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CONTENTS FOR AUGUST



| | | |
|---|-----------------------------------|------|
| FRONTISPIECE (Polly's Letter) | Ida Waugh | PAGE |
| A BATTLE WITH A WINDMILL . . . | Frank H. Coleburn . . . | 197 |
| WITH WASHINGTON AT VALLEY | | |
| FORGE (Serial) | W. Bert Foster | 201 |
| Illustrated by F. A. Carter | | |
| MARY LANE'S HIGHER EDUCATION . . . | Marguerite Stables | 210 |
| Illustrated by Ida Waugh | | |
| LITTLE POLLY PRENTISS (Serial) . . . | Elizabeth Lincoln Gould | 214 |
| HOW PLANTS LIVE | Julia McNair Wright | 221 |
| Illustrated by Nina G. Barlow | | |
| A DAUGHTER OF THE FOREST (Serial) . . . | Evelyn Raymond | 223 |
| WOOD-FOLK TALK | J. Allison Atwood | 230 |
| THE OLDEST COLLEGES | | 231 |
| WITH THE EDITOR | | 232 |
| EVENT AND COMMENT | | 233 |
| OUT OF DOORS | | 234 |
| THE OLD TRUNK (Puzzles) | | 235 |
| IN-DOORS (Parlor Magic, Paper VI) . . . | Ellis Stanyon | 236 |
| WITH THE PUBLISHER | | 237 |

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YOUTH

VOL. I

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No. 6

A BATTLE WITH A WINDMILL

By Frank H. Coleburn

SHORTLY after I left college, my father died, leaving me, his only son, so well-nigh penniless that I was very glad, indeed, to accept the position which Mr. Eller, an old friend of the family, offered me in his vineyard.

My benefactor's home was in southern California, a region where the people's livelihood depends upon grapes and wine-making.

One day, not long after my arrival, the big windmill, which supplied the whole winery with water, got out of order and refused to pump. Mr. Eller examined it carefully, but was unable to learn where the difficulty lay. He came down from the tank much disturbed, for water was a great necessity in that dry country.

"Harry," he said to me, "you're something of a mechanic, aren't you?"

"I did pay a little attention to the study at one time," I answered, modestly.

"Well, I wish you would try what you can do in the way of fixing that windmill."

I promised that I would, and Mr. Eller left me.

After supper that night I secured a hammer and a chisel and started for the windmill. I had need to make haste if I expected to accomplish anything that evening,

for the days were shortening and already darkness was falling.

The windmill stood some two or three hundred yards from the house directly behind the wine cellar. It was about seventy-five feet high—from the base to the top of the wheel—but in that deceptive twilight it looked like some giant finger reaching to the sky.

I stuck my tools in my coat pocket and began to climb the long ladder which stretched to the top of the tank. From thence it would be easy to reach and manipulate the wheel.

I made the ascent in safety, and after a little stood on top of the rough boards with which the tank was covered. For some time I stood, admiring the splendid view and wondering at the extent of country that came under my gaze, until warned by the ever-increasing gloom that I was out on business, not pleasure.

I forget just what was the matter with the wheel. Some simple disarrangement of the machinery which took me but little time to ascertain and less to remedy. Feeling certain that the mill would now perform its duty as well as before, I turned to retrace my way. In doing so I stepped upon a half-concealed trap-door, intended

HOW PLANTS LIVE

By JULIA McNAIR WRIGHT

IN the hot August days, when the air scarcely stirs, the birds sit silent in their coverts, the cattle stand under the thickest shade or knee-deep in the ponds. Only the insects seem to rejoice in the burning rays of the sun, and gayly hover around the splendid profusion of flowers.

In this season we may make various studies in plant life. Seated upon some shady veranda, we have the glory of the garden spread out before us. Or we may be on some hill, tree-crowned, not far from the sea; we find within hand reach golden-rod, asters, milfoil, blazing-star, indigo. Looking down the gentle slope to the level land, we see black-eyed Susan flaunting beside St. John's wort and wild snap-dragon. Yonder, the little brooklet slips along without a ripple, cherishing on its border loosestrife and jewel-weed. Out in the roadway, defiant of the summer dust, almost in the wheel track, the mullein lifts its dry, gray foliage and unfolds its tardy pairs of clear yellow bloom beside that exquisite flower, the evening primrose, of which the harsh, dusty stem and leaves are such rude contrast to the fragrant calvers of pale gold—the blossom of one night.

We have ample opportunity in some or all of these to study the motion, food, and some of the varied products of the plant world.

