# "Dirtless Farming" Goes Outdoors

*** *** *** ***

## *Tanks of Liquid Plant Food Yield Potatoes at Rate of Over 75 Tons Per Acre*

### California Professor Starts With Water Gardens Under Glass; Now Outdoors

BERKELEY, Calif.—"Dirtless farming," the technique of growing enormous crops of vegetables in tanks of water containing the necessary fertilizer chemicals, has now been carried outdoors by its inventor, Prof. W. F. Gericke of the University of Southern California. He has obtained enormous yields of potatoes, turnips, carrots, and other garden truck from his outdoor vegetable beds in tanks, and he states that "crops can be grown out of doors in liquid culture medium, in proper season, anywhere the given crop is grown by agriculture."

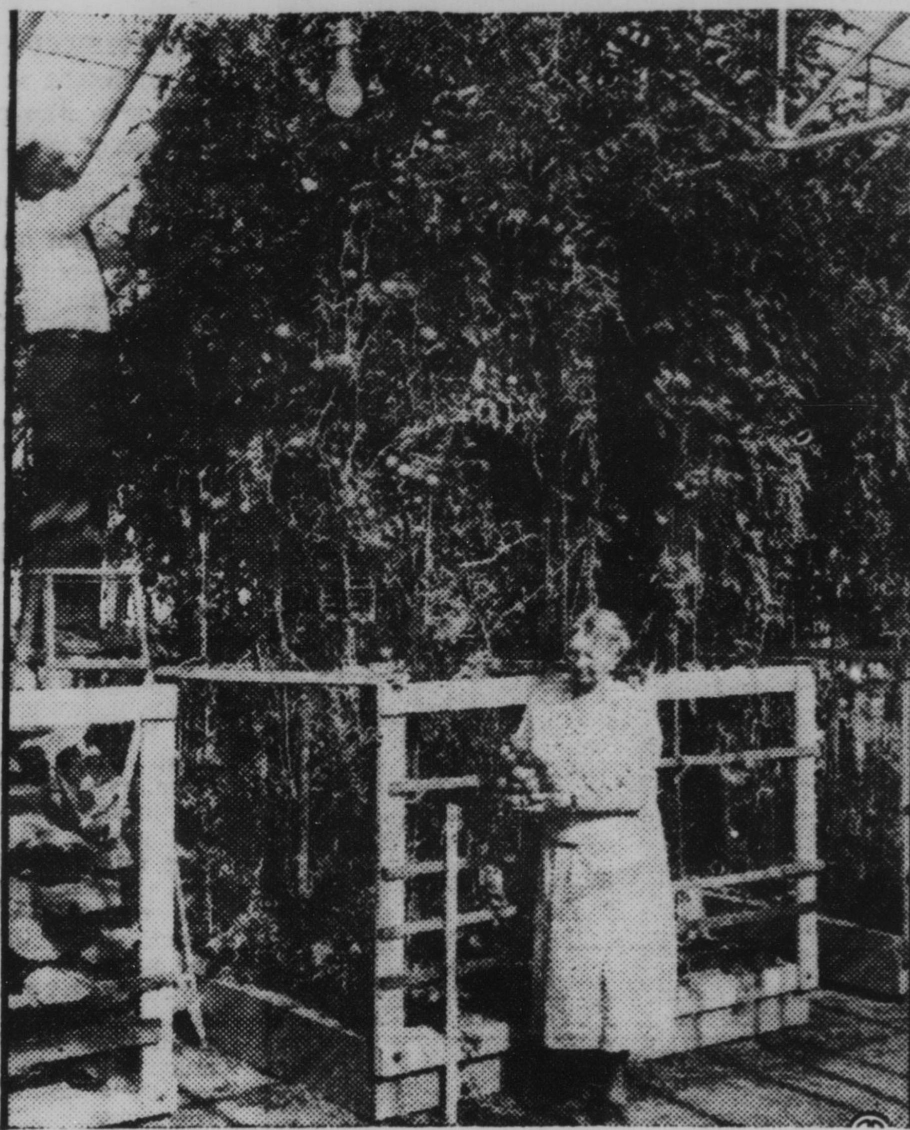
Professor Gericke started his experiments and achieved his first successes with vegetables and flowers grown under glass—the luxury, out-of-season crops that yield the biggest cash returns. This has worked out so well that now several California greenhousemen are trying out the system on a large scale, under Professor Gericke's personal supervision. Now he is pioneering with the next step, to bring his tanks out of their glass houses to test their possibilities in the raising of more plebian vegetables without the expensive overhead involved in greenhouse culture.

