

All these cells are formed in the cambium where they start life very similar in shape, but soon they begin to differentiate. The rimu wood has only three cell types with the mass of the wood consisting of tracheids, which are ingeniously adapted to provide strength and also to conduct. Silver beech divides these jobs between two markedly different cell types. Drawings showed the progressively more complex structures and cell differentiation to be found in other hardwoods, tawa, oak, etc. As shown by these drawings and photos the principal features of the several cell types are: -

Tracheid. Long bluntly-pointed cell with thickened walls broken at intervals, especially on radial walls, by bordered pits; these pits connect with similar pits in adjacent tracheids and serve for conduction.

Vessel. A number of small lengths of tube, each originating as a cambium cell are connected to form a conducting pipe. The wall is typically thin and the cavity large.

Fibre. A double-ended short needle with thick walls and small cavity.

Parenchyma. In rays and longitudinal strands of thin-walled cells, frequently brick-shaped, connected to the conducting vessels or tracheids by large pits.

Microscopic Characters used in Identification.

1. Vessels "ring porous", e.g. oak, ash, and numerous other North Hemisphere hardwoods.
2. Vessels "diffuse porous", e.g. most N.Z. hardwoods.
3. Vessels absent, e.g. Softwoods.  
Sub-divide 1 and 2. (a) solitary arrangement; (b) radial groups; (c) other specific groups; (d) typical number in group; (e) size and shape.
4. "Perforations" between vessel segments (vertically):  
(a) Scalariform e.g. many of more primitive families e.g. Monimiaceae (Pukatea), Cunoniaceae (Kamahi).  
(b) Simple.
5. Wood rays, sub-divided according to:  
(a) Width, uniseriate (1 cell wide), biseriate (2 cells wide), multiseriate.  
(b) Composition, homogeneous (1 cell type), Heterogeneous (2 or more types)  
(c) Number per mm. in tangential face  
(d) Size, width and height average
6. Longitudinal parenchyma grouping  
(a) Metatracheal (not associated with vessels) frequently in tangential bands e.g. kohekohe  
(b) Paratracheal (around vessels) e.g. tawa  
(c) Terminal (at outer limit of growth rings) e.g. maire and tawa.  
(d) Diffuse, e.g. beech.

By analysing these numerous features it is generally possible to differentiate woods, and even to group them botanically in many instances. Similarities between related species and genera were shown in photomicrographs. Sometimes whole families will have some distinguishing feature such as "oil cells" in most genera of Lauraceae, and "looped" arrangement of vessel-parenchyma groups between broad wood rays in Proteaceae.

.....

THE DEVELOPMENT OF THE KIDNEY BEAN.

In the Transactions of the Royal Society (vol. 74 (2), pages 196-206, Sept. 1944) Dr. Holloway of Otago University, writes on the gametophyte, embryo and developing sporophyte of Cardiomanes reniforme (Forst.) Presl. The study is based on cultures grown from spores and maintained over a period of 6½ years. This is the first detailed account of the embryogeny of any member of the Hymenophyllaceae. Some of the points brought out indicate that Cardiomanes has closer affinities with Hymenophyllum than with Trichomanes, the genus to which it was previously referred.

.....