PLANT PHYSIOLOGY

Growth without Roots

Tissue cultures have been used to produce fungi and viruses which cause diseases in plants. These studies hold high promise for crop plague fighters.

FUNGI and viruses that cause disease in plants have been grown for experimental purposes on masses of plant tissue, which were themselves growing separately from the original plants, fed on a chemical solution, after the manner of the "immortal" chicken-tissue cultures made classic by the late Dr. Alexis Carrel.

This feat of plant physiology, which promises to be highly useful to fighters against crop plagues, was reported by Dr. R. J. Gautheret, eminent French plant scientist, before the Growth Symposium at Kingston, R. I. Dr. Gautheret, one of a small number of researchers in this country and abroad who pioneered the difficult business of getting plant tissue cultures to grow indefinitely, reported to his American colleagues on work which he and his associates had carried on in France despite the wartime blackout of most research.

They have been able to produce tissue cultures of a considerable number of plants, including both fleshy tissues like carrot, endive, Jerusalem artichoke and tobacco stem, and woody stems like those of willow, grapevine and Virginia creeper. Many of the cultures are as much as six years old and have been transplanted more than 20 times.

Plant tissue cultures, Dr. Gautheret remarked, do not need to be transplanted as frequently as animal tissue cultures. He showed one that had been allowed to grow for ten months without being divided and transplanted; it weighed more than five ounces.

These plant tissue cultures are neither stem, root nor leaf; they are "just plant." They resemble the callus that grows over healing wounds on trees, and consist of masses of almost undifferentiated cells.

In the nutrient solution which he supplied in his cultures, Dr. Gautheret included a growth-promoting substance, heteroauxin, in addition to the usual mineral salts, sugar, amino acids and vitamins. This produced rapid growth, but it also changed the appearance of the new tissue, giving it some resemblance to the abnormal growths provoked by bacteria that have been termed plant cancer. Dr. Philip R. White in this country has grown tissue cultures of plant cancers without using heteroauxin. After suggesting that these changes "may represent a sort of cancerization," Dr. Gautheret added the cautionary note: "The future will tell if this comparison is well-founded."

Science News Letter, September 7, 1946

INDUSTRIAL HYGIENE

No More "Mad Hatters"

THE "MAD HATTER" has disappeared and there is no possibility of his reappearing in the United States, thanks to studies by industrial hygienists of the U. S. Public Health Service.

The hatter's proverbial madness, characterized by the "shakes" and mental disturbances, was due to mercury poisoning acquired on his job of hatmaking. John J. Bloomfield, assistant chief of the Industrial Hygiene Division of the federal health service, told how this hazard to workers' health was conquered when he appeared as guest of Watson Davis, director of Science Service, on Adventures in Science, radio program presented under the auspices of Science Service over the Columbia Broadcasting System.

Mercury was formerly used as a carroting agent to increase the felting properties of rabbit and other skins used for felt hats, he explained. Hat makers displayed mental and physical symptoms in proportion to the amount of mercury vapor to which they were exposed in a late stage of hatmaking. The poisoning affected 8% of the fur cutters and 12½% of the hat makers.

Better ventilation and housekeeping in hat manufacturing plants were recommended and installed. Then, some years later, a representative of the hatting industry came to the U. S. Public Health Service with the announcement that he had found a substitute for mercury as a carroting agent. As a result, industry, labor unions, the federal health service and the Commissioner of Health in Connecticut, which has a large number of fur cutting and hat manufacturing plants, got together and urged all states to forbid the use of the mercury carrot in fur cutting.

Every time a new product or device is introduced, from plastics to television, every time a new industry is developed or a change made in an industrial process, a new hazard to workers' health may be involved.

Industrial hygienists have developed the technique and the "know-how" to solve practically any problem presented to them, Mr. Bloomfield said. These health workers wish that they would be consulted when a change in industrial process or manufacture of a new product is in the planning stage, so they can advise how to avoid hazards to workers' health before the workers start on the job.

Science News Letter, September 7, 1946