Charles H. Carpenter, Lawrence Leney, Harold A. Core, Wilfred A.Côté,jr. and Arnold C.Day: Papermaking Fibers, a photomicrographic atlas of woody, non-woody, and man-made fibers used in papermaking.

Technical Publication No. 74, State University College of Forestry at Syracuse University - 1963

In the preface to the new edition of "Papermaking Fibers" the author's statement shows that Charles H. Carpenter published, as early as 1931, an "Atlas of Papermaking Fibers". This booklet has been out of print for rather a long time, a Syracuse team of scientists planned a new edition which appeared in October 1962. The index of the contents recites 42 softwoods and 45 hardwoods together with 18 plant fibres of miscellaneous origin. In addition to that, natural fibres of animal origin such as wool and silk, mineral fibres such as asbestos and man-made fibres such as rayon, nylon are included. In a short glossary, the most important terms of fibre structure are explained and in 77 plates the structures are described with extremely good photomicrographs. Each plate is commented on by a short text describing the single fibres. This atlas is a very helpful tool for anybody who has to identify fibres or describe special properties of fibre material. In this light, we can highly recommend it.

This publication is available, at a cost of $ 4.00 per copy, from the State University of Forestry at Syracuse University.

H.H.B.

MISCELLANEOUS

The IUFRO Section 41 has held a congress in Madison, Wisc., U.S.A. from September 11 to 13. During this meeting, a new organisation of this section was established. There are now three Working Groups, and the one on "Wood Quality" may be of interest for our members. Our former Secretary-Treasurer Dr.H.E. Dadswell, Director of the Forest Products Research Laboratories in Melbourne, is the chairman of this group. Under his most active and stimulating leadership the discussions in the field of wood quality have been a real success. It is planned to work in future along four different lines: spiral grain, specific gravity, fibre characteristics and hardwood formation. These subjects are covered by one sub-group for microscopic characteristics where Prof. Dr. W.Knigge holds the chairmanship. Another sub-group (Chairman: Dr J.H.Jenkins) deals with the macroscopic characteristics and will concentrate its work on: quality requirements for each specific end use, relationship between the visible surface characteristics and the interior wood quality, standardization of terminology and preparation of a glossary, tree-growth stresses and effect of pruning on wood quality.
A number of our members has attended the Madison Congress; thus close co-operation between the IUFRO Section 41 and our Association will be easily possible and will certainly contribute to the benefit of both.

H.H.B.

INTERNATIONAL ASSOCIATION OF WOOD ANATOMISTS

NEWS BULLETIN 1964/1

Edited by the Secretary Treasurer Zurich, Switzerland
Office: Laboratorium für Holzforschung E.T.H. Universitätstrasse 2

EDITORIAL

Your Secretary Treasurer has the pleasure of announcing that the "Multilingual Glossary of the Terms used in Wood Anatomy" is now ready for publication. The 2nd English edition of 1957 has been translated into French, German, Italian, Portuguese, Serbo-Croatian and Spanish, so that we possess a comparative dictionary covering seven languages. A certain number of definitions have been improved and terms mentioned as deprecated in the last edition have been dropped.
The funds at disposal are insufficient for a manual published by the I.A.W.A. alone. Wo we tried to place it in a similar series as the former edition which appeared in the periodical "Tropical Woods". The director of the Swiss Forest Research Institute, Prof. Dr.A. Kurth, took an interest in our Multilingual Glossary and offered to publish it in the Proceedings of his Institute. Further financial help could be obtained from the president of the Centenary Foundation ETH 1955, Prof. Dr.H. Pallmann.
The total costs of our publication amounts to about sFrs. 10'000.-- which sum will be covered by the following budget: I.A.W.A. sFrs. 2'000.-; Swiss Forest Research Institute sFrs. 3'000.--; Centenary Foundation ETH sFrs. 5'000.--.

