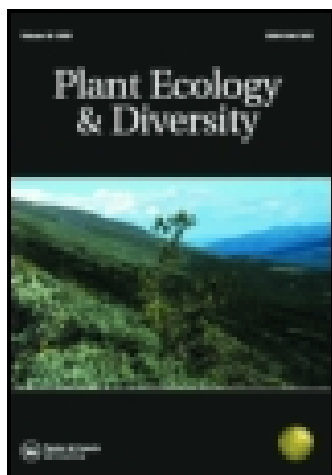


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### V. On the Indian Woods that have been tried for Engraving

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parts where the current ran less rapidly, its aerial fronds with their narrow revolute segments rising aslant above the surface, while the natant leaves spread out their broad segments a little beneath, being submersed rather than natant. What is novel in it to me is its mode of multiplication, the species being propagated not by the usual spores, but by axillary and occasionally marginal buds becoming perfect plants on the parent frond. The pressed portions inclosed exhibit the two forms the fronds assume, on one of which the little marsupials are shown in various stages of growth. A minute roundish leaf is the first produced, others following with gradually increasing dimensions, but of the same form, till a genuine frond is unrolled, the little plant having in the meanwhile shot out several roots vertically into the water, and laterally along the surface of the parent segments. The aerial fronds of this plant are much divided into narrow segments, which have their margins rolled back upon themselves, so as to make them look narrower still. The segments of the submersed leaves are broad. The embryo plants thrive equally well with their leaves above or below water, and separation takes place only by the decay of the mother frond."

The aquatic fern referred to by Mr Thomson is *Ceratopteris thalictroides*, (Brongn.) It is found in the tropical parts of the Old and New World, and has been figured in Hooker's "Exotic Flora." Its viviparous character is well known. The specimens sent are very characteristic. An *Asplenium* sent by Mr Thomson is not easily determined. It is possibly only a form of *A. Trichomanes*. In the Grevillean Herbarium, there is a fern from New Holland very much resembling it, but unnamed. The rhizomatous fern of Mr Thomson is a *Davallia*, probably a form of *D. Canariensis*. In many respects it resembles *D. bullata*, which is found in Assam and Nepaul, as well as *D. pyxidata* of the southern hemisphere. The segments of the frond are rather broader and longer than those of the ordinary form of *D. Canariensis*.

IV. *On the Palms of the Feejee Islands.* By Mr WILLIAM MILNE. Communicated by Professor BALFOUR.

Mr Milne stated that after the departure of the Herald for Sydney on 28th October 1856, he examined the palms of the Feejee Islands, and the following are those which he observed:—1. *Cocos integrifolia*. 2. Dwarf Coco-nut Palm, which seldom exceeds 12 feet in height. 3 and 4. Two species of *Areca*. He also noticed several forking varieties of palms as occurring on the islands.

V. *On the Indian Woods that have been tried for Engraving.* By ALEXANDER HUNTER, M.D., Madras.

It may interest the Society to know that the results of the experiments commenced in the School of Arts at Madras in 1853, to improve the illustration of the literature of India, attracted considerable attention in London, Edinburgh, and Glasgow, where specimens of the woods and of the engravings upon them were exhibited. For several years the attempts were very feeble and indifferent, although much on a par with the early efforts at illustration in England about sixty years ago. Rewards were offered for the best kinds of wood produced, and the following were the results:—

The Guava (*Psidium pyrifera*) was found to be close-grained and moderately hard, with a thin bark and pretty uniform texture of both the

outer and inner parts of the wood when cut across the grain. It cut easily and cleanly like firm cheese, and gave delicate lines; but being a little softer than boxwood it did not stand the pressure of printing, though it yielded very good impressions with a burnisher. The art of printing from woodcuts being in its infancy for illustrating literature in India, many of the early impressions were spoilt from too heavy pressure. For four or five years the guava was used, and answered well for bold engraving, or for cutting blocks for large letters; attempts to cut small letters upon it for a Tamil alphabet proved a failure, though the large Tamil and English alphabets succeeded very well, and were useful for several purposes, as printing large school and diagram letters, stamping on cloth and clay to get letters or numbers for use in schools. The guava-wood was found to vary very much in texture, the large trees yielding a soft, coarse wood, while the small wood from hilly districts was hard and fine in the grain. Samples that had been sent to England, and tried for engraving, were pronounced to be too soft, and inferior to English boxwood.

