

The background of the cover is a detailed black and white micrograph of plant tissue. It shows several vascular bundles arranged in a ring. Each bundle contains a central pith, surrounded by a cortex, and then a large secondary xylem region with distinct growth rings, and a secondary phloem region. The cellular structure is highly detailed, showing various cell types and their interactions.

IAWA
BULLETIN

1972 / 2

OUR COVER

The cover of the IAWA Bulletin for 1972 consists of photomicrographs (cross- and tangential sections) of *Apeiba membranacea* Spruce ex Benth., Family Tiliaceae. Broad bands of radially aligned parenchyma cells are prominent features in this species.

The material was collected on 5 August 1933 by Boris A. Krukoff (No. 5304) in the Territory of Acre, on the Rio Purus, Brazilian Amazonia. The slide was prepared by Mr. A. C. Day from specimen BWC_w No. S12437 which was borrowed from the Harry Philip Brown Memorial Wood Collection at State University of New York College of Forestry. Photomicrographs were prepared with the assistance of Mr. J. J. McKeon. Magnification: 70X.

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The International Association of Wood Anatomists was organized in 1931 to advance the knowledge of wood anatomy in all its aspects. It does this in part by attempting to promote and facilitate cooperation among the relatively small number of specialists in wood anatomy.

Prospective members are invited to write to the Office of the Executive Secretary for a copy of the Constitution, an application form, and information about IAWA. Membership dues, which includes a subscription to the IAWA Bulletin, are currently \$3.50 (U. S.) per year.

EDITORIAL

Your editors faced the preparation of this issue of the IAWA Bulletin with considerable concern. Not only is there little activity to report in the field, but technical papers or notes simply are not coming to us for publication. Four issues a year does not require many contributions; eight or ten short papers from a membership of nearly 200 would seem to be reasonable. In this 1972/2 issue we have had to proceed with but one short note. Won't you consider sending us something soon?

With the mailing of this lean issue, we are also sending the revised membership directory and a mail ballot on a constitutional amendment. Details on both of these items are found under Association Affairs.

A number of our Associate Members will be completing their advanced studies this year for the M. S. or Ph.D. degrees. Employment opportunities, always rather restricted in the field of wood anatomy, may be worse than ever this year due to the economic situation in many countries. Members having knowledge of open positions, or opportunities that may be developing in the future, are urged to use the IAWA Bulletin to inform these colleagues. Similarly, persons seeking employment in the broad field of wood anatomy are invited to submit short items for publication in future issues.

W. A. Côté

C. H. de Zeeuw

COMPRESSION WOOD IN *Pinus ponderosa* Laws.

-- A SCANNING ELECTRON MICROSCOPY STUDY

By

S. M. Jutte* and J. F. Levy

(Department of Botany, Imperial College, London)

In a branch (10 growth rings wide) taken from a *Pinus ponderosa* Laws. tree, compression wood was strongly developed. Radial longitudinally-split surfaces were prepared from the fourth and fifth growth rings using the method described by Jutte and Levy (1971) for studying wood structure with the scanning electron microscope (SEM). The wood was first fixed for two hours in 2% KMnO_4 at room temperature, washed thoroughly in distilled water and air dried.

It is useful to compare some of the SEM micrographs of compression wood with corresponding results obtained with the transmission electron microscope (TEM). Many have been published from both sections and replicas of softwood species, amongst others by: Côté and Day (1965), Côté *et al.* (1966), Harada *et al.* (1958), Wardrop and Davies (1964), Wergin and Casperson (1961), Casperson and Zinsser (1965).

The characteristics of compression wood are summarized by Côté and Day (1965). The features are possibly most prominent when seen in transverse sections.

