

BOTANY

# Beauty Unseen

## Scientist-Photographer's Patient Skill Shows Us Treetop Flowers We Usually Pass by Without Noticing

By DR. FRANK THONE

See Front Cover

**T**HE FLOWERS that bloom in the spring, to most of us, are the same flowers that as children we eagerly gathered in woods or Grandmother's garden—violets and buttercups, daffodils and tulips. Big, bright, brave blossoms, that are pleasant to look at and easy to see.

Yet the woods in spring are full of other blossoms, that most of us never take the trouble to look at, but that nevertheless are of surpassing beauty if we were not still as much in a hurry, and as little in patience, as the children we once were. The tiny flowers of the trees are almost ignored.

To be sure, we do take note when the maples break into blossom on the first warm day, encouraging the first venturesome bees. We know, too, in a hazy sort of way, that the pussy-willow is the willow-tree's flower. But if some one asked us to bring him a single flower of maple or willow, we would be very likely to bring a whole bunch of them—for they come in clusters, and the individual flower is too small to make much of an impression on the unaided eye.

There is a good deal to be said for an old-time naturalist's declaration that everybody ought to carry a strong pocket magnifying glass all the time, to give him new pictures of the world he walks through every day. We could count ourselves better educated and more civilized, if we did so.

### Need Interpretation

But even the best of pocket magnifiers would fail to give whole views of many things; their field is too limited. Also, many of the things we see, whether with the naked eye or with an enlarging lens, need interpretation unless we are veteran naturalists ourselves.

A satisfying and beautiful compromise, bringing the beautiful, tiny, enlargement-needing flowers of trees to us and offering with them brief but adequate interpretations, has just become available in a book that is at once

an artistic feast and a botanical education. It was written and published by Prof. Walter E. Rogers of Lawrence College. He has called it "Tree Flowers of Forest, Park, and Street."

The outstanding feature of the book, its real reason for being, is the collection of many scores of tree flower photographs, most of them enlarged many times to bring out their inconspicuous but delicate beauty, exquisite beyond all telling. With each, Prof. Rogers puts a couple of paragraphs of compact descriptive text, and on the back of the page is a black-and-white silhouette of the whole tree, done by Olga A. Smith, another member of the Lawrence College botanical faculty. These, with sensitively executed marginal drawings, achieve an apt blending of science with art, to the benefit of both.

One of the first lessons one gets, on examining pictures of the earliest tree flowers that open in spring, is the beauty that can be achieved in nature by the right arrangement of the barest

biological necessities. For many of these flowers, such as willow, poplar, elm, and so on, dispense altogether with the bright collar of petals that is the "flower" to most of us. Yet, even before they open at all, they have beauty. The varnished bud on a willow twig, as enlarged in one of Prof. Rogers's photographs, has all the shapely, shining beauty of an ancient bronze spear, and it looks as ready and purposeful.

As these unadorned flowers open, for their pollen-traffic in the uninfested air, they disclose new beauties. One is taken especially with the repetition of what might be called the vase motif: everywhere one finds this shape, with swelling body, tapering neck, and frequently what looks like a pair of plumes thrust into the top. Flowers on the black-walnut tree, for example, show this arrangement to perfection.

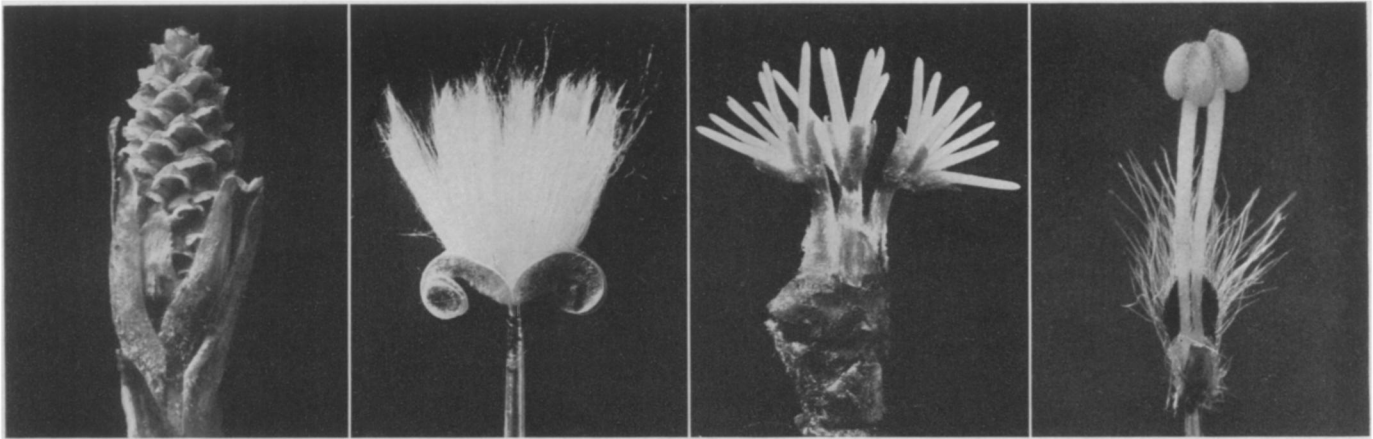
Those little vases are the abodes of life itself, the hope of the coming generation of the species. For they are the essential parts of the pistillate or female flower. In them the seed will be formed and matured; their plumes bear the receptive surfaces that await the coming of the wind-borne pollen.

