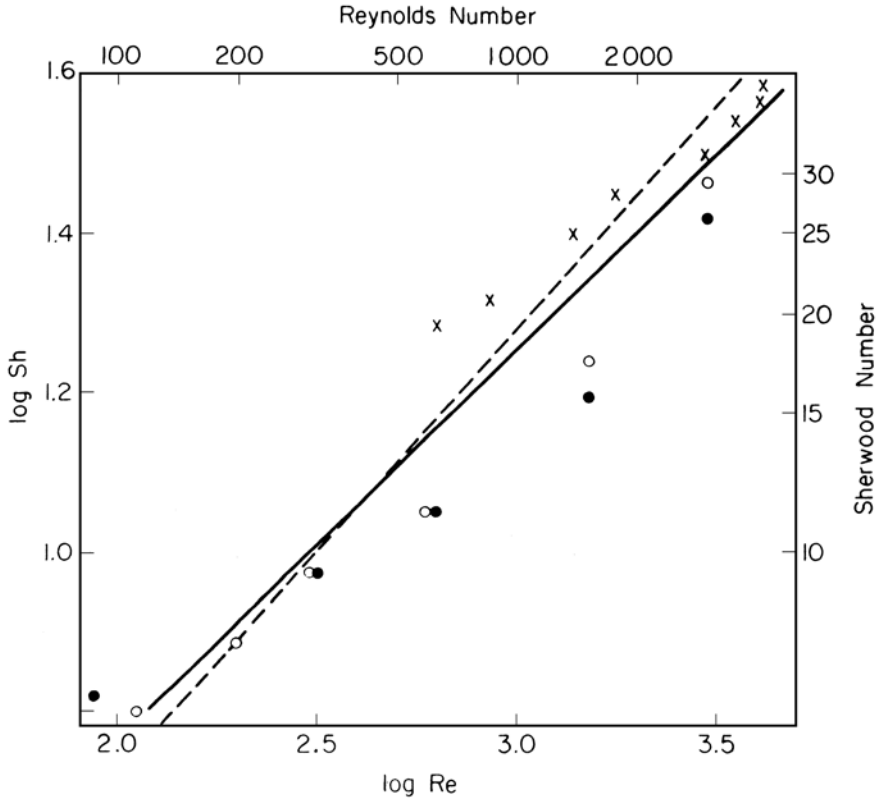

Figure 11.1 Relation between Sherwood and Reynolds numbers for plates parallel to the airstream. Continuous line, standard relation Sh = 0.57 Re0.5; dashed line, measurements on disks by Powell (1940); ×, measurements on model bean leaf by Thom (1968); o, measurements on replicas of alfalfa and Cocksfoot leaves by Impens (1965).

