



Falling Leaves

► GENERATIONS OF poets have perpetuated a dismal autumnal picture of "melancholy days, the saddest of the year," with trimmings of wailing winds and "leaves both brown and sear."

But this is not fair. Autumn is a grand season, a time of both fulfilment and preparation. And for the trees that shed their leaves it in no more a time of doom and death than any other season of the year.

The leaves die and drop off, it is true, but the trees themselves stand and survive; they are no more dead in autumn and winter

than they are in spring and summer. We humans, egotists that we are, are simply reading our own feelings and reactions into beings whose lives are quite unlike our own.

The trees, as a matter of fact, are very business-like about this letting their leaves go. In their purely automatic, unconscious way they prepare for the coming winter and the spring that is to follow a great deal better than self-styled *Homo sapiens* manages his own future.

The first thing that happens, as the nights grow longer and chillier, is the draining back into the tree's branches and trunk of practically all the foodstuffs in the leaves. Leaves, as we all know, are the ultimate food factories and during their active life always contain a good deal of sugar, starch and protein. That is why grazing and browsing animals eat them while they are green—nobody ever saw a deer, or even a goat, try to get a living out of fallen leaves.

After the foodstuffs have been drained out of the leaves, the green coloring matter that helps to make them break down

chemically, and in doing so becomes colorless. It is then that the leaves begin to glow in their autumn glory of yellows and reds and purples.

These colors have been there all the while, the yellows as microscopic solid bits of pigment, the reds and purples as dissolved dyes in the cell-sap. Only during the summer there is so much more of the green pigment in most leaves that it covers up and masks the bright hues.

While the color change is going on, a double layer of cork cells forms right across the base of the petiole, or leaf-stem—the only common case in nature of a bandage being applied before a wound occurs.

After this cork layer is formed, it splits apart, one half going with the leaf, the other covering the scar on the branch and sealing it against the entry of decay-causing germs and spores. Students of plant life call this cork layer the "absciss layer," which in plain English means simply the "cutting-off layer."

And so the leaves drop off.

Science News Letter, October 23, 1954

FORESTRY-METEOROLOGY

Fire Hazard in Southeast

See Front Cover

► UNLESS 12 to 15 inches of rain fall on southeastern forests in the next few weeks, that area of the United States will be approaching a critical forest fire level.

It may wreak as much havoc as the dry 1952 season which plagued the Ozarks, southern Appalachians and southern Alleghenys with many large fires and heavy economic damage.

Carl A. Gustafson, chief of the U. S. Forest Service's fire control section, told Science Service that southern California now constitutes the country's most critical area.

Forest fire conditions are moderating in the lake states, and in Oregon, Washington, western Montana and as far south as Boise, Idaho. In some cases, they have eased off considerably. The front cover of this week's SCIENCE NEWS LETTER shows the terrible destruction in one Oregon forest fire.

Colorado, Arizona and New Mexico are in "pretty fair shape," but central California is "not out of the woods yet."

If rain does not make up the "moisture deficiency" in the Southeast by the time leaves fall off the trees, the conditions will be ripe for fires. Although the situation is not yet "desperate," rain should begin falling not later than Nov. 10.

Should bad forest fires spring up in the Southeast, helicopters probably will not be used, Mr. Gustafson declared. He explained that the machines are useful in the West where fires start in out-of-the-way places.

But the Southeast is covered with a web of roads that permit fire-fighters to rush equipment close to the battle line. Mechanized plows, hauled on two-ton trucks, form the Forest Service's front line of de-

fense in the flat wood areas of the southern states.

Using the plows, a small crew of men can ring the blaze with a trench to prevent its spreading. In an average year about 700 to 1,000 miles of these trenches are plowed to control about 1,600 fires, Mr. Gustafson reported.

The "tanker truck" is also a popular piece of equipment, especially in California. It resembles a fire truck and can be operated by a few men. It carries water which is squirted on the fire.

Tankers, plows and men equipped with hand tools, plus the Service's 260 smoke jumpers, are able to control 95% of the 11,000 fires a year that the Forest Service combats.

Over all of the national forest areas, the Service may build 3,500 miles of fireline in a year's time. Half is done with equipment and half is done by hand.

New methods proposed for fighting forest fires are given trials by the Forest Service. Chemicals have been tried. Bombing the fire with water also has been tried. But no panacea has been found. The best equipment to use, with economics considered, is still the mechanized plow, the tanker truck and teams of stout-hearted men.

Science News Letter, October 23, 1954

PUBLIC HEALTH

Water for Washing Way to Check Dysentery

► PROVIDING ENOUGH water for washing and bathing would be a relatively cheap and effective way of controlling dysentery, four medical and health scientists

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declared at the meeting of the American Public Health Association in Buffalo.

