PLANT PATHOLOGY

NATURE RAMBLINGS
by Frank Thone

Spreading Menace

PERSIMMON wilt, new and deadly enemy of persimmon trees, has crossed the Mississippi. It has been found as far west as Oklahoma, by Drs. K. Starr Chester and W. W. Ray of Oklahoma A. and M. College.

Persimmon trees have a threefold importance: their wood is ideal for golf club heads and similar small objects, their fruit is one of the most important wildlife foods, and their tough, ropelike roots made them favorites with soil conservation workers as plantings to check erosion.

The disease is caused by a fungus known as *Cephalosporium*. Its course is terribly rapid; trees usually die within a few weeks after they are attacked. There is no known cure or preventive. It is quite possible that all of America's persimmons may go to join the chestnut trees, wiped out by the chestnut blight several decades ago.

Persimmon wilt was first discovered in 1937, on a farm in Tennessee. Since then, infestations have been found widely spread in the Southeast, and now it is known to be invading the Southwest.

The big-fruited Japanese persimmon, raised for market in parts of the South, is resistant to the disease when grown on its own roots. However, many of the orchards are of trees grafted on American persimmon roots, and these trees are susceptible.

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Sea level along the Pacific coast varies a few inches with the seasons, being high in the winter at Seattle, for instance, and low in spring and summer.

Bronze hand mirrors used by Etruscan women of ancient Italy were engraved with pictures of Helen of Troy and other romantic characters.

BOTANY—GEOLOGY

Plants Used as Prospectors For New Mineral Wealth

The Plant Material Is Reduced to Ashes, Then Placed In Carbon Arc and Analyzed With the Spectrograph

BOTANY may presently come to the aid of geology in prospecting for mineral wealth, if a new method proposed by two Swedish scientists, Drs. Nils Brundin and Sven Palmquist, works out as well in the field as laboratory tests promise.

The Brundin-Palmquist method depends on the fact that all substances in the ground dissolve at least to a slight extent in soil water, and are taken up with the water by plant roots and concentrated in the leaves and young twigs.

In testing any given area for the possible presence of a sought-for mineral, leaves and twigs are collected from deep-rooted trees and shrubs and stored in numbered bags. Corresponding numbers are marked on a map.

In the laboratory the plant material is reduced to ash in an oven. Samples of the ash are placed in a carbon arc, and the light is broken up by the prisms of a spectrograph and recorded as lines on a photographic plate. The stronger and more pronounced the lines indicating any given element, the more abundant that element was in the plant.

Obviously the method is not particularly well adapted to prospecting for such common metals as iron and aluminum, which are present in abundance in practically all soils, even though they may be in commercially useless compounds. However, it should prove especially valuable in the search for rarer metals like nickel and molybdenum, which are very "spottily" distributed and difficult to locate by methods now in use.

Naturally the new Swedish method would not be sufficient by itself to locate the ore-bearing bed of rock. This would not necessarily be directly beneath the indicator trees. Soil water, especially at deeper levels, has often traveled considerable distances. Where the botanist leaves off the geologist would have to start, endeavoring to trace to its source the water that brought the telltale traces of mineral elements to the trees.

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PHOTOGRAPHY

Robot Deep-Sea Camera Makes Photographs Two Miles Down

PHOTOGRAPHS two miles down in in the ocean—deepest sea pictures ever taken—have been snapped in Bermuda waters by means of a massively built, automatically operating deep-sea camera outfit invented by Prof. E. Newton Harvey of Princeton University. Previous record for submarine photography was William Beebe's "shooting" from the bathysphere, about half a mile down, only a quarter of the new depth record.

Prof. Harvey's device has two windows of an extra-strong type of glass, to resist the tremendous pressure of two tons to the square inch encountered at two miles down. The camera looks out through one window, and through the other a beam of light is projected. A timing device turns the electric lamp on and off at predetermined intervals, and a motor winds the camera film, which is of ordinary 16-millimeter size. Current is supplied from two six-volt batteries.

A lure, in the shape of a wooden figure of a deep-sea fish, is suspended in front of the camera, to coax hungry deep-sea predators to attack it, and thus come within camera range.

