
How plants live & works.

HUGHES-GIBB ELEANOR

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EXPLANATORY PREFACE.

THE study of Plant-life has, for many years, been one of the keenest and most unfailing pleasures in my life.

The companionship of all the green things on the earth has always been felt by me to be a very real one; and the loneliest of country walks becomes bright and cheerful when one's little friends peep out from the hedge-rows, or look up from the short downland grass as if expecting a nod and a word of recognition and greeting.

I took the trouble, during one summer, to become personally acquainted with every species of the umbelliferous family which grew anywhere within reach. No very easy task; but I have been amply rewarded by the pleasant conviction that they are my fast friends for life, and warmly appreciate my discriminating glance of recognition, in place of the usual careless look and hasty generalisation under the very comprehensive (as thus applied) term of "Hemlock!"

It is, however, worth while trying to know something more than the names of one's little friends; to enter into their lives, and to understand their constitution and manner of growth; to appreciate their marvels of mechanism and symmetry, and to trace out the same laws and the same central plan and idea running through their simple existence

and our own more complex life. The pleasure of these studies and observations is a specially wholesome and elevating one; it braces, and yet soothes; it carries the mind away from itself and its own narrowness, and leads it out into the broad and breezy fields of natural science, whose wonders and delights are ever new, and can never weary or pall, for they are infinite. Like all pure and wholesome pleasures, this one soon prompts the mind which enjoys it to seek for sharers in its happiness. It is so natural and right to desire that others should sympathise and enjoy with us.

Children are very near to Mother Nature's heart. She loves them, and they return her love with a delightful, ardent affection. Could anything be easier than to interest a little child in botany, if only one does not use hard, incomprehensible terms, and if one allows the young eyes and fingers to work for themselves? Yet how many little village children, wandering through country lanes and fields, miss the precious, simple pleasures, inestimably beneficial in their purifying, elevating, and broadening effects upon the mind, which lie scattered along their path, in every little weed and wayside flower; each one of which, rightly understood, is like a beautiful story or poem, told in Mother Nature's own attractive fashion.

This pleasure, at least, need not be confined to children born in the so-called "upper classes"; and, with these thoughts in my mind, I began, in my leisure moments, early one spring, to make careful notes and preparations for a course of lessons to village children, which I hoped might awaken their interest in the dear green world around them, and teach them how to listen for Nature's voice and to watch

her at work, intelligently, and with a fair hope of comprehending her.

The lessons were given in the summer of 1894 to a small class of village children, boys and girls; and the result encouraged me to believe that, with a little help and teaching, a little patient guidance, and a spark of enthusiasm on the part of some leisured lover of Nature, many a little soul might be led to make a friendship with the "Great Mother" which should last its life, much to its own happiness and advantage.

In the hope that some may be induced to undertake this charitable work, and may find my simple programme for a first course of lessons useful, I have amplified my notes and written them out in a more or less complete form, as they might be delivered. I may venture to suggest that it is my experience that anything which appeals to the eyes, as well as to the understanding, will be of the greatest service in interesting children and fixing their attention.

It would be well to procure, if possible, three photographs of the same person at various ages, as suggested in the course of the first lesson.

I found my microscope invaluable; and keen interest was aroused by the gift of a few peas, with the request that the children would keep them in damp moss until they germinated, and bring them back at the following lesson.

At the end of each lesson I append a note to the teacher, suggesting some small task which might be set to the children in the interval between the lessons, as a means of keeping their interest alive and of awakening their powers of observation. Of course it would be optional with the teacher to use these suggestions or not.

My aim throughout these pages has been to attain the utmost simplicity, so that every detail may be clear to the mind of a young child, and at the same time such careful accuracy that nothing learnt here shall ever have to be unlearned. I can only hope that, in some measure at least, I may have succeeded.

E. H. G.

March 1896.

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HOW PLANTS LIVE AND WORK.

P A R T I.

LESSON I.

LIFE AND ITS SIGNS.

You have come to me, dear children, to hear something about plants. You want to know about their life, their habits, their needs, and their uses. I think I can promise you it will not be dull. I hope to show you how to enter into their lives, to sympathise with them, and to enjoy them in quite a new way.

But before coming to this, our own, subject we must talk a little about life in general.

You, children, have something to say about this, for you are some of Life's children, are you not? In other words, you are alive.

How do I know this? How can you prove to me that you are really living creatures?

If I watch and observe you for a little while I shall soon have three proofs which will be enough to convince me of the fact.

Mary, what has happened to the sleeves of your frock? Have you cut a piece off them? I know they were long enough when it was made for you, and now they are right up

"Oh, it's because I'm growing so fast! I've nearly out-grown my frock altogether!"

Then it is you who have altered, and not the frock? You **grow**; that is, your body gets larger in every direction. Does it alter in any other way?

Just look a moment at these three photographs I have brought with me. See this one first.

"Oh, what an ugly little baby!"

Well, yes! I can't say much for the poor little bald-headed creature. But now look at this.

"How sweet! What a pretty young lady!"

Yet she is the very same person as the little bald-headed baby! How she has changed, has she not? You wouldn't know her again.

Now see this third photograph.

"It is quite an old lady with such a wrinkled face. We don't like it as well as the pretty young lady!"

Yet she is the same person; and she and the little bald-headed baby are one! It is funny, is it not?

How these bodies of ours do change in appearance! Not only while we are young, and people say: "How she has grown! I shouldn't know her!" But all through life the process of change goes on.

This is what is really happening. All day long and every minute little tiny particles of your body are dying. You may think of them as the ashes of a fire which has burnt up a piece of coal or wood and leaves behind that which it cannot use. The fire is like your life; the white ash is the used-up particles of your body, which must be got rid of as quickly as possible. Your body has many most beautiful and wonderful arrangements for doing that. Your skin, with its countless tiny invisible "pores" or little openings, is one of Nature's plans for carrying away all the dead waste matter of our bodies. That