"A strange, wild set."

The great admiration for Red Cedar and a few other timbers was slow to extend to the timber cutters themselves, who comprised a group of botanical investigators quite unlike any other. They had given trouble since the earliest days of organized timber cutting. In January 1797, for example, "several people who had been hired to saw timber on the public account" were found guilty of falsifying their returns.[136] The following year it was still evident that "the people who are employed by Government at the Hawkesbury, such as sawyers, carpenters, and other working people" were devoting more than half their time "to their own purposes and...thro' that imposition the public work is almost wholly neglected."[137]

In 1814, Macquarie, perturbed by trouble between cedar-cutters and aborigines, and convinced that

> the Indulgence...occasionally...granted to Masters and Owners of Vessels...to bring Timber from Shoalhaven is subject to considerable Abuse,

forbade vessels to visit that river.[138] Being the first to penetrate many coastal river valleys, the cedar-cutters often determined the nature of subsequent relationships between the aborigines and the permanent white settlers. At Port Stephens, the Myall River and elsewhere the

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136 The men "were sentenced to make up the deficiency, and to work for government, without being paid, for six months." He who measured the sawn timber "received the additional punishment of 200 lashes, which he amply merited." (Collins : An Account, II, (1802), pp.17-18. A Govt. and Gen. Order of 15 May 1798 condemned this "shameful imposition...practis'd for some time past by those sawyers whose labour is the property of the Crown." HRNSW, III, p.384.

137 "Unless...they cutt what is a fair weekly task, they are to be employed...from daylight until 8 o'clock, then an hour for breakfast, from 9 until 12, then one hour and a half to dinner, and from half-past 1 until sunset...The labouring people who supply the pits can in three days furnish enough for the week, the rest of their time to be employed in splitting shingles, or paling for enclosing the public buildings..." Govt. and Gen. Order, 30 Oct. 1798, HRNSW, III, pp.498-499.

138 Syd.Gaz., 3 Dec. 1814.

vanguard of timber men won scant respect from either race.[139] The justice administered to the aborigines on the Nambucca about 1845 was probably typical of that on most "cedar rivers". On losing some of their number in

> murderous attacks from the native tribes...the sawyers mustered together, armed with their guns, and swords, roughly manufactured from their pit-saws.

These "retaliatory expeditions" must have been as effective as they were terrifying, for "a great number of blacks were killed in the skirmishes...and they gradually became more peaceably inclined."[140]

In 1826 complaints of a different kind were made about the cedar-cutters at the Illawarra. Not only did they cut cedar on private grants and on Crown land with a happy indifference but,

> vice of the most abominable kinds was practised among those cedar hordes, to the total annihilation of every correct principle.

Governor Darling felt bound to send "a Magistrate to Illawarra" in 1828 since

> there are a number of Cedar cutters, who are a very disorderly set of men, and the runaways, who associate with them, have of late been very troublesome.[142]

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139 Dawson : Present State, pp.18,20-21, also p.41: "The timber-cutting parties...were composed of convicts and other people not remarkable either for humanity or honesty...not at all to the advantage of the poor natives, or...to the settlers who succeeded those parties."

140 Hodgkinson : Australia, p.24. The Macleay aborigines had by 1842, apparently become "more peaceably inclined" for they were then "chiefly employed by the Whites in hunting, fishing, going errands, and seeking crooked Timber, and such other as may be required by the ship builders." Henry Oakes, Report on Aborigines, 22 Mar. 1842, NSW Gov.Desp. 1842, Vol. 39, ML. A1228, p.666.

141 Syd. Gaz., 1 July 1826.

142 Darling to Huskisson, 25 Sept. 1828, HRA, XIV, p.404. The magistrate was Major D'Arcy, who was advised on 3 June 1828 that "the population of the district consists with some exceptions of settlers of an inferior order -- their servants and men who are employed in procuring Cedar, and I am...to request that your particular attention may be directed to the preservation of order amongst the latter who in general are of a very disorderly character." There was also "reason to suppose that many Prisoners of the Crown occasionally resort to the District and remain at large either cutting Cedar, or under pretence of being so employed..." quoted in McDonald : Illawarra, pp.39-40.

