

BOTANY-PHYSIOLOGY

# Don't Blame the Goldenrod

## Most Likely It Is the Unsightly, But Innocent Appearing Ragweed That Causes the So-Called Hayfever

By DR. FRANK THONE

**G**OLDENROD flaunts its blonde beauty along every roadside.

Hayfever sufferers crash into a crescendo of sneezes.

Through red-rimmed eyes they glare blearily at the jocund weed, with heaving lungs they vent on it their most explosive curses.

They do themselves, as well as the innocent goldenrod, a most grievous wrong. For in fastening the blame on a blameless plant they are permitting the real culprits, the ragweeds, to escape unindicted.

It is the same way, too, with those whose hayfever smites them in spring. Roses are in bloom then, so they are very likely to call their affliction "rose fever," instead of placing the responsibility where it really belongs, on various kinds of grasses, a few species of trees, and especially the villainous low-lying narrow-leaved plantain.

Folk who blame goldenrod and roses for their hayfever are victims not only of the sneezing scourge, but of their own bad logic.

They perceive a certain effect: in the present instance, painful sneezing.

They look about for a possible cause. They see certain bright flowers, that came into bloom about the time the sneezes started.

They jump to the conclusion that the flowers caused the sneezes.

Philosophers have a name for it. They call it the argument "*post hoc ergo propter hoc*." That Latin means, "following it, therefore because of it."

### Not Rare

Folklore is full of such cockeyed reasoning. There is a thunderstorm. Afterwards you find the milk sour. Therefore the thunder soured the milk. Or: you leave your windows open at night, and the night air comes in through them. Afterwards you have malaria. Therefore the night air is bad and unhealthful.

The very name malaria is a monument to this poor guess, for it is a combination of two Italian words that mean bad air—*mal aria*.

Hayfever's own name is another monument to similar loose *post hoc* reasoning. Farmers began cutting their hay. You began to sneeze furiously, and felt a little feverish. The hay must cause the malady; hence "hayfever."

Scientific reasoners have nothing more than such coincidences of events to start with. They differ from the jumpers-at-conclusions, however, in that they are not satisfied with the first of such coincidences as being causally connected. They hunt out all of them they can find, and test them one by one until the false connections are discovered and discarded and the true connections made evident. Then, they say, they have found the cause, or causes.

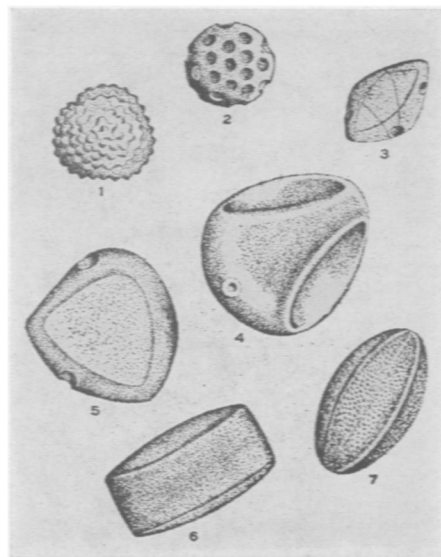
Thus, it was simple to put screens over the windows open to the "bad" night air. The air came in, but you didn't get malaria after all. Apparently night air wasn't guilty. Further search disclosed mosquitoes, not the air, as the carriers of the chills-and-fever illness.

### Fantastic Theories

More complicated and difficult was the search for the cause of hayfever. Multi-form and fantastic were the guessed-at causes: hot weather, bright sunlight, the moon, thunderstorms, dust (that one came fairly close!), the aforementioned falsely accused hay and bright flowers. Equally weird were the efforts at cure: bicycle riding, carrying an umbrella, living on top of a high building, snuffing alum and other stringents up your nose.

Slowly, often in the face of ridicule, the hayfever fighters sought the stronghold of the enemy, studied the strategy of attack, considered means of defense or avoidance. Some of the experiments, in which the experimenter used himself as his own guinea pig, were heroic to say the least. But it was established to the conviction of practically everybody that most hayfever is due to pollens, and that pollens of just a few weed species are responsible for the great bulk of all cases.

