CORNELL: Walter Norton Hess, "Studies on the Lampyridæ." Clarence Hamilton Kennedy, "Study of the phylogeny of the Zygoptera." Fred Waldorf Steward, "Development of the cranial sympathetic ganglia in the rat." Benjamin Percy Young, "Attachment of the abdomen to the thorax among Diptera." Laura Florence, "Hog louse, *Hæmatopinus suis*, Linné: its biology, anatomy and histology." Walter Housley Wellhouse, "Insect fauna of the genus *Cratægus*."

GEORGE WASHINGTON: Benjamin Schwartz, "Hemotoxins from parasitic forms." Frank Alexander Wetmore, "Body temperature of birds." Thomas Elliott Snyder, "Colonizing termites."

HARVARD: Vasil Obreshkove, "Photic reactions of tadpoles in relation to the Bunsen-Roscoe Law." James Montrose Duncan Olmsted, "Experiments on the olfactory and gustatory organs of *Amiurus nebulosus* (*Lesueur*)." Herbert Greenleaf Coar, "Shell of *Balanus eburnus*." William Norton Barrows, "Modifications and development of the arachnid palpal claw, with especial reference to spiders." Leslie Clarence Dunn, "Linked genes in mammals." Alfred Charles Kinsey, "Studies of gall-wasps (*Cynipidæ hymenoptera*)."

ILLINOIS: Hachiro Yuasa, "Classification of the larvæ of Tenthredinoidea."

INDIANA: William Marion Goldsmith, "Comparative study of the chromosomes of the tiger beetles (*Cicindelidæ*)." William Ray Allen, "Studies of the biology of freshwater mussels."

IOWA STATE: Gertrude Van Wagenen, "Coral Mussa fragilis, and its development."

JOHNS HOPKINS: Bessie Noyes, "Experimental studies on the life history of a rotifer reproducing parthenogenetically (*Proales decipiens*)." Hoyt Stilson Hopkins, "Conditions for conjugation in diverse races of *Paramœcium*."

KANSAS: Paul Bowen Lawson, "Cicadillidæ of Kansas."

MICHIGAN: Walter Norman Koelz, "Coregonine fishes of Lake Huron."

MISSOURI: Erwin Ellis Nelson, "Chemical composition of the ovaries and skeletal muscle of the fresh water gar, *Lepidosteus*."

PENNSYLVANIA: Joseph Hall Bodine, "Factors influencing the water content and the rate of metabolism of certain Orthoptera."

PRINCETON: Wilbur Willis Swingle, "Germ-cell cycle of *Anurans*. I. The male sexual cycle of *Rana catesfrava*." Elmer Lentz Shaffer, "Germ-cells of *Cicada septemdecim* (Homoptera)."

WISCONSIN: Bert Cunningham, "Some studies in the natural history and early development of *Chrysemys cinerea*." George Holman Bishop, Title for thesis not given. Archie Evans Cole, Title for thesis not given.

YALE: Harry Hayward Charlton, "Spermatogenesis of *Lepisma domestica*." Ruth B. Howland, "Experiments on the effect of removal of the pronephros of *Amblystoma punctatum*."

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SPECIAL ARTICLES

A METHOD OF STUDYING THE ABSORPTION-TRANSPIRATION RATIO IN NUTRIENT MEDIA

SEVERAL writers have shown that the water content of plants varies with the hour of the day. This variation is of course due to differences in the rates of water entrance and exit. Wilting takes place when the ratio of the rate of entrance to the rate of exit is less than unity whether caused by excessive transpiration or by a decrease in root absorption. These two plant processes may easily be studied as a laboratory exercise in plant physiology by using water culture plants exposed to different environmental conditions or placed in solutions of different osmotic pressures. The following experiment will serve to illustrate the manner in which changes in the strength of solutions affect the ratio of absorption to transpiration. The method here described is practically the same as one used by the writer in a series of experiments reported by Livingston.[1]

The roots of a tomato plant were passed through a hole in the rubber stopper of a large mouth bottle of about 600 c.c. capacity. A water-tight seal of chewing gum was made around the stem of the plant; a 2 c.c. pipette, graduated to 1/20 c.c. and a thermometer were inserted into the bottle through the stopper.