I wish to thank President Pallmann and Director Kurth in the name of the members of the I.A.W.A. very sincerely for their really substantial help.
We hope to issue the Glossary with a comparative index by the time of the Xth International Botanical Congress at Edinburgh in August 1964 and to circulate it whenever possible to the members beforehand.

Hoping to seeing many of you in Edinburgh,

A. Frey-Wyssling
Secretary Treasurer

April 1964

SCIENTIFIC REVIEW

RELATION OF WOOD DENSITY TO WOOD STRUCTURE IN POPULUS.

by G. Scaramuzzi and G. Ferrari

"Centro di Sperimentazione Agricola e Forestale"
E.N.C.C., Rome, Italy.

Introduction

Wood density is widely used as a criterion of wood quality because of its close relationship to the strength of wood and to pulp yield. The reason of this relationship is that specific gravity expresses the amount of wood substance present per unit of volume.

Wood density varies directly with the proportional amount of the different kinds of cells, the size and cell-wall thickness of such cells, the amount of infiltration present in the wood. Variations in the packing density of cell-walls have also recently been proved.

The relationship between specific gravity and wood structure has been quantitatively investigated by several workers in conifers and regressions of specific gravity on percentage of summerwood have been obtained for a certain number of species. On the other hand, very little information is available for hardwoods.

The problem is presently being approached in our laboratory for two groups of diffuse-porous hardwoods, poplars and eucalypts, with the main purpose of a better understanding of the factors governing wood density, which is needed in wood quality improvement programs. On the base of the results of preliminary tests, the possibility of using wood structure data for the evaluation of specific gravity in small wood samples from standing trees has also been considered.

More advanced results are presently available for poplars and special reference will be made to them here. Data so far available for eucalyptus, however , show similar conditions.

Experimental

In view of their wood structure uniformity, materials of different species were included in the investigation, namely of Populus tremula L., of five cultivars of P.x euramericana (Dode) Guinier and of two cultivars of P. deltoides Bartr., covering a total of twenty-five trees ranging from 9 to 78 years of age.

Taking into account the high proportion, specially by weight, of the fibre tissue to the whole, consideration was limited to the proportion of fibres and their cross sectional dimensions.

A brief description of the procedure adopted will be given. The materials examined were in the form of stem cross sections taken from the utilizable bole. Representative, axially consecutive, samples were cut from each cross section, to be used respectively for specific gravity, fibre dimensions and fibre volume determinations.

Wood density (oven-dry weight/green volume) was determined by conventional methods. The proportion of fibre-tissue was measured on wood cross sections using an integrating stage. Fibre dimensions were determined on isolated elements, in surface view, with a projection microscope measuring 250-500 fibres for each specimen; the standard error did not exceed 1.5 %. Dimensions were conventionally measured in the zone of maximum fibre width.

Specific gravity values were first plotted against the values of fibre-volume, of the various fibre characteristics considered or combinations of them to dectect possible relationships. When promising conditions appeared, the data were submitted to statistical analysis. The results of the analysis are shown in the table.

Specific gravity was closely related to relative fibre-wall thickness, i.e. ratio fibre-wall thickness to fibre radius (2p/l). The simple regression accounted for 86 % of the total variation of specific gravity, ranging from 0.264 to 0.509 gr/cm^3. The inclusion of the volume of fibres in the product V_fx2p/l decreased the accountable variance to 84 %, which could be attributable to the very low correlation of wood density to the volume of fibres (V_f). Simple regressions of specific gravity on fibre-wall thickness (p) and fibre-width (l) accounted respectively for 71 % and 40 % of the variance.

A multiple regression including fibre-wall thickness (p) and fibre width (l) as components of the independent variable accounted for 89 % of the variation. Here again the further addition of the proportion of fibres caused a slight decrease of the accountable variation. Partial regression coefficients were all significant at the 0.01 level, except for V_f coefficients, which resulted not significant.

