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A new method of tissue culture for accurate and rapid measurements of the growth.

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The new method of culture consists in placing the tissue in capillary tubes instead of hanging drop, which was employed heretofore. The glass tube consists of two parts: one part, about 1 mm. in diameter, is used for handling by the operator, the other part, drawn out to about 0.3 mm. in diameter, is filled with the liquid medium, into which is placed the tissue to be cultivated. The thickness of the walls of this second part of the tube is less than 0.1 mm. The length of the whole tube is about 2 inches. 20 such tubes are placed with the thin ends down into a small beaker. A few drops of fluid are poured into the beaker, and this fluid through capillarity fills the tubes. The whole is placed into a test tube and may be sterilized and cooled without handling the individual tubes. A piece of tissue about 0.5 mm. in its widest diameter is placed into the wide part of each tube and then by the aid of a very fine glass rod immersed into the fluid, then with a piece of dry cotton attached to the thin end of the tube a drop of the fluid withdrawn and at the same time the tissue moved deeper in the fluid. The tissue becomes elongated and *grows only at both ends and consequently in one direction*. It is therefore quite easy to measure the longitudinal increase in size with accuracy of nearly $\frac{1}{20}$ of a millimeter. The narrow end of each tube is closed with sealing wax and the thick end by a gas flame. As a result of this manner of sealing the tube the piece of tissue falls out without effort on breaking off of the thin end of the tube.

For microscopical study 3 tubes are fastened to a microscopical slide and placed on a mechanical stage. The specimen may then be connected with a projection apparatus or a measuring device. The experiments were conducted with a solution con-

sisting of NaCl—1.2 per cent., CaCl—0.025 per cent., KCl—0.042 per cent., $NaHCO_3$—0.02 per cent. To 1,000 parts of this solution was added 1 part of commercial (3 per cent.) H_2O_2 in order to allow the tissue a sufficient amount of oxygen and at the same time obviate the appearance of free bubbles in the specimen. An increase of size of the tissue was obtained in nearly 85 per cent. of the specimens. Tissues used for the present study were the spinal cord and intestines of a chick embryo of 4 to 10 and 14 to 17 days respectively. The increase in size was pretty regularly about 0.5 mm. during the first twenty-four hours, which corresponds very nearly to the results obtained by M. R. Lewis.

The newly grown part of the tissue has often the same thickness as the rest of the piece, the whole piece becomes usually more uniform. On the other hand in about 36 specimens in which there was no growth the thickness of the tissue was not uniform. Apparently then a successful growth of tissue is not due to any chemical or physical phenomenon.

Experiments are undertaken with tissue cultures in serum and on influencing the growth with physico-chemical agents.

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Uridin and cytidin phosphoric acid.

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In a series of articles published in course of the last few years, Walter Jones and his co-workers advanced a theory on the mode of linkage of the four nucleotides taking part in the molecular structure of yeast nucleic acid. According to these authors, the nucleus of yeast nucleic acid is a tetra ribose of the following structure $[(C_5H_{10}O_5)_4—3H_2O]$. The assumption was based on the isolation of three substances which the authors viewed as dinucleotides, having the properties of a tetrabasic acid. In a previous publication the present author expressed the view that the experimental evidence adduced by Jones and coworkers was not sufficient to establish their theory. It also seemed to the present author that the experimental evidence presented was insufficient to establish the individuality of the guanosin