

NATURE STUDY.¹

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ONE of our great educational principles is that education is the science of relations, and one of the most important of these relations is that to be formed with Nature, and it is of that that we are going to talk to-night.

Nature study should form, not only a part of the school curriculum, but a large part in the life of the home. We all know that children are usually much more observant than their elders, and one of the surest ways of increasing this power of observation is to give the little child an interest in and consequently a love of the beauties and wonders of the world around him.

Nature study is of importance, physically, intellectually, and spiritually. During the first six or seven years of his life the child should learn almost entirely through his senses, and nature study affords the only perfect means of sensory training, thus the senses of the savage whose only book is nature are keener than those of any civilized man.

Hours spent far away from the smoke and cry of the town are, we know, the healthiest, and none are so refreshing as those spent in (constant) search of the constant new wonders, which abound in our country lanes or fields.

The early out-of-door nature study is to be a preparation for the science teaching of the school, and during the early years books should not be used by the child, though we, ourselves, find books on Nature indispensable if we are to be ready to answer his frequent searching questions, and to help him to arrange his knowledge in an orderly way, that it may be helpful to him in future years.

A child's sense of beauty grows from early contact with nature, and his life cannot be fully blessed without this sense. Without it he is unable to appreciate in future years pure art, [p 338]

and many of the thoughts of great writers, particularly of our poets. Nature's influence on the works and lives of many great men, again, shows us the importance of this study. We cannot think of Wordsworth apart from Nature, and in such lines as these we feel how intimate was his knowledge:

“Sweet are the sounds that mingle from afar,
Heard by calm lakes, as peeps the folding star
Where the duck dabbles 'mid the rustling sedge,
And feeding pike starts from the water's edge,
Or the swan stirs the reeds, his neck and bill
Wetting, that drip upon the water still;
And heron, as resounds the trodden shore
Shoots upward, darting his long neck before.”

An Evening Walk.

Or, again, in these lines, written in early Spring:

“To her fair works did Nature link
The human soul that through me ran;
And much it grieved my heart to think
What man has made of man,
Through primrose tufts in that sweet bower
The periwinkle trailed its wreaths;
And tis my faith that every flower
Enjoys the air it breathes.

“The birds around me hopp’d and play’d
Their thought I cannot measure
But the least motion which they made
It seem’d a thrill of pleasure.

“The budding twigs spread out their fan
To catch the breezy air;
And I must think, do all I can
That there was pleasure there.”

Again, in Shakespeare’s works we see how familiar he was with the beauties of the country, and we know that he must have gained this knowledge in childhood, whilst living in Warwickshire. The following are a few passages in which we feel Shakespeare’s intimacy with Nature:

“Daffodils that come before the swallow dare
And take the winds of March with Beauty.”
Winter’s Tale.

or

“I know a bank where the wild thyme blows,
Where oxlips and the nodding violet grows;
Quite over-canopied with luscious woodbine
With sweet musk roses, and with eglantine.” etc.
A Midsummer Night’s Dream.

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“Like the toad, ugly, and venomous,
Wears yet a precious jewel in his head,
And this our life exempt from public haunt,
Find tongues in trees, books in the running brooks,
Sermons in stones, and good in everything.”
As You Like It.

Nature study may lead us to a greater reverence and a fuller appreciation of our God, the Creator of all.

Reverence for life, as a wonderful and awful gift which a ruthless child may destroy, but never can restore, is a lesson of great importance to be taught to each child. Remembering this, we should not allow the little child to pull a flower to pieces, or to injure or destroy any form of life, though dissection of flowers is necessary when more advanced botany is taken in the school, it is quite possible for the little child to gain sufficient knowledge from the growing plant, flower, or living creatures to enable him to make a rough classification. This he should be encouraged to do, that he may be able to distinguish petals, sepals, and stamens, to recognize leaves by their shapes and veins, to know trees which keep their leaves all the year, and trees which lose them in the autumn, to distinguish creatures with backbones from creatures without, those that eat flesh from those that eat grass, and so on.

