

# "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.

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

## 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.

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

## Do You Know?

Liquid *metals* can be used to transfer heat at extremely high temperatures.

Cigarette *smoking* has increased approximately 700% in the past 30 years in the United States.

*Polyshield* is a ceramic that provides a wide spectrum of protection against radiation for building materials.

*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

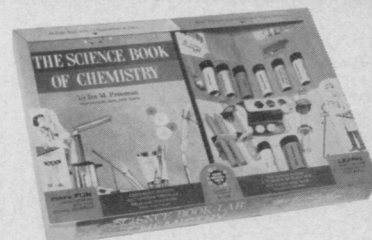


# "LEARNING CAN BE FUN"

A SUBSIDIARY OF  
ALLIS-CHALMERS

WITH  
SMC Science Specials

Young people respond enthusiastically to the world of science when introduced to these science materials designed by leading educators.



### Science BOOK-LAB\* Series

A combination of library and laboratory, this series for children ages 8 to 12 features brightly illustrated 48-page books and actual science materials relating to the contents of each volume. Designed by leading scientists, educators and authors. For use without adult supervision. Ideal for science project assignments.

CHEMISTRY Stock No. 1455 .....	\$3.95
MATHEMATICAL SHAPES Stock No. 1454 .....	\$3.95
JETS AND ROCKETS Stock No. 1427 .....	\$3.95
MAGNETS Stock No. 1421 .....	\$3.95
SEEDS Stock No. 1422 .....	\$3.95
AIR EXPERIMENTS Stock No. 1420 .....	\$3.95

\*BOOK-LAB is a Science Materials Center, Inc. trademark

### FREE BONUS OFFER

You get Celestial Jigsaw Puzzle FREE with purchase of 2 Science BOOK-LAB Kits. You get Whirling Worlds with purchase of 4 Science BOOK-LAB Kits.



### WHIRLING WORLDS

When assembled and suspended overhead, this colorful 3-dimensional plastic mobile shows the relationship of planets and moons in the solar system. A manual prepared by Dr. Franklyn M. Branley of the Hayden Planetarium contains information and photographs of each planet. Stock No. 0524, \$3.95

### ASTRA-GLOW GIANT STAR CHART

Large 18" x 18" chart specially treated to glow in dark for night observing. Chart can be rotated to indicate all the stars visible at a specific time in the Northern Hemisphere. Stock No. 0523, \$2.95

### CELESTIAL JIGSAW PUZZLE

An enjoyable way of learning the names and positions of the constellations visible in the Northern Hemisphere. This large circular puzzle is printed on sturdy cardboard. Stock No. 0550, \$1.95

ORDER BY STOCK NUMBER • SEND CHECK OR MONEY ORDER—ADD 6% FOR POSTAGE, INSURANCE AND HANDLING (MINIMUM 50c) • SATISFACTION GUARANTEED, SCIENCE MATERIALS CENTER, INC., Dept. 81E, 220 E. 23rd St., New York 10, N. Y.

FREE science literature with your order. Use coupon below

- Guide to Science Projects—32 pages of instructions for 222 "learning can be fun" science projects. (If not accompanied by order, enclose 10c for mailing and handling.)
- Children's Science Recognition Program entry forms and rules for boys and girls age 8 through 14. Certificates of Merit plus 300 awards with a value of \$5000. (If not accompanied by order or request for Guide or Catalog, send stamped self-addressed envelope.)

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_