On separate trees, or sometimes in separate flower-clusters on the same



PROF. WALTER ROGERS

*He who sees beauty in tiny, ignored things: with one of his simpler camera set-ups. In the sand-filled tumbler, he is carefully maneuvering a tiny flower into position for picturing.*



tree, are the pollen-bearing staminate or male flowers. Always these hold up on longer or shorter stalks what look like thickish twin sausages. These are the anthers, packed with yellow pollen that will presently drift down the wind. Millions of grains will be lost for every one that reaches its biological destination; it is a very wasteful process. Yet the world remains filled with trees, and the supply of seedlings does not fail. Even inefficiency sometimes suffices.

#### Opening Bud Photographed

The opening of a bud filled with these flowers, male or female, is a fascinating thing to watch, if you have the time and patience. The scales that have protected it all winter unclasp so slowly, deliberately; the flowerparts within, huddled and cramped for economy of room, rise and stretch as though they were actually relieving muscles held too long in one position. Prof. Rogers shows this remarkably effectively in more than one series of photographs.

Sometimes the flowers will achieve so bizarre an appearance that one might accuse them of being the work of a cartoonist, or miniature medieval gargoyles. A single male flower of a willow, for example, has the look of a fantastic little beastie with big solemn black eyes, wild white bristly hair standing on end, and a pair of club-ended horns rising from its nose.

Fantasy often goes with beauty, as in the male and female flowers of the hemlock. The male flowers are arranged in an evanescent little cone at the end of a twig. It stands on a tiny little stalk of its own, like a tiny tree of shells or bells. In the enlarged picture, the short needles of the hemlock thrust out around it like broad-bladed

protecting swords. The female flower-cone, also tipping a twig, might be mistaken for a carefully made model of a rose, by a Japanese artist. This flower will remain, to become the tiny brown cone of the hemlock when its treasured seeds ripen.

Other cones Prof. Rogers displays in his book: fir and spruce, pine and tamarack. It is difficult to grasp that structures so rough and scaly in their maturity should be so delicate and tender when they are young. The infant white-pine cone, for example, half-embraced among the soft leaves of the twig-tip, somehow reminds one of a fawn. For good measure, Prof. Rogers throws in a picture of more mature cones, especially a group on a balsam spruce—smooth, symmetrical, close-scaled like beautiful tropical fish. Not all grown cones are rough.

#### No Bright Petals

Most of these beauties are achieved without any of the things we consider necessary to beauty in flowers—bright petals, and other colored parts of the floral envelope. True, some of the maples have a delicate little circle of what most of us would call petals. Really they are sepals—but that is a difference for botanists to bother about. However, even among the maples, most of the species get along without these trimmings.

Yet it must not be imagined that the tree flowers that bloom in the spring are all of them unadorned. Plenty of them have their petal frocks, even though these may not be so long and wide as those tree-flowers we know most easily—magnolia, hawthorn, and dogwood. Tiny though these lesser tree-flowers are, they have grace and beauty of their own, which quickly becomes apparent when we look at some of the

#### BEAUTY OF THE TREETOPS

*On the left is the young cone of the white pine, next the fruit of the willow tree looking like spurting white flame, then three chestnut flowers and finally the male flower of the willow.*

enlargements made by Prof. Rogers.

We ordinarily look for beauty in the holly along about Christmas time. But in its time of blossom it also has its attractiveness. The berry-bearing tree produces a multitude of tiny white flowers, each with four petals, and in the midst the pistil, or fruit-forming part, that will eventually swell into the big red berry. But now it is shaped like a short, lidded Japanese vase, and is green. It will not redden until autumn.

Around the pistil there are four stamens, so that at first we might think that here we have what botanists call a "perfect" flower, that is, having both male and female parts in one. But a closer look at the stamens shows that they have no pollen—none of the vital golden dust bulges their ends. They are sterile—evolutionary leftovers, like our own tonsils and appendix. The real male flowers are on a holly tree somewhere else, that never has berries.

#### Sassafras

One-sexed also are the flowers of the sassafras, borne on separate trees. But the stamens are big and husky, and there is a big family of these brothers—nine of them—surrounded by six things that most of us again would call petals, of a not unattractive yellowish green. There is something irresistibly rural about the sassafras flower—like the tea that is made from the bark.

Sometimes the showiness of petals is attained by parts of the flowers' vital organs themselves. The triple pistil of

the female chestnut flower, for example, divides in its upper portion into six waxen tapers that spread out like fingers. Three of these tiny "hands," in an attitude of supplication, are shown in Prof. Rogers's book—a not inappropriate suggestion, considering how a fungus plague has all but wiped the chestnut out.