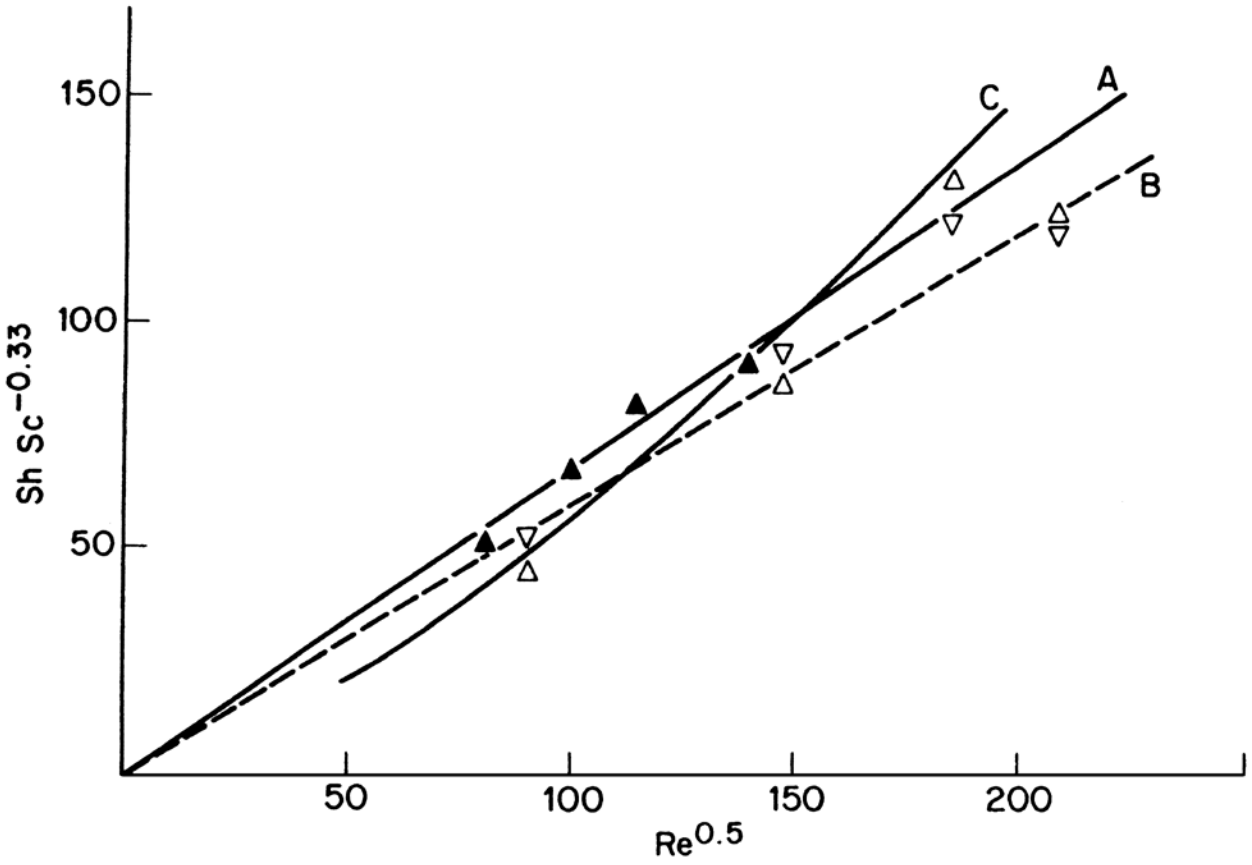

Figure 11.2 Comparison of measurements of mass transfer between air flow and flat surfaces parallel to the flow. The non-dimensional group Sh Sc−0.33 is plotted as a function of Re0.5 to give the constant of Eq. (11.4) as a slope. Symbols and lines: small leaves; large leaves; ∇ large leaves (central strip only); A—Pohlhausen (1921); B - - - Thom (1968); C—Powell (1940): (from Chamberlain, 1974).

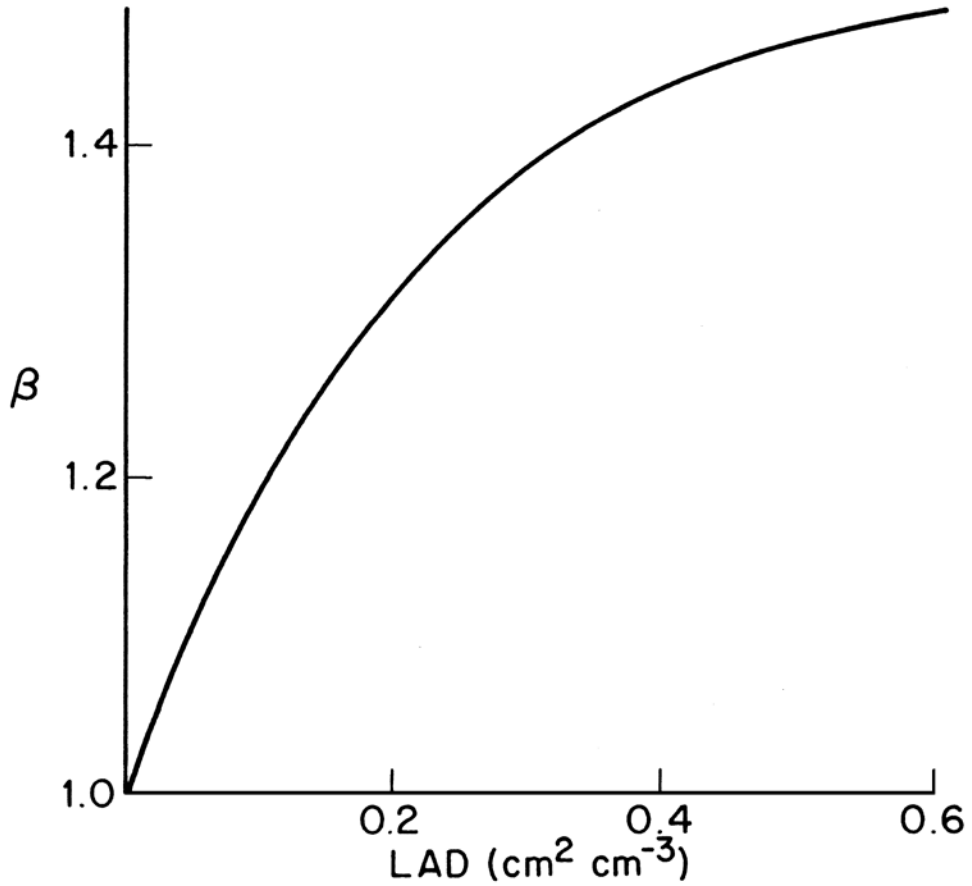

Figure 11.3 Ratio *β* of boundary layer resistance for an isolated *Citrus* leaf to resistance measured within a canopy of leaves of specified leaf area density (LAD) (redrawn from Haseba, 1973).

