of the apical region of the phyllode and not homologous with the blade of a
dicotyledonous leaf. Such a blade among monocotyledons Mrs. Arber calls
a "pseudo-lamina." Such theories have been devised to explain the parallel
venation of monocotyledonous leaves. Attention is also called to Gray's
suggestion that some gymnosperm leaves may be equivalent to petioles, and
the further suggestion made that this may be applied specially to the Gnetales.

These views were tested by Mrs. Arber in anatomical investigations,
comparing scale-leaves, petioles, and phyllodes of dicotyledons with the leaves
of monocotyledons, the conclusion being reached that the occurrence of inverted
vascular bundles toward the adaxial face of a leaf may be an indication of
"phyllodic morphology." Other indications of phyllodic anatomy are devel-
oped, and its systematic distribution shows that it does not occur with any
frequency outside the Helobiae, Liliiflorae, and Farinosae. This distribution
is taken to confirm the view that phyllodic anatomy is an ancient character,
revealing the origin of the monocotyledonous leaf.—J. M. C.

Stomata.—Rehfous' has published a detailed study of the stomata of
many groups. The details are too numerous for citation, but some of the
general conclusions may be indicated. He is convinced that stomata are of
first importance in indicating phylogeny and relationships. Their structure he
claims is very constant within a group, numerous examples of this being given.
For example, the structure of the stomata of the Amentiferae shows that they
are nearer the level of the dicotyledons than of the gymnosperms or pterido-
phytes. In the same way it is shown that the Polypodiaceae constitute a
special group, and that the Osmundaceae, Gleicheniaceae, and Schizeaceae
approach more nearly the higher plants. A close resemblance is found between
the stomata of cycads and conifers, leading to the conclusion that these groups
are of common origin. Numerous illustrations of claimed relationships within
great groups are either confirmed or contradicted. Several new types of sto-
mata are described, among which those of Polypodium, Platycerium, Cycas,
and Casuarina may be cited. In connection with the last named genus it is
pointed out that its stomata are related to those of certain monocotyledons, as
the grasses and certain of the xerophytic Liliaceae. The contribution is a
valuable assemblage of facts in reference to the structure of stomata, accom-
panied by clear illustrations. The conclusions drawn from these facts are open
to discussion.—J. M. C.

Water conduction in trees and shrubs.—Farmer' has published the results
of an investigation of the comparative efficiency of the wood as a water-
conducting tissue in about 60 species of plants, chiefly trees and shrubs. The

no. 6. pp. 110. figs. 125. 1917.

12 Farmer, J. Bretland, On the quantitative differences in the water-conductivity
https://doi.org/10.1086/332456.

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