**Still Experimental**

Professor Gericke stresses the fact that in spite of the successes scored to date he still regards the whole business as being in the experimental stage. All the projects, both in his own laboratory and in the privately owned greenhouses that are co-operating with him are under his daily personal guidance. He is loath to see his system tried elsewhere by enthusiastic amateurs, or even by experienced gardeners, for, he says, each locality and each crop presents special problems, which cannot be solved on the basis of "dirt farming" experience, no matter how skilled. So he makes haste slowly, discourages "bloom" suggestions, and repeals would-be promoters.

The system is an expansion of experimental methods that have been in use on a laboratory scale for a long time. Plants are grown in glass jars, without soil, in every college botany department, and sometimes even in the elementary schools. This is only for the purpose of demonstrating the basic scientific principles of plant growth and for research on their mineral requirements; nobody expects such experiments to be cash-paying propositions.

Professor Gericke, however, several years ago conceived the idea that but putting these "solution cultures" on a wholesale basis they might be made economically profitable, especially since they would permit of closer spacing of plants in greenhouses, where space is naturally at a premium.



Science Service Photo.

**These immense tomato vines were raised in water in which were dissolved the necessary fertilizer chemicals. Prof. W. F. Gericke of the University of California, pioneer experimenter in this new botanical method, climbs a ladder to harvest his hot-house-water tank crop, while Mrs. Gericke examines a cluster that looks like a bunch of giant grapes.**

### Market Growers Try Gericke Method

He developed a simple type of tank, made either of redwood, concrete or sheet metal. Standard dimensions are 2½ by 10 feet, with a depth of eight inches. Over the top wire netting is spread, to support the "seed bed" of sawdust, moss, excelsior, or other similar material. In this the seeds are planted, or young plants set out, and their roots grow down into the water-filled tank below. Over them is spread a "top dressing" of the same material as the seed-bed, to conserve warmth.

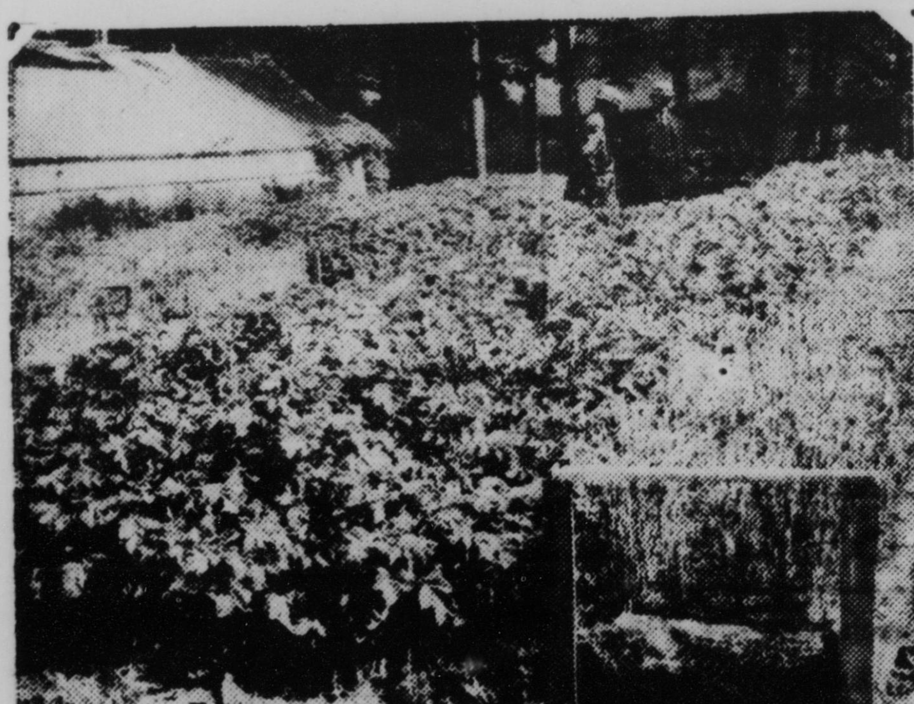
**Electric Heating**

As used in the green house, the tank also contains an electric heating cable, operating on the same principle as a heating pad or electric iron. This holds the water at the temperature which experiments show will encourage fastest growth in the particular crop under cultivation.