We believe that all knowledge is given to us through the revelations made by the Holy Spirit, and we want to teach children that all great scientific discoveries are only revelations of God's power, shown to us, when He sees that we are ready, through some chosen messenger.

The love of God is very much revealed to us in Nature study when we consider the multitude of wonderful ways He has provided for sustaining life, and of protection; an example of this is that of the guillemot's egg, which is laid on a ledge of a rock on a cliff, but is so pointed that the wind, or the movement of the parent bird only makes it roll round in a ring, and return to its old position; (or the scent of the butterfly orchis which is only produced at night that the night-flying moth which pollinates it may be attracted). There are many examples of mimicry or protective resemblance which living things assume, for instance, the chrysalis of a butterfly often has the exact colouring of its particular surrounding; or the colour of a plover's egg, the dark brown spot making it closely resemble the ground on which it is laid.

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Having considered a few of the many reasons for encouraging Nature study, I will mention some of the ways in which this study may be carried on.

Little children very much enjoy what Miss Mason in *Home Education* calls "sight-seeing." The children are spending a day in the country, the mother sends them off to explore, and they are to return in a few minutes, and see who can tell the most of some stream, hill, wood, cottage, or farm. They look upon this as a game, but its educational value is great; the children's powers of observation and expression are being trained, they are increasing their vocabulary and their range of ideas; and at the same time truthful habits are being formed, as care is taken that they see the fact and state it exactly without omission or exaggeration. The children are also storing up a life-long possession, mental pictures which will be a source of delight in years to come.

Another way in which we may help children to gain these exact images of the beauties of Nature is by picture painting; for this we get the children to look well at some patch of landscape and then to shut their eyes, and to call up the picture before them, and then let them say what they see. Such games as these must be used with discretion, and at first a little guidance must be given that they may see distant features, and notice any reflections. And thus we may enable them to say with Wordsworth:

"Though absent long,

These forms of beauty have not been to me,
As is a landscape to a blind man's eye—
But, oft, in lonely cities, I have owed to them,
In hours of weariness, sensations sweet,
Felt in the blood, and felt along the heart;
And passing even into my purer mind
With tranquil restoration."

On their walks children may be made familiar with the common flowers of our fields and lanes. Not only may they learn the names of the flowers, but all about them, where they grow, when they flower, how they are fertilized; may classify them as the daisy tribe, the butterfly tribe, not at first burdening small children with too many Latin names. They should also be taught to recognize the fieldcrops, and to know the times of the harvests.
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Even in the town we may help them to be familiar with the more common of our birds, especially if we feed them regularly during the winter months. In the parks the children may learn to recognize the trees, let them pick out a dozen in their winter nakedness, and take these to be their yearlong friends, watching the buds as spring advances, the buds fattening, and then the delicate young leaves unfolding; then, and even before the leaves show themselves they may see the flowers, and watch for the fruit in the autumn. But Nature walks quite in the country are indispensable, therefore day's excursions must be arranged. A pair of field-glasses are of great use in bird-stalking, and bird walks, because it is so difficult to get a clear idea of a bird's colouring unless one is quite close to it. A good deal of time should be given to watching birds, in order to learn their habits, and if possible to know their chief food, whether it be land or water plants, or insects, or small fish. The nesting season is the best time for such observations.

All children in the Parents' Union Schools keep Nature Note Books, or Nature Diaries; in these they may enter an account of the wonders they have found and seen on their daily walk, and a record or calendar for the year of the first flower, first tadpole, first oak-leaf, first ripe blackberry, and where and when found that they may be on the look out the next year. The children illustrate these with brush drawings, these drawings should be done without pencil, just freely with the brush, and the child should be left to his own initiative, as far as possible, a little guidance being given at first, but his Nature Note Book should not comprise his drawing and painting lessons.

At the end of the book a bird and flower list should be kept, and older children may add sketches, astronomy charts, maps, and suitable poetical quotations.

The making of collections of pressed flowers and grasses, particularly the latter, affords an interesting and instructive occupation.