[1] Livingston, B. E., "Incipient Drying and Temporary and Permanent Wilting of Plants, as Related to External and Internal Conditions," Johns Hopkins Univ. Cir., March, 1917, pp. 176–82.

The bottle and pipette were then filled with the nutrient solution, care being taken that no bubbles were inclosed beneath the stopper. Loss in weight of the plant and container gave the amount of transpiration, while the loss of solution from the pipette gave the amount of root absorption after temperature corrections were made. These temperature corrections were made by comparing these pipette readings with those of a pipette in a similar bottle containing no plant, but exposed to the same set of conditions. Transpiration was measured in grams while absorption was measured in cubic centimeters, but as the variations in density of the solutions for these temperature ranges were small in comparison to the actual values dealt with this correction was not made. The experiment was performed on November 6, 1919, in the diffused light of the laboratory during a period when variations in temperature and the index of evaporation were slight.

TABLE I

Data Showing Rates of Transpiration and Absorption of a Tomato Plant with Roots Immersed Successively in a Three-salt Nutrient Solution of 1.75 Atmospheres Osmotic Pressure, Cane Sugar Solution of 5.06 Atmospheres Osmotic Pressure and Distilled Water

Period	Hourly Rate of		Ratio A/T	Solution and Osmotic Pressure
	Transpiration	Absorption		
	gram	*cc.*		
1	.41	.44	1.07	3-salt, 1.75 atm.
2	.31	.37	1.19	3-salt, 1.75 atm.
3	.42	.28	.67	Sugar, 5.06 atm.
4	.29	.18	.62	Sugar, 5.06 atm.
5	.41	.46	1.12	Distilled water
6	.32	.39	1.22	Distilled water

When the hourly rate of absorption is in excess of transpiration the ratio, A/T, is greater than unity and the plant cells increase in turgor. When this rate is less than unity turgor is decreased and if the process is continued long enough the cells become flaccid and the plant is seen to wilt. The plant gained in turgor during the first two periods given in Table I., but during the third and fourth periods the ratio values decreased very much. This decrease was mainly due to lower absorption rates since the roots were surrounded by a solution much stronger osmotically during these two periods than during the first two. The rates of absorption for the last two periods were greatly increased by placing the roots in distilled water.

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THE AMERICAN MATHEMATICAL SOCIETY

THE two hundred and twelfth regular meeting of the society was held at Columbia University on Saturday, October 30, 1920, extending through the usual morning and afternoon sessions. The attendance included thirty-five members. President Morley occupied the chair. The council announced the election of the following persons to membership in the society: Dr. P. M. Batchelder, University of Texas; Miss Vevia Blair, Horace Mann School; Mr. E. H. Carus, La Salle, Ill.; Mr. W. E. Cederberg, University of Wisconsin; Mr. R. P. Conkling, Newark Technical School; Mr. P. H. Evans, Northwestern Mutual Life Insurance Company, Milwaukee, Wis.; Mr. B. L. Falconer, U. S. Civil Service Commission, Boston, Mass.; Mr. J. A. Foberg, Crane Junior College, Chicago, Ill.; Dr. Gladys E. C. Gibbens, University of Minnesota; Professor L. E. Gurney, University of the Philippines; Professor Archibald Henderson, University of North Carolina; Miss Jewell C. Hughes, University of Arkansas; Miss Claribel Kendall, University of Colorado; Mrs. M. I. Logsdon, University of Chicago; Mr. R. L. McNeal, General Motors Laboratories, Detroit, Mich.; Mr. H. L. Olson, University of Michigan; Professor Leigh Page, Yale University; Captain H. W. Rehm, Aberdeen Proving Ground, Md.; Mr. Irwin Roman, Northwestern University; Mr. Raleigh Schorling, Lincoln School, New York City; Mr. E. L. Thompson, Junior College, Joliet, Ill.; Dr. Bird M.