NATURE RAMBLINGS by Frank Thone

BOTANY

Breadfruit's Cousin

OSAGE ORANGE, that terrifically thorny shrub that in the days before barbed wire hedged in nearly every farm in the Midwest, is botanically a next-door neighbor to the Polynesian's tree-borne manna, the breadfruit. The similarity can be noted if one is able to get a preserved specimen of the breadfruit and compare it with the fruit of the Osage orange; there is the same exterior roughness, which upon splitting open discloses itself as due to the innumerable splinter-shaped segments of which the fruit is built up.

But let no one presume on this evident similarity in structure by taking for granted a similarity in edibility! The Osage orange is exceedingly bitter, and is reputed to be poisonous. Its odor alone is enough to give some persons a headache. Not without reason does it bear a second common name; mock orange.

The shrub got its name, quite probably, from the fact that its center of distribution in the Ozark Mountains was in the general region occupied by the Osage Indians. The "orange" appellation arises easily enough out of its superficial resemblance to a rough-skinned orange, though the plant is not at all nearly related to the citrus fruits. In the days of its rural usefulness it became widely known as Osage hedge, and indeed in many country regions simply as "hedge."

In the heyday of its employment as guardian of field boundaries the Osage orange was planted literally by the mile, and rural swains taking their best girls out for a buggy ride in the 'eighties and 'nineties found the high hedges welcome screens from over-curious observation.

But like many other useful institutions, the Osage hedge has been superseded. It was a gross feeder, and made profitable cultivation impossible on a strip fifteen or twenty feet wide on either side of the hedge. Besides, it was forever growing up to almost tree height, necessitating a laborious chopping down. So when barbed wire became cheap the farmers had their hundreds of rods of Osage hedge rooted up and replaced them with the thriftier though less picturesque fence. Today there are relatively few Osage hedges left.

Yet the Osage orange, like a good loser, was able to do its supplanter a good turn. For where it had been allowed to grow up into a small tree, as it will if not kept cropped, it produced post-wood of iron-like durability for the support of the barbed-wire fence.

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CHEMISTRY

Intense Audible Sounds Cause Chemical Changes

SOUNDS can cause chemical changes of many different kinds if only the sounds are intense enough. This was reported before an audience of chemists at the meeting of the American Association for the Advancement of Science in Chicago, by Dr. Earl W. Flosdorf and Dr. Leslie A. Chambers of the University of Pennsylvania School of Medicine.

Most of the sounds used were shrill as well as intense, but one type of apparatus produced a sound of only moderately high pitch, two octaves above middle C of the piano. The sounds, projected into liquid media, coagulated proteins, broke down ethyl acetate to produce acetic acid, cracked vegetable oils with the generation of acetylene gas, and to a slight extent decomposed starch to produce glucose.

A spectacular demonstration was the apparent soft boiling of an egg subjected to the effects of the intense sound for a few minutes, without any raising of the temperature.

All the changes take place quickly, some of them in a fraction of a second, so that the nature of the action causing them is an interesting problem to chemists. Drs. Flosdorf and Chambers believe them to be due to a momentary kinetic, or speeding-up, effect on the molecules involved, affecting them in much the same manner as heating.

The first indication that sound or sound-like vibrations could effect chemical and biological changes was obtained by Prof. R. W. Wood of the Johns Hopkins University and Alfred L. Loomis, working at the latter's private laboratory at Tuxedo Park, N. Y. The vibrations they used were far above audible pitch, in what is called the "super-sonic" range. The pioneers in the discovery that audible sounds could have similar effects were Prof. O. B. Williams of the University of Texas and Prof. Newton Gaines of Texas Christian University.

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ICHTHYOLOGY

Catfish Know When Quake Is Coming

CATFISH know when an earthquake is due, two Japanese scientists, Dr. Shinkishi Hatai and Dr. Noboru Abe, have discovered. Usually the most placid of fish, they become very nervous and "jumpy" about six hours before the shock occurs.

Drs. Hatai and Abe are seismologists. They had noticed that catfish in pools were unusually susceptible to slight stimuli just before earthquakes registered themselves on their instruments. This led them to make definite experiments on the fish.

Three times a day they tested fish in an aquarium by tapping the supporting table with a finger or knuckle. They found that when no earthquake was impending the catfish moved very lazily or not at all. But about six hours before a shock the fish would jump when the table was tapped, and sometimes would swim about agitatedly for a time before settling down again on the bottom.

After a period of several months it was found that the catfish had been correct in 80 per cent. of their earthquake predictions, covering the occurrence of 178 quakes of all degrees of severity. Unfortunately, however, they seemed to be quite unable to discriminate between slight local shocks and strong earthquakes occurring at a distance; they were just as "jumpy" before little quakes as before big ones.

The Japanese seismologists conjecture that their catfish are made sensitive before earthquake shocks through some electrical changes in the earth. They believe this because only when the aquarium was kept electrically grounded, through the drain pipe, could the fish be sensitized when an earthquake was approaching.

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