PIT-SAWING

PIT-SAWING : George Vidler (b.1874) and his son John demonstrating pit-sawing on a scaffold saw-pit on H.M. Crawford's property at Tregeagle in 1956. The saw which had belonged to his father, had been in George Vidler's possession for 65 years at this time. Photo : RRHS, originally published in The Northern Star, 28 June 1956.

PIT-SAWING

PIT-SAWING : George Vidler holding a flitch of Red Cedar, Toona australis, cut during a pit-sawing demonstration at Tregeagle, 1956. About 1895, Vidler pit-sawed some 4,000 super.feet of cedar in Cambewarra Mountain near Nowra. Note that chains were used here instead of iron "dogs".

Photo : RRHS.

From his reformed and somewhat puritanical position, Alexander Harris recalled a seaside debauch of Illawarra cedar-cutters who gathered round five and ten gallon rum kegs obtained from the cedar boats :

> A more unlicensed and reckless mob than was thus sometimes gathered on that else lonely beach, prolonging day and night their carousal until all the liquor was gone, it would be impossible to find anywhere. The bushrangers often mingled with the boisterous assembly, and took their tithe of the revel...

The "bushrangers" or escaped convicts were largely untroubled by the police. Not only did the rainforest provide them with ample refuge, but also the sawyers, "having mostly been prisoners themselves", felt obliged to help any "bolters", especially as they were prepared to work for the sawyers at a lower rate than anyone else,[143] and "almost every pair" had "one or two bushrangers" as labourers.[144]

Although one diarist considered that "the Illawarra gentry" were not much better,[145] this general picture of the cedar-cutters persisted for half a century, apparently with ample reason. In 1837, the Sydney Herald called on

> the Government to put a stop to the wholesale system of robbery...taking place in every district of the Colony where there is any cedar on unlocated ground.

It was claimed that "immense quantities of cedar" were being daily cut "by parties who have not an acre of land" so that those "purchasing the land, are in a manner robbed." As if "this nefarious traffic" were not enough, it was

> well known that the cedar-grounds are the resort of runaways and other bad characters, who flock to these places where they are almost beyond the pale of the law, and the scenes of infamy and vice that are to be witnessed there, are, we are informed, horrible to contemplate.[146]

From the point of view of the respectable inhabitant, it was well that such vicious characters were conveniently ensconced in the rainforests away from the more closely-settled districts, but it was somewhat disturbing to know that these same characters were making a comfortable

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143 Harris : Settlers and Convicts, p.35.
144 Harris : Secrets, p.145.
145 a free man named Webster recorded in 1833 or 1834 that he heard the Rev. F. Wilkinson preach "a capital sermon" in the Wollongong Anglican Church, "on scandalising, slandering, and interfering with our neighbour's affairs. Very suitable to the Illawarra gentry." McDonald : Illawarra, p.49.
146 SMH, 20 Nov. 1837.

living out of pillaging the cedar trees on land which could well be obtained by grant or purchase when the time was opportune.

To the north, around Dungog, the sawyers achieved the same notoriety :

> The cedar trade gives employment to a considerable number of sawyers...principally old hands...who...are by no means patterns of virtue, either in regard to temperance, or to anything else at all creditable...they too frequently spend the high wages they earn in scenes of beastly intemperance -- setting all the decencies and proprieties of civilised life at defiance...[147]

Cedar-cutters on the Macleay about 1840 rigorously maintained the tradition :

> These men are generally convicts, who have become free by servitude; they live in pairs in the dense dark brushes; their habitation being merely a few sheets of bark temporarily piled together...

On bartering their timber for tobacco, food, clothes, wine and rum from the cedar dealers, gentlemen "not remarkable for delicate scruples of conscience", the sawyers embarked upon

> a fortnight's drinking bout...The scenes...at the Macleay river, on these occasions, surpass all description. Men and women, (for many of the sawyers have wives), lying day and night on the bare grass in a state of intoxication, and only recovering to renew their orgies; casks broken in, and the contents passed round in buckets; men fighting; native blacks...supplied with liquor, yelling and screeching like demons...At length, when they have drank (sic) enough to balance their account, they wend their way once more to the brushes with their rations, there to remain until the next time.[148]

When Thomas Gainford[149] visited the Richmond in 1855, after cedar-cutting had been in progress for some thirteen years, he found that

> very many of the settlers, cedar-getters, and others... were time-expired convicts; and strange characters they

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147 Lang : Historical Account, II, pp.227-228. Lang also considered that the "somewhat lawless...cedar-cutters of New South Wales" bore "a sort of family likeness to the lumberers of British America." op.cit., p.80.

