

DISCUSSION OF SHORT COMMUNICATIONS ON EVAPORATION

Communication of HOLMES, vide discussion MORTIER—DE BOODT, pag. 145.

Communication of BROUWER—POSTUMA.

Comments VAN WIJK : Dr. BROUWER discussed his paper with us a few weeks ago. The maximum radiation intensity in his experiments was approx. the same as on a bright summer day but he used an incandescent lamp. Thus the radiation in his experiments consisted for over 90 % of infrared radiation and it was immediately thought that this fact might explain the closing of the stomata. Dr. BROUWER told me yesterday that the stomata were open when the leaf was exposed to daylight.

Reply BROUWER : Indeed the stomata were open in daylight, the maximum aperture was 3 μ .

Communication of NEALE.

Comments DE VRIES : Draws attention to BRIGG's and SHANTZ's article on evaporation of pot plants (1917). VAN DUIN and he calculated the diurnal variation of evaporation for one of their experiments on a energy basis and found a satisfactory agreement with observation.

Comments STANHILL : There is a drop in transpiration mid-day on NEALE's and also in the curve of DE VRIES and VAN DUIN's paper referring to BRIGG's and SHANTZ's experiments. This would be interesting in respect to Mr. SLATYER's remarks about a mid-day drop in evaporation.

Reply DE VRIES : The same drop occurs in radiation intensity. It must have been caused by clouds.

Communication of HESSE.

Comments PEERLKAMP : Sie haben gezeigt, dass am Morgen die Transpiration sehr schnell zunimmt und dann stark abfällt. Können Sie dafür eine Erklärung geben. Kann es etwas zu tun haben mit Öffnen der Stomata bei geringen Lichtintensitäten, wie Dr. BROUWER uns gezeigt hat ?

Reply HESSE : Starke Verdunstung tritt zunächst früh bei Pflanzen nach Taunächten auf. Es liegt wohl daran, dass nach Verschwinden des Taus die Transpiration rasch einsetzt. Über die späteren Schockwirkung müssen die Pflanzenphysiologen eine Antwort suchen. Ich werde noch hinzufügen dass wenn die Pflanzenoberfläche ganz feucht ist dann wird eine maximale Apertur der Stomata nicht möglich sein.

Comments BUSINGER : Sind Verdunstungsmessungen im Windkanal zu übertragen für Verhältnisse in der freien Atmosphäre ? Man muss erwarten dass für Grassland die kritische Windgeschwindigkeit des Schliessens der Stomata nicht erreicht wird.

Reply HESSE : Transpirationmessungen im Windkanal sind bei Pflanzen, die höher sind als 1 Meter anwendbar, da dort schon Windgeschwindigkeiten über 4 m/sek ohne weiteres auftreten.

Comments DE VRIES : Sind die Lysimeter absonderlich aufgestellt ?

Reply HESSE : Nein, sie stehen in Parzellenbestände und unterliegen somit den Freilandbedingungen.

Communications of MAKKINK and of SLATYER.

Comments STANHILL : There is great need of study of root systems so that we may be able to equate soil moisture deficits in inches with percentage available moisture within the root zone. Also it is necessary to know how much of the root system is needed to supply the transpiration requirement of the atmosphere under different conditions of soil moisture supply and atmosphere.

Comments DAVIDSON : Would there be time for these authors to re-plot their evaporation curves on the same co-ordinates as used in the symposium articles in the recent number of the American Geophysical Union (April and June 1955) in which VEIHMEYER re-affirms his hypothesis of a steady evaporation rate under drying conditions until there comes a sharp cut-off at permanent wilting point and for the sets of curves to be compared and discussed by the meeting ? On reading the symposium I could not feel that the contention had been either proved or disproved and was disappointed that none of the curves illustrated, even by VEIHMEYER's critics, departed greatly from the form of VEIHMEYER's own curves — a fact which VEIHMEYER pointed out in his summary as lending support to his view. By contrast, SLATYER's curves under conditions other than "normal" seem to cut right across the VEIHMEYER hypothesis. Can we reduce the respective curves to a common basis of comparison, have all factors such as transfer rate in the soil been considered, and are any differences shown under "arid" conditions apparent or real ?

Reply MAKKINK : Mr. MAKKINK gave the following written reply : It appears to us that the value of our curves lies in the analytical way of handling the records and in the fact that they are expressed in terms of soil moisture tension. Replotting them in the way in which VEIHMEYER and HENDRICKSON plotted their curves (*Transact. Amer. Geophys. Union*, June 1955, p. 425–428) would not lead to a conclusive interpretation in terms of energy and of drying power of the atmosphere. In fact, our original curves of loss of weight of lysimeters are as little conclusive as those of VEIHMEYER and HENDRICKSON, even less because of irregular rainfall throughout the season. It would be desirable, if VEIHMEYER and HENDRICKSON would replot *their* curves in *our* way instead of in terms of volume percentages of water or in terms of loss of weight.