The Satinwood of Ceylon (*Chloroxylon Swietenia*) proved to be hard, but uneven in the grain, coarse in the pores, and, like many woods of a large size, harder and denser in the centre than near the bark. Under the graver it was found to splinter, and not to cut sweetly or turn over in curls as it ought to do. This wood was condemned as unsuited for wood-engraving both in Madras and England.

The Palay (*Wrightia tinctoria*). The native name is a very vague one, being applied to a number of woods that have a milky juice. The wood, however, is better known to the public as one from which native toys are frequently turned. It is a pale, nearly white wood, close and uniform in the grain, but too soft to stand printing. It cuts smoothly, but does not bear delicate cross-hatching. It was pronounced unfit for wood-engraving in England, though well suited for turning, carving, and inlaying with darker woods. A kind of indigo is obtained from the leaves of this tree.

Veppaley or *Wrightia antidysenterica*, was found to be very hard in the centre, but soft in the outer portions, and liable to the attacks of insects. On examining this wood under the microscope it gave promise of being suitable for the purpose, from the closeness of texture and the polish left by the chisel in cutting it across the grain, but the uneven quality and the softness of the outer parts showed that it was not fit for engraving. Its chief use is for posts and rice-beaters.

Sandalwood (*Santalum album*) proved to be the nearest approach to the boxwood in working quality, hardness, and durability under pressure. This is a moderately-sized wood, with thin bark, which is usually a criterion of fine even grain. It cuts smoothly, the chips curl well under the graver, and the oily nature of the wood seems to preserve it from splitting when wet. There are considerable differences in sandalwood, according to the locality from which it is procured, the small, dark coloured wood of 5 inches diameter, grown on dry rocky soil, being the best. Many hundred engravings have been executed upon this wood, and it has been found occasionally to equal boxwood, though it is not quite so hard. It is an elastic wood that hardens on exposure to the air, and stands a good deal of rough usage in the press; some blocks have yielded upwards of 20,000 impressions without being worn out. The large pale sandalwood is not so good as the small dark kinds. This wood was not tried in England, as its price was thought to be too dear, but on comparing it with boxwood, which sells in England for one penny the square inch, it was found to be cheaper in India than boxwood in England, though it

is ten or twelve times the price of any of the other woods that were tried.

The Beyr-fruit tree (*Zizyphus Jujuba*) gave good promise under the microscope, but proved to be a soft, spongy, light wood, that did not stand cross-hatching or pressure. It is used for native sandals.

The wood of the wild orange (*Citrus Aurantium*) bears a strong resemblance in appearance to box in working qualities, and is often as hard, but, like the sandalwood, the small old trees from the hilly districts yield the best wood for engraving. It has a very thin bark, a bright yellow colour, and a very uniform and close texture. The cultivated or garden orange has a coarse wood with a very uneven texture, produced in some cases by a curious mode of propagating the trees—viz., by splitting down the parent stem and planting every piece that has a root attached; a barbarous and primitive mode of culture, but thought by the natives to improve the fruit.

It was reported that a kind of boxwood was common in the gardens about Madras, but on procuring a specimen of the flower and fruit of the tree for examination, it proved to be a species of China orange, the *Murraya exotica*, with a very small fragrant fruit little larger than a pea. On trying the wood for engraving, it proved to be like the wood of many of the Aurantiaceæ or orange family, hard and close in the grain near the centre, but softer near the bark. The cross section of this tree is very irregular, being deeply indented, from the same mode of propagation as is followed with some of the garden orange trees. The result of this is that both the wood and bark of the tree are impaired, though the flowers and fruit are not. The flower of this plant is used by brides'-maids instead of the true orange blossom, which it resembles.