Motion? What motions have plants other than as the wind sways them? True, there is an upward motion; they grow up inch after inch, foot after foot, the law of growth overcoming the law of gravitation. The sap rises in the vessels by root-pressure, by capillary attraction, by the forming of a vacuum in the leaf-cells, by evaporation, and so the climbing sap builds up the plant. This getting up in the world is not a

trifle in plant life any more than in human life.

Many a plant seems to have an extreme ambition to rise, and if its stem proves too weak to support any decided advancement in growth, it takes measures to secure aid. It twines, bodily, perhaps, around the nearest support, as do the trumpet-creeper and honeysuckle; it modifies leaves into tendrils, as does the sweet pea; it puts forth aerial roots at its nodes, as does the ivy; it elongates a leaf stem to wrap around and around some proffered stay, as does the clematis, or diverts a bud for such purpose, as the grape-vine.

Other plants of lowlier mind creep along the ground. The prince's pine forms a strong, thick mat, cleaving to every root, twig, grass-stem, in its way, striking root-lets here and there, until only a strong hand and a firm wrench can drag it from the earth, its mother. Cinque-foil and its cousin, strawberry, send out runners from all sides, which root and shoot up new plants until the whole bed is a solidarity, and would so remain did not the thankless plants keep all the food and moisture for themselves, and deliver over the runners to death by starvation.

The walking fern has a most original way of getting over the ground. It bends its slender frond and starts a root by extending the tip of the mid-rib; so it sets up a new plant and is anchored fast on all sides by its rooted frond tips, covering the ground with a rich carpet of verdure. The variety of runners along the ground is as great as the climber. All motion of the plant is a form of growth. The plant grows by day and by night, but more by day, as light and heat are incentives to growth.

Interesting as is the study of plant motion, let us forsake it and consider for

a little plant food. The plant receives food from earth, water, and air. The earth gives the plant sulphur, iron, soda, magnesia, phosphorus, and other mineral substances. These are all fed to the plant in a solution of water.

From the rain the plant receives as food hydrogen and forms of ammonia.

From air the plants absorb carbon, oxygen, nitrogen, and ammonia; very much of the first, little of the second, and very little of the others.

When plants grow out-of-doors, the winds, dews, and rains free the leaves from accumulations of dust which obstruct the pores and hinder the receiving of food. In very dry and dusty seasons we notice that the plants become sickly from the stopping of the pores. Plants need clean skins as human beings do.

House plants should be well washed all over now and then, to admit of their getting their proper amount of food from the air.

Certain classes of plants use a portion of animal food. We are accustomed to the idea of animals eating plants, but when we see the tables turned, and the plants eating

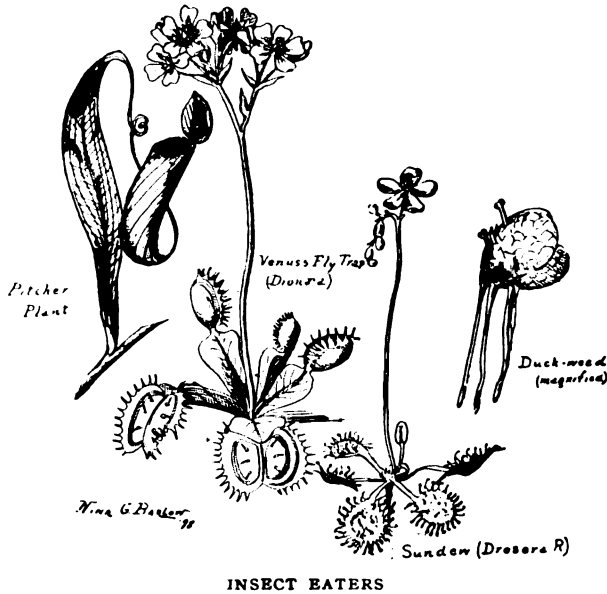
animals, that is queer, indeed! The animal food of the "flesh-eating," or carnivorous, plants is really the juice sucked from the bodies of insects.

The sun dew, common in marshes, expands a little, sticky, pink-green shirt-button of a leaf, on which are numerous stiff hairs. The clear drops of gum attract insects to the leaf, and they are held by the feet or wings. Their struggles cause the

leaf to fold together, when the hairs pierce the body of the insect and drink up the juices. When only a dry husk remains the leaf opens and the wind shakes the shell away.

The pitcher-plant invites insects by a honey-like secretion. They fall into the liquid stored in the pitcher and are thus drowned, be-

cause, owing to numerous downward-pointing hairs in the throat of the pitcher, they cannot climb back. Easy is the descent into evil! The acrid liquid in the pitcher digests the bodies of the insects, turning them into plant food. Flies, ants, gnats, little beetles, are often caught, but bees very seldom. Bees have their own affairs to attend to, and cannot go picnicking into pitcher-plants.



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