148 Hodgkinson : Australia, pp.11-12. Cf. a description of the Macleay sawyers about five years later : "These sawyers and their mates are a strange, wild set, comprising in general a good proportion of desperate ruffians, and sometimes a few runaways, they themselves commonly being ticket-of-leave men, or emancipists." Henderson : Excursions, I, p.124.

149 Thomas Gainford (1823-1884), then a Wesleyan lay preacher and proprietor of a sawmill at Duck Creek near Parramatta.

> were, exhibiting all the lower traits of human nature in their worst forms. The cedar-getters were especially a rough lot; and Mr. Gainford, on going amongst them, and having to do with them in business matters, soon found that there was abundant scope for work both in regard to religion and morality.[150]

Gainford was scandalized to find that a pair of sawyers at the end of a good season of cutting could

> have a raft of cedar worth a thousand or fifteen hundred pounds. Their first care, after receiving payment, was to adjourn to the public house...The scenes which commonly occurred...beggar all description...Few would...believe that human beings could become so helplessly the victims of intoxication and filth as to be found sleeping in the vicinity of a bush public-house, with maggots crawling in and out of their eyes and ears...[151]

Nearly twenty years later the same impression of the Richmond timber men was given in reminiscences of early Ballina :

> The character of those employed in the timber trade was not in any way refined; living a hard and toilsome life in the solitude of the bush, they dearly earned their wages; and, when pay day came round, once in twelve months perhaps, the year's toil hardly sufficed to provide such a debauch as the bushman looked for as the reward of his labour. The rum cask was his Bible, and the grossest scenes of vice his highest ambition. Gradually the cedar-cutter and his immorality had to give way to agriculture and the civilizing influences of a home-seeking population.[152]

No doubt the similarity of these, and other accounts, is due in part to the fact that the very same men were being described in different places as they moved northward in search of new stands of cedar. Further, the comparative isolation of the cedar-cutters and their families would have ensured a self-perpetuating manner of life.

The reporter who covered the visit of John Robertson[153] to the Tweed River in 1869 acknowledged the traditional toughness of the cedar-cutters without over-emphasising any undesirable qualities :

> They are the roughest of rough fellows -- muscular as a working bullock, hairy as a chimpanzee, obstinate as a mule, simple as a child, generous as the slave of

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150 J. & W.R. Gainford : Memoir of Incidents in the Life and Labours of Thomas Gainford, Orpington, Kent, 1886, pp.117-118.

151 Gainford : op.cit., p.119.

152 SMH, 11 Nov. 1872.

153 John Robertson (1816-1891) instigator of the Selection Acts, was then Member for the Clarence District, Premier and Colonial Secretary.

> Aladdin's lamp. A fondness for rum, and a capacity for absorbing vast quantities of that liquid, are among their prominent characteristics. They are also in the habit of 'bruising' each other upon the smallest provocation; and it is a noticeable fact that one of the surest modes of securing the friendship of a cedar-cutter is to knock him down. He will probably return the compliment with interest, and reduce your features into an unrecognisable condition, but he will ever afterwards be your firm friend.

Thus the plants and resources of the Australian bush were not always investigated by genteel botanists collecting material to send to Sir Joseph banks, the Royal Gardens at Kew or to the Admiralty. It is interesting, however, that the same reporter should have noted

> a good deal of rude honour about the fellows. Thus if one chances to light upon a 'fall' of cedar, none of the others will attempt to cut even a tree out of the group. The first discoverer is considered to have a claim upon the whole, and to interfere with him would be thought a very base act indeed.[154]

John Oxley found this same kind of "rude honour" at the Illawarra over forty years earlier :

> ...they have established a rule among themselves... No pairs of sawyers can claim a right to more trees than they can cut at one pit, if they fall trees for which it will be necessary to erect other pits... the persons so felling are not considered as having any right of property in them and any other pair of sawyers is at liberty to cut them up when the last tree is on the pit. The sawyers to whom it belongs may then fall as many more as can be taken to any other pit...

