

character is. From the examination of some 1500 species I am convinced that the character of the medullary rays (which, by the way, are anything but medullary in the secondary wood) is the most constant feature and should form the basis of an artificial key, but it separates the genus *Betula*, the rays of which are but a millimetre high on a vertical section from *Alnus*, where they may run to inches, and it cuts the Leguminosæ into two halves, one of which has bold spindle-shaped rays in transverse section (*Ulex*, *Cytisus*, &c.), while in the other the rays seem to meander amongst the vessels like so many limp threads (*Mimosa*, *Gleditschia*, &c.).

Nevertheless, a useful key may be constructed by first distinguishing those woods with two kinds of rays (many *Cupuliferæ*) from those having but one. The latter then fall into two groups, one having rays which have intervals between them of not less than the transverse diameter of the largest pores present, the other conversely having the intervals between the rays never greater than the pore-diameter, *i.e.* the rays diverge and run round or avoid the pores. These two types of rays are very clearly marked and have quite different aspects. The arrangement of the vessels or pores can then be usefully employed, as the concentric radial, tree-like or undulating groups, or uniform distribution of the pores is very constant in many genera, as are

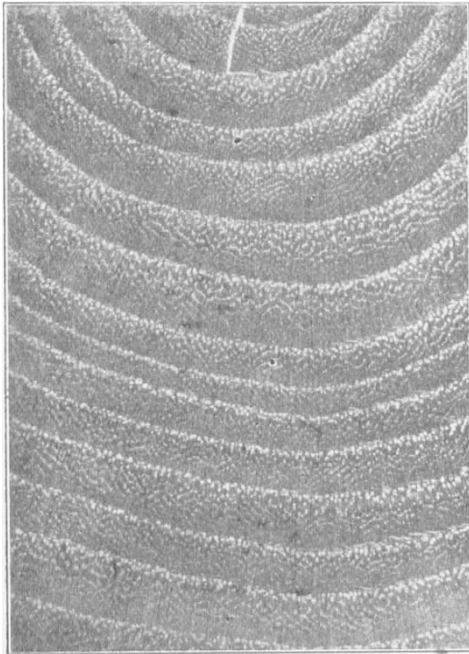


FIG. 2.—Common elm. Transverse section $\times 3\frac{1}{2}$.

also the equally varied forms assumed by the soft-tissue (wood-parenchyma), which comes next in order of importance. It would be out of place here to go into further detail, and it need only be pointed out that by following this sequence all members of the same genus except the aberrant forms fall together into the same ultimate group, which is not the case with Nördlinger's or any other key that I have used.

Many groups, or even whole genera, are so similar in structure that their species can only be distinguished by long acquaintance, *e.g.* *Fraxinus*, *Acer*, &c., and it is then necessary to have recourse to other features, such as the specific gravity, colour, smell, taste, hardness, behaviour with certain reagents, colour of their solution with water and alcohol, &c. Frequently these are so pronounced that a single feature may be sufficient to describe a species, as, for example, the offensively powerful cheese-like smell of *Goupia tomentosa* and the flinty hardness of *Lignum vitæ*, hence it has often been urged that if a wood can be so readily identified by such simple means, why employ a more complicated and less accessible method. No one underrates obvious characters, but there are thousands of species, hundreds of which are employed in the arts, that have no pronounced

feature of this kind to distinguish them. The value of the anatomical characters to the systematic botanist and to the trader is, however, in inverse proportion. The closer the resemblance in structure between the members of the same group the stronger the claim for a place in classification. On the other hand, the greater the dissimilarity the easier becomes their discrimination for commercial purposes.

CONFERENCE ON SCHOOL GARDENS.

A CONFERENCE on school gardens was held under the auspices of the Berkshire County Technical Education Committee at Reading College on Saturday. Mr. T. G. Rooper, one of His Majesty's inspectors of schools, read a paper on "School Gardens in England and in Germany," giving an account of those he has helped to institute in this country and others which he visited on the Continent. He dwelt, too, upon the provision made in Germany at the Pomological Institute for training elementary teachers, and one of his most interesting points was with regard to them. They are not, as here in England, expected in return for tuition, maintenance and travelling expenses, to attend courses of instruction during well-earned holidays, but they have the additional privilege of working at the Institute during term time, a substitute being paid to take their duty.

English school gardens, though at present comparatively few in number, are on all sides acknowledged to be the most practical yet instituted. Except in the case of those attached to continuation schools, no attempt must be made to utilise them for the technical teaching of gardening or otherwise than as mere training, mental and manual. A point obvious enough that was touched upon was that inspectors of schools should know something of horticulture if they are to report on school gardens and these are to be instituted in larger numbers. The importance of it is that, with very few exceptions, the inspectors are not at all well versed in the subject. County Councils cannot spend money directly upon elementary schools, but training of teachers they can arrange for, they can hold conferences such as the one here discussed, and their horticultural instructors may, and do, without breaking the law, give advice on the laying out of school gardens. Mr. J. C. Medd, in the course of his remarks, alluded to the Nature-Study Exhibition, with a view to holding which in London during next summer an association has just been formed. At this, which if it comes about will be greatly due to Mr. Medd's efforts, garden produce that may be in the proper condition at the time will no doubt be welcomed. Sir John Cockburn, lately Premier and Minister for Education in South Australia, is the chairman of the executive committee. Sir John, speaking at the Conference, alluded to "Arbor Day," upon which everyone in the antipodes who can plant a tree. The idea, one might say, is borrowed from America and is a very good one.

The difficulty of getting proper time for practical work was also touched upon by Sir John Cockburn, who said that, although one hour was all he could obtain at first, nevertheless, before he left South Australia, schools had been started in which only half the time was devoted to theoretical instruction.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

OXFORD.—At the 232nd meeting of the Junior Scientific Club on Wednesday, February 12, two papers were read, *viz.* "Colour and Chemical Composition," by Mr. S. A. Ionides, Balliol College, and "The Centrosome," by Mr. A. D. Darbishire, Balliol College.

By his will, Sir J. H. Gilbert, F.R.S., who was Sibthorpean professor of rural economy from 1884-90, and who died on December 23, 1901, bequeathed the portrait of himself by his brother, Josiah Gilbert, to the University of Oxford, to be placed in the library of the Sibthorpean professor of rural economy.

DR. F. T. TROUTON, F.R.S., of Trinity College, Dublin, has been appointed Quain professor of physics in University College, London, in succession to Prof. H. L. Callendar, F.R.S.

DR. W. H. WILLCOX has been appointed deputy lecturer in hygiene at Bedford College for Women, on the resignation of