### Beauty in Clusters

Sometimes the best effect of the little flowers is obtained, after all, when they are in their natural clusters. A striking example of that is the picture of the flower of the button-bush. Each flower of this water-loving shrub is a tiny trumpet with a long column (part of the pistil) sticking out. United at a single point by their lower ends, they form a compact shining ball with rays protruding on all sides, like a jeweler's conventional model of the sun. The compact round head these flowers form has been recognized in the botanical name of the bush: *Cephalanthus*, which is Greek for "head-flower."

Sometimes again, a flower that is beautiful in the bunch is also beautiful when taken out and enlarged separately. Prof. Rogers has demonstrated this well with his top-view enlargement of a single flower of the mountain laurel. This picture brings in a third element, mathematics, to join already companioned art and botany, for it is a vivid demonstration of what might be termed the "decimal perfection" of this blossom.

### Finds the Value

And so Prof. Rogers goes, from picture to picture, from flower to flower. In his work, one must find the value and bring it out, as the skilled Chinese jade-carver or the Italian maker of cameos can project imagination into patterned stone, to bring out patterns that are not obvious to the hasty passing eye. But he does it. With deft fingers, keen dissecting scalpel, and proper lenses for his camera he does it, and the result is beauty.

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A device has been invented to prevent ice from forming in the carburetor of an airplane engine.

A sociologist reports that women are less affected in morale by going on relief than men are.

AGRICULTURE-CHEMISTRY

# Vast Power from Atoms Hopeless for Industrial Uses

WITH GRADUAL depletion of oil reserve, man will have to depend more and more upon solar energy stored in coal and organic products of the soil plus water power, Dr. Robert A. Millikan, of California Institute of Technology, told 250 western states scientists, research workers and agricultural and industrial leaders at the Farm Chemurgic Council's Western Conference at Fresno, Calif.

Dr. Millikan predicted increased efficiency in the utilization of energy derived from coal and from farm products as experience and scientific research point the way. Deriving vast power from breaking up the atom was placed by Dr. Millikan in the laboratory category and not in the field of industrial practice.

The symposium of scientific progress in Pacific Coast industries using mainly products of farms and orchards revealed that science, in practically all instances, has led the way to economies in manufacture and profits. Wastes are being converted into staple products widely distributed throughout the nation, and this, in many instances, represents the difference between loss and profit.

Concentration in volume of surplus farm products is essential to successful operation of an alcohol industry, Louis S. Wetmore of Libby, McNeill and Libby, San Francisco, said. Sugar beets, potatoes and other starch commodities must be delivered in quantities to assure at least 65 per cent operation of plant capacity throughout the year. The remaining 35 per cent might well come from surplus or cull fruits in the West.

Doubts as to the practicability of obtaining alcohol from cull fruits and vegetables were expressed by Charles S. Ash, chief chemist of California Packing Corporation, San Francisco, who said that water content up to 85 per cent is a serious obstacle in processing.

Emory E. Smith, pioneer San Francisco consulting engineer, reviewed the beginnings of many of Pacific Coast's leading industries which have been developed into profitable enterprises through scientific research. Among these he cited oil refining, conversion of wastes from citrus, peaches, raisins and lumber into widely distributed

products, gassing of green oranges to give them a golden glow, removal of a gum from ramie grass which previously had prevented its use in textile manufacture, feasibility of growing cork oaks in this region, and production of perfumes and pyrethrum.

Charles S. Knight, industrial director of California State Chamber of Commerce, San Francisco, commended the Farm Chemurgic Council movement for bringing together industry and agriculture which, he said, should be studied in a survey wherein industries would indicate how they could be aided by specific research.

### Tung Plantings

Fifteen thousand acres in Texas and Louisiana are being planted to tung trees this year under carefully controlled advance studies, as a result of the Farm Chemurgic movement, Victor H. Schoffelmayer, Agricultural Editor of the *Dallas News*, reported to the conference. Other thousands of acres will be devoted to new plantings of soybeans in the Texas areas, Mr. Schoffelmayer said.

The tung plantings are being restricted to areas where necessarily acid soil conditions prevail, where temperature and water table situations correspond to those required for successful growth of the trees. A tung oil conference was held at Beaumont last October.

Mr. Schoffelmayer also reported that Texas cotton oil interests, in a recent meeting in Clarksville, gave assurance that they would pay farmers several dollars a ton premium for soybeans as over cottonseed.

"Texas cotton oil mill operators, in order to keep their mills running," Mr. Schoffelmayer said, "have had to import from India, Russia, Manchuria, Argentina and other countries thousands of tons of soybean and other competing oilseeds. Texas can and will supply these raw materials. The cotton oil industry is anxious to utilize the merits of the soybean as a new source of raw material."

*Science News Letter, April 4, 1936*

Nine flies out of ten found in or near dwellings are common house-flies.