Do You Know?

The *sandbox,* tropical American tree, grows woody capsules which dry and burst with a loud report like a pistol shot, scattering their seeds.

Pollinating *insects,* such as honeybees and bumblebees, are not injured by sabadilla, a new insecticide for alfalfa, as they are by DDT.

Soil erosion by wind and water removes 20 times as much soil fertility annually as is required by agricultural crops.

The extraordinary *Brazil nut,* growing on trees from 100 to 120 feet high, is really a seed and not a true fruit like walnuts, or chestnuts.

Ocean currents are indirectly responsible for Peru's guano deposits; fish are stunned by the sudden change in temperature where a cold and a warm current meet off the coast, making the region a feeding area for guano-producing birds.

PHYSICS

Microwaves Flow

Close relatives to wartime radar, they can be reflected from the human body as well as metal surfaces and can pass through tubes and around bends.

➤ MICROWAVES, close relatives to wartime radar, can be reflected from the human body as well as metal surfaces, and can be made to flow through pipes like water, reports Prof. George B. Hoadley, of the Polytechnic Institute of Brooklyn, and chairman of the New York Section of the Institute of Radio Engineers. The microwave band of the spectrum is sandwiched in between the frequencies suitable for radio broadcasting of sound and the heat and light frequencies. Transmitted from an antenna, one to two inches long, they exhibit strange properties.

The radar action of microwaves was demonstrated by Prof. Hoadley before the American Institute, by placing the transmitter and antenna equipment on the focal point of parabolic mirrors on the stage, then beaming the mirrors at a three-by-four-foot sheet of metal held aloft at the back of the auditorium. The transmitted waves directed by the parabolic reflector bounced off the metal surface and were picked up by the receiver, also in a parabolic reflector. He also showed that the waves could be reflected from a human body or even a hand, placed in the path of the beam.

Using a 24-foot tube of ordinary four-inch pipe, with an elbow joint in it, Prof. Hoadley showed that microwaves can pass with undiminished power through the tubes and around bends, like water.

He demonstrated that microwaves polarize, like light, by showing that when the receiving and transmitting antennae are set at right angles to each other, no signal is transmitted, even though they are in physical contact. However, when they are parallel, the radio signal can be transmitted.

"Just as glass makes light waves passing through it get shorter," Prof. Hoadley explained, "so does paraffin shorten the wavelength, although the frequency of the signal remains the same." Setting the transmitting antenna in a pipe four inches in diameter, and four feet long, the signal came through virtually with undiminished strength. Prof. Hoadley then fitted a one-foot section of tubing only one and a half inches in diameter to the end of the four-inch pipe. No trace of the signal came through the restricted section. The smaller diameter pipe acted like a perfect plug to stop the flow of current. Pushing a small solid rod of paraffin into the small pipe, the signal increased in volume reaching its full strength when the paraffin block completely filled the restricted pipe area.

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CHEMISTRY

Plastic Molding Compound From Surplus Sugar

➤ SURPLUS sugar (don't look now!) and waste products from sugar factories may be used to make a new plastic molding compound, it was revealed by Dr. Louis Long, of the Massachusetts Institute of Technology, in a report to the Sugar Research Foundation. The advantages of sucrose as a plastic raw material, he says, are due to its almost unlimited supply as an inexpensive, very pure organic compound.

Many attempts have been made during the past 15 years to use sugar or its by-products as a raw material for plastic substances, he states. The results to date have been only theoretical because of the sensitivity of the sugar molecule to heat and chemical treatment, causing it to discolor, and because of the difficulty of controlling the polymerization to produce desirable results. A plastic molding compound, however, is already in commercial production on a small scale from bagasse, a waste product from sugar factories.

"Sucrose, and its hydrolysis products glucose and fructose, are potential raw materials," the report states, "for the formation of both colored and colorless plastics of either the phenolic or the alkyd type, the two resins produced in the largest quantity in this country. Sorbitol and mannitol, reduction products of glucose and fructose, should find application as polyhydric alcohols for alkyd resins. Bagasse molding powders are useful in the thermosetting phenolic plastic field."

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