BOTANY

Plant Tissue Still Lives

This year marks tenth anniversary of first time bit of plant root was kept growing in dish of nutrient separated from the parent plant.

➤ THIS YEAR marks the tenth anniversary of the first permanently successful plant tissue culture—a separated piece of a plant, growing in a dish of nutrient fluid after the manner of the longer-established and better known bit of embryo chick heart started by Dr. Alexis Carrell in 1912.

The first successful long-term plant tissue culture, started in 1933 at the laboratories of the Rockefeller Institute for Medical Research by Dr. Philip R. White, is still growing (*See SNL,* Jan. 6, 1934). It is a bit of the root of a tomato plant, which Dr. White states "shows every evidence of potential immortality." It has "offspring" at four other research laboratories in this country.

At the Rockefeller laboratories, the basic stock of the culture is represented by 25 pieces of root growing each in its individual dish. Every week, the amount of growth that has taken place is measured, and 15 millimeters (about five-eighths inch) is cut off the tip and the rest discarded. This of course is to obviate the accumulation of simply unwieldy masses of root cultures.

Dr. White calculates that if it had been possible to keep the original piece growing, with all its branches, the total length in kilometers would now be represented by a figure 10, followed by 2799 ciphers; that is, 10 to the power 2800, in kilometers. To write that figure out in full, using ordinary typewriter type, single spaced and without margins, would require just about half an ordinary lettersize sheet. What it would be in astronomical distances is simply beyond human imagination.

The exactly measured weekly growth rates, it has been found, show a curious seasonal fluctuation, with peaks in summer and slumps in winter. What this may mean, in a root that has not been attached to the rest of a plant for 10 years, is not yet explained.

Dr. White's results are presented in the British journal, *Nature* (July 31) which has just reached this country.

Science News Letter, September 25, 1943

MILITARY SCIENCE

Time, Space Great Factors In Global War Strategy

➤ LINES of communication encircling the earth and extending over 56,000 miles became necessary in the present global war.

It is "not merely a war on two fronts, but in several theaters," declares Gen. G. C. Marshall, Army Chief of Staff, in his biennial report to the Secretary of War, covering the two years since July 1, 1941. "Military operations in the Pacific area and the Far-East created unprecedented logistical problems with respect to shipping. Time and space factors dictated our strategy to a considerable degree."

To land and maintain American forces in Australia required more than twice the ship tonnage necessary for similar American forces in Europe and North Africa. The sea route for army transportation from San Francisco to Sydney requires 28 days. The air route by way of Hawaii and New Caledonia requires less than three days ordinarily, approximately 67 hours. To reach the same Australian port from New York by way of the Cape of Good Hope and the Indian Ocean would require from 70 to 80 days. From San Francisco to Guadalcanal by sea route takes 26 days.

The Aleutians in the north Pacific are much more quickly reached. The sea route to Kiska requires 12 days from Seattle, and to Dutch Harbor about nine days. By way of Alaska, Dutch Harbor may be reached by air in 21 hours and Kiska in an additional six hours.

The route by sea from New York to Basra, Iraq, at the northern end of the Gulf of Persia, was a 70 day trip when it was necessary to round the Cape of Good Hope; now by way of the Mediterranean only 42 days are needed. To Calcutta about the same time is required. Much war equipment and supplies were shipped to Russia and India over the long route before the Mediterranean was cleared.

To Liverpool from New York by ocean convoy some 17 days are ordinarily consumed. To Casablanca from the same American port one additional day is needed. Mediterranean ports are reached by way of Gibraltar in 20 to 24 days.

By air England is reached in 20 hours from New York. Flying to Accra, Africa, by way of Brazil requires 56 hours. From there to Cairo takes an additional 38 hours, and another additional 25 hours to get to Kunming, China, the eastern end of the Burma Road.

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Ventilation under buildings helps prevent decay of wood floors and floor beams.