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R. A. EDWARDS, Acting Librarian.

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RHODODENDRON LEAVES AS THERMOMETERS.

By JOHN F. JOHNSON.

[From Country Life in America, November, 1904, vol. 7, No. 1, p. 72.]

Rhododendron leaves constitute a fairly reliable natural thermometer. The photographs were all taken from the same plant at different temperatures. The first picture, taken with the thermometer at 45° F., shows the normal or flat condition during mild weather. Waiting until the thermometer registered 17° F., I photographed the same branch, and found the leaves in the position illustrated in fig. 2[1], a drooping of the leafstalks and an inward curling of the blades having taken place.

After noting this change in conditions, I was interested to find out what effect a sudden rise in temperature would have upon the leaves, so I took this branch away and placed it in a temperature of 45° F. Immediately, with a springing motion, the leaves started to expand, the leafstalks to straighten themselves, and in eight minutes both leaves and leafstalks had reverted to their normal condition. Thus, it will be observed that the transition in the conditions of the leaves from fig. 2 to fig. 1 occupied a space of time not much exceeding that which mercury would take to cover the same number of degrees, under similar conditions. Having noted the effect of a rise in temperature, I set the same branch outside again in 17° F. This time the leaves took twenty minutes—nearly three times as long—before they reached the condition of fig. 2.

Fig. 3 illustrates the effect of zero weather on another branch from the same bush. Here the leaves I found to be much more tightly rolled up, the edges in most cases curling inward to touch the midrib on the under side. The difference between fig. 2 and fig. 3, or 17° F., will be observed to be fairly proportionate to that between fig. 1 and fig. 2.

Nature has a purpose for all these metamorphoses. Less transpiration and consequently less loss of heat is the result of this curling. This power in living plants of conforming to external circumstances is called irritability. Somewhat analogous to the above is the closing up and sleeping of clover leaves at night. Tulip flowers also exhibit this power of closing and expanding under different temperatures. When placed in a heated room, during sunshine, or mild weather outdoors, the petals expand, but will contract and close together when subjected to reduced temperature.

FAKE RAINMAKING—A LETTER FROM THE CHIEF OF BUREAU.

U. S. DEPARTMENT OF AGRICULTURE, WEATHER BUREAU,
Washington, D. C., April 5, 1905.

EDITOR THE TOLEDO BLADE,
Toledo, Ohio.

DEAR SIR: In reference to a dispatch from Riverside, Cal., which appeared in your issue of March 29, and which stated that heavy rains had occurred in southern California during the past winter as the result of a single rainmaking station established on the slope of Mount Wilson, permit me to say that the liberation of chemicals on Mount Wilson had nothing to do with the rainfall in southern California. Your dispatch stated that the heaviest rain fell in the region of the rainmaker, and that the rainfall had not been large in any of the other regions of the subarid West. This statement is erroneous, as during the same period general and excessive rains occurred throughout Arizona and New Mexico. The cause of heavy rains was not local, but was associated with general abnormal atmospheric conditions over the United States that were in turn associated with abnormal conditions that obtained over a large part of the Northern Hemisphere.

It is known that when barometric pressures for a month are low in the Southwest[2] the period is one of frequent and heavy rains in that region, and this barometric condition pre-

[1] The photographs are omitted as not essential to the main idea of the paper.

[2] That is, the southwest, the north, and the east portions of the United States.—ED.