BIOLOGY

Four Plant Sex Hormones Found in Low Form of Fungus

Two Arise in Female Plant and Other Two in Male; They Spread in Water, Bringing Response in Other Sex

FOUR different hormones, created and acting in sequence, control the preliminary sex functions in a newly discovered species of fungus water mold, a very primitive plant form, it has been shown by Dr. John R. Raper, Fellow of the Harvard Biological Laboratories.

Sex hormones have been studied for many years in human beings, animals, and higher plants, and there have been a few indications that such substances operated in low plant forms. But the activity of sex hormones in a plant have not been shown clearly and conclusively until Dr. Raper's work.

Two of the four hormones observed by Dr. Raper arise in the female plant, and initiate responses in the male plant; the other two hormones are produced by the male and initiate responses in the female. The hormones are known as "diffusion hormones," originating in plants of one sex and spreading through the water to plants of the other sex.

In his elaborate and delicately controlled tests, extending over two years, Dr. Raper determined that the hormonal activation and coordination of reproduction in the water mold is exercised as follows: hormone "A" arises from the female plant, is carried to the male plant through the water habitat, and induces the formation on the male plant of shoots, known as antheridial branches; hormone "B" arises from these new male branches, diffuses to the female plant, and gives rise there to small bulbs, known as oogonial initials, which afterwards contain the egg cells; hormone "C", arising from the female bulbs, attracts the male branches into contact; hormone "D" arises from the branches and delimits the female plant bulb.

Sterile When Separated

Reproduction of the water mold is rapid when male and female plants are placed in the same culture; but the plants are sterile when the sexes are separated.

Dr. Raper emphasized that his findings apply only to certain low forms of plant life, and perhaps not to other low forms or to higher more complex forms, such as flowers and trees. It may well be that the reproductive cycles of other low forms and the higher forms have entirely different controls from those observed in the water mold, he said.

His work provides ground for belief that at some points the functions of sex hormones in the water mold are quite similar to those in animal forms. It was shown that in the primitive water mold the hormone control of the reproductive cycle is extremely complex, as it is in higher animals.

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CHEMISTRY

Besides Food, Products of Farm Used 400 Ways

THE American city-dweller may have a picture of the American farmer as the man who raises the food stuffs of the nation but, with the advance of industrial research, the time-honored scene is no longer strictly true.

The U. S. Department of Agriculture has recently compiled a list of the non-food uses of American agricultural products whose publishing takes four pages in fine print in *Industrial and Engineering Chemistry*.

Even farmers may be surprised to learn that from 86 sources of agriculture there come 133 raw materials useful in other ways than food. And out of these raw materials are fashioned 240 different manufactured products. Finally the consumer—rural or city dweller—will be amazed to learn that there are more than 400 non-food uses for these products of the farm.

Cattle, of course, have food value as meat but most motorists may not know that cattle grease is a source of glycerol that may end up as anti-freeze for the family car. Or, just to vary the process, the glycerol may become part of the explosive dynamite.

Corn, in contrast, appears in our daily lives as the sizing on the backs of carpets, or as an adhesive, a rayon fiber, a tanning agent, a smoking pipe or as wall board.

Even such items as grapes have non-food uses for the grape seeds yield an oil that appears in lubricants and in soaps.

Trees, of course, have a major value as lumber but omitting this item, they and their products do the following things: Make possible book and newsprint paper. Help tan leather. Create fiberboard. Act as an adhesive for lenses. Smoke meats. Yield valuable chemicals like acetone and acetic acid. Furnish dyes and create valuable plastics.

Even the bees have a role. They furnish beeswax which appears in the form of polishes, candles, cosmetics and is used in the lithography which makes today's brilliantly colored advertising pictures.

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ARCHAEOLOGY

Science Can't Agree Over Medieval Norse Mystery

ONE of the strange mysteries of the Middle Ages began to unfold when Eric the Red planted a Norse colony in Greenland in 986.

For several centuries the venture flourished. Bishops and churches, republican government, farmsteads, all bespoke the solidarity of the pioneer settlements among Greenland Eskimos.

Then came adversity, and 9,000 Norsemen vanished, no one knows when or why.

Scientists still hope to solve the mystery by aid of excavations and documentary studies. Settlements in both west and east Greenland have been explored. Recent discoveries in western settlements revealed farms, church, a forge, and nearly 1,200 objects used by the colonists. In the graveyard, later burials intruded on older ones, suggesting haste and emergency.

The most oft-repeated explanation of what happened is that the colonists eventually lost touch with the homeland, became malnourished on Eskimo food, caught the Black Death raging in Europe, and succumbed to their troubles, which also included violent Eskimo attacks.

But another solution has it that Eskimos did not wipe out the white settlers, but absorbed the remnant by marriage; and that descendants of the ill-fated colony are among the fairer Eskimos of Greenland today.

Arctic explorer Vilhjalmur Stefansson dissects the arguments in his *Unsolved Mysteries of the Arctic,* and declares: "The question of whether the European colony disappeared by extermination or amalgamation threatens to become an