They based this on a study of dysentery due to *Shigella* organisms in migratory farm labor in California's San Joaquin Valley. In the camps where these laborers lived, the prevalence of dysentery germs was highest where water for washing was least accessible. For example, dysentery germs were found between four and five times as often in households with outside water faucets as in households with water faucets inside the cabins.

Heretofore, the scientists pointed out, epidemic fighters have considered water pri-

marily as a vehicle for spreading disease germs. But the California studies and similar findings among non-migrant families in some parts of Georgia show that water may play a part in disease fighting by acting to dilute and thus reduce the number of intestinal infections when used for hand washing and other personal hygiene.

The studies reported today were made by Dr. A. C. Hollister Jr., and M. D. Beck and A. M. Gittlesohn of the California State Department of Public Health, San Francisco, and E. C. Hemphill of the U. S. Public Health Service's Communicable Disease Center, Atlanta, Ga.

Science News Letter, October 23, 1954

GENETICS

Predict Inherited Diseases

► SPECIFIC BIOCHEMICAL tests will some day be found for detecting specific inherited diseases carried by seemingly healthy parents and capable of being transmitted to offspring.

This was predicted by Drs. Harold F. Falls and James V. Neel of the Heredity Clinic of the University of Michigan in a paper presented at the World Population Conference meeting in Rome.

The average normal and healthy individual is, in reality, a potential storehouse of genes for one or more hereditary diseases. Although the carrier does not suffer from the disease, he can pass it on to his children, causing them to suffer.

"The day may soon come when by appropriate tests the average individual may actually be demonstrated the carrier of one or several recessive genes," the Michigan scientists said.

Detection of recessive or hidden genes carrying disease has heretofore been largely a matter of family history. However, simple and specific tests are now being perfected which allow a great degree of accuracy in predicting the birth of a diseased child.

Two such diseases, for which tests have been accurately employed, are the sickle cell disease of Negroes, a form of anemia; and choroideremia, a rare eye defect for which there is no known cure.

"There are a very few diseases for which we can predict with a high degree of accuracy just which marriages will result in affected children," the scientists said.

However, they listed several diseases that they believe are inherited. From their study, they have found that there is strong evidence that lack of fibrinogen in the blood; albinism, a whiteness of the skin, hair and eyes and some forms of anemia are inherited.

Evidence has been found to indicate that many eye diseases, including myopia; the mental disease, schizophrenia, and some allergies are inherited, but the evidence is dubious in the opinion of Drs. Falls and Neel.

The ability of researchers to detect car-

riers of disease genes will afford doctors invaluable data to supplement their clinical diagnosis and prognosis. It will also enable counseling of married couples and the control of inherited diseases.

Science News Letter, October 23, 1954

ENTOMOLOGY

Wage Atomic Warfare Against the Screwworm

► A SECOND attempt is now being made at eradicating the screwworm, an insect pest of livestock, by using atomic radiation to sterilize the males.

In this "Operation Screwworm," U. S. Department of Agriculture scientists are working with the Dutch authorities on the Caribbean island of Curacao in an effort to completely eradicate the screwworm fly,

whose maggots attack livestock in Florida and Curacao, causing millions of dollars loss each year.

Preliminary reports from Curacao indicate that this full-scale attack will be the first successful atomic radiation pest control measure of practical significance.

The screwworm fly and the island of Curacao were selected for this experiment with this modern insect warfare method for two basic reasons: the female fly mates only once a year and with only one male, and the fly infests only limited areas and therefore can be found in isolated pockets.

To eradicate the population, the entomologists released thousands of normal looking males that had been raised in the laboratory. In reality, these males had been made sterile by exposing them to gamma rays from radioactive cobalt.

When mated with a sterile male, none of the 300 eggs the female produces during the year hatch out. Thus, the population in the next generation is reduced.

The scientists reported that calculations show that turning loose five sterile males for every normal wild male fly, should cut the next population down by 80%.

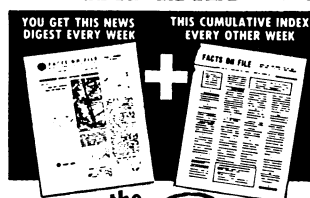
The first field-test of this kind was carried out on Sanibel, a small island off the coast of Florida. But, flies from the mainland flew to the island and replenished the screwworm population.

Curacao is 50 miles from the nearest land. If the overall tests prove successful, eradication of the screwworm from the Dutch island will give valuable knowledge for a possible attempt to rid Florida of the pest.

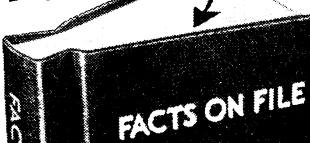
Details of the atomic age test were reported in the U. S. Department of Agriculture's publication, *Agricultural Research* (Oct.).

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