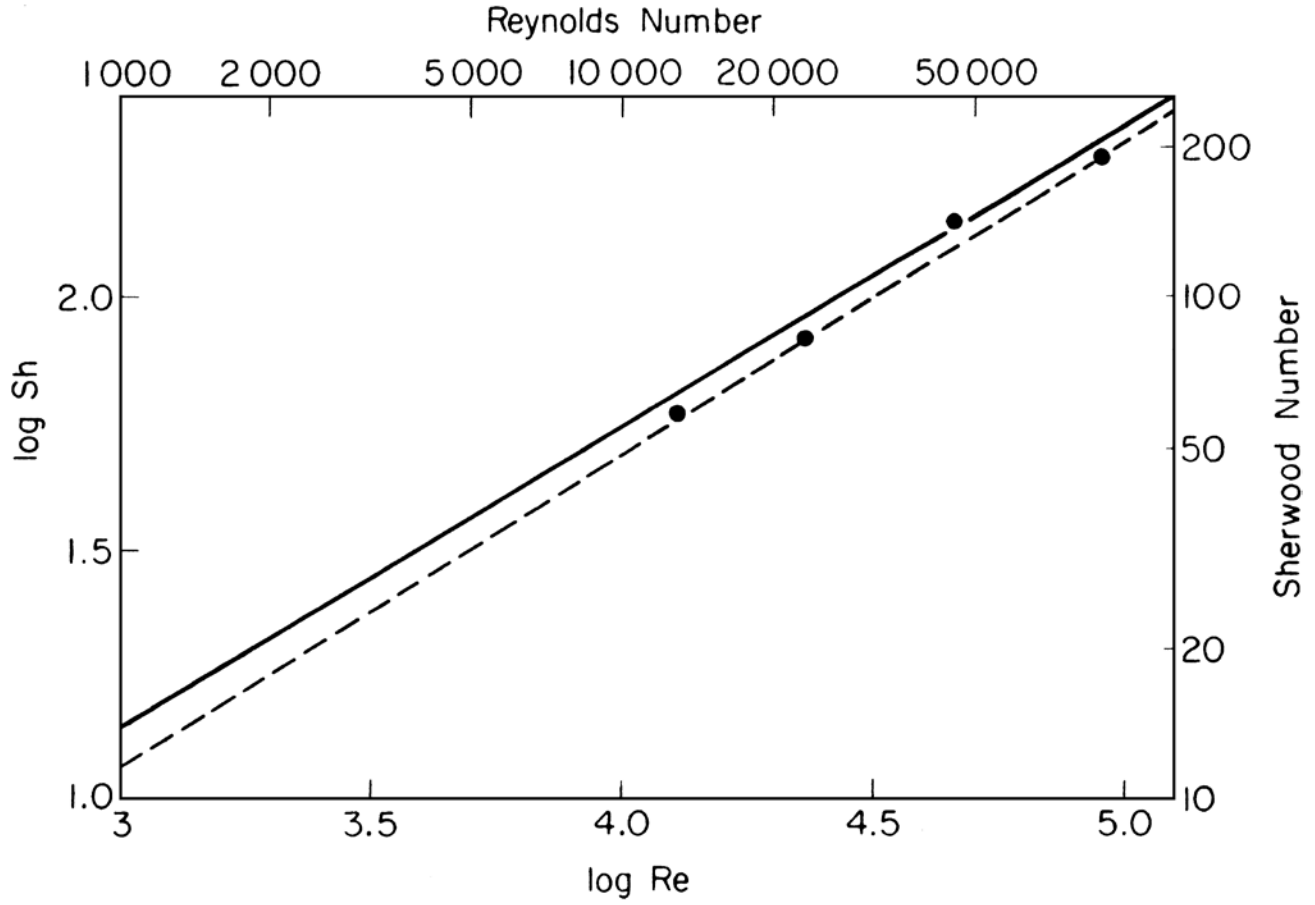

Figure 11.4 Relations between Sherwood and Reynolds numbers for a wet cylinder at right angles to the airstream. Continuous line, $Sh = 0.22\ Re^{0.6}$; dashed line, $Sh = 0.16\ Re^{0.62}$. The points were calculated by Rapp (1970) from measurements by Kerslake on a man covered with sweat.

Figure 11.5 Open-top chambers in a field of beans at Sutton Bonington. The boxes adjacent to the chambers contained fans for ventilating the chambers, and some also contained charcoal filters for absorbing gaseous air pollutants. The “frustum” design at the open top reduced the rate of incursion of unfiltered air (see text).

