BOTANY

Growth Factor Found

A better understanding of the growth process of plants is now possible with the isolation of the chromophore, a bile pigment present in certain plant proteins.

➤ SCIENTISTS are coming closer to understanding and regulating the timing system of plants that controls how tall or short they grow, when they bloom, when they produce certain chemicals, and many other growth processes.

The secret of command lies in a small pigment on a protein molecule found in the plants' stems, leaves and buds, but not the roots. This tiny but important bile pigment, called chromophore, has been isolated and identified by Drs. Harold Siegelman and Sterling Hendricks of the Agricultural Research Service, part of the U.S. Department of Agriculture.

Research on the growth and timing of plants has been going on at the ARS laboratories, Beltsville, Md., for the past 15 years.

This chromophore is extremely sensitive to light, the scientists said, and acts as a switch to activate the protein molecule which, in turn, governs flowering, stem elongation, germination, pigmentation and other processes of plants.

The protein molecule, called phytochrome, exists in the plant in two forms, active and inactive. Each form can be changed into the other by exposure to two kinds of light. When the phytochrome is inactive, exposure to visible red light converts it to the active form. When it is active, exposure to infrared light converts it to the inactive form.

The pigment chromophore, which constitutes only one percent of the molecule, triggers the change of the protein molecule.

Further understanding of the light mechanism may result some day in farmers being able to produce and harvest fruit, grain or vegetable crops at different times of the year, when supplies are low, Dr. Harry A. Borthwick, ARS plant physiologist, said.

Even now, florists are producing chrysanthemums at different seasons of the year. Chrysanthemums naturally bloom only in the autumn, when the nights become long. During the sunlit days of summer, the daylight hours keep the phytochrome in a form which inhibits flowering. But when nights become longer, the pigment begins a gradual change to a form that does not inhibit flowering, and the fall blooms are ready for the football season.

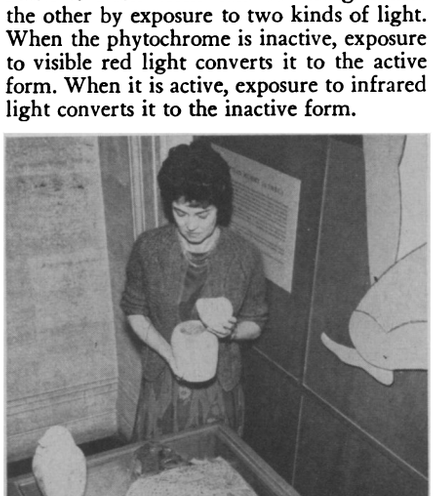
However, man, not nature, can now regulate the phytochrome and produce the mums with summer roses.

Farmers might be able to extract more sugar from sugar cane by inhibiting the flowering of the plant, Dr. Borthwick believes, since as soon as the plant starts to flower, the sugar production stops.

The chromophore is closely related to the pigments that give the yellowish or greenish color to the bile of animals, said Dr. Borthwick. In algae, these bile pigments have an active role in photosynthesis, and in mammals, in eliminating waste. The different bile pigments, apparently closely related, have vital and distinctly different functions in algae, seed plants and mammals.

Their function depends on the kind of protein molecule to which they are attached.

• Science News Letter, 88:21 July 10, 1965



Los Angeles County Museum

EGYPTIAN MUMMY — A special case with mirrored bottom allows a complete view of the reclining Egyptian mummy from Ptolemaic times, about 330 B.C., at the Los Angeles County Museum. Mary Butler of the Museum staff holds one of the symbolic stone jars used in the burial ceremony.

ENTOMOLOGY

Scientists Find Ways To Save the Honeybees

➤ CHEMICALS are being tested to attract valuable honeybees to crops needing pollination and repel them from areas where they might be killed.

The rapidly dwindling numbers of honeybees, particularly in the southwestern states and California, are causing concern among farmers who depend on them to fertilize their crops, and among beekeepers who depend on them for their livelihood.

Of the attractants three were alcohols and one was a fatty acid having four carbon atoms, according to researchers with the Agricultural Research Service, part of the U.S. Department of Agriculture. The ARS scientists were working with members of the University of Arizona and the Arizona Agricultural Experiment Station.

The strongest repellents included amines, acids and carbonyl components. These chemicals could be used in areas that have been sprayed with materials poisonous to honeybees.

• Science News Letter, 88:21 July 10, 1965

TOXICOLOGY

Insecticide Kills Cats

➤ DDT IS KILLING the cat that catches the rat that plagues the house that Juan built.

This old rhyme chain of events is taking place in Bolivia where interior spraying with DDT to kill malaria-bearing insects is taking its toll on cats. This, meanwhile, is a boon to the rodent population.

The specific rodents in question are small mouse-like creatures scientifically known as *Calomys callosus*. These animals were found to carry the deadly virus of "black typhus" or hemorrhagic fever, a disease that took 300 lives in San Joaquin a few years ago.

Poisoned bait took care of the rodents believed responsible for the epidemic, but not before they had come into the houses and presumably infected people. When house cats are present, the rodents usually stay out of doors.

In Bolivia and other parts of Latin America, the national Government and the Pan American Health Organization with other international health agencies are trying to stamp out malaria. Workers spray long-acting insecticides such as DDT and dieldren repeatedly on the inner walls of dwellings.

Cats pick up the poison in their fur and ingest it while licking and preening, a report in Medical World News, 6:66, 1965, stated. Dogs have been largely unaffected, probably because they do less preening.

No criticism of the malaria eradication program is intended, Dr. Karl M. Johnson, chief of the U.S. epidemiology team that brought Bolivian hemorrhagic fever under control, emphasized.

Only one cat was tested for DDT at the Communicable Disease Center in Atlanta, Ga., but concentrations of the powerful insecticide were found in this animal's brain. Healthy cats inoculated with hemorrhagic fever virus did not get sick, proving that the fever itself had not killed the large number of felines that have died during the past several years.

Dr. Johnson is chief of the Middle American Research Unit, called MARU for short, in Panama. MARU is sponsored by the National Institute of Allergy and Infectious Diseases, Bethesda, Md.

Dr. Johnson and collaborating scientists trying to find out the way tropical hemorrhagic fever is transmitted to man, have found no virus in the mites, ticks and mosquitoes of San Joaquin, although recent outbreaks of hemorrhagic fever in Asia have been reported spread by mosquitoes.

• Science News Letter, 88:21 July 10, 1965