Operation is entirely automatic, and the "shots" have to be made entirely by chance. If no subjects happen to be in front of the lens, of course a blank frame on the film results. However, it is possible to make so many exposures on a reel of film that this is a matter of no great consequence.

Describing his apparatus (*Science*, Aug. 25), Prof. Harvey states that he sent it down for five descents in the deep water off Bermuda. The mechanism operated successfully, but got no pictures of any large fish or other marine animals. The only objects recorded were 17 small organisms of some kind that swam across the field during one of the runs, but they were not large enough to be identified.

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PUBLIC HEALTH

Size of Families a Factor Affecting TB Decline

A NEWLY discovered factor in the tuberculosis deathrate which has been continuing over a long period of years has been brought to light by Miss Jean Downes of the Milbank Memorial Fund. This factor, it appears, will in the future continue to play an increasingly important part in the continued decline in tuberculosis mortality.

The new factor Miss Downes has discovered has to do with the effect of tuberculosis on the size of the family unit. The family unit in her studies consisted of mother, father and children. When one of the parents had tuberculosis, the family had fewer children than non-tuberculous families did. The tuberculous family's size was further reduced by earlier deaths of its members.

This tendency of the tuberculous family to be eliminated more rapidly, through the combination of lower fertility and excessively high mortality of offspring, has contributed to the decline in the tuberculosis death rate, Miss Downes believes.

Since limitation of births among the tuberculous is now being encouraged as a health measure for the tuberculous, Miss Downes says that if in the future there is no marked change in the hazard of death and disease to the offspring of the tuberculous, the size of the family unit among the tuberculous will play an increasingly important part in decline in mortality from this disease.

Her conclusions were drawn from a study of family histories in a rural area of Cattaraugus County, N. Y. She found about the same difference in average size of families between tuberculous and the group as a whole in both the nineteenth and twentieth centuries. Among families in which all children were born before 1901, for example, at the end of 25 years of married life 100 women in tuberculous families had borne on an average 481 children compared with an average of 526 children per 100 women in the general group of families. During the period from 1900 to 1929, after 16 years of married life 100 women in the tuberculous families had had on an average 261 children compared with 375 for the 100 unselected women.

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CHEMISTRY

Chemists to Honor Charles Goodyear

THE NATION'S chemists gathered in Boston on September 11 at the meeting of the American Chemical Society to honor the 100th anniversary of Charles Goodyear's discovery, in 1839, of the use of heat to vulcanize rubber. A special symposium served as a sounding board of discovery which harks back to Goodyear's success, a century ago, of turning sticky, tacky "India Rubber" into a tough, pliable and valuable article of commerce.

While chemistry played its role in the first fabrication of a useful rubber, Goodyear himself was the first to claim that his discovery was not the result of scientific investigation.

Said Goodyear, "While the inventor (Goodyear) admits that these discoveries were not the result of scientific chemical investigations, he is not willing to admit that they were the result of what is commonly termed accident; he claims them to be the result of the closest application and observation."

Much folklore surrounds Goodyear's discovery but the actual sequence of events was fairly simple. By using sulfur to take the stickiness off rubber articles the inventor interested the Post Office in ordering 150 mail pouches.

The bags were fabricated and seemed perfect. In a final test they were hung by their handles but soon were on the floor and others, not yet fallen, were in a sorry condition.

Suspecting heat might be the cause of the decomposition Goodyear experimented with sulfurized rubber. When touched to a red hot stove such rubber charred like leather instead of melting as would untreated rubber. From this Goodyear rightly inferred that if the charring could be stopped at the right point the whole mass of rubber would be "cured", remain elastic and not be sticky.

This idea he verified by discovering that rubber could not be melted in a bath of molten sulfur but only charred. Always, beneath the charred surface, he found a tiny layer where the rubber was perfectly cured. It was this significant finding, made just a 100 years ago, on which rests the great world-wide rubber industry of today.

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When laminated glass was first patented in England in 1885, the idea was not safety, but the decorative feature of colored glass between clear sheets.