A wood that disappointed the expectations that had been formed of it from the first trial was coffee (*Coffea arabica*). The first piece of this that was sent to the School of Arts was very hard, uniform and close in the grain, but small. Some pieces of old trees, about 6 inches in diameter, were afterwards procured, but they proved to be soft, uneven in grain, and not fit for engraving, though the wood is well adapted for ornamental carving or inlaying. We should be glad to hear more about this wood, and to receive other specimens of young and old wood cut when fresh. The specimens sent us were old trees that were past bearing, and that had been pulled up, left on the ground for a few weeks, and then dried near the cook-room fire for some days; a great mistake, as woods for engraving ought not to be too dry. This wood works beautifully on the turner's lathe, and cuts very sharply under the chisel, gouge, or graver; it is deserving of more attention for ornamental carving and inlaying. It harmonises well in colour with the orange and with the wood of the *Inga dulcis* or Corookapoolee. It approaches in colour and grain to walnut, but is too coarse for engraving, though fit for gunstocks and cabinet work.

The only other woods tried for engraving were—1. A very close-grained fine and uniform wood which was sent from the Neilgherries under the name of iron wood, used for turning and for making walking-sticks; it worked well under the graver and on the turning lathe, but the piece sent was too small to print from. 2. A piece of *Fustic* (*Maclura tinctoria*) that had been grown in the Horticultural Gardens at Madras, but this proved to be too soft and coarse for engraving, though a rich-coloured bright yellow wood, suited for inlaying.

About two years ago, it was reported that true boxwood was discovered in the North-West Provinces, and a log of it was kindly procured for the Madras School of Arts by Captain Maclagan, of the Roorkee College, and

forwarded to Calcutta for despatch to Madras ; but it seems to have been appropriated for use in the School of Arts in Calcutta, where a prize of 500 rupees was offered for the best substitute for English boxwood fit for engraving. We do not yet know if the prize has been awarded, but we heard from a friend who had lately visited the School of Arts in Madras and Calcutta, that a good deal of boxwood has been sent to the latter school, and our log is one of those probably. We should think the prize of 500 rupees too large for such a discovery in Madras, as we have collected all the above-named woods, and used some of them for engraving and illustrating scientific and educational books, reports, and many of the advertisements in the Madras newspapers, and all have been the result of a reward of 10 rupees offered to Captain Puckle who sent us the best collection of woods, and who liberally handed over the reward to the natives who collected the specimens. We have to deplore the loss of the services of our best wood-engravers in Madras. Mr Garrick, who was at the head of this department, has been tempted away from us to Calcutta with the offer of a high salary. Mr J. Duarte, Mr Sharleib, and many others who used to render us valuable aid, have obtained more remunerative employment for their talents than we could afford to give, and we are reduced to one intelligent deaf and dumb native lad, who promises as well as any of the above named.

We have still got a good staff of engravers and etchers upon copper. This style of work was pointed out to us in England as one in which the natives of India were calculated to excel, as it admits of a free and flowing kind of line which cannot be easily imitated in wood engraving. We wish our former teachers and pupils every success in after life, and should be glad to see them trying to aid in the extension of a taste for the fine arts, or for illustrating literature in Southern India. A good many lads began to learn wood engraving in Madras, but few of them had the perseverance to carry it on, chiefly, I believe, on account of its difficulty, and the time and labour required to be expended on its study.

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8th March 1860.—Professor BALFOUR, V.P., in the Chair.

The following donations were announced to the Herbarium :—

Specimens of *Tephrosia toxicaria*, var. *Schiediana* (Sch.), from Dr W. H. Campbell, Demerara. The plant had been sent to Dr Campbell as being used by the negroes in one or more cases of poisoning, which had lately occurred near Georgetown, Demerara.

Specimens of *Cuscuta Epithimum*, from Penmanshiel, sent by Mr James Hardy. Mr Hardy says—“ It was confined to one spot in a field which is under tillage for next year's crop, so that it may disappear. The soil was originally reclaimed from a state of nature ; and whether it was attached to the wild thyme or heather that once grew there, or has been introduced with cloverseeds, I cannot ascertain. The dodder is a new plant to