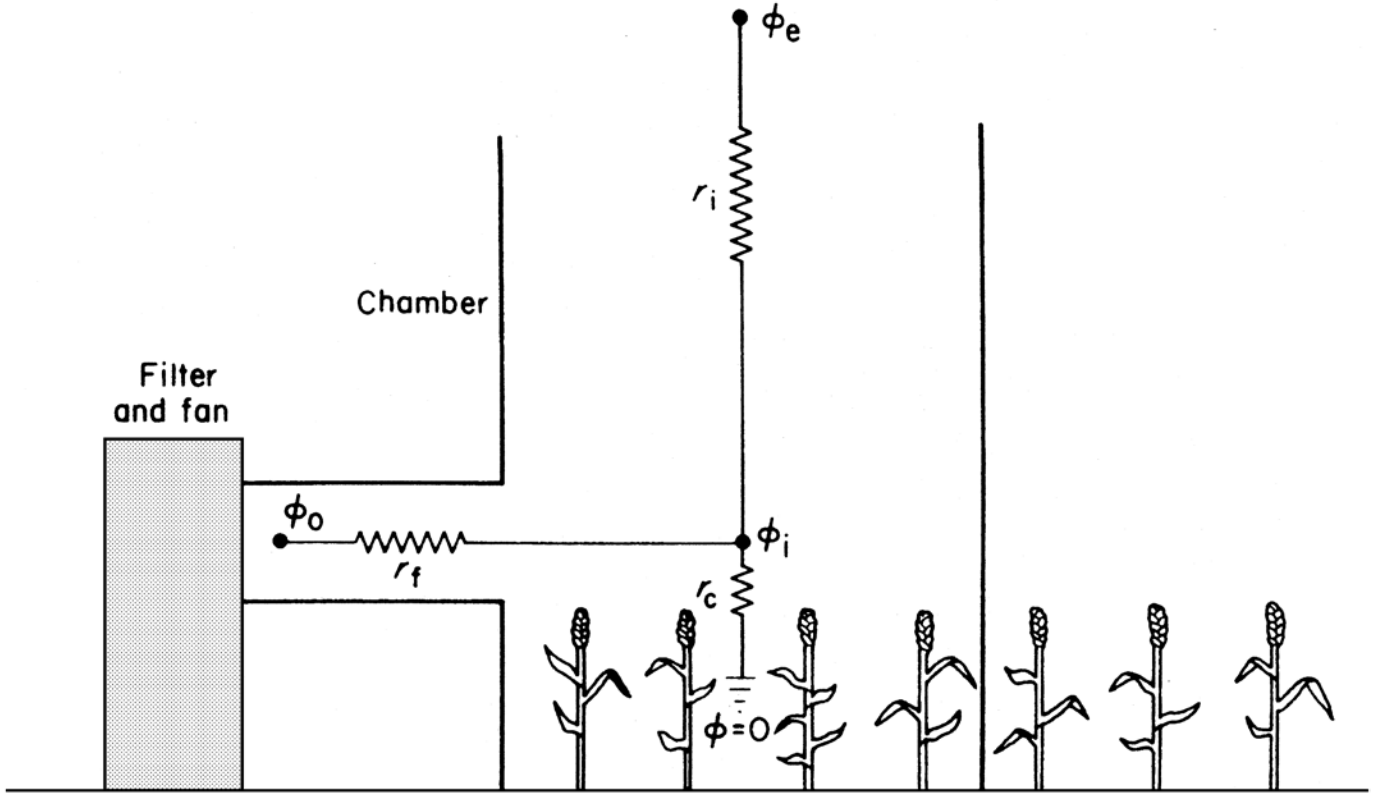

Figure 11.6 Schematic diagram of an open-top field chamber and the equivalent resistance analog.

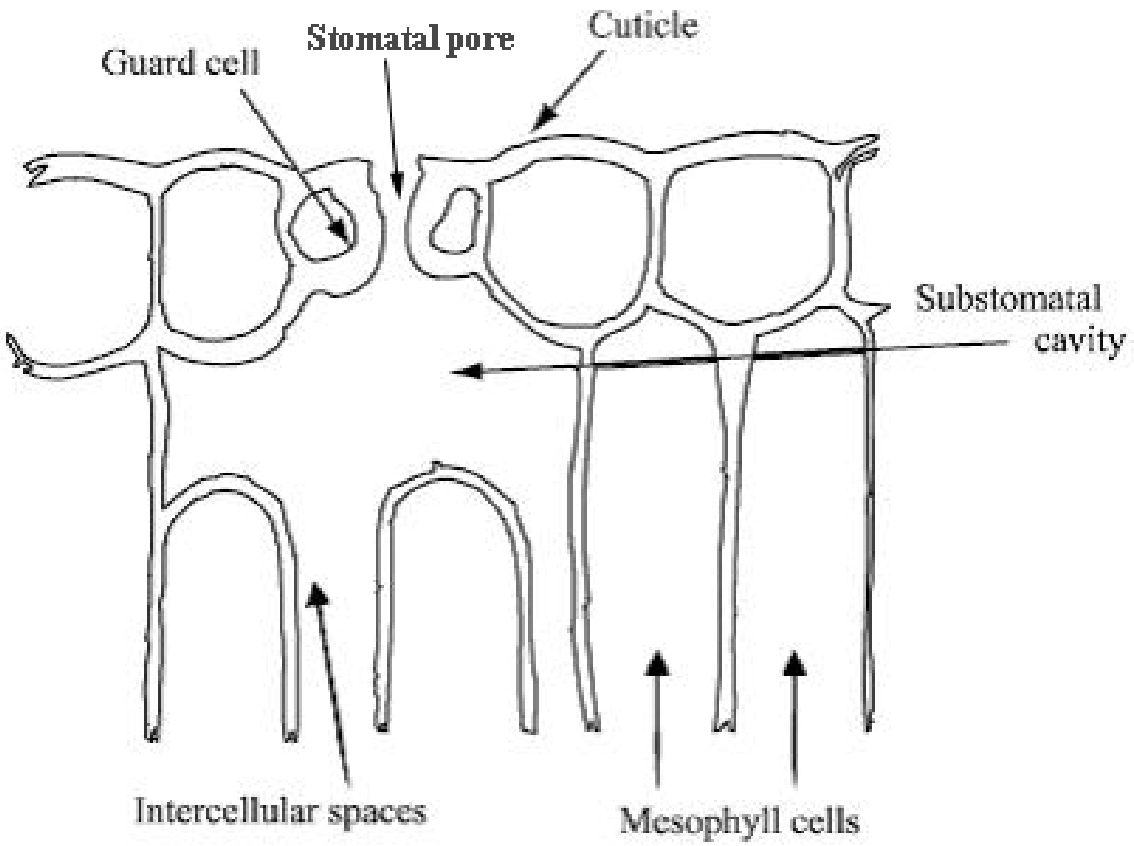

Figure 11.7 Schematic diagram of a single stoma (after Jones, 1992).

