

Fireflies Flash in Unison

► IN ONE INSTANT a whole tree was lighted up as thousands of individual fireflies on thousands of leaves flashed their signals. Then the lights went out, and the tree was in complete darkness. Again on, then off—the whole tree was illuminated by fireflies in perfect unison at the rate of about three flashes in two seconds.

This amazing spectacle of the flashing firefly tree takes place in southeast Asia, usually along a riverbank. Several trees, sometimes for a distance of a tenth of a mile, can be lighted in this manner. The flashing, accomplished only by the males, occurs in perfect unison hour after hour, night after night, for weeks or even months.

This group behavior of synchronous flashing is apparently unique in the animal kingdom, according to Dr. John Buck, biologist at the National Institutes of Health, Bethesda, Md.

On a recent trip to Thailand and Borneo, Dr. Buck and his wife found that riverbank trees near Bangkok were full of fireflies in the early evening and other times of the day, as well as at night. This suggests that insect populations remained on the trees and

did not move to other spots and then reassemble each night.

Since captive firefly adults die in only a few days, indicating a short adult life-span, Dr. Buck believes that the huge congregations of fireflies must maintain themselves for weeks or months by constantly breeding and having their numbers replenished by younger generations. Mating couples have been found around the area, and it has been strongly suggested that the whole lighting behavior pattern serves as an attraction to promote mating.

The "lightning bugs" seem quite selective about their choice of trees, and prefer the mangroves, mangoes, sagoes and acacias. On one occasion they were seen on a small thorn bush.

It has been firmly established that male and female fireflies attract one another by means of their flashing signals. In most species in other lands, the widely distributed males fly on individual journeys to search for stationary females. These individual roving fireflies are found primarily on open ground such as meadows, forest glades, road clearings, savannah and jungle trails.

Thus the synchronized mass flashing of fireflies in Asia is a puzzle. They may be using the same principle as neon signs to catch attention. Or they may turn on all their lights at one time in order to increase the brightness of the tree, making it visible at greater distances for other lone fireflies. Possibly the choice of a tree beside a river or watercourse may provide a sufficiently bright and large beacon in the tangled tropical area, enhanced by reflections in the water.

Reports of this rhythmic flashing have been appearing in southeast Asia for more than two hundred years, Dr. and Mrs. Buck said in *Nature*, 211:562, 1966. Firsthand accounts in the Philippines, Malaysia, New Guinea, Indonesia, Thailand, Burma and tropical India outnumber those from the rest of the world by three to one.

Only about half a dozen reports of so-called synchronous firefly flashing have appeared in the United States, from New York, Maine and Ohio. The flashing here is not the same kind as in Asia, said Dr. Buck. There are not so many individuals in one area, and the flashing seems to come in waves, as if each insect is following the leader.

TECHNOLOGY

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► THE WORLD'S largest nuclear fueled desalting and electric power plant will soon be constructed in the Los Angeles area.

The plant will produce 150 million gallons of fresh water daily along with 1,800 megawatts of electric power. Participants in the agreement for its construction were the Metropolitan Water District of Southern California, the Federal Government represented by the Department of the Interior and the Atomic Energy Commission, and the electric utilities of the Los Angeles area.

Under the agreement pending Congressional authorization, the Federal Government would participate in the development of technology for a large-scale plant by providing financial technical or other assistance to the Metropolitan Water District for the design, development, construction and operation of a water treatment and desalting plant to be constructed as part of a dual purpose electric power generation and desalting project in the southern California area.

The proposed plant would produce enough fresh water to meet the needs of a city of 750,000 and would more than double the combined capacity of all the desalting plants in the world today. The total capital cost of the dual purpose plant to be located on a man-made off-shore island is estimated to be \$390,900,000.



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