

## BOTANY

# Botany Fit to Survive?

► IN THE HEARTLESS world of biology—whether we are talking about the way it operates in the jungle or the way it is taught in school—survival belongs to the fittest.

The impact of this law of nature is felt today by old-style teachers of botany, the science of plant life. Classical botany, with its accent on the identification and classification of the vast array of vegetation, is fighting for its existence in the overcrowded high school and college curricula.

The struggle was carried to the American Institute of Biological Sciences meeting at the University of Massachusetts in Amherst, Mass.

Classical botany has just about run its course as a science, many biologists contend. Foremost among these is Dr. James Bonner of California Institute of Technology.

They say that except for a few fine points regarding photosynthesis, there is little basic knowledge to be gathered from more old-style research in botany. Further, almost all plants of consequence have been classified, so that botanists today find themselves searching for ferns in the wilds of Peru.

Meanwhile, they complained, vital research in other phases of biology, especially biochemistry, remains understaffed.

The other side of the battle is being fought by a group of botanists headed by Dr. Warren H. Wagner Jr. of the University of Michigan and Dr. Harriette V. Bartoo of Western Michigan University.

They say that a complete understanding of living organisms still requires botanists trained in time-honored methods.

"We are breeding a new generation of microbiologists who know quite a bit about

the inside of a cell, but have never really examined an entire plant," Dr. Bartoo said. "A living organism, after all, is much more than the sum of its parts examined after the organism has been killed."

She said she has encountered several examples of weeks of pointless research with an electron microscope that could have been avoided had the scientists been better grounded in classical botany.

The most prevalent stand among biologists is that of Dr. Elton C. Cocke of Wake Forest College, North Carolina.

Although he has taught old-school botany for more than 30 years and is convinced it is a vital branch of science, he has helped set up a modern biology program in his school.

This program retains, but de-emphasizes, classification and naming of plants, called taxonomy, and accents the similarities of life between plants and animals. The student examines the chemistry and physics of life in general and then studies how they apply to plants.

"When you get down to the level of the cell it does not matter much whether you are looking at the cell of an animal or of a plant in the study of basic principles of life," Dr. Cocke said. "It happens that plants are easier to work with. It is somewhat difficult for some of us older teachers to accept the new ways, but it is the thing to do."

This hybrid of the old and new approaches to the study of botany seems to be taking hold in most colleges today. It is a phenomenon that biologists themselves would call natural adaptation.

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break, has been seen, lesser varieties have been caused by a type of dengue virus.

Dengue fever is rarely found in this hemisphere, but an outbreak in Jamaica, where well over 100 cases have occurred in 1963, is believed responsible for the outbreak in Puerto Rico. Six cases have been reported in the United States this year, stemming from the Jamaican epidemic.

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## EPIDEMIOLOGY

## Medieval "Black Death" Exists Throughout World

► THE "BLACK DEATH" of the Middle Ages, bubonic-pneumonic-septicemic plague, is not extinct. Some 1,420 cases were reported to the World Health Organization last year—about half of them in India, the rest scattered throughout the world.

The plague is transmitted primarily by fleas and other parasites carried by plague-infested rodents, particularly the black rat. Throughout history, it has killed unbelievable numbers of persons. An estimated 100 million perished in the 6th century Justinian epidemic alone.

Often referred to simply as "bubonic," the plague actually takes three forms. In the most common form, the bubonic, it is characterized by inflammatory swellings of the glands, headaches and high temperatures.

In the pneumonic form, it attacks the lungs, causing swelling and an excess of fluid. Septicemic plague infects the bloodstream directly, causing death within two to three days.

Evidence of the plague's existence has been found as far back as 1320 B.C., and the world has suffered at least four major outbreaks since that time. These were the sixth century pandemic, plus three others in the 14th, 17th and late 19th-early 20th centuries.

The 14th-century "black death" originated in Asia, and swept through Europe, killing more than one-fourth of the population. Great Britain lost nearly two-thirds of its inhabitants, 100,000 in London alone.

In modern times, thanks to better sanitation and improved techniques of inspection, immunization and isolation, the incidence has been sharply reduced. The last serious outbreak was in China in 1930, when 20,000 were lost. However, in tropical countries where sanitation standards lag, the plague is still found.

Present-day methods of prevention include vaccination with dead or non-virulent forms of the plague bacillus, dusting with DDT and other chemicals to kill the fleas and other plague agents, and destruction of the plague-carrying rats.

These methods are quite effective in treating the bubonic plague, if administered soon enough, but are less effective on the pneumonic form. Recovery from septicemic plague is very rare.

It is doubtful that the plague will ever be completely exterminated, since animal carriers exist everywhere in the world except Australia.

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## EPIDEMIOLOGY

## 'Dandy' Fever Outbreak

► PUERTO RICANS who are afflicted with the current epidemic of dengue fever prefer that name to "dandy"—a nickname that comes from the mincing gait of the dandy with which they walk because of stiff joints.

About 3,000 cases have been officially reported, but the number could be much higher.

Dengue (pronounced "dengy") fever victims have aching bones, fever as high as 105 degrees and a measles-like rash. But they rarely die, unless they have another accompanying fatal disease. Victims usually recover in a week.

The elusive culprit that carries dengue fever is the former carrier of yellow fever, unknown in Puerto Rico since the beginning of the 20th century, and not seen in the United States since 1924. The *Aedes aegypti* mosquito is being hunted in the tin cans, rubber tires and stagnant water in the slums of San Juan and towns, including Camuy and Vega Baja, but it cannot be reached easily by sprays.

Dr. David J. Sencer of the U.S. Public Health Service's Communicable Disease Center, Atlanta, Ga., told SCIENCE SERVICE that half a dozen scientists from CDC were in Puerto Rico to study and help in the epidemic.

"Dr. Alexander Langmuir, chief of epidemiology here, is in San Juan," Dr. Sencer said. "Two entomologists, Lester Beadle and Milton Tinker, are in Puerto Rico collecting specimens of *Aedes aegypti* for study. Donald Schliessman, an engineer; Dr. Donald Quick, a virologist, and Dr. John Neff, an epidemiologist, are all there."

The only way to get rid of the epidemic is to get rid of the mosquito that is spreading it, but Dr. Sencer said this is not an easy thing to do because of the way the insect hides.

Estimates of the number of persons affected in Puerto Rico have varied from 2,000 to 7,000. Dengue fever is hard to diagnose. Although the classical type, which gives the patient so much pain in his bones that he thinks he will die or that his bones will