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LEAF STRUCTURE AND WOUND RESPONSE¹

THE leaf through its light relation underlies the specializations of vascular plants. As the primary food-making organ its demands explain in large measure the habits and structures of terrestrial vegetation. The radial symmetry about an air-earth axis, the non-motile plant body with its firm cell walls, the habit of indefinite elongation with correlated radial growth, the persistent alternation of generations and sporophyte dominance, and even the complex spore-bearing parts in their interesting array, are logical corollaries to the nutritive independence achieved through photosynthesis.

The foliage leaf, despite its temporary nature, dominates the plant's organization. The stem in final analysis is only a structure for supporting leaves, carrying to them certain raw materials and transporting from them the products of their elaboration. The root likewise is servant to the foliar organ, anchoring the whole mechanism and responsible also for the intake of water and dissolved materials. Flowers, seeds and fruits are the crowning achievements of organisms that must reproduce with limited motion and without locomotion. But the leaf as the energy-binding agent is of primary importance, and without it other parts are helpless and meaningless.

The foliage leaf is necessarily a delicate and exposed organ. Since light must penetrate to its interior tissues, it may not employ the massive coverings which protect larger roots and stems. Nor is its position in any degree protective as is the case with roots which lie buried in soil. The leaf is not only aerial but constitutes the peripheral zone of the shoot system, and becomes therefore the most exposed part of the plant. For most leaves, a single cutinized wall of microscopic thinness constitutes the only barrier between the living protoplasm and the outside world. Auxiliary covering layers are found on many, but these at best are an inefficient substitute for the cork and bark which constitute the buffer tissues for other plant parts.

Leaves are therefore peculiarly liable to injury. Physical forces such as wind or hail often break their

¹ Address of the retiring vice-president and chairman of Section G—Botany—American Association for the Advancement of Science, Philadelphia, Pennsylvania, December 28, 1926.



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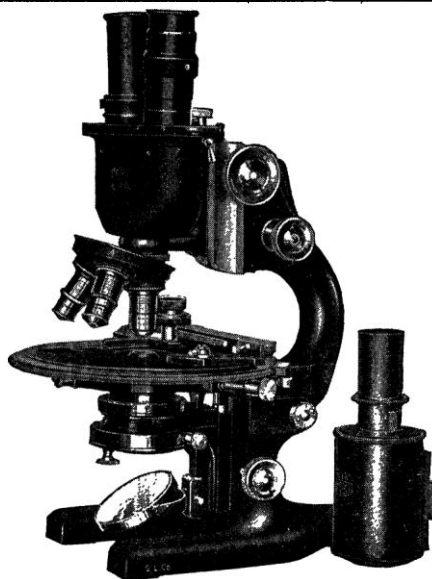
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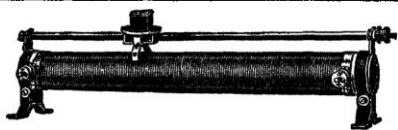
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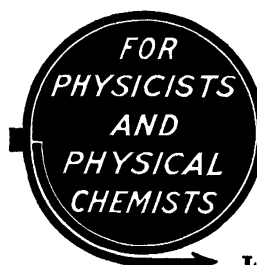
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