The standard error of estimate ranged from 0.02437 (= 6.6 % of the mean specific gravity), in the multiple regression involving fibre-wall thickness and fibre width, to 0.05590 (= 15.2)%). The standard errors for multiple regressions involving (p,l,V_f) and for simple regressions with 2p/l and V_fx2p/l proved close to the best condition.

The results obtained show a very close dependence of wood density on wood structure in the materials investigated, approximately 90 % of the total variation of specific garvity having been accounted for by wall thickness and fibre width. A predominant influence was proved by cell-wall thickness , which alone accounted for 71 % of the variation. The proportion of fibres proved a negligible influence. The possibility of evaluating wood density from cross sectional fibre dimensions to an acceptable degree of accurancy was proved. Investigation is beeing extended to further materials to obtain regressions for the single species.

Relationships between wood density (oven-dry weight/green volume) and various wood structure characteristics tested for the materials investigated. Linear regressions, correlation coefficients and standard errors of estimate.

Wood or fibre charact.	regression equatation	correlation coeffic.	standard error of estimate
p	d_b=0.10253+0.05872 p	0.844*	0.03835=10.4%
l	d_b=0.69595-0.01134 l	-0.634*	0.05590=15.2%
2p/l	d_b=0.14073+0.71164 2p/l	0.929*	0.02709= 7.4%
V_fx2p/l	d_b=0.13028+0.01285 V_fx2p/l	0.919*	0.02844= 7.7%
p,l	d_b=0.36246+0.05088 p-0.00774 l	0.945*	0.02437= 6.6%
2p/l,V_f	d_b=0.16580+0.70262 2p/l-0.00038 V_f	0.927*	0.02778= 7.6%
p, l,V_f	d_b=0.28830+0.05003 p-0.00924 l+0.00208 V_f	0.937*	0.02513= 6.8%

p=fibre-wall thickness; l=fibre width; 2p/l=ratio fibre-wall thickness to fibre radius (=relative wall thickness); V_f=percentage volume of fibres; d_b=wood density; *= level of significance 0.01.

BOOK REVIEW

LINDEMAN, J.C. and MENNEGA, A.M.W. : Bomenboek voor Suriname

Mededeling van het Botanish Museum en Herbarium, Rijksuniversiteit Utrecht No. 200. Edit. Kemink en Zoon, Utrecht 1963. 312 pages text, 16 pages photographs of trees, 96 plates and 96 photomicrographs.

This is a wonderful book. It includes 370 trees species, 120 of which are shown by excellent line-drawings of their leaves, flowers and fruit. Beautiful photographs of trees with a characteristic appearance are included. The wood of species used as timbers is fully described and explained by photomicrographs of cross-sections. - The description of the plants is arranged in alphabetical order of the families and of the genera within a family. Two dichotomous identification keys allow of finding the name of a given tree. These have been drawn up with the help of punched cards prepared by the authors. The first makes use of vegetative characters (leaves, twigs, bark) disregarding flowers and fruit used in floras. The second key is based on the anatomy of the wood as disclosed by a hand-lens. A taxonomic survey of the families involved indicates not only the numbers of the described genera and tree species, but also includes the numbers of all the other woody plants (shrubs and vines) in Surinam. A bibliography and alphabetical lists of the scientific and local tree names conclude the book. - In a way it is a pity that this standard monograph is written in the Dutch language. For scientists who master this language it possesses a special flavour and excites admiration for the Dutch scientific achievements in the East Indies. The unfamiliarity of many Anglo-Saxons with continental languages may, however, prevent this valuable "Book of Trees in Surinam" from obtaining the international recognition it so highly deserves. Fortunately there are short introductions in English and Spanish which explain the use of the identification keys, and the Dutch terms involved are illustrated by line-drawings. F.W.

INTERNATIONAL ASSOCIATION OF WOOD ANATOMISTS

News Bulletin

ZÜRICH 1964/2

Editor: A. Frey-Wyssling, Secretary-Treasurer