This specimen of branchwood exhibited the well-known compression wood patterns. The helical cell wall ridges and checks were most obvious where

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compression wood was heavily developed (Figs. 1 and 2). The ridges of the inner S_2 were at an angle of approximately 45° with the vertical axis. The grooves between the ridges were deep to very deep, giving rise to a "split" surface. The whole surface of ridges and slits was covered with a warty layer (Figs. 2 and 5) as was found by Wardrop and Davies (1964) and Harada *et al.* (1958). The intercellular spaces and rounded cell outlines could also be traced here, though they are not as prominent as in transverse sections (Fig. 1, arrow).

Figs. 3 and 4 show a distinct transition from normal to fully developed compression wood tracheids. The ridges are clearly developed with only a shallow groove between them and almost horizontally orientated. The lumen wall interface is covered, in both normal and compression wood tracheids, with a warty layer (Figs. 3 and 4).

Another feature in compression wood tracheids is that bordered pits can be observed in which the shape has changed. It would be interesting to make a more detailed study of this type of pit. No real domes could be observed, the aperture being sunk in a slit between the ridges.

Finally it can be said that the scanning electron micrographs give a clear picture of the compression wood structure. The longitudinal surfaces show up especially clearly in the SEM where preparation difficulties and associated artifacts are less than in the TEM. Both instruments should be used in combination to give a true overall picture of the morphology of compression wood.

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CAPTIONS

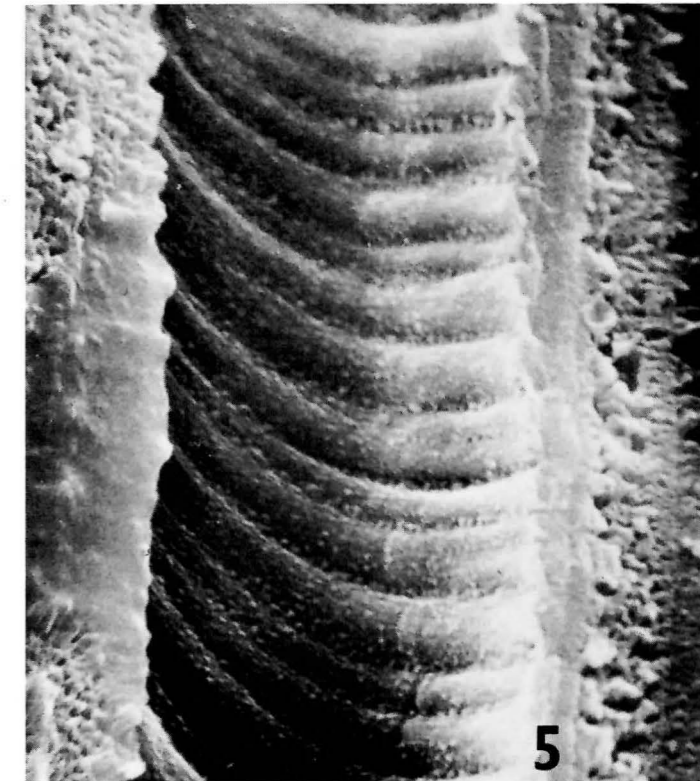
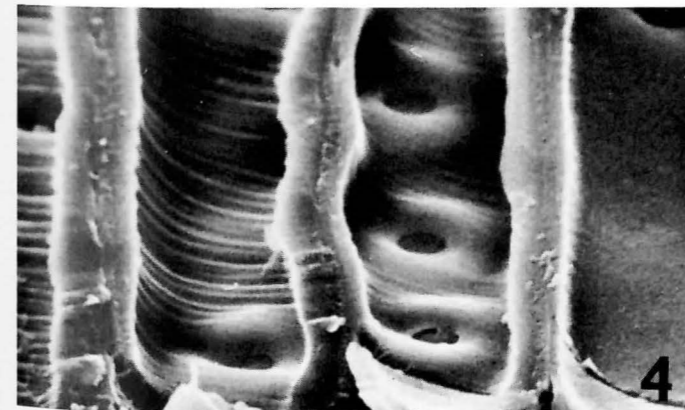
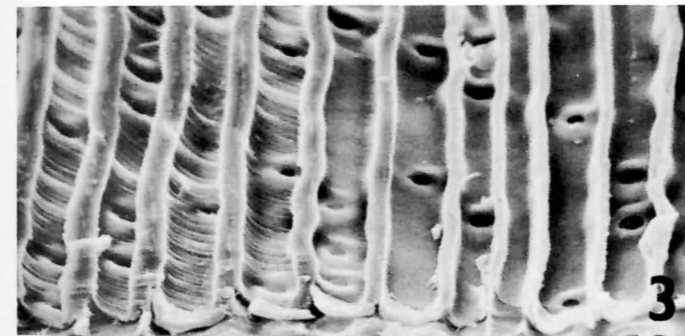
Figure 1. Three tracheids showing typical compression wood structure at the interface of cell wall and lumen. Where the S-layer is split off, the intercellular "spaces" are obvious (arrow). (1200X)