A scattering few persons can get hayfever from any of several scores of different pollen types—oak, corn, hemp, sagebrush, etc. But the "run-of-the-clinic" hayfever patient has a nose that is out-



### HOW IT LOOKS

These are pollen granules, very highly magnified. 1. Common Ragweed. 2. Russian thistle. 3. Hemp. 4. Corn. 5. Hickory. 6. Oak. 7. Sagebrush. (From Durham's "Your Hay Fever")

raged by one of the two abundant species of ragweed. Or, if he begins his season of misery in late spring or early summer, the tests will show up narrow-leaved plantain or one of five or six kinds of grass as the culprit. This handful of species take care of more than nine-tenths of the hayfever business.

But why should just these few plants, out of all the many hundreds of species that clothe the landscape, be the principal provokers of sneezes and smarting, watery eyes?

### Great Amounts

The answer lies partly in the inherent viciousness of their pollens, but more in the enormous quantities of it they produce. Without exception, the most active pollens come from plants that depend on wind rather than insects to distribute it to other flowers for the production of seed. Wind-borne pollen is always light and dry and far more abundant than insect-borne pollen.

Necessarily so, for the bee or moth smells and sees its way straight to the next flower, so a little pollen will meet requirements for propagation of the species. But pollen shed into the air, to drift on the blind wind until chance brings it into contact with another



### PROTECTED

*In a room with filtered air, passed through the cabinet under the window, young hayfever victims forget to sneeze.*

flower, must needs be produced (and wasted) in tremendous quantities. That is why millions of grains of ragweed pollen come to your suffering nose, while of the heavy, sticky pollen that comes in goldenrod flowers you can't get so much as a grain unless you deliberately shake a bunch of goldenrod, with your face buried in it. And even then, you'd be more than likely to shake loose some ragweed pollen that had drifted onto its leaves and stems, and thus get a second-hand ragweed sneeze after all.

### Modest Blooms

Most of us have grown up with a rather vaguely formed idea that a flower has to have bright petals to be a flower at all. It is perfectly natural to feel that way about it, for the first flowers we come to know as children are the bright and conspicuous ones. However, only the flowers that depend on insect pollination are showy; their shining petals are signboards to the bees: Nectar on Tap Here. Wind-pollinated flowers as a class have no petals or colored parts of any kind, only stamens to shed the superabundant pollen and pistils to receive a tiny part of it and develop the seeds.

The male or pollen-producing flowers of the ragweeds are in tall spikes at the ends of the branches. Every plant has thousands of them. Shaken by the wind,

they shed the yellow dust in clouds, to drift down the air sometimes for many miles. You don't need to be anywhere near a ragweed patch to get a sneeze-starting dose of pollen. If you are on the Empire State Building tower, ragweed pollen from over the river in New Jersey can reach you easily.

There are several species of ragweed, but the two most abundant are the tall or giant ragweed, also called horseweed, and the low ragweed. The tall species likes moist, rich soil, and is most abundant in neglected fields, on river bottoms, on the wastelands among railroad tracks, and around city dumps. It is a big, lusty weed, with broad, rough, three-lobed leaves, and it reaches a height of from eight to twelve feet.

### Low Type

The low ragweed, also known as hogweed and bitterweed, runs riot over worn-out pastures and stands thick among ill-plowed corn. It can get along in drier situations than the tall ragweed likes. It grows from knee-high to waist-high, and tends to be bushier than its giant cousin. Its leaves are finely divided, rather like carrot leaves, except that they also are rather rough-surfaced.

Both ragweeds come into flower just about the time that the goldenrods bloom. And since we can't help seeing the goldenrod and usually don't notice

the green flowers of the ragweeds, we hastily blame the goldenrod.

Botanically the ragweeds are members of a very large family, which includes such diverse plants as goldenrod, aster, sunflower, dandelion, lettuce, thistle, chrysanthemum, dahlia, and cocklebur. The scientific name of the ragweeds is an ironic mistake: *Ambrosia*. Tournefort, the early French botanist who named it, never saw it alive but had only pressed specimens from America—for ragweed does not grow in Europe. If he had got some of its pollen up his fine French nose he might not have been so complimentary.

So much for ragweed, and how it gets in its vicious work.

What to do about it?

The easiest thing, and the most effective, is to run away. Mountainous country, and the Far West generally, have no ragweed, and have long been the refuge of hayfever victims who have money and time enough to afford this escape. To be sure, there are other pollen-shedding plants where the ragweeds are not; but the action of pollens is specific: you may sneeze for ragweed but not for grasses, or for grasses and not for ragweed. So usually the fugitives from ragweed find surcease from sneezing if they get far enough away.