In this way, the sawyers with the means to employ a large number of labourers were not advantaged, and Oxley

> did not learn a single instance of dispute having arisen between parties whether employed for themselves or others.[155]

It is understandable that many cedar-cutters were ex-convicts for the bush skills some had learned in the Government sawing gangs were readily adaptable to individual advantage, as official enquiries had long since revealed. Further, the demand for cedar was heavy, the equipment

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154 SMH, 26 Aug. 1869. Cf. the Wide Bay sawyers who, to the surprise of one observer in the fifties, despite the quiet luxuriance of their rainforest surroundings, were "the most reckless, dissipated, and yet most generous-hearted of the many classes who dwell in the great forests." Cooper : Wild Adventures, p.45.

155 John Oxley to Alex. McLeay, 8 Dec. 1826. ML. AO 15(2)/2.

CLEARING THE 'BIG SCRUB'.

TREE-FELLING in the Big Scrub which once extended from the Tucki Swamp in the south to the McPherson Ranges in the north. Small pockets still exist. Note the enormous buttress roots of this rainforest tree, and the use of springboards to avoid the difficulty they presented. The cutter on the top springboard is wearing bowyangs. Photo : RRHS, from original presented by Mrs. Mary Handley, daughter of Walter Newton who selected 'Brockley', Wollongbar in the late 1860s.

was reasonably simple[156] and cedar grew within forty miles of Sydney to the west and south.[157] Oxley recognised three main categories of men involved in the industry in the 1820s[158] : (i) Sydney merchants who employed sawyers and supplied bullock teams or boats to transport the sawn timber; (ii) carters and teamsters who conveyed the produce of the saw-pits; (iii) the sawyers themselves, resident in the rainforests. While the former two groups had their problems with markets, roads, carts and animals, it was the sawyer himself who had the hardest lot, and a few observers appreciated this although chiding the sawyers for their conduct. First, the rainforests had to be located. From a vantage point, even at a fair distance, an experienced eye could identify these by their darker green and lush appearance contrasting with the more alive or glaucous green of the surrounding sclerophyll forests.[159] Second, amid the heavy rainforest canopy, the deciduous Red Cedar trees had to be detected; in late autumn by colour changes in the leaves, in winter by the bare limbs, in spring by the new pink foliage.[160] If there were no vantage point, as when looking from a boat into the dense rainforest strip, perhaps a quarter or half a mile wide, on either side of a river, or when actually "prospecting" for cedar within the rainforests, one had to be able to recognise the characteristic brownish scaly bark of the cedar trunks[161] and any shed pinnate leaves, not unlike those of the walnut, as Governor Phillip had once pointed out.

Once located, the cedar trees were felled and trimmed, and the logs were either deposited whole[162] into the nearest water-course or drawn to the pits for squaring or flitching as described earlier. Cedar nearest the river banks was cut first -- this was the "handy cedar" -- and

156 e.g. felling and broad axes, crosscut and pit saws, mauls and wedges, iron 'dogs' for holding logs on the pit transoms, files, etc.

157 a Red Cedar was still standing at Richmond on the Nepean in 1939. See JRAHS, 1939, p.131. In 1892 a log over 5' in diameter, cut at Otford, north of Stanwell Park, about 1863, was found "almost perfectly sound". Ag. Gaz. NSW, 1893, p.603.

158 Oxley to McLeay, 8 Dec. 1826. ML. AO 15(2)/2.

159 see photographs, Chapter III, pp.171,256.

160 see Wm. Mallett in RRHS Journal, No.2, 1938, p.32 and Windsor Lang in Northern Star, Lismore, 14 Dec. 1946. Spring was the time apparently preferred on the Richmond. Sometimes aborigines (who knew the tree as Widgee on the Richmond) were employed for "cedar spotting".

161 see photograph on p.347.