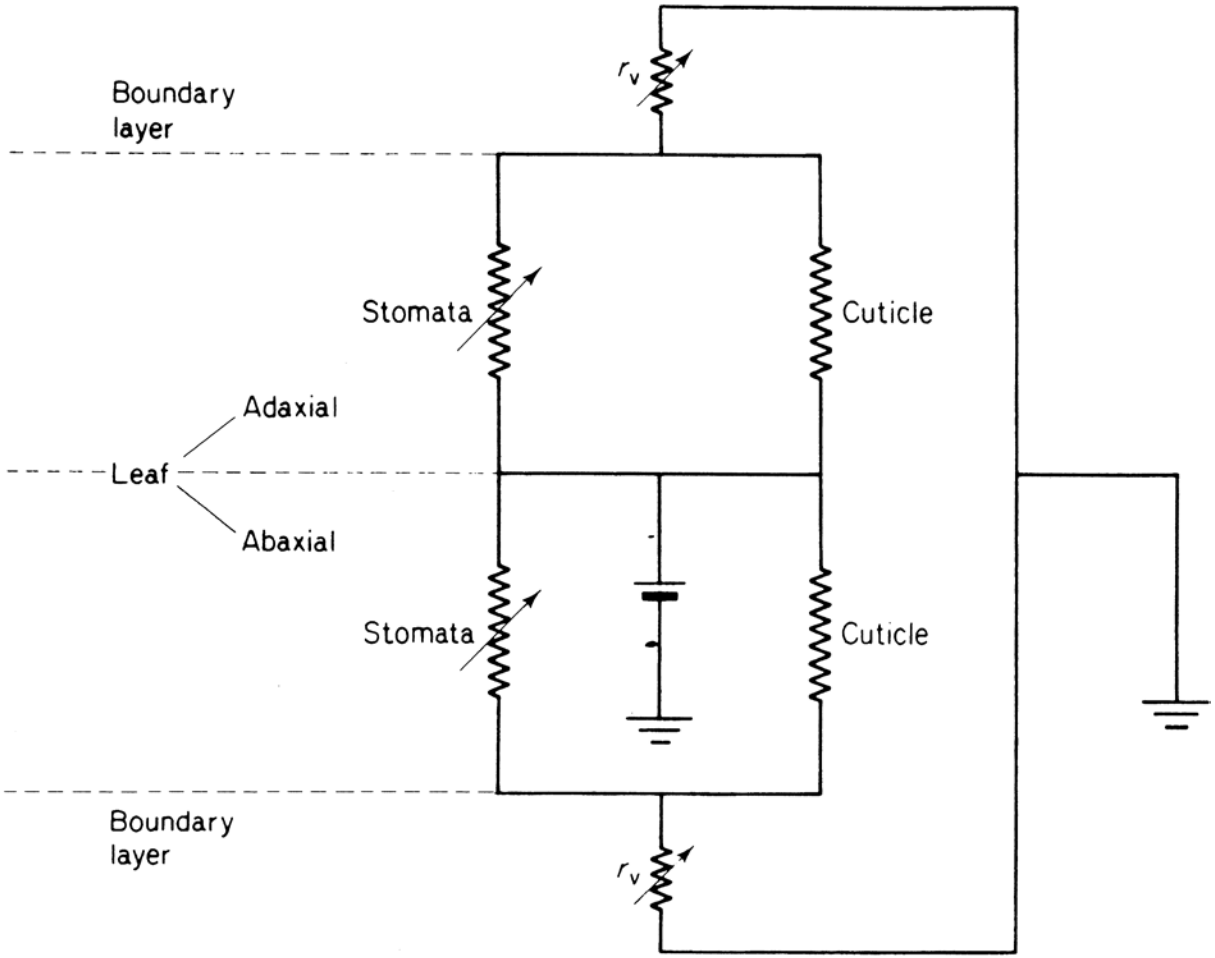

Figure 11.8 Equivalent electrical circuit for loss of water vapor from a leaf by diffusion through the stomata and cuticle of the upper (adaxial) and lower (abaxial) epidermis.