Figure 2. A reaction wood tracheid from Figure 1 enlarged to display the prominent ridges and fissures covered with a well developed warty layer. (6000X)

Figure 3. Distinct transition from normal to compression wood tracheids which are not strongly developed. Note the change in shape of the bordered pit dome. (500X)

Figure 4. Close up of central portion of Figure 3 giving a more detailed picture. The warts, although small at this magnification, are found on the surfaces of all tracheids. (1500X)

Figure 5. Transition compression wood tracheid. The shallow ridges and grooves, which are not as steep as in the strongly developed compression wood, are covered with a warty layer. (6000X)



ASSOCIATION AFFAIRSAmendment to IAWA Constitution

With the mailing of this issue of the IAWA Bulletin you should find a pink sheet which forms the basis of a mail ballot on changes to the Constitution of the Association. The memorandum is self-explanatory and we simply urge you to participate in the voting on these changes at your early convenience. The results of the election will be reported in a future issue of the Bulletin.

New Membership Directory

Also sent with this issue of the Bulletin is a new Membership Directory that includes information provided through a survey made in conjunction with dues payments for 1972. All those members who supplied the information requested will be listed with code letters following their names indicating the type or types of activities in which they are involved. It was felt that this information might prove to be useful to all members who have research projects or other interests where they might seek the cooperation of other members of the Association.

Unfortunately, not all members have responded nor have we been able to obtain the latest addresses for certain individuals. For example, we seek the assistance of our readers in determining the present whereabouts of members R. Hejazi and P. A. Wanaraks. Mail to these members has been returned as undeliverable.

Members Deceased

We regret to report the death of two members of IAWA, Dr. Albina Messeri and Dr. H. H. Pfeiffer. News of these losses reached us through indirect means and we have been unable to get complete information about the circumstances in either case. Dr. Pfeiffer was affiliated with the Lab. für Polar-Mikroskopie, Bremen, Germany. We have no indication of Dr. Messeri's last affiliation.

New Members

Since issue 1972/1 the following new members have been elected to membership in IAWA:

Dr. Salvatore J. Cudia
Biology Department
State University College
Fredonia, New York 14063

Dr. Rajni N. Patel
Forest Research Institute
Private Bag
Rotorua, New Zealand

Dr. Ing. Ladislav Kučera
ETHZ
Institut für Mikrotechnologische
Holzforschung
Universitätstrasse 2
CH 8006 Zürich, Switzerland

Dr. Božidar Petrić
Wood Structure & Preservation
Section
Forestry Faculty
University of Zagreb
P. O. Box 178
41001 Zagreb, Yugoslavia

Dr. Lidija Murmanis
U. S. Forest Products Laboratory
Madison, Wisconsin 53705

Dr. John T. Quirk
117 North Franklin Avenue
Madison, Wisconsin 53705

We welcome these new members to the Association and wish to remind all members that there is still great opportunity for increasing the enrollment of the Association since many wood anatomists have never been considered for membership nor approached by us. If we are to broaden the base of our activities, we should recruit active wood anatomists whenever possible.

