

FOREST PATHOLOGY

# Oak Wilt Menaces Forests

Fungus-caused disease threatens the sturdy oak, source of lumber supply for many uses. Chances for control of oak wilt are good if prompt action is taken.

By ANN EWING

► OUR STURDY oaks are wilting away. And this is literally true. The disease known as oak wilt is attacking the source of our lumber supply for such uses as flooring, beams for mine props and houses, and railroad ties, as well as for furniture.

Oak wilt is caused by a fungus. Infected trees are fairly easy to spot from airplanes in the summer time—the dead and dying trees make a brown patch in an otherwise green foliage.

The disease spreads to nearby trees through intermingling of roots of red oak with red oak, and to a less extent perhaps of white oak with white oak. But how the vicious killer jumps long distances to attack trees in untouched areas is still a mystery.

To find a solution, scientists in most of the 17 states where infected trees have so far been found and at the U. S. Department of Agriculture are trying to learn more about the fungus in their laboratories. And forest specialists have been alerted to watch for dull green or brown leaves on oak trees. Some trees have been known to lose nearly all their leaves within a month of becoming infected.

## Prompt Action Needed

"With prompt action, chances for control of this dread forest disease are good," Dr. Curtis May of the Department of Agriculture and advisory member of the National Oak Wilt Research Committee states. This committee, composed of representatives of lumber-using industries, in 1951 started an intensive three-year research program to find ways of combating the disease. Headquarters for the group is in Memphis.

To date there are two known methods of fighting oak wilt. When the infected tree is somewhat separated from other trees, such as those used for shade around homes and in parks, the usual method is to cut a very deep trench around the tree, thus severing the disease-carrying root connections. Timing is important in this method, for the roots must be cut before the infection has spread through them to nearby trees. Sometimes two of the deep trenches are dug around the infected area, just to insure checking the spread.

The other effective method of combating the spread of oak wilt is to poison the

healthy trees in a ring around the diseased tree. This can be done where the individual trees that will be killed off are of relatively little economic value.

One-third of the standing hardwood timber in the eastern United States is oak. The acorns from these trees are staples in the diet of such wildlife as deer, squirrels, wild turkey and bear.

Although much of oak's reputation is built on white oak, there are 84 known species of the tree in this country. Numerically and economically, the oaks are our most important hardwoods. Georgia, Illinois, West Virginia and Connecticut have species of oak for their state trees.

The oak wilt fungus, previously known as *Chalera quercina* Henry, is "two-faced." The ordinary, or imperfect, form has been known since 1944. Then, last year, both in the laboratory and later in nature, the perfect stage of the fungus was found. The perfect stage for the fungus is one which carries it over the period when it might otherwise die.

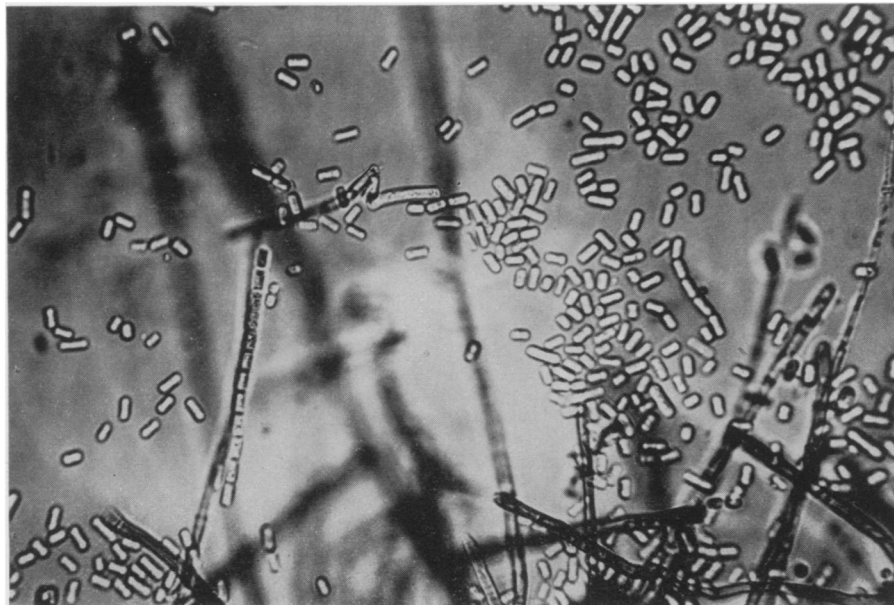
Dr. T. W. Bretz of Agriculture's Experiment Station in Columbia, Mo., discovered the ascospore, or sexual, stage of the fungus in the laboratory.