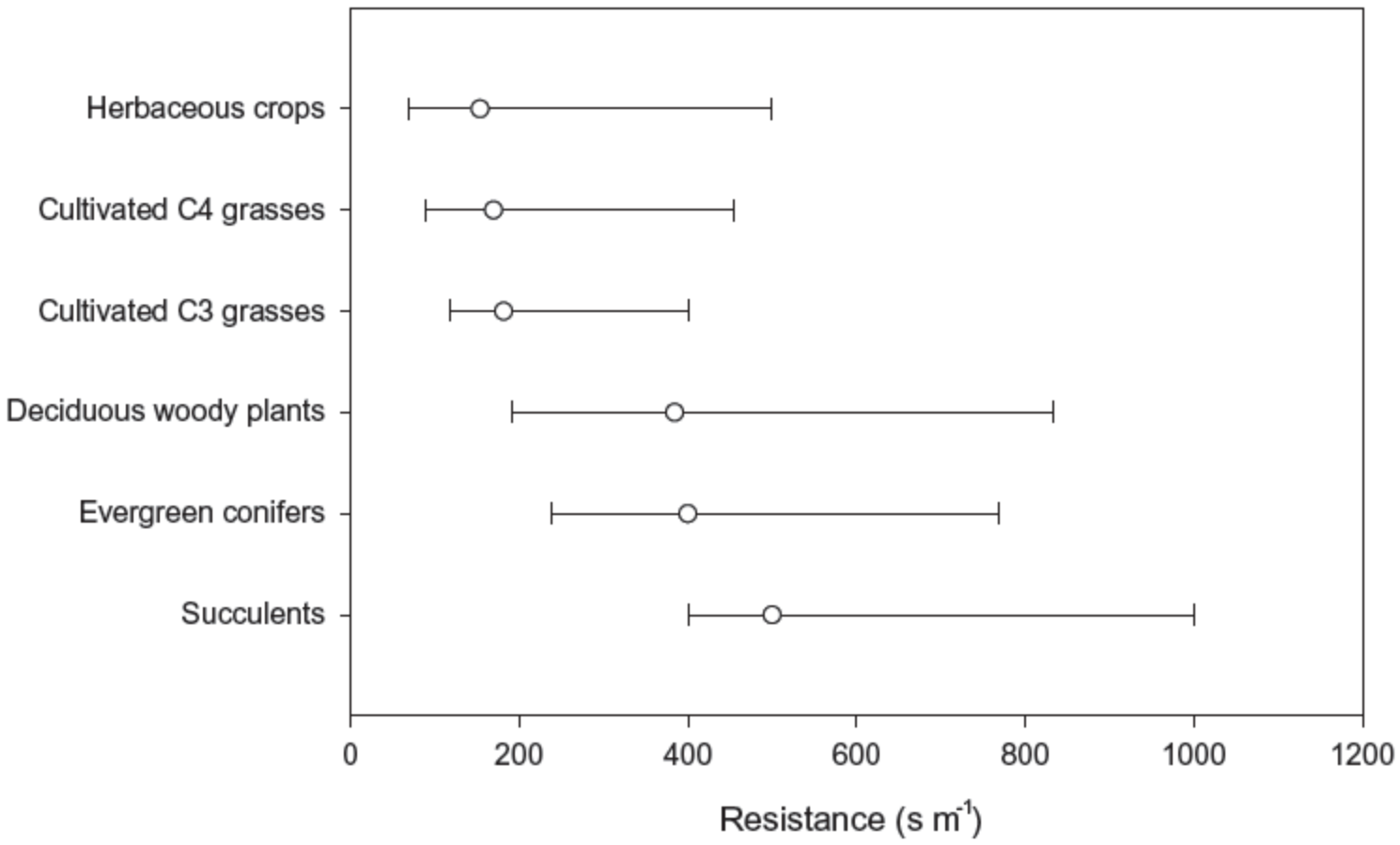

Figure 11.9 Mean values and ranges of minimum leaf stomatal resistances reported for different plant types (after Jones, 1992).

