BOTANY

Trees Contain Air

The microscopic tubes in the sapwood of trees, commonly assumed to be wholly devoted to carrying water upward to the leaves, are to a large extent simply air reservoirs. Moreover, the air-containing tubes are not merely scattered at random, but have a definitely zoned arrangement which differs in different species of trees. Researches leading to these conclusions, conducted by Dr. D. T. MacDougal of the Carnegie Institution of Washington, Prof. J. B. Overton of the University of Wisconsin and Prof. G. M. Smith of Stanford University, were reported before the meeting of the Botanical Society of America in Nashville.

The three researchers investigated the way wood carries water by injecting a red dye into various kinds of trees and either letting the natural suction of the leaves pull it up, or pulling it up themselves with a vacuum pump, or else driving it up with a force pump. When the suction applied was light, the colored water travelled up the trunk in the natural way, and of course did not enter the tubes that were blocked with air. The zone of travel was thus clearly marked with red. When violent pressure or suction was applied the air was driven out, and the water traveled through the whole available space, blotting out the zonation.

By these means it was found that in willow the sap stream passes exclusively through wood formed late in the summer, in alder it is in early spring wood only, and in walnut it passes through the inner and outer face of an annual ring.

Science News-Letter, January 7, 1928

AGRICULTURE

Paper Carpet in Gardens

Crop increases of five and six hundred per cent. following the use of a "magic carpet" of heavy waterproof paper, covering all the ground not actually occupied by the stems of the plants themselves, were reported by Dr. L. H. Flint of the U. S. Department of Agriculture, before the meeting of the Botanical Society of America, in Nashville.

The system is known as "paper mulching," and was first practiced on tropical pineapple plantations. It worked there, and the experiments were then made to see whether it might not be beneficial for various garden crops in a temperate climate. Dr. Flint carried on his researches for three years before he was ready to report on them.

(*Just turn the page*)

ENTOMOLOGY

Fruit Pest Eradicated

The prospects are good for ousting from the United States the Mexican fruit worm, a serious menace to the entire fruit industry of the South, according to Dr. A. C. Baker, in charge of subtropical insect investigations at the U. S. Bureau of Entomology.

This insect is one of the worst pests of tropical fruit in North and Central Amercia, Dr. Baker stated. It was discovered in this country first in April in grapefruit in the lower Rio Grande valley in Texas. Steps were immediately taken to eradicate it and a thorough clean-up of all fruits known as hosts was instigated and carried out during the summer. A quarantine was placed on the Rio Grande valley, which was divided into inspection districts based on the areas of known infestation.

Thorough inspection of this season's crop has ben made every thirty days, Dr. Baker declared, while only fruit from groves known to be free of the pest is allowed to move in interstate trade.

The results from this vigorous campaign have been very encouraging, Dr. Baker stated, in the light of the fact that whereas the infestation was distributed throughout the entire valley this spring, not a fruit worm has been found in this season's crop.

Science News-Letter, January 7, 1928

ENTOMOLOGY

Europe's War on Insects

A new style of chemical attack on insect pests of forest and orchard trees which may partly or wholly replace the time-honored but expensive methods of spraying and dusting, is described by Dr. L. O. Howard, chief of the bureau of entomology of the U. S. Department of Agriculture. He saw it being tried out during his stay in Europe last summer.

The method was developed by chemical warfare technicians, who wished to turn their military talents to use in the arts of peace. The materials used resemble somewhat the "smoke candles" used to generate a smoke screen in wartime, except that the fumes given off by these peacetime chemical smudges contain arsenic.

In some places the arsenic smokes are set on the ground at intervals, and in others they are carried through the grove or orchard on long poles by a rank of men. In either case they fill the air with a white fog, which takes about an hour to settle. At the end of that time an examina-

(*Just turn the page*)

HYGIENE

World Well in 1927

The people of the United States have stayed in good health at home and have been successful in keeping out the major plagues from abroad, according to the annual report just submitted to Congress by the Surgeon General of the U. S. Public Health Service.

International public health organization now makes it practicable for different countries to keep informed of the progress of epidemics, if any, throughout the world. The increased facility of communication of modern times is of great importance in preventing the introduction of dangerous communicable diseases from abroad. No cholera, for instance, yellow fever, nor bubonic plague gained access to the United States during the current year.

Up to June 30, 1927, health conditions throughout the world were better than for any previous year on record. The influenza epidemic is considered responsible for the larger number of deaths in Europe during the latter half.