Two alert young plant pathologists, George Stessel and Bert Zuckerman, of the Illinois Natural History Survey, found the same stage on a dead oak tree in Peoria, Ill., the first time such a stage had been seen growing naturally on diseased oak trees. They noted very minute droplets of the sticky white substance that is one characteristic of the ascospore stage. The finding of this stage may explain how the oak wilt jumps long distances—birds or insects could become smeared with such spores and carry them to far-away trees.

Finding the perfect stage of the fungus both in nature and in the laboratory means that the fungus will be renamed, *Endoconidiophora jagacearum*.

Red oak trees inoculated with the disease die within a few weeks or months after injection. The fungus may kill by plugging the tree's circulatory system. If this is true, researchers suggest that the wilting symptom of the disease might be explained largely by lack of water. No oak trees have yet been discovered that are immune to the fungus blight.

The disease was first found in Wisconsin, Minnesota and Iowa, then Missouri, Illinois and Indiana. Since then it has fanned out to cover a total of 17 states, from Pennsylvania to Arkansas and to North Carolina, covering a large percentage of the area where oak is the common species. In some of the infected states, however, only one or just a few diseased trees



OAK WILT DISEASE—A microphotograph of the oak wilt fungus taken by scientists at the Ohio Agricultural Experiment Station.

have so far been spotted, thus making the chances for control good.

Forest pathologists estimate that the disease has been present in the United States perhaps 25 to 40 years, although the fungus causing it was not isolated until 1944. If the killer were native to the United States, all oak trees would probably have been dead long ago. The infection in the Ozark region is believed to be about eight to ten years old, having been ravaging there for some time before it was identified as oak wilt.

Science News Letter, May 3, 1952

#### ASTRONOMY

### Spot 1952's Fourth Exploding Star

► THE FOURTH exploding star to be spotted this year by Dr. Guillermo Haro, director of Mexico's National Astrophysical Observatory, Tonanzintla, Puebla, has just been found in the southern constellation of Scorpius. The nova is of the 11th magnitude and thus quite faint. News of its discovery has just reached Harvard College Observatory, Cambridge, Mass., clearing house for astronomical information in the western hemisphere.

Science News Letter, May 3, 1952

#### GENERAL SCIENCE

### Conant Wants Taxpayers' Advocate to Fight Projects

► A TAXPAYERS' advocate in the Defense Department, who would provide forced opposition to new projects, would insure that the taxpayers' money would be more wisely spent, according to Harvard President James B. Conant.

In the third of a series of Bampton Lectures at Columbia University in New York, Dr. Conant said: "There should be arguments against the proposal, they should be vigorous but candid; a technical expert should speak on behalf of the taxpayer against each large proposal."

With opposing briefs, arguments, and cross-questioning, he went on, many facets of the problem would be brought out into the open. Dr. Conant suggested that the opposition expert be either a civilian or a retired officer.

Dr. Conant pointed out that such procedures for balancing the bias of technical men, particularly scientists turned inventors, have been worked out almost without plan in the successful industries of this nation. He advocated similar methods of operating in other areas, including the government.

In government, he said, they are particularly needed because government has entered research and development on a very large scale indeed.

Science News Letter, May 3, 1952

#### GENERAL SCIENCE

## Seeds of Future Progress

Although often rejected by scientists who prefer to cling to existing modes of thought, unorthodox ideas can be basis of progress.