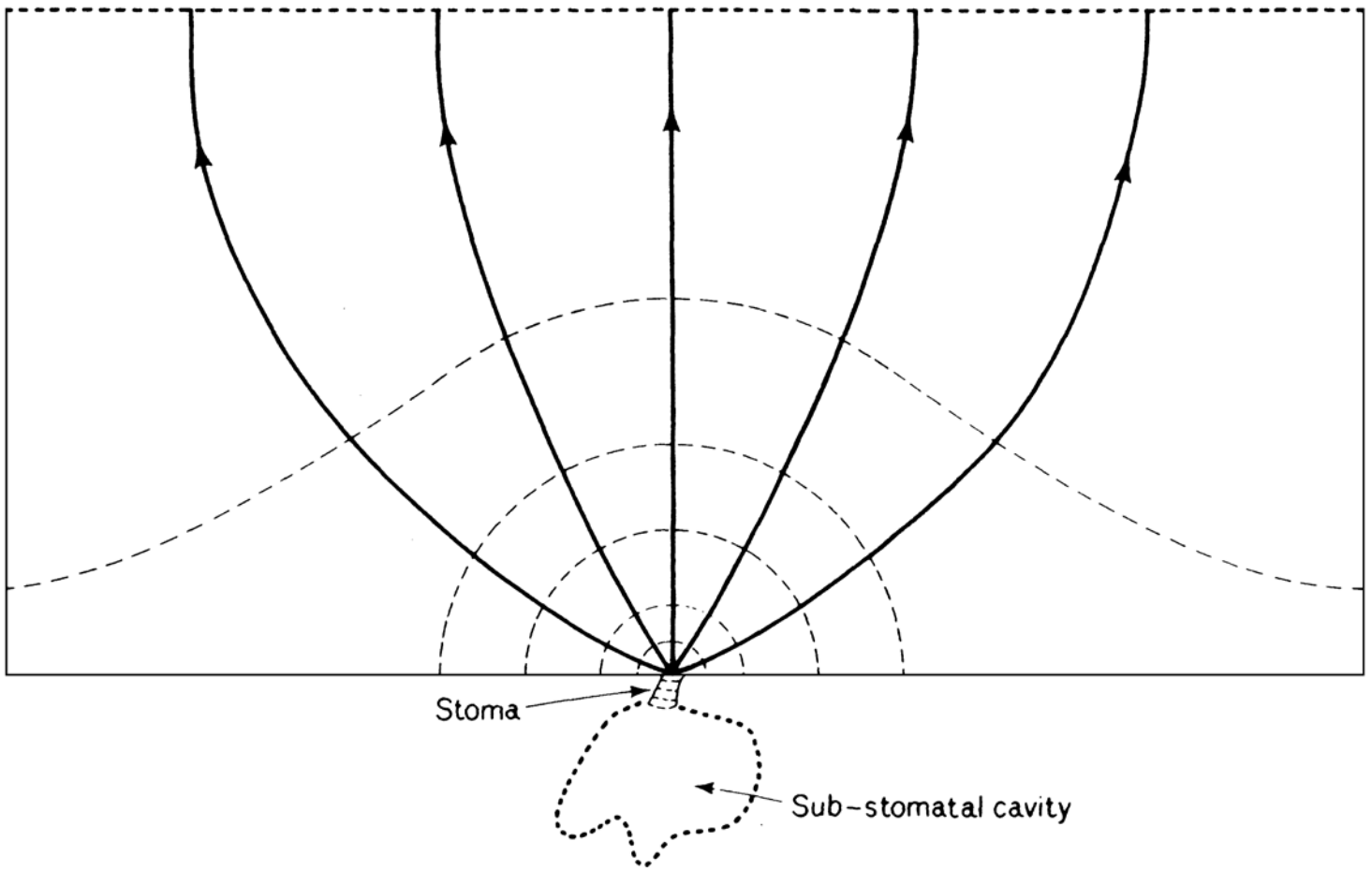

Figure 11.10 Electrical analog of diffusion of water vapor from a single stomatal pore. Note the absence of equipotential lines in the substomatal cavity showing that the “end-correction” can be neglected at the inner end of the pore.