WOOD ANATOMY ACTIVITIES AROUND THE WORLDWood Samples in the Scrophulariaceae Wanted

I am seeking authenticated wood samples from stems of trees or shrubs in the Scrophulariaceae with the exception of the genus Paulownia Sieb. & Zucc. Samples of the following genera are particularly desired:

Aragoa Kunth.

Dermatocalyx Oerst.

Eremogeton Standl. & L. O. Williams (Syn. Ghiesbreghtia A. Gray)

Gerardia Benth.

Halleria Linn.

Monttea C. Gay

Please write if you have samples for exchange or can collect material.

Carl de Zeeuw, Curator
H. P. Brown Wood Collection
SUNY College of Forestry
Syracuse, New York 13210
U. S. A.

Film on Three-Dimensional Structure of Wood

Dr. Martin H. Zimmermann has informed us of the availability of a 16 mm film about the three-dimensional structure of wood. The film runs for seven minutes and is made up entirely of individual frames of transverse sections of wood. The motion seen on the screen is not real, but it is simulated by the transformation of the axial dimension of wood into time.

Reprints of an article, "Dicotyledonous Wood Structure (Made Apparent by Sequential Sections)", by Dr. Zimmermann are available by request from him.

The article appeared in Encyclopaedia Cinematographica, a publication of the Institut für den Wissenschaftlichen Film in Göttingen, Germany. A summary from this article is as follows:

"Serial transverse sections of secondary xylem have been photographed, frame by frame, with a motion-picture camera. The three-dimensional structure of the specimen is thus transformed into a moving two-dimensional picture. The resulting film shows four features of wood structure, three of which are not easily revealed by conventional methods of wood anatomy.

1. Vessels are made up of chains of vessel elements.
2. Vessels are of finite lengths, their ends are nearly always located within clusters or at least pairs of vessels.
3. Vessels show individual tangential deviations from their axial paths, they group and re-group repeatedly with other vessels.
4. Vertical and ray parenchyma cells form a continuous three-dimensional network."

The film itself may be obtained through various agencies throughout the world. This information is also available through Dr. Zimmermann along with the reprinted film description mentioned above. His address is:

Dr. Martin H. Zimmermann, Harvard Forest, Petersham, Massachusetts 01366
U. S. A.

BOOK REVIEW

Rao, K. Ramesh and K. B. S. Juneja: FIELD IDENTIFICATION OF FIFTY IMPORTANT TIMBERS OF INDIA, Forest Research Institute and Colleges, Dehra Dun, India, PFRI. 152/2090, 1971.

Publication written in English, 123 pages, 14 x 22 cm., illustrated with line drawings, price Rs 3.20 or £ 0.37 or \$1.16.

This publication has been designed for field use by persons without extensive knowledge of wood anatomy. The first twenty-seven pages are devoted to an illustrated discussion of the gross and hand lens features used for description and identification of the various woods. Chapter V devotes forty-nine pages to descriptions of the kinds of wood with each one illustrated very clearly with 10X drawings of cross sections. A workable dichotomous key is included and a tabulation of data is presented so that a punched card key may be constructed. An appendix contains a coded table which indicates availability and uses, as well as seasoning, durability and treatability in relative terms for each of the timbers. The publication is well indexed.

A very useful book which has been carefully designed and written. This publication can well serve as a model for field manuals in many other countries which now lack any aids to wood identification for persons without formal training in wood anatomy.

LETTERS TO THE EDITOR

Dear Professor Côté:

... "may I say how much I look forward to receiving the I. A. W. A. Bulletin; it is so well produced and full of interest. Involved, as we are, with very practical applications of plant anatomy, particularly with the identification of timbers, it is good for us to have a journal which enables us to read about the research of colleagues and to be aware of recent developments."

(3/72)

Signed: Dorothy M. Catling