The study of living creatures is, however, more attractive to most children, and if so even greater care is needed to see that they have a true reverence for life. In this age of collecting we must be careful that our Nature study does not lead to any cruelty or destruction of life. We daily hear that many

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creatures who were once common in our country districts are now very rare, or extinct, and this is due partly to the keen naturalists. A suggestion in the *Country Side* seems to afford a very superior substitute for the merciless slaughter, which, up to now has been the work of the ardent private collector. This is to take photos of living creatures, and make a collection of these, which would indeed be more true to life than any preserved dead specimen, and would help to prevent the extinction of many of our most beautiful creatures.

Instead of bird-nesting, Miss Mason recommends bird-stalking, which certainly needs great skill, and is full of interest and excitement. During the winter months the children have become familiar with the notes and appearances of many of our resident birds, but as the spring advances, the song and additional notes are bewildering, and the thickness of the trees hides the bird. Now is the time for bird-stalking, the children having singled out some unknown note or song determine to find out the songster, so they creep along, as silently as possible, hardly daring to breathe, and having tracked a note to its source they have the joy of a find, and may silently watch a nuthatch, a tree-creeper, or shy little willow-wren, which until now have only been names to them.

There are many ways by which children may carry on close observation, and so gain a living knowledge by themselves of such creatures as the frog, bee, ant, caterpillar, etc. For example, ants may be brought under home observation in the following way. Get two pieces of glass, 1 foot square, and three strips of glass 11 1/2 inches long, and one strip 11 inches long, these all 1/4 inch thick. The glass must be carefully cut, so as to fit exactly. Place the four strips of glass upon one of the sheets of glass and fix in an exact square with glue or some other good fixer. Get from an ant-hill about twelve ants (yellow ants are best, as the red are inclined to be quarrelsome), a few eggs, and one queen. The queen will be quite twice as large as an ordinary ant, and so can be easily seen. Take some of the earth of the ant-hill, put the earth with your ants and eggs upon the sheet of glass, and fix the other sheet above, leaving only the small hole in one corner, made by the shorter strip, which should be stopped with a bit of cotton wool. The ants will be restless for perhaps two days,

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but will then begin to settle and arrange the earth. Remove the wool plug once a week, and replace it after putting two or three drops of honey on it. Once in three weeks remove the plug to drop in with a syringe about ten drops of water. This will not be necessary in the winter while the ants are asleep. This "nest" will last for years.

Another means of arousing, and sustaining interest is an aquarium, either of fresh or salt water, but it must not be forgotten that daily inspection and attention is necessary. We should encourage children to keep pets, and if they do, insist on each giving personal attention to her own pet, and we must not allow them to shirk the sense of responsibility they should feel by leaving the necessary attention to be given by others.

Gardening is another form of Nature study, which most children enjoy, provided they have their own gardens, and grow just what they like. Older children may have botanical gardens, and grow plants in separate beds, according to their natural order, growing both the wild and cultivated specimens, and thus they are helped in the classification of plants. It is very useful too to know the Latin names of flowers by which they are known the world wide; this knowledge enables us to carry on our study abroad as easily as at home.

A weekly Nature paper such as the *Country Side* will often be found useful, and will add to the children's interest and knowledge.

Another out-door study is geography. At Ambleside we go for frequent "geography walks" during the summer. We believe that all small children should learn their early geography in their walks. A duck-pond is a lake, a stream is a river, a hillock grows into a mountain, a small wood may suggest some large forest, in fact, all the natural features may be learnt in this way, and should be on the return home traced or built on a tray of sand. Children should be taught to tell the time of day by the position of the sun in the heavens. Before they can have a real understanding of maps they must have the idea of distance, and the best way to give them this idea is by pacing. The child's pace is measured before starting, then a certain length of road is paced, and a little sum follows. The time taken to pace a certain number of yards will be the next

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step, and from the time taken for a given distance the number of miles or yards may, in future, be calculated.

The idea of direction must follow that of distance, first to be learnt by watching the sun rise and set; the child of course knowing that it rises in the east, and sets in the west, is ready to tell approximately the aspect of the places near his home and which way the windows of his own home face.