► STRANGE AND unconventional new ideas in science, greeted with hostility by most scientists, may actually contain seeds of future progress. But the hurdle of the acceptable and the orthodox in science can be counted on to screen out all but well-substantiated new ideas.

These are the conclusions of Dr. I. Bernard Cohen, Harvard expert in the history of science and one of a panel of five scientists who discussed "Some Unorthodoxies of Modern Science" at the meeting of the American Philosophical Society in Philadelphia.

They discussed Dr. Immanuel Velikovsky's theories of worlds in collision and ages in chaos, dowsing or the finding of water through use of a forked stick, and extra-sensory perception.

None of the scientists agreed with any of the unorthodoxies or even with the methods by which the unorthodox try to prove their theories. But in opening the meeting, Dr. Cohen pointed out that most of the great revolutionary scientific theories, hypotheses and even announcements of new effects have met with hostility on the part of those who preferred to cling to existing modes of thought.

This does not mean, however, Dr. Edwin G. Boring, Harvard psychologist, declared, that orthodoxy must be swept aside.

"Orthodoxy in science at any moment in the history of science," he declared, "is the agreement of the experts . . . When observations conflict, then scientific truth has for the time being to be set in accordance with the weight of the evidence, for you have to suspend judgment about an unorthodox belief when that belief contradicts a large body of accepted consistent scientific fact."

Dr. Cohen praised the "inertia of orthodoxy" as a legitimate hurdle which acts as a screen permitting only useful and well-substantiated ideas to pass. There may be delays in this method, he said, but there would be difficulty in conceiving the true progress of the sciences without the restraining bond of orthodoxy.

Dr. John L. Kennedy, senior social scientist of the Rand Corporation, Santa Monica, Calif., discussed extra-sensory perception and found many problems of experimental control in the work at Duke University. His paper was read by Dr. Leonard Carmichael, president of Tufts College and new secretary of the Smithsonian Institution.

Dr. Cecelia Payne-Gaposchkin, Harvard astronomer, discussed the Velikovsky hypothesis.

Her paper was read by Dr. Donald H. Menzel, professor of astrophysics at Harvard.

Dr. Thomas M. Riddick, consulting engineer and chemist of New York, concluded about dowsing that it does not seriously threaten to shake the present foundations of society.

Science News Letter, May 3, 1952

#### VOLCANOLOGY

### Volcano Collapsed 25,000 Years Ago

► A COLLAPSED volcano is the cause of the mile-wide hole in the earth's surface known as Crater Elegante, about 30 airline miles south of the Arizona border in northern Sonora, Mexico.

The vast rock heap shuddered and fell into the earth like a piston dropping in an almost circular cylinder, Dr. Richard H. Jahns, geologist at the California Institute of Technology, Pasadena, reported.

The history of the volcano, which disappeared from the skyline possibly some 25,000 years ago, is written on the walls of the huge circular cavity and was reconstructed by Dr. Jahns. The crater is about a mile in diameter and the maximum depth of its flat floor is 800 feet.

Conspicuous on its walls is a great thickness of cliff-making basalt, a dark fine-grained rock of volcanic origin. Above the basalt flows are black and red cinders topped by sedimentary beds.

Science News Letter, May 3, 1952

**LISTEN and LEARN a LANGUAGE by LINGUAPHONE** IN 20 MINUTES A DAY

World's-Standard CONVERSATIONAL METHOD

FRENCH  
SPANISH  
GERMAN  
RUSSIAN  
CHINESE  
—29  
Languages available

AT HOME learn easily, quickly by the LINGUAPHONE CONVERSATIONAL METHOD. You LISTEN—you hear native men and women speak—you understand—you SPEAK. Worldwide educational endorsement: a million home-study students. Write today for FREE Book.

Approved for Veteran's Training

SEND FOR  
**FREE**  
BOOKLET

LINGUAPHONE INSTITUTE  
3105 Radio City  
New York 20, New York

Send me your FREE book. I want to learn..... language.

Name .....

Address .....