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The Daily and Seasonable Variation in the Internal Temperatures of Two Trees, *Populus deltoides* Marsh

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THE DAILY AND SEASONABLE VARIATIONS IN THE
INTERNAL TEMPERATURES OF TWO TREES,
POPULUS DELTOIDES MARSH

J. N. MARTIN

The two poplars of this experiment are on the parking of a street running north and south. At three feet above ground, where the temperatures were taken, the south tree is 18.5 inches and the north tree 16 inches in diameter. All lower branches have been removed to a height of 16 feet or more and there are no obstructions to forenoon or afternoon sunlight. They are openly situated.

One series of readings was taken on the north side of the two trees at depths of 1.5 inches and 6 inches within, the purpose being to compare variations in the temperature of the cambium with that of the central portion of trees on the side least exposed to sunlight. Readings were made at 7-8 A.M., 12:30-1:30 P.M. and 7-8 P.M. during July and August, 1931, and January, February, and March, 1932.

A second series of temperature readings, taken at 1.5 and 6 inches within, was made on south side of trees to determine influence of sun's rays on variation of internal temperature.

The data shows the temperatures of the north sides of the two trees practically the same. The data also shows that on the north sides the temperature is pretty uniform from cambium to center of trees, there seldom being more than one degree difference.

The records show that on the south side of the trees the direct rays of the sun have a marked influence on the temperature of the cambium but little on the temperature at a depth of 6 inches within the trees. Neglecting the influence of the direct rays of the sun, the curves show that the daily fluctuation in the internal temperature is seldom more than two degrees centigrade, but follows that of the outside air. The curve of the internal temperature of the trees in summer approaches the curve of the minimum temperature of the air, while in the winter the curve of internal temperature approaches the curve of the maximum temperature of the air.

The seasonal variation in the internal temperature ranged from -17 to 25.5 centigrade.

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