162 apparently the logs were usually squared before being so deposited until cedar became scarce, then whole round logs were loaded on to vessels.

the logs fashioned into rafts[163] upon which the sawyers, and even their families, might live[164] while the raft was poled down the stream to the shipping terminal. Cedar cut away from the main rivers was often dragged by bullock teams or projected down hillside chutes, or "shoots"[165] into dry creekbeds where the branded logs remained until sufficient rain fell "to enable the logs to be 'freshed out'"[166] into the main stream.[167] Downstream the progress of the logs was checked by a "stop", an anchor chain stretched across the river to retain the logs while they were

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163 squared logs were the more readily made into rafts. Major J. T. Morisset reported in 1820 that cedar was rafted 70 miles down the Hunter River in batches of 75 or 100 logs. Bigge : Report, Appendix, ML. BT. Box 1, pp.472-473. Macquarie "inspected a very fine raft of 22 logs of cedar & 1 large one of rosewood" brought"down the River Hastings from the First Falls" in Nov. 1821. Journals of Tours, p.213. Sometimes the rafts were lost. Early in 1836, for example, the steamer William the Fourth "suffered much detention at Port Macquarie from the drifting of a raft of thirty thousand feet of cedar beyond the bar." Syd.Gaz., 11 Feb. 1836. On the Richmond in the fifties, rafts comprised 2, 3 or 4 tiers of logs, each tier with 100 logs, fastened together by chains passing through the "eyes" of iron dogs. Joseph Greenhalgh : "A Cedar Getter's Life", 1922. MS.RRHS. Sometimes vines were used for fastening logs on the Macleay. Henderson : Excursions, I, p.127. Richmond cedar was also dragged by bullocks directly into the sea, and the logs towed to the vessels standing beyond the breakers. Charles Yabsley (b.1850) : "My Early Days", Typescript, p.4, RRHS. See also John L. Towner : "The History of Settlement in the Richmond River District", Typescript, p.9, RRHS.

164 on the Hunter, huts were built on the rafts "for the protection of the gangs". Morisset, loc.cit. Henderson distinguished a separate group, "the rafters" who sometimes took their wives down the Macleay to Trial Bay on cedar rafts. Henderson : op.cit., pp.127-128; see also Hodgkinson : Australia, p.12. Richmond cedar men sometimes lived a fortnight on their rafts during the 70 mile journey from Lismore to Ballina. Greenhalgh : loc.cit. Also Bernard Jarrett (b.1858) : "Reminiscences" in Northern Star, 20 Dec. 1924 : "We always had six or eight of the widest planks in the middle of the raft to build the camp on." This was constructed of "a tarpaulin... two or three sheets of bark on the floor, some grass and ...blankets ..."with 12"-18" soil on the bark for a fireplace.

165 e.g. "Cooper's Shoot" and "Possum Shoot" on the Richmond, and "McLeod's Shoot" near Byron Bay. For the use of "shoots" on the Blue Mts. for hardwood logs, see Charles Lyne : The Industries of New South Wales, Syd., 1882, p.119.

166 W. Pope in Aust. Forestry Jour., 1918, p.7.

167 Henderson : op.cit., p.129; Greenhalgh : loc.cit. The cedar-cutters were alerted to a "fresh" in the river when "an aquatic plant known to old hands as 'duck feed'...is seen floating down stream, it is a sign that the river is rising and a warning that precautions must be taken..." Herbert J. Peak : "Echoes of Vanished Years from Richmond River", RRHS, MS. 2531E, p.5. This plant was probably the aquatic fern Azolla.

gathered and sorted.[168] Sometimes there was a long delay. In 1864, for example, one Paddy Smith

> had one million feet of timber cut in the Tyalgum scrub, but...it lay valueless until the floods of 1871 dislodged it. In the great flood of 1889 cedar logs said by experts to have been cut for 20 years, floated down the main street of Murwillumbah.[169]

Hazards and Threats

Such hoards of cedar were usually accumulated under rather trying conditions.