A little later he should be introduced to the wonders of the mariner's compass, and with the help of this and pacing, the child is able to draw rough maps and plans of his own home and immediate neighbourhood according to scale. Older children may draw sketch maps of villages and towns, and by the use of the aneroid barometer be enabled to add the elevations. Additional interest to this study is given by a knowledge of the local history; this may entail much out-of-door work in the search for ancient remains and relics. We may also help the children to notice how the industries of a district depend almost entirely upon its physical conditions.

Another science which we must not omit, and which may go hand in hand with geography is geology, or in other words the science which investigates the history of the earth.

What Pope says of the different parts of the human frame in his *Essay on Man* can as truly be said of the various branches of Nature study:

"All are but parts of one stupendous whole
Whose body Nature is, and God the soul."

Geikie says "Geology is essentially a science of observation": Geology takes us into fields, over hills and dales, along banks of rivers, and lakes, and the shores of the sea. Geological operation is always in progress, hence by careful observation we can watch, on a small scale, some of the forces which have gone to the building up of our present landscape. Geology may be made both interesting and instructive to children. Each pebble has its tale to tell, while a fossil takes us back to remote periods of the world's history.

The study of astronomy has a particular fascination for children, and all should be taught to recognize the most important constellations, and to know the planets and watch their

movements. A deep insight into this enthralling subject is impossible for children, but a little knowledge of this, the

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greatest of all the wonders of the universe, will fill them with a holy awe and give them a desire to study astronomy more seriously as they grow older.

Though we attach great importance to observation, and consequently self-obtained knowledge in Nature study, we do not look upon Nature walks as the time for direct scientific instruction. We believe that the study of science should be pursued in an ordered sequence, which is not possible or desirable on a walk.

The following are some of the ways that are used in the Parents' Union School for teaching Nature study in school hours, and indoors, by the use of books:—

Classes IA. and IB. do brush drawings of twigs, flowers, or other finds which they may have made during their walks twice a week, and each term they have read to them such books as Mrs. Brightwen's *Inmates of my House and Garden*, *Wild Nature Won by Kindness*, or Miss Buckley's *Wild Life in Woods and Fields*, *Insect Life*, *By Pond and River*, etc. The teacher amplifies where possible, and specimens are shown, or are looked for on the next walk with additional interest. Visits to a public museum might follow if the children live in a town. Some object of particular interest found on one of the walks may call for a special lesson. What is read or told to the children they are required to narrate at the end of the lesson as we do not believe that any lesson is received until the children have reproduced it themselves.

Class II. use such books as *Life and Her Children*, Miss Buckley; *More About Wild Nature*, Mrs. Brightwen, which are somewhat of an advance on those of Class I. and have the addition of Mr. Holden's book *The Sciences*, which includes lessons on astronomy, physics, the science that explains heat, light, sound, electricity, magnetism, chemistry, meteorology, the science of the weather, and physiography, the science of the land and sea. Wherever possible, experiments are made by the pupils, so that the lessons may be living. The children in the practising school at Ambleside keep astronomy and weather charts. To help them with the latter they have a rain gauge, thermometer, and barometer, which they take it in turns to examine daily and mark the record on their chart.

In Class III., lessons in elementary botany form the chief

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work, Oliver's *Botany* being used, and during this time the girls learn the general characteristics of the natural orders, that they may be able to classify the plants they find. The pupils in Class IV. read usually by themselves, the teacher only giving introductory or summary lessons or amplifying where necessary the following books, *Chapters on Modern Botany*, by Geddes; *Study of Animal Life*, by Thomson; *Starland*, by Sir Robert Ball, and Geikie's *Geology*.

Classes IV. and III. connect the studies of geography and natural history by the use of such books as Darwin's *Coral Reefs*, *The Voyage of H.M.S. Beagle*; Drummond's *Tropical Africa*; and Bate's *Naturalist on the Amazon*.

There are endless animal story-books, well written, which will help children to enter into the life of the creatures, to feel for them, and to love them. Thompson Seton's and John Long's *American Tales* are admirable for all; and for bird stories, Warde Fowler's *Tales of the Birds*, or some of Kearton's will always be much enjoyed by children.

