



LARGE GERMANIUM CRYSTAL—A large crystal of germanium is shown here being grown in the center of the quartz housing in the semiconductor physics laboratory of Delco Radio Division, Kokomo, Ind. In about five hours, the crystal will be about 11 inches long and one and a half inches thick, valued at more than \$3,000.

CYTOLOGY

Find Graft Chemical

► **DISCOVERY** of ES, a substance that breaks the barrier to transplantation or grafting of tissues from one body to another, was announced by the American Cancer Society.

The discovery was made by Dr. George D. Snell and associates at the Roscoe B. Jackson Memorial Laboratory, Bar Harbor, Me. ES, for Enhancing Substance, was found in mouse blood and tissue. When ES was injected into mice, tissues then transplanted to the mice survived and grew, although without ES injections, the mice invariably produced antibodies which destroyed the transplants.

ES has implications for many clinical uses but, in the fundamental research center at Bar Harbor, no studies on humans will be made.

Although the Bar Harbor research was done almost exclusively on mice, scientists elsewhere have made similar observations in other animals and in humans that support the belief ES may be a universal mechanism in immunity.

Every individual produces a different kind of ES, possibly as distinctive as his appearance and abilities. ES from one person would not establish a tolerance for another person's tissues or cells.

ES, the Bar Harbor group has learned in mouse studies, is manufactured in cells under the direction of a certain cluster of genes on the ninth chromosome. Weaker forms of ES may be made by still other gene clusters. Several steps are involved in the manufacture of ES, and the genes operate like chemists on an assembly line in compounding it.

ES seems to be able to tie the hands of lymphatic and other tissues that manufacture antibodies.

ES is present in tumors and in many normal tissues. Red blood cells and spleen are particularly rich sources of it. It has been extracted from tumors in partly purified form and been shown to consist of at least two parts, one a protein and the other a carbohydrate.

One of the problems under exploration is the role of ES in cancer. The scientists are trying to determine whether the presumably strange cancer cells produce ES that enables them to grow in the host.

Several strains of mice have been treated with ES from tumors to which they normally are resistant; and in each case ES made the mice tolerant of the tumor, which then grew and killed them.

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AGRICULTURE

Plasma Substitute Is Soil Conditioner

► **CHEMICALS** that give new life to ailing humans can be used to give new life to ailing soil, a report in the *Journal of Agricultural and Food Chemistry* indicates.

Dextrans, chemicals used as blood plasma substitutes, act as soil conditioners and as a source of nitrogen, phosphorus and potassium for plant growth when mixed with soil, Dr. Leo J. Novak, E. E. Witt and Malvern J. Hiler of the Commonwealth Engineering Company, Dayton, Ohio, reported.

Boosts in plant growth of as much as 70%, increases in seedling emergence up to 44% and marked improvement in soil stabilization resulted in tests with dextrans, the scientists reported. In their trials, they used about one and a half ounces of certain dextrans per square foot of garden soil, mixed to a depth of four inches.

Made from sugar, dextrans are relatively economical soil conditioners. The well-drained granular condition of fertile virgin soils is partly due to the presence of natural dextrans, synthesized by bacteria in the soil, the scientists said.

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ARCHAEOLOGY

3,000-Year-Old Bathtub Discovered in Greece

► A **BUILT-IN** bathtub more than 3,000 years old was found near Pylos, Greece, and is evidence to the luxury in the ancient palace of heroic King Nestor, Dr. Carl W. Blegen of the University of Cincinnati reported to the Archaeological Institute of America in Chicago.

A drinking cup found on the floor of the tub made Dr. Blegen wonder "if it was the custom in the palace to drink wine while being bathed."

The tub consisted of an under-container of clay and perhaps crude brick into which had been set a terracotta inner tub with three or four handles.

The tub was decorated inside and out with painted patterns.

Not only did King Nestor have the convenience of a built-in bathtub, but the used bath water was carried away by a drain. In fact, rain water from all the broad roofs and the court yards was also carried off by an elaborate system of drains.

"Each court so far examined," Dr. Blegen said, "has revealed in some place a depression in the floor, where a perforated stone slab allowed water to run down into a underlying drain."

The southwesterly part of the palace was drained by several small branch channels emptying into a main tunnel that discharged into the low ground beyond the steep southwestern edge of the site, Dr. Blegen reported.

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