In the tank he also places what he calls a fertilizer unit—a bottle containing the right amount and proportion of mineral nutrients, with a couple of holes in the stopper to let them diffuse slowly into the water as they dissolve.

Yields of the Gericke system have been phenomenal. Tobacco plants grew 22 feet high. Gladioli plants surprised even Californians. Each of four heated greenhouse tanks produced an average of 306 pounds of tomatoes, and the vines grew until the huge clusters of fruit had to be harvested with the aid of a stepladder. One tank, providing exactly a hundredth of an acre of water surface, produced 25.6 bushels, or three quarters of a ton, of potatoes.

So while Professor Gericke insists that his work is still an experiment, he is willing to admit that it looks rather like a hopeful experiment.



Science Service Photos.

**Top: A "bed" of potatoes growing in two of Professor Gericke's tanks. Alongside is a little experimental wheat, growing in another tank. Bottom: The harvest. It is hard to imagine where more potatoes could have found space to grow, in this limited area.**

## Cancer-Like Disease of Blood Cells Follows Mendelian Heredity Law

COLD SPRING HARBOR, N. Y.—Cancer-like behavior on the part of the white blood corpuscles, a wild uncontrolled growth that turns them from their normal role of "cops" to the malignant one of "robbers," follows a definite hereditary pattern, Dr. E .C. MacDowell of the Carnegie Institution of Washington has discovered, in the course of researches conducted at the institution's Department of Genetics here.

Science Service Photo.

**Dr. E. C. MacDowell in his leukemia laboratory at Cold Spring Harbor, N. Y. Left background: Highly magnified photograph of normal blood. Right background: Blood of leukemic mice on the same scale. Note the large number of cells that show black in the leukemic blood. These are white blood cells that were stained dark to make them prominent in the photomicrograph. The small cells are red blood corpuscles.**

Leukemia, the disease is called in medical circles. The name is Greek for "white bloood," because of the terrific excess of white blood corpuscles that crowd the circulatory system and congest the vital organs. Because the white blood corpuscles are free to move about the body, leukemia is not susceptible to the kinds of treatment that can eradicate or check malignant tumors occurring in the "stationary" tissues. Hence leukemia is a highly fatal disease.

In his efforts to learn the causes of leukemia, Dr. MacDowell has worked with mice instead of men, for a number of obvious reasons. By the closest kind of inbreeding, he has produced a leukemic strain of black mice, of which it can be confidently predicted that only one individual in ten will escape the disease. By similarly close inbreeding, he has produced another strain, light-colored, of which only one in a hundred develops it. He has carried this breeding of leukemic and non-leukemic mice through 36 mouse generations—equivalent to over a thousand years, in terms of human generations.

When mice of the two strains are crossed, about half the offspring become leukemic, and the other half do not, although all the hybrids have the hereditary factor that makes for the development of the disease.

Dr. MacDowell interprets these results as meaning that in the "pure-line" leukemic mice heredity is so strong a factor that environmental influences cannot avail to check it; as if fated, the mouse develops the disease regardless. But in the hybrids, the hereditary dose of doom is not so large, so that some of the individuals respond to ameliorating factors in the environment and the malady does not develop.

As Dr. MacDowell phrases it: "Putting all this together, we find evidence that wild growth does not depend merely upon a change in the cells, but also upon the relation of this change to the growth-controlling forces of the particular individual . . . Heredity sets limits, environment decides the exact position within these limits."

Dr. MacDowell's researches were conducted in co-operation with the Department of Pathology at Columbia University, supported by funds supplied by the Carnegie Corporation of New York.