General Baden-Powell's extensive scouting scheme is included in the curriculum of the Parents' Union School. The scheme has nothing whatever to do with soldiering, but it has been set on foot with the idea of making good citizens of our boys and girls. The acquisition of all kinds of scientific knowledge comes under the head of "Scout Craft," and there are many games suggested in the hand-book *Scouting for Boys*, which are taken up by children with great zeal. The "Scout Law" is based upon the old laws of chivalry, and a true scout must put God, honour, duty, and the sacrifice of self before all.

Thus scouting gives an attractive occupation in the open air, resulting in alertness and independence, and also affords moral training.

Finally, what is there for us of great attraction at this season of awakening and of hope? Nature is rousing from her winter sleep, and the birds, her natural choristers, are celebrating the levee. We may daily watch the return of some of our yearly visitors from Southern lands, amongst the earliest arrivals are the stone-chat and the chiff-chaff. The thrushes and blackbirds are probably in some parts already nesting, and the rooks are unceasingly busy putting the finishing touches to their nests.

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It is during the early spring that we may begin bird-stalking with the children, and so help them to become familiar with our birds, and with some of their songs. The birds are all rapidly assuming their brightest plumage, for they are all going a courting. We may even watch quite closely the robin, and other bold birds on their nest in the low hedge; but above all things let us impress upon the children the cruelty of robbing their nests. To our song-birds we owe the music of the green lanes and woods of Old England, and without them, it wouldn't seem summer, in spite of flowers and leaves. If we live in a district where it is difficult to watch the birds, visits to the bird rooms of museums will be found very helpful, but better than this is a visit to the beautiful new aviaries at the Zoo, where nearly all our birds may be seen alive, and in almost their natural surroundings.

This is the time when in the woods we see the beautiful pendulous hazel catkins ripening and scattering clouds of yellow pollen in all directions. On the same twigs we find the pistillate flowers; they are not showy as the staminate ones, but small oblong brown buds, from whose tops several crimson stigmas protrude. The children may watch and measure the growth of the buds of their chosen friends among the trees, and be constantly watching for the bursting of the bud, and the unfolding of the first tender leaves.

Each day we see the floor of the woods, and the sides of the lanes becoming more green and bright, and the children may be encouraged to watch for and keep a careful record of all first flowers, which seem so eager to blossom, that in some cases they appear before their leaves, whilst in others it is the bright green leaves which first attract our attention, the moschatel, or adoxa, and wood sanicle are examples of the latter.

The following are a few of the flowers which it is possible to have found during the first two and a half months of this year: daisy, chickweed, groundsel, dandelion, gorse, hazel, staminate and pistillate, ivy-leaved toadflax, wych elm, yew, coltsfoot, snowdrop, barren strawberry, bitter-cress, celandine, elm, golden saxifrage, dog's mercury, primrose, and many others.

Insect life, too, is awakening, and we may see an occasional tortoiseshell butterfly on a bright day, or the red admiral, peacock, or small cabbage white. The gnats too may be seen

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rising in the air, when sunny, and an occasional dragon-fly. But these insects are dependent on the presence of the flowers, without which they would be foodless. The flowers secrete honey, and manufacture a superabundance of pollen, in return for which the important function of flower life, cross-fertilization, is performed.

Very soon we may find the jelly-like eggs of the frog in some green pond, and constant visits will be paid to it by the children to watch the wonderful growth which will take place. Caddis worms, carefully concealed in their wonderful cases may be found under stones at the bottom of streams.

In springtime children should study germination through all its most interesting phases, they might gather some sycamore samaras, and put them on damp moss in a saucer, then watch first the radicle protrude, then the plumule, bearing the two cotyledons which are the first true leaves, noticing the differences between these and the leaves that follow. We may let children grow mustard and cress on damp flannel, and now is the time for the gardens to be dug up, and early seeds planted.

Day unto day is uttering the speech of Nature, night unto night revealing her knowledge. It is a time to live, to think, to ponder, and to grow reverent in! and with these lines from Wordsworth I will end:

“And hark! how blithe the throstle sings,
He, too, is no mean preacher:
Come forth into the light of things
Let Nature be your teacher.”

¹ Paper read at the Middlesboro' Branch of the P.N.E.U.