### Safety at Home

For those who cannot get away to a ragweedless haven, it is sometimes possible to set up air-filtering systems that take the pollen out of all air admitted to a room or even a whole house. But such de-pollenizing plants also cost money. And every other opening to the room must be good and tight, lest an unauthorized draft bring in the dreaded pollen.

Most popular, and most convenient for those who have to go about their daily occupations, sneezes or no sneezes, are the treatments with pollen extracts. This is a trick borrowed from the bacteriologist's bag. Ripe ragweed is harvested by hardy souls lucky enough to be immune to hayfever. The pollen is permitted to drop out of the flowers on to sheets of paper in a draftless room. It is treated chemically to extract the poisonous protein that causes all the trouble.

The patient is tested by the hayfever specialist, with various types of pollen and other substances, to find the particular thing that sets him to sneezing and suffering from other hayfever symptoms. Then he is treated with graduated doses of the pollen extracts, which cause

his body to develop resistance to the pollen proteins very much as vaccines or serums provoke resistance to specific disease germs.

There are several well-known manufacturing laboratories that produce these extracts for the use of physicians. They maintain not only the regular working staff members for the manufacture of the extracts, but also support research specialists in immunology and botany, who are constantly at work to increase knowledge of the plants that produce the pollens and human reactions to their poisonous effects. In a relatively short period, as the development of medicine goes, they have contributed much to make life easier for the hapless victims of hayfever.

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*Science News Letter, August 7, 1937*

## SEISMOLOGY

## Earthquake Is Located In Gulf of Mexico

A SEVERE earthquake was centered in the Gulf of Mexico about 30 miles northeast of Vera Cruz on Sunday, July 25. Reports to Science Service from leading seismological observatories allowed U. S. Coast and Geodetic Survey experts to determine the quake's location.

Reports were received from Georgetown University, Weston College, Dominion Meteorological Observatory at Victoria, B. C., University of California, Fordham University, Seismological Observatory at Pasadena, Coast and Geodetic Survey at Ukiah, Calif., and Tucson, Ariz., Dominion Observatory at Ottawa. (Epicenter at 19.5 N 96 W. Time: 10:47.2 p. m. EST, Sunday, July 25.)

*Science News Letter, August 7, 1937*

For success in transplanting ornamental trees, a scientist recommends that as much soil as practicable should be taken undisturbed with the roots.

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### SEASICKNESS



### HUNTING ICE AGE MAN

With scientific precision WPA workers hunt hopefully for Ice Age man on Abbott Farm, New Jersey. Thousands of later Indian relics have come to light, as shown in foreground, where an earth block has been isolated because it contains a clay jar. Workers record depth of the jar in earth and will dig it out with trowels and fine implements. See page 86 for story.

## MEDICINE

## Earhart Plane Loss Stays Collection of Micro-Organisms

AMONG the scientific experiments under way on the world-girdling flight of Amelia Earhart and Capt. Fred Noonan was one involving the collection of micro-organisms from the air, it has been revealed by Fred C. Meier, chairman of the National Research Council's Committee on Aerial Dissemination of Pathogens and Allergens. The objective of this committee is the charting and recording of the manner in which harmful organisms and material which produce allergy are transmitted. The equipment carried on the Earhart plane was of the type developed by Col. Charles A. Lindbergh and used by him in 1933 on the North Atlantic and Greenland flight with Mrs. Lindbergh.

"Miss Earhart, in this phase of her research program, was utilizing the airplane to advance knowledge in a field opened by Louis Pasteur in classical experiments which he reported in 1860 and which were followed up by medical men and botanists of many countries during the 19th and 20th centuries," said

Mr. Meier. "Results of such studies of the upper air bring to light fundamental principles of the spread of microscopic organisms by winds. Better knowledge of these principles leads to many practical applications, perhaps the most important of which are improved measures for control of diseases of plants and animals," he continued.

Since the Lindbergh flight of 1933, the "sky hook" has been standard equipment for these investigations. It was carried on the 1934 Alaskan expedition of the Army bombers, and by Mr. Meier on flights over practically all sections of the United States. With the aid of Pan American Airways, the instrument was used to bring together valuable information concerning content of the air over the Caribbean Sea. Major Albert W. Stevens carried specially designed equipment for making similar collections on his record breaking flight in the National Geographic-Army Air Corps stratosphere balloon, Explorer II.

From Java, in a telephone conversa-