Yet we are sure that the general results justify all the effort.

Theoretical pedagogical ideals can be applied by the good teacher who comes into personal relations with the children, and they are almost certain to work out well. These ideals cannot always be applied, however, with persons who are to be reached by means of correspondence and in a great variety of conditions, and particularly when many of the subjects lie outside the customary work of the schools.

Likewise, the subjects selected for our nature-study work must be governed by conditions and not wholly by ideals. We are

* From Bull. 206, Sixth Report of Extension Work, 1902.

sometimes asked why we do not take up topics more distinctly agricultural or economic. The answer is that we take subjects that teachers will use. We would like, for example, to give more attention to insect subjects, but it is difficult to induce teachers to work with them. If distinctly agricultural topics alone were used, the movement would have very little following and influence. Moreover, it is not our purpose to teach technical agriculture in the common schools, but to inculcate the habit of observing, to suggest work that has distinct application to the conditions in which the child lives, to inspire enthusiasm for country life, to aid in home-making, and to encourage a general movement towards the soil. These matters cannot be forced. In every effort by every member of the extension staff, the betterment of agricultural conditions has been the guiding impulse, however remote from that purpose it may have seemed to the casual observer.

We have found by long experience that it is unwise to give too much condensed subject-matter. The individual teacher can give subject-matter in detail because personal knowledge and enthusiasm can be applied. But in general correspondence and propagandist work this cannot be done. With the Junior Naturalist, for example, the first impulse is to inspire enthusiasm for some bit of work which we hope to take up. This enthusiasm is inspired largely by the organization of clubs and by the personal correspondence that is conducted between the Bureau and these clubs and their members. It is the desire, however, to follow up this general movement with instruction in definite subject-matter with the teacher. Therefore, a course in Home Nature-study was formally established under the general direction of Mrs. Mary Rogers Miller. It was designed to carry on the experiment for one year, in order to determine whether such a course would be productive of good results and to discover the best means of prosecuting it. These experimental results were very gratifying. Nearly 2,000 New York teachers are now regularly enrolled in the Course, the larger part of whom are outside the metropolitan and distinctly urban conditions. Every effort is made to reach the rural teacher.

In order that the work may reach the children, it must be greatly popularized and the children must be met on their own ground. The complete or ideal leaflet may have little influence.

For example, I prepared a leaflet on "A Children's Garden" which several people were kind enough to praise. However, very little direct result was secured from the use of this leaflet until "Uncle John" began to popularize it and to make appeals to teachers and children by means of personal talks, letters and circulars. So far as possible, his appeal to children was made in their own phrase. The movement for the children's garden has now taken definite shape, and the result is that more than 26,000 children in New York State are raising plants during the present year. Another illustration of this kind may be taken from the effort to improve the rural school grounds. I wrote a bulletin on "The Improvement of Rural School Grounds," but the tangible results were very few. Now, however, through the work of "Uncle John" with the teachers and the children, a distinct movement has begun for the cleaning and improving of the school grounds of the State. This movement is yet in its infancy, but several hundred schools are now in process of renovation, largely through the efforts of the children.

The idea of organizing children into clubs for the study of plants and animals, and other outdoor subjects, originated, so far as our work is concerned, with Mr. John W. Spencer, himself an actual, practical farmer. His character as "Uncle John" has done much to supply the personality that ordinarily is lacking in correspondence work, and there has been developed amongst the children an amount of interest and enthusiasm which is surprising to those who have not watched its progress.

The problems connected with the rural schools are probably the most difficult questions to solve in the whole field of education. We believe, however, that the solution cannot begin directly with the rural schools themselves. It must begin in educational centres and gradually spread to the country districts. We are making constant efforts to reach the actual rural schools and expect to utilize fully every means within our power, but it is work that is attended with many inherent difficulties. We sometimes feel that the agricultural status can be reached better through the hamlet, village, and some of the city schools than by means of the little red school house on the corner. By appeals to the school commissioners in the rural districts, by work through teachers' institutes, through farmers' clubs, granges and other means we believe that we are reaching farther and farther into the very agricultural regions. It is diffi-

cult to get consideration for purely agricultural subjects in the rural schools themselves. Often the school does not have facilities for teaching such subjects, often the teachers are employed only for a few months, and there is frequently a sentiment against innovation. It has been said that one reason why agricultural subjects are taught less in the rural schools of America than in those of some parts of Europe, is because of the few male teachers and the absence of school gardens.

We have met with the greatest encouragement and help from very many of the teachers in the rural schools. Often under disadvantages and discouragements they are carrying forward their part of the educational work with great consecration and efficiency. In all the educational work we have been fortunate to have the sympathy and co-operation of the State Department of Public Instruction. We do not expect that all teachers nor even a majority will take up nature-study work. It is not desirable that they should. We are gratified, however, at the large number who are carrying it forward.

This Cornell nature-study movement is one small part of a general awakening in educational circles, a movement which looks towards bringing the child into actual contact and sympathy with the things with which he has to do. This work is taking on many phases. One aspect of it is its relation to the teaching of agriculture and to the love of country life. This aspect is yet in its early experimental stage. The time will come when institutions in every State will carry on work along this line. It will be several years yet before this type of work will have reached what may be considered an established condition, or before even a satisfactory body of experience shall have been attained. Out of the varied and sometimes conflicting methods and aims that are now before the public, there will develop in time an institution-movement of extension agricultural teaching.

The literature issued by the Bureau of Nature-Study is of two general types: that which is designed to be of more or less permanent value to the teacher and the school; and that which is of temporary use, mostly in the character of supplements and circulars designed to meet present conditions or to rally the teachers or the Junior Naturalists. The literature of the former type is now republished and is to be supplied gratis to teachers in New York State. The first publication of the Bureau of Nature-Study was a series of teachers' leaflets. This series ran to twenty-two

numbers. It was discontinued in May, 1901, because it was thought that sufficient material had then been printed to supply teachers with subjects for a year's work. It was never intended to publish these leaflets indefinitely. Unfortunately, however, some persons have supposed that because these teachers' leaflets were discontinued we were lessening our efforts in the nature-study work. The fact is that later years have seen an intensification of the effort and also a strong conviction on the part of all those concerned that the work has permanent educative value. We never believed so fully in the efficiency of this kind of effort as at the present time.