



PINE'S BRIDAL CHAMBER

Sealed against unwanted matings with wind-borne pollen, these pine flowers are being fertilized with selected pollen sprayed upon them by a hypodermic needle thrust through their enclosing bag.

GENETICS

Hypodermic Needle Carries Pine Pollen for Hybrids

HYBRID pines and other trees, to grow better lumber in less time, are the goal of the Institute of Forest Genetics, with headquarters at Placer-ville, Calif. Several new tricks of botanical technique have been developed to speed the work, one of the most interesting of which is the use of a hypodermic needle for pollinating the female pine flowers, which develop into the seed-bearing cones.

Under natural conditions, pines and similar trees are wind-pollinated. Their female flowers open and receive pollen shed into the air by the male or staminate flowers, and carried by the wind in yellow clouds.

This is obviously a most unselective process. One can select a good mother for one's crop of seeds, but their fathers are wholly unknown, as chance and capricious as the wind itself.

To insure a knowledge and control of the paternity as well as the maternity of their seeds, the botanists tie close-woven canvas bags over the twigs bearing unopened female flowers. Celluloid windows in the bags permit them to see when the flowers open. No chance wind-borne pollen can reach these cloistered pine-flower virgins. They are as strictly (*Turn to Page 330*)

PHYSIOLOGY

New Communication System Discovered in Animal Body

"Neurohumor" Secretion, Passing From Cell to Cell, Relays Messages From Nerve Centers to Peripheral Regions

A HITHERTO little recognized transmission system between cells of animal bodies, including those of man, was reported upon to the National Academy of Sciences meeting at Ann Arbor this week by Dr. G. H. Parker, director of the zoological laboratories of Harvard University.

Dr. Parker declared that this physiological mechanism that allows one cell to influence another by producing and sending a "neurohumor" secretion from cell to cell is "of as great importance as the blood or the lymph," which have been long known as conveying substances within the living body.

Recent extensive researches in America and abroad have caused scientists to conclude that the sense cells of the living organism produce secretions of a peculiar sort. Dr. Parker christens the secretion "neurohumor." Deeper-lying nerve fibers and nerve cells are activated by the neurohumor secretions of the sense cells, and the excitation thus conveyed to the central nervous organ sets up at the central termination a similar secretion which excites the next nervous element in the chain.

Finally a secretion relaying the original orders of the sense cells is produced at the peripheral end-organ such as a muscle, gland, or other portion of the body that does a certain piece of work.

Dr. Parker finds that the secretions pass in solution over the narrow spaces that separate one nervous element from the next and that they are in the nature of hormones or humoral substances.

When more is known about them, it is expected that they may explain some obscure nervous diseases, since Dr. Parker declared that the neurohumoral substances are presumably of first importance in many such ailments.

Neurohumors can be experimented with in fishes and other animals that can change color. Dr. Parker injected some of the tissue juice of a light-colored fish under the skin of a dark-colored fish and found that a light spot was produced. The reversed experiment also

was successful. If, however, a spot on the skin of a fish is denervated by cutting its nerves, this spot takes on the color of the rest of the fish only very slowly, due to the slow percolation of the neurohumor produced adjacent to the spot.

So slow is this percolation that Dr. Parker concludes that it does not occur through the blood or the lymph, but must occur by the passage of the secretion from cell to cell.

From an evolutionary standpoint, the newly revealed intercellular system is vastly older than the blood and lymph system of the higher animals. In lower animals such as the coral and the sea anemones which have no blood or lymph, the neurohumor system is the only one existing. It was therefore evolved long before blood started to serve the animal organisms.

Science News Letter, November 19, 1932

STATISTICS

Homicide Rate Almost Unchanged for 20 Years

FEWER people are dying of typhoid fever than in 1911, more are dying in automobile accidents or from cancer, but they are killing each other at just about the same rate as they did in 1911, the Metropolitan Life Insurance Company has found from a survey of statistics on its policyholders.

The homicide rate has shown almost no change during the past two decades. It is practically the only cause of death that has shown no upward or downward long-time trend. It is the cause of one per cent. of deaths from all causes.