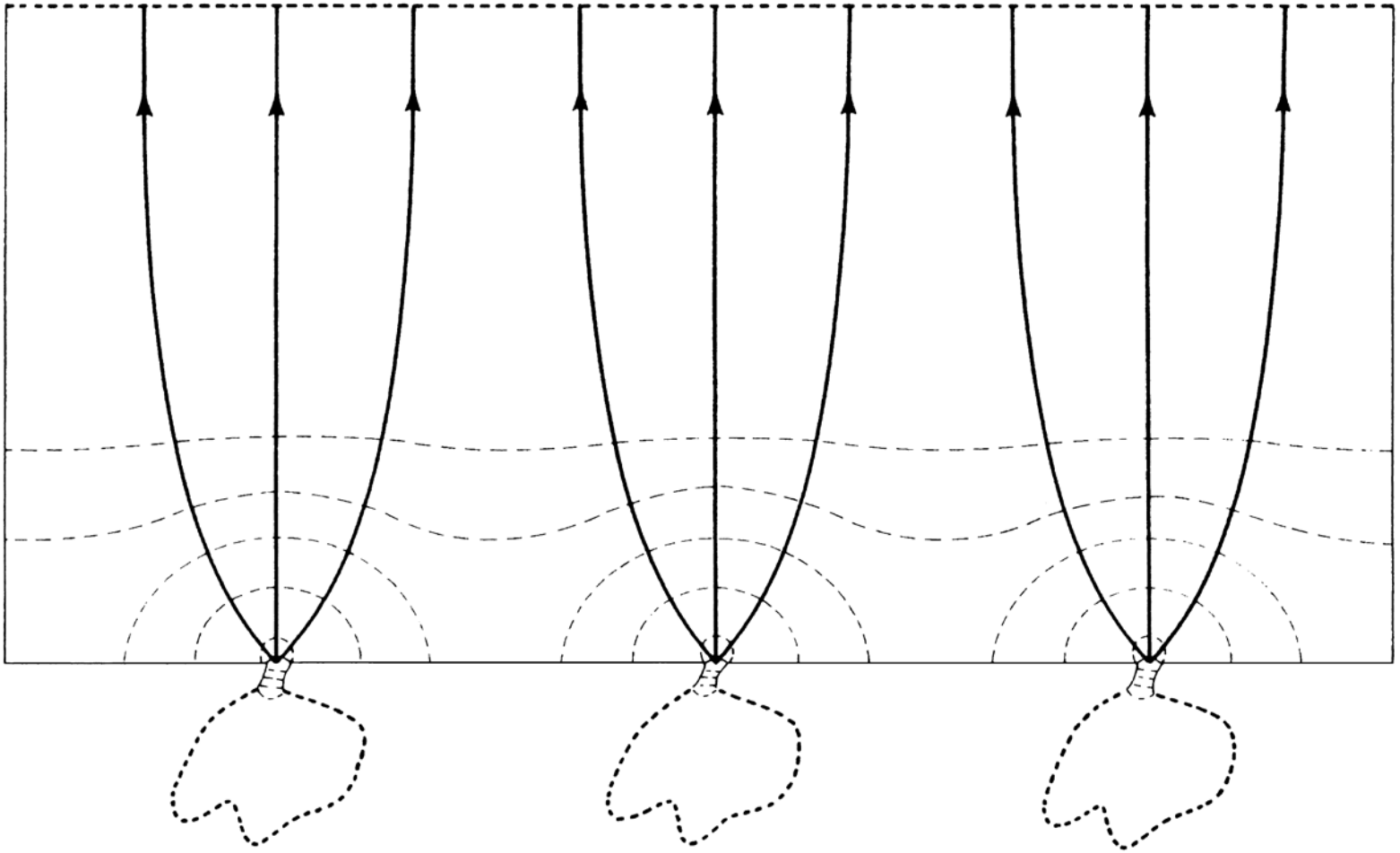

Figure 11.11 Electrical analog for a leaf epidermis showing three pores. Note the merging of the equipotential lines which decreases the effective end-correction for the outer end of each pore.

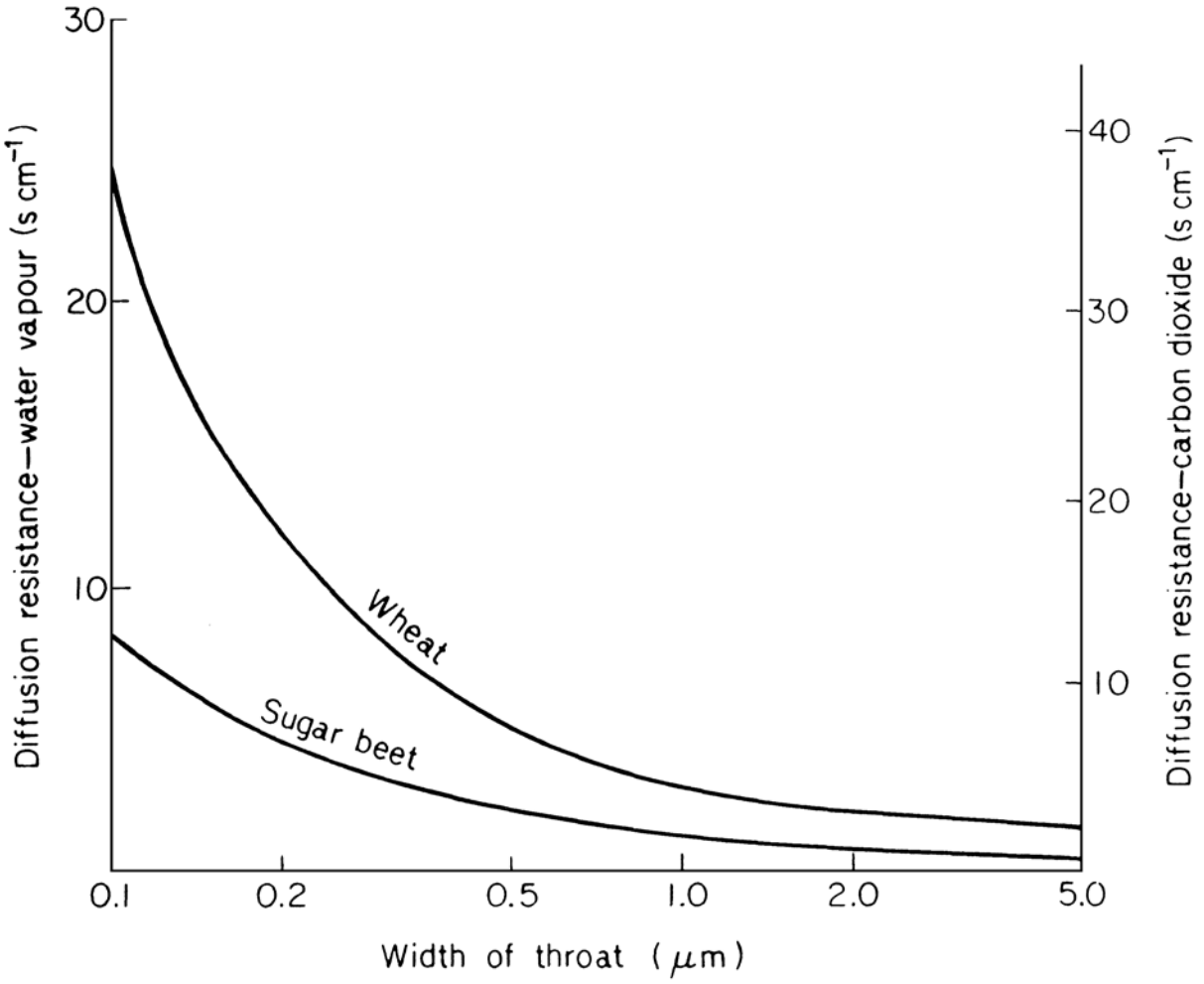

Figure 11.12 Diffusion resistance calculated for wheat (Milthorpe and Penman, 1967) and sugar beet leaves (Biscoe, 1969) as a function of stomatal throat width. Resistances for water vapor and carbon dioxide are given on left- and right-hand axes, respectively.