

Botany. — *Contact prints of wood.* By L. G. M. BAAS BECKING and JOHA. WALENKAMP.
(From the Botanical Institute, Government University, Leiden.)

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In the excavations performed under the direction of Prof. Dr. A. E. VAN GIFFEN several specimens of wood, in various stages of preservation, have been brought to light. In order to obtain a permanent record of the characteristics of those samples, the handling of which is often cumbersome, a method was developed which enabled us to obtain many prints from a single sample of wood. The method described in this note has been applied chiefly to cross-sections. Although tangential and radial sections yielded promising results, the preparation of contact prints on these planes has not yet been fully worked out.

1. Oak wood (*Quercus sessiliflora* Sm.).

Cross sections of logs were made by means of a saw and those sections were carefully planed. From such a freshly planed section contact-prints cannot be obtained. After 3—4 days drying sufficient relief appeared. Observing the section with a hand lens at a glancing angle showed the vessels protruding from the rest of the tissue. This differentiation of high and low relief is brought about by the differences in the directions of maximal swelling, which is perpendicular to the direction of the micellae. Observation of thin radial sections under polarized light corroborated this supposition.

Shrinkage of wood-parenchyma and medullary-ray cells rather than changes in the longitudinal dimension of the vessels, therefore, caused the surface-differentiation necessary to prepare contact-prints.

Plaster casts of the above-mentioned surface showed beautiful details, the individual vessels (appearing as pits) being clearly visible by means of a hand lens.

If, on the contrary, dry oak wood is cross-sawed and planed and afterwards soaked in boiling water for 15—20 minutes, a differentiated surface appears which is, in a great many respects, a counter-mould of the first-mentioned cross-section. The vessels appear either flush with the surface, but mostly sunken. Medullary rays and parenchyma appear in high relief. A plaster cast of such a surface shows the vessels as rings, while much detail may be observed of both ray- and other parenchymatous tissue.

Prints were made of the above preparations by either inking the surface, covering it with a suitable paper and hammering the top-side of the paper with a felt-covered hammer, or the ink was applied on the top-side of the paper, and "hammered-through".

Inking of the wood-surface yielded the best results. We used the following inks and stains; printers ink, mimeograph ink, copy-ink, Indian ink, Azure-blue, Fuchsin and Nigrosin-black. The Nigrosin-black proved to be the most suitable. The ink has to be almost dry before a print can be made. The paper which proved to be most suitable was a very thin type writer copy-sheet. Cellophane, however, yielded the most superior results, if its surface is free from grease.

Collodion films prepared on top of the inked surface gave trouble because of the many air bubbles escaping from the lumina of the vessels and so rupturing the film.

Figure 1 shows a paper-nigrosin print of a cross section of oak wood, obtained from the foundation of a Roman Castellum, excavated near Valkenburg S. Holland and marked 520. This wood was sawed when wet and allowed to dry afterwards.

Photo 1 shows a part of this print, enlarged 15 times. Much anatomical detail is visible.

Photo 2 is made from a cellophane print, enlarged 15 times. The wood (recent oak) was sawed when dry and soaked in boiling water afterwards. Much more detail is visible in this print, which is, in many respects, a counter-mould of Photo 1.



Fig. 1.

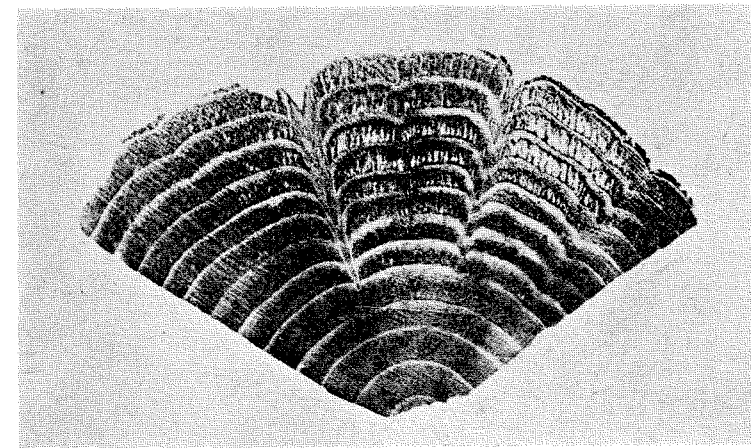


Fig. 2.

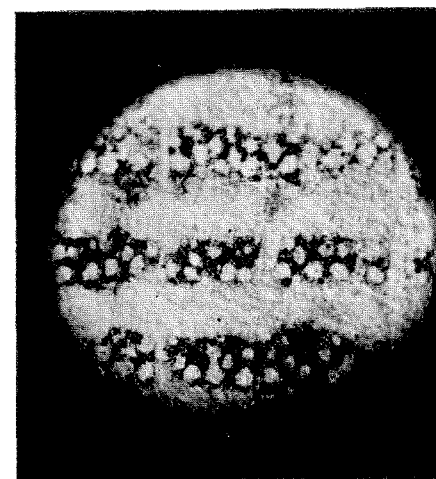


Photo 1.

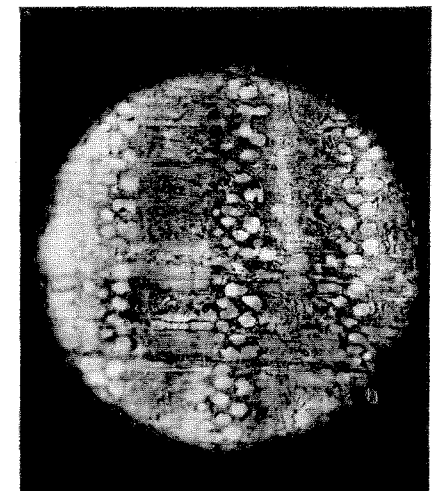


Photo 2.

2. *Other, so called "ring-porous" wood yields suitable prints.*

Both elm and ash, recent and excavated, were used.

3. *Coniferous wood.*

One might expect scanty detail in contact prints, due to the monotonous anatomical structure. To our surprise, however, good prints could be obtained. Figure 2 shows a nigrosin-paper print of *Pinus radiata* Don., the Monterey-pine. The spring-wood takes the ink, the closer-built and more resinous autumn-wood fails to take the stain (Figure 2). With several other conifers, e.g. *CEDRUS*, *ABIES* and *TAXUS*, similar results were obtained. In some cases an effective counterstain could be found in Scarlet red, which stained the autumn wood. Two-colour prints were made in this way.

Further trials are needed to perfect the method outlined in this note. It seems possible, in collaboration with a wood-technologist, to elaborate a field method, by which a complete record could be obtained from the stems of a felled parcel of forest, the records of which may yield valuable information both to the ecologist and to the forester.