India continues to remain the principal seat of infection for bubonic plague and Asiatic cholera. The devastating epidemics of typhus fever which swept Russia after the World War seem to have definitely passed, though the disease remains endemic in that region.

Modern sanitary science has practically confined yellow fever, once the scourge of the southern states, to one section of the continent of Africa. One case at Bahia, Brazil, was reported in the Western Hemisphere this year.

"The death rate for all causes for the calendar year 1926 in 28 States," declared the Surgeon General, "was 12.1 per 1,000 population. This was slightly higher than the rate for 1925, which was 11.7. The increase was probably caused principally by the large number of deaths from respiratory diseases. This country escaped the epidemic of influenza which swept over Europe during the winter of 1926-27, and the few cases reported here were mild. Typhoid fever declined during the calendar year 1926, and the case and death rates for the year were the lowest ever recorded. This disease showed a small increase, however, during the first part of 1927. The general downward trend in diphtheria is undoubtedly the result of the use of antitoxin and toxin-antitoxin immunization.

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World Well in 1927

(*Continued from page* 13)

"The death rate from tuberculosis continued its decline, and heart disease, diabetes, and nephritis, which had been increasing in recent years, showed lower rates than were expected."

Smallpox decreased during the calendar year 1926. In most sections of this country the disease was of mild-type, but in some localities it existed in severe form. In view of the demonstrated protective value of vaccination, the Surgeon General says that it is difficult to explain why this simple preventive measure is not universally employed.

The geographical prevalence of tularaemia, a disease identified a few years ago by an investigator of the Public Health Service, was discovered during the year to extend to 10 additional States, increasing the area of known distribution of this new disease to 36 States, the District of Columbia, and Japan.

Rocky Mountain spotted fever is another disease being studied by the Public Health Service, the knowledge of the area of prevalence of which is being extended. This disease, originally reported by only two Western States, was reported last year from nine States.

Europe's Insect War

(*Continued from page* 13)

tion of the leaves shows that they are are covered with a thin deposit of arsenical residue. Results are not all in from the first experiments, but if the new method is effective against the insects its cheapness and quickness of operation will be strong arguments in favor of its general adoption.

The warfare now being waged against forest insects in many parts of the world, by means of airplanes that swoop over the trees scattering clouds of poison dust in their wake, received a dramatic justification in Czechoslovakia.

During his recent European tour Dr. Howard was shown a tract of spruce woods in Czechoslovakia. This forest was divided into three parts, one of which was owned by the government, one by a wealthy nobleman, and the third by a neighboring city. When it was proposed to dust the forest from an airplane to check the ravages of the destructive nun moth, the government and the owner of the private estate agreed to assume their share of the cost, but the municipality refused to spend the money. The aviator therefore dusted the portions of the forest for which protection had been provided, and left the municipal forest untreated.

At the end of the past season the results of the divergent policies became apparent. The government and private parts of the forest were in thriving and healthy condition, whereas the municipal forest fell a victim to the false economy of the city fathers, and is now practically ruined by the moths. It will have to be cut down and sold for paper pulp at a fraction of its value.

The thorough-going Teuton has developed a scientific method of crossing a bridge before you come to it.

There is in Germany a new and well-equipped laboratory for the study and combat of the European corn borer, which is working costly havoc on the eastern border of the American corn belt.

Dr. Howard knew that corn had never been raised in Germany to any extent, and the laboratory seemed to be a sheer case of borrowing trouble. He asked a German fellow-scientist about it.

"No, we do not have much corn as yet," was the answer; "But you see we are about to begin cultivating it on a large scale in this country. Of course, when we do we shall have to contend with the corn borer, and we think it is well to get a head start while we can!"

News-Letter Features

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Paper Carpet

(*Continued from page* 13)

He tried the paper mulch on a great variety of garden crops, and all but one of them responded with heavily increased yield. The increases during the 1927 season varied from 11 per cent. with garden peas to 516 per cent. with spinach. The crop of lettuce was more than doubled, that of green corn was trebled, and that of potatoes almost quadrupled.

According to Dr. Flint the paper mulch results in an increase in soil temperature, a reduction in the loss of soil moisture and a modified distribution of water. All three of these factors are favorable to plant growth under usual summer climatic conditions. A further effect of the blanket of paper over all unoccupied soil spaces is to smother all weed growth.