

# "Trapped" by Heredity

► IF A GRANDFATHER fig tree couldn't stand a cold climate, its grandchild cannot grow there either.

Laurel, camphor, coffee and other trees have been growing in warm climates around the equator for ages and will continue to do so, stated Dr. Jens Clausen, emeritus member of Carnegie Institution's department of plant biology. On the other hand, he said, pine trees, birches, beeches and oaks grow in colder climates and at higher altitudes, and cannot live in the world's warm regions.

Trees are "trapped" in their particular environments primarily by heredity, Dr. Clausen told the 100th annual meeting of the National Academy of Sciences at Washington, D. C. Latitude, altitude or regional climates also influence geographic limits of trees' growth, but the principal reason is the germ plasm which has been carried for many geologic epochs by the trees, and passed on from generation to generation.

Trees native to tropical latitudes may show frost damage even before the freezing point of water has been reached, Dr. Clausen pointed out. In such regions, he said, the timberline, or line beyond which the trees do not grow, tends to follow the line for occasional mild frosts.

"In contrast," he added, "pines and hemlocks of the high Sierra Nevada thrive in a climate where during eight months of the year, the average night temperatures drop below the freezing point and occasionally as low as 23 degrees below zero Fahrenheit."

Only a dozen tree species are hardy enough to advance to the highest latitudes and altitudes—to about 70 degrees north latitude and 10,000 to 12,000 feet above sea level, at lower altitudes. This group of the world's hardiest trees includes species of the larch, pine, spruce, fir, hemlock, juniper and willow.

Most of the world's trees are confined to the low-latitude forests on both sides of the equator, Dr. Clausen said. Unable to change their inherited limitations even after millions of years of evolution, these trees cannot survive latitudes or altitudes that experience even occasional frosts.

• Science News Letter, 83:285 May 4, 1963

## Drugs Affect Learning

► TWIN DRUGS speed up and retard the learning process.

They change the amount of time that normally elapses between having an experience and forming a memory of it, University of Michigan scientists have found.

By modifying the structure of the nerve cell, the drug U-9189 facilitates learning and 8-azaguanine slows learning, Dr. R. W. Gerard, T. J. Chamberlain and G. H. Rothschild told the 100th annual meeting of the National Academy of Sciences at Washington, D. C.

Tests on rats support the position that learning, in general, is a biochemical proc-

ess involving changes in cell structure. Drugs that favor the formation of ribonucleic acid (RNA) in the nerve cell shorten the time necessary to fix a memory in the animal's system. Drugs that interfere with RNA formation increase the "fixation time," the investigators explained.

In one experiment the rat's posture was changed by disrupting the normal flow of messages from the higher nerve centers to the posture-controlling nerve cells. Without drugs it takes 45 minutes to fix this change in the rat's memory, they said. If the irregular flow of nerve impulses was cut off before the 45 minutes had elapsed, the rat's posture returned to normal. After this time the uneven posture remained.

When the animals were treated with the drugs, learning time was either reduced to 30 minutes or increased to 70 minutes.

The effect of the drugs has also been shown for maze learning, the scientists reported. The drug U-9189 facilitates maze learning and 8-azaguanine retards learning.

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## BIOCHEMISTRY

### Faulty Body Chemistry May Cause Cancer

► CANCER-CAUSING chemicals need not necessarily come from outside the body, but may be due to faulty transformation of hormones in the course of body chemistry.

Drs. William R. Nes and D. L. Ford of Clark University at Worcester, Mass., working with animals, have changed a natural substance into an aromatic hydrocarbon (4',10-dimethyl-1,2-benzanthracene) of a class that readily causes cancer. Using pregnenolone, which is formed in living tissues from cholesterol and is normally converted into hormones, they stimulated changes they believe to be similar to what happens in the body.

The American Cancer Society helped to support the research.

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*Birds* kept in a 70 degrees Fahrenheit room grow about 20% faster than those in an 85 degrees Fahrenheit room.

*Mexico*, with 38.3 million people, is the most populous Central American country.

• Science News Letter, 83:285 May 4, 1963



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