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.

Science News Letter, June 17, 1939

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.

Science News Letter, June 17, 1939

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

absurdly nationalistic issue. For most Danes favor the extermination theory, and most Norwegians the one of amalgamation.

Stefansson provides good ammunition for the amalgamation theory: A plague would have weakened Eskimos as well as beleaguered Norse. Malnutrition would hardly have beset Norsemen who fell back on the same meat diet on which Eskimos throve; but on the contrary a mixed diet of imported food and meat handled in European manner might have diet deficiencies. And certain observers who reported the Norse extinct may have misunderstood what they saw.

Science News Letter, June 17, 1939

MEDICINE

Lack of Vitamin C May Be a Cause of Food Allergy

LACK of the scurvy-preventing vitamin C from citrus and other fruits and fresh vegetables may be one cause of food allergy, Drs. J. Bronfenbrenner, D. M. Hetler, Frances Love and Jack M. Burnett of St. Louis announced.

People with food allergy are the "one man's meat is another man's poison" folks. Eating tiny amounts of certain foods, most often eggs, milk or wheat, gives these patients severe attacks of asthma, hives, migraine headaches or other allergic ailments. Treatment with ascorbic acid, as vitamin C is now called, may enable these people to eat the foods to which they are sensitive.

Guinea pigs furnish the evidence for this theory. Pigs made sensitive to egg white could eat this food when they were given the vitamin. When the vitamin was removed from their diet, practically 100 per cent. of the animals developed allergic symptoms when fed egg white. If enough vitamin was given to these animals over a period of weeks, they could eat the egg white, although hypodermic injections of it showed they were still sensitive to the substance.

Science News Letter, June 17, 1939

MEDICINE

Kidney, Heart and Artery Ailments Analyzed

EVERY other person in the United States past 50 years of age dies of diseases of heart, blood vessels and kidneys. That statement and an analysis of the problem was presented by Drs. F. W. Konzelman, Lawrence W. Smith, Edw. Weiss, Walter I. Lillie and Edwin S. Gault of Philadelphia at the recent meeting of the American Society of Clinical Pathologists.

Since the average age of the population is getting older, more and more people are reaching the period at which these degenerative diseases take their toll.

The cardiovascular renal diseases, as listed by the Philadelphia physicians, are: 1. high blood pressure, without previous kidney disease, resulting in diffuse hardening of the arteries; 2. atherosclerosis, a special kind of hardening of the arteries which is a senile degenerative process affecting the large blood vessels and their branches; 3. the kidney ailment, glomerulonephritis, in which the kidney disease is primary and the high blood pressure secondary; and 4. a combination of these conditions, especially of the first and second.

With this as a background, the Philadelphia doctors list the main causes of death from cardiovascular renal diseases after age 45 as follows: 1. heart failure and hardening and blockage of the heart's arteries accounts for 50 per cent.; 2. hemorrhage, blockage or other accidents to the blood vessels of the brain, familiar to the layman as apoplexy and "stroke," accounts for from 30 per cent to 40 per cent.; 3. kidney failure with uremia accounts for 10 per cent.

In childhood, adolescence and early adult life, rheumatic fever, syphilis and other infections are chiefly responsible for the damage to heart, blood vessels and kidneys. In middle life syphilis is the chief villain. In older life it is the degenerative diseases which weaken the structure and impair the functions of the vital organs.

About half of all those over 50 years who die of cardio-vascular renal diseases have had high blood pressure. One-half of all women who have toxemia of pregnancy will within five years develop high blood pressure or chronic kidney disease. The younger the person who develops heart, blood vessel and kidney ailments, and the higher the diastolic blood pressure, the less favorable is the prognosis.

Science News Letter, June 17, 1939

From Page 371

never before been recognized as a cause of human illness, although it has been found in other animals.

Science News Letter, June 17, 1939

Study Brain in Operation

BRAIN wave studies can now be taken directly from the patient's brain as it lies exposed on the operating table. A method of doing this under aseptic conditions and the results of such studies were reported by Drs. Ernest Sachs, Henry G. Schwartz and Alan S. Kerr of St. Louis.

Brain tumors, tumors of the pituitary gland, hydrocephalus (water on the brain) and Meniere's disease were the conditions studied with this new technic. Tumor tissue itself is not electrically active, the St. Louis doctors reported. Characteristic waves of high amplitude and slow frequency were found in tissue overlying or adjacent to a tumor. More marked activity was noted in the record from tissue overlying a cerebellar tumor than from a similar area of the brain in a patient with Meniere's disease. In one case of hydrocephalus, no electrical activity could be discovered until after release of the fluid in the ventricles.

Science News Letter, June 17, 1939

Although a cow "mows" with mouth only three inches wide, she can gather in 150 pounds of herbage in a good day.