

in rhythmic harmony, has been reproduced in its essential electrical mechanics in the large cells of the water plant known as *Nitella*, Drs. W. J. V. Osterhout and S. E. Hill of the Rockefeller Institute for Medical Research reported.

The cells of *Nitella* do not pulsate like hearts, but they do have rhythmic electric currents, known as action currents, that sweep through their protoplasm at regular intervals—15 to 30 seconds under normal conditions. The same kind of rhythmic currents, occurring more frequently, are responsible for the regular beating of the heart.

In the heart, the action currents originate in a physiological center known as a "pacemaker." So long as it keeps sending out its signals at the normal rate, all is well. If anything causes it to increase the rate abnormally, the rhythm of the parts is broken, and "flutter" or "block" results.

By appropriate chemical treatment, continued for several weeks, isolated cells of *Nitella* were given artificial pacemakers that speeded up the rate of the action-currents to once a second. The physiology of the cells proved unable to stand the pace; conditions arose closely resembling the electrical states of "fluttery" and "blocked" hearts.

Control of Evolution

CHEMICAL control of evolution has now been extended to molds and other fungi, it was reported by Drs. Charles Thom and Robert A. Steinberg of the U. S. Department of Agriculture. They were impelled to try to change the course of heredity in these lower plants by the recent successes in changing the genetics of flowering plants with the drug colchicine.

Colchicine and other chemical reagents had no effect on the several strains of mold on which the two experimenters worked. However, when they grew their cultures on a medium containing sodium nitrite, changes in character that appear to be stable and permanent developed.

Vitamin Need Increases

STERILITY due to lack of vitamin E, the fertility vitamin, becomes increasingly difficult to overcome with advancing age, it was shown in experiments with rats conducted by Prof. Herbert M. Evans and Dr. Gladys A. Emerson of the University of California.

Young female rats reared on a vitamin E free diet are unable to bear

young. A comparatively small amount of the vitamin will enable them to reproduce, if given in early maturity. At eight months of age, this initial curative dose no longer suffices, but if doubled or trebled the rats will still become sexually normal. At a year, the dose has to be multiplied by eight or ten to be effective. In still older rats, embryo development can be initiated, but is never carried through to birth, no matter how much of the fertility vitamin they are given.

New Canyon Explanation

A NEW hypothesis to account for the great canyons known to exist under the sea, cut deep into the continental shelf, was offered by Prof. Douglas Johnson of Columbia University. Subterranean streams of water, such as

are known to cause canyons on land through undermining and collapse of surface layers, may also have operated in the sea-bottom sediments, he suggested.

This hypothesis, if accepted, would do away with one of the most troublesome angles of the explanation most generally accepted at present, Prof. Johnson pointed out. This theory holds that the canyons were formed by ordinary stream cutting while the present sea bottom was dry land, and that subsequent sinking "drowned" the coast and the canyons with it. The difficulty is that some of these canyons are now submerged to depths of several thousand feet, and it is hard to account for that great a subsidence of the land or rise in the sea level.

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BOTANY

Plant Tissue in Test Tubes; Made to Develop Small Plants

PLANT TISSUE that is neither root, stem nor leaf, but "just plant," is kept growing in test tubes at the Rockefeller Institute for Medical Research laboratories in Princeton, N. J., by Dr. Philip R. White. Potentially immortal, these masses of plant cells can be made to develop and differentiate into small plants at the will of the experimenter. At the meeting of the Torrey Botanical Club, New York, Dr. White described his technique and its results.

The principles would apply to any of the higher plants; the actual species used by Dr. White are tobacco and tomato. The outer layers of the stem are peeled away, and a conical piece broken out of the growing tip. All the work is done under aseptic conditions, for the presence of bacteria or fungi would quickly cause decay and destroy the cultures.

The bits of stem-tip tissue are placed on a mixture of mineral and organic nutrients solidified into a jelly with agar. They develop outgrowths of cell masses, that can be cut off and re-propagated in the same way, indefinitely.

So long as these cell-mass cultures are kept on the nutrient agar jelly they continue to grow as undifferentiated tissue—stuff that is "just plant." But if they are taken off the jelled substratum and dropped into a liquid solution containing the same food substances they sink

to the bottom and presently produce first stems, then leaves and roots—complete plantlets.

Why these masses of generalized plant cells should be induced to turn into differentiated and specialized stem, leaf and root tissues by being thus immersed, Dr. White declared himself unprepared to state positively. He conjectured, however, that the difference between the oxygen supply at the top and at the bottom of the solution may have something to do with it.

These masses of plant tissue have been kept growing for 18 months, divorced from the original parent plants, Dr. White told his listeners. Next step in the research is to see whether plant cells can be grown as separate individuals, instead of in the tissue masses as at present.

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● RADIO ●

Dr. William C. Sandy, director of the Bureau of Mental Health of Pennsylvania, will be the guest scientist on "Adventures in Science" with Miss Jane Stafford, medical writer, Science Service, over the coast to coast network of the Columbia Broadcasting System, Monday, May 8, 5:45 EDST, 4:45 EST, 3:45 CST, 2:45 MST, 1:45 PST. Listen in on your local station. Listen in each Monday.