Every case of homicide shows evidence of social disorder. Officers of the company suggest that efforts should be made to determine what factors cause one man to kill another, and that then corrective measures should be applied, just as in the case of diphtheria, malaria and typhoid fever.

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CHEMISTRY

Ether Aids in Separation Of Rare Earth Elements

ETHER, widely used as an anesthetic, is finding a new role as the solvent used in separating the rare chemical element, praseodymium, from its most common rare earth chemical sister, neodymium, Prof. B. S. Hopkins of the University of Illinois, discoverer of the element illinium, told the National Academy of Sciences in Ann Arbor.

Water has always been used in the past to separate the members of the rare earth group of elements. Prof. Hopkins explained to the academicians how he is studying the action of other solvents, particularly the alcohols and similar chemicals, in the hope of finding liquids whose solubilities for the anhydrous rare earth chlorides and nitrates will make possible quicker and more complete separations.

His most striking success came through the discovery of the differential solvent action of ethyl ether on neodymium and praseodymium nitrates. At ordinary room temperature (20 degrees Centigrade, 68 degrees Fahrenheit) the praseodymium compound is practically insoluble in the ether while the neodymium nitrate dissolves to the extent of five grams in a liter of ether (about a sixth of an ounce in a quart of ether). By further improved methods Dr. Hop-

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kins believes that it should be possible to use ether to remove the last traces of neodymium from praseodymium, a separation that has been very difficult to bring about by older methods. Praseodymium is rare and it possesses properties which are remarkably similar to those of neodymium.

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Ethylene glycol, now used as an anti-freeze for autos, may prove useful in bringing about a separation of neodymium and lanthanum. Other solvents are being investigated.

The rare earths include fifteen elements, numbers 57 through 71, the most widely used of which is cerium, which with thorium compounds formed the mantle of Welsbach gas lamps. The element illinium, discovered by Dr. Hopkins a few years ago and named after the State and University of Illinois, is number 61.

Science News Letter, November 19, 1932

PALEONTOLOGY

Modern Hawk's Skull in 35,000,000 Year Old Rocks

SOME birds did their evolving early. New evidence on this point was presented at the meeting of the National Academy of Sciences in Ann Arbor by Dr. Alexander Wetmore of the U. S. National Museum and Prof. E. C. Case of the University of Michigan.

They reported on the discovery of the skull of a hawk of fully modern type in the Badlands of South Dakota, in rocks of the oligocene geologic period, which began some 35,000,000 years ago, according to estimates based on earth radioactivity. The skull belonged to a bird of the genus *Buteo*; modern representatives of this group include such well-known species as Swainson's hawk, the red-tailed hawk and the broad-winged hawk.

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ENGINEERING

Tires Inflated With Carbon Dioxide

MANY German motorists no longer carry emergency tire pumps, states the German scientific journal *Technische Blätter*. Instead, they carry small cylinders of compressed carbon dioxide, equipped with hoses and suitable nozzles. Each cylinder will serve for several inflations.

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Strictly American

AFTER the turkey has been stripped to his framework and the cranberry sauce and sweet potatoes and all the rest of the "fixin's" have departed with him, the Thanksgiving feast is appropriately rounded off with pumpkin pie. Even the least forethoughtful of small boys will have left a corner somewhere into which he can drive a wedge of it.

The fruit pie is a typically American dessert, and the pumpkin is a typically American pie material. Europeans know it not; they are abashed and embarrassed in its presence. There is a tale that a member of Sara Bernhardt's entourage once informed the great diva that pumpkin pie is "the American national cake." But it is as natural for an American to demolish pumpkin pie as it is for him to turn a deaf ear—or radio dial—to patriotic orators.

The typical farm scene, of orange-yellow pumpkins littered among dun-colored cornshocks, was American while the Pilgrim Fathers were still Englishmen. For the Indians cultivated corn and pumpkins together exactly as we do today, and when the white men came they learned this agricultural trick from the red men. Though there is little doubt that pumpkins originated on this continent, they are not known anywhere in the wild state. Like the corn they grow with, the Indians had them in cultivation but knew nothing of their source when the white man first arrived. Unlike corn, however, pumpkins have relatives all over the world. But the yellow pumpkin that makes our pies is still of straight American ancestry.

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