

## PHYSIOLOGY

# Cancer Causes Double

Plant studies that seem to be applicable to humans indicate that a substance harmless in itself can cause cancer when another substance is added to it.

► IT TAKES two to make that kind of biological quarrel commonly called a cancer. This has been definitely proved for plant cancers, and seems highly probable for human and animal cancers as well, Dr. Philip R. White of the Institute for Cancer Research, Philadelphia, declared before an international symposium on the growth and development of organisms in Strasbourg, France.

Demonstration of a dual causation of cancer did not come from a single set of experiments. Dr. White reviewed a long course of development in the study of tissue cultures and other artificially-stimulated growths, primarily in France and the United States, in which a considerable number of researchers took part, both independently and as teams.

First came the proof that plant tissues, both normal and tumorous, could be grown apart from the plants that produced them, in glass vessels containing suitable nutrient solutions. One of the necessary ingredients of such culture fluids was shown to be the plant growth hormone, indole acetic acid.

Then it was shown that one of the substances produced when crown-gall bacteria caused plant cancers was this same indole acetic acid. One of the steps in this demonstration was the growth of plant cancers when a weakened culture of crown-gall bacteria, in itself no longer able to start a cancer on a stem, received an assist in the form of artificially applied indole acetic acid.

Yet this acid, applied alone, does not produce plant cancer. Something else, as yet unidentified, is evidently produced by the bacteria. It is not the bacterial cell itself, or anything immediately produced by it; for if the bacteria are inoculated into the plant tissues, left there for some hours, and then killed by heat, the cancerous growth develops later on.

With these evidences for the dual nature of cancer production as clues, students of human and animal cancers have been examining the histories of the malignant growths on which they work for possible parallel cases, and they have been finding some indications that cancer causes in their field are at least as complex.

This, Dr. White admitted, makes the search for cancer causes, and hence for cancer cures, very difficult. However, he would not admit that the search is hopeless. Some research workers have developed techniques for culturing cancer tissues from single cells rather than from whole chunks, and this should trim down the problem materially.

Finally, his own present quest for a completely known and controllable nutrient solution for animal tissues, as successful as his solution for plant tissues has already been, has shown some promise of final success. Once it becomes possible to grow single-cell cultures in a definitely known culture medium, a long step towards final understanding—and hence conquest—of cancer will have been taken.

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## CHEMISTRY-ENGINEERING

## Synthetic Detergents May Be Fouling the Works

► SYNTHETIC detergents may be a boon to the housewife, but they are also under suspicion from chemists for fouling up the works—water works and sewage disposal works.

As the only new factor known, the soap-

less soaps are suspected of being to blame for settling tanks not settling. Water and sewage treatment chemists discussed this difficulty at a recent meeting of the American Water Works Association.

Circumstantial evidence against the synthetic detergents is the fact that the recent settling tank trouble seems to come early in the week. Monday washings with the new products look like a good bet for the blame, the chemists feel.

William Gallagher, superintendent of the Appleton, Wis., Water Department, said that his calculations placed the amount of detergents causing the difficulty at his plant on the order of one part per million. Lindsey Hobbs of the Standard Oil Company (Ind.) indicated that this would make it hard to get proof in blaming the new cleaners. He said that present techniques give only questionable results at concentrations as high as 200 parts per million.

Detergents in the water in very small amounts give an undesirable flavor ranging from soapy to bitter. And they can produce "off-odors", tests described by J. T. Cross of the Chicago Water Department indicated.

Conclusions of the chemists, reported in CHEMICAL AND ENGINEERING NEWS (June 13), were that methods of analyzing for smaller quantities should be developed and ways of decomposing the compounds needed to be found.

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**ELECTRONIC CUTOUT**—Called the "G-E contour following system," this instrument has an electric eye which follows the lines of a drawing through a microscope. It is connected to a metal-cutting tool which reproduces the drawing's outlines in metal. Developed by General Electric engineers, the device is designed to simplify manufacture of irregularly-shaped metal parts.