> Lawyers, supplejacks, slime, and dead timber wait on the man who penetrates these solitudes and he must travel with open knife to cut the parasites, which now embrace him round the waist, now seize him by the neck and anon send him headlong by getting among his legs...[170]

The cedar-cutters often worked extremely hard between their debauches, "exposed to...myriads of noxious insects"[171] such as "gigantic mosquitoes and other vermin"[172], ticks, and leeches, while "shut out from the genial rays of the sun"[173] in an atmosphere which was often cold and damp. Although the aborigines of some areas apparently backed into the Stinging Trees, Dendrocnide excelsa et al.spp. to relieve rheumatic complaints, the

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168 one such "stop" was at the site of Lismore where chains stretched across the North Arm of the Richmond held the logs sent down Leycester and Wilson Creeks. Later a "stop" was constructed at Boatharbour further up Wilson's Creek, where a small rainforest reserve still exists. Towner : loc.cit. The chain at Lismore broke in the 1858 flood, and many logs were lost at sea. Ballina Pilot, 12 Apr. 1961. See also W.P. Pope : "Our Vanishing Brush Forests" in Aust. Forestry Jour., 1918, p.7 : "I have frequently seen practically every leading tributary of the Richmond and Tweed Rivers literally choked with cedar logs waiting for a 'fresh' which would send them with a boiling rush down to permanent deep water, there to be arrested and held by a boom constructed of a heavy anchor chain made fast to trees on either side..." and supported by floaters "to which the chain was secured by reeving it through 'rafting dogs'."

169 M.J. Martyn : "Cedargetters on the Tweed", in Tweed Daily, c.1947, cutting in RRHS collection. The cedar-cutters referred to such a beneficial flood as "a saleable water". Baker : Aust. Language, p.78.

170 Lawyer Vine, Calamus muelleri and Supplejack, Flagellaria indica are both formidable climbers, but not parasites. Town & Country Journal, 4 Mar. 1871, referring to the vicinity of Bellinger River.

171 Hodgkinson : Australia, p.11.

172 Henderson : Excursions, I, p.126.

173 ibid.

sawyers found any accidental ministrations from such trees yet another hazard. "Fever and ague" were

> prevalent among the cedar sawyers, who lead a life, compared with which, the life of the lumberers, or wood-cutters in Canada, is civilization itself.[174]

Emerging from the gloomy rainforests after months of hard labour, sustained only by "salt beef, damper, tea and sugar"[175], they stood out from other outdoor bushworkers by being "as pallid as corpses".[176]

The sawyer lived in a "gunyah"[177] or

> a tent hut thatched with the fan-like leaves of the cabbage tree, open at one end, with the fire in front,[178]

or in the shelter of "merely a few sheets of bark temporarily piled together"[179]. He might even live in "a miserable cabin"[180] with his sawyer mate, or with a "dirty and forbidding wife, or mistress, probably a ticket-of-leave woman, or emancipist."[181] If the sawyer had the additional company of his children, they, according to the observations of one Macleay visitor, were apt to be

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174 Hodgkinson : op.cit., pp.10-11.

175 Henderson : op.cit., p.125.

176 Harris : Settlers and Convicts, p.45. This condition at Illawarra was "not necessarily attended by any sensation of illness." The Macleay sawyers were subject to illness apparently occasioned by lack of sunlight (and subsequent lack of vitamin D), a poor diet, hard labour and over-indulgence in rum. Doubtless the age and state of health of a sawyer at the outset, and the length of time continuously worked in the rainforests, were the telling factors. Other observers also spoke of the cedar-cutters' distinctive pallor. Robert Leycester Dawson, a Lismore historian noted, "It is a fact that in the early 70's a visitor to Lismore could pick out a 'Big Scrub' cedar-getter by his pale and bleached countenance -- so different from the brown and bronzed faces of men who worked in the open country." Yet, "I do not recollect ever hearing of any cases of fever or malaria." Northern Star, Lismore, 14 Dec. 1946. On the other hand, Charles Jarrett (1827-1908), the "Cedar King" of Ballina, no doubt referring to an earlier time, maintained that among the cedar cutters "fever and ague...prostrated nearly all newcomers for several years..." Jarrett : "Reminiscences", 1902, Typescript, p.5, RRHS. An Anglican minister who travelled from his Grafton headquarters to the lower Richmond early in 1850 noted that the sawyers' wives and children especially were "quite pale with a yellowish tint". Rev. Coles Child to his sister, 5 Jan. 1850, in A.P. Elkin : The Diocese of Newcastle, Syd., 1955, p.426.

177 Harris : Settlers and Convicts, p.32.

178 op.cit., p.43 (referring to Illawarra).

179 Hodgkinson : Australia, p.11 (Macleay R.).

180 Henderson : Excursions, I, p.126 (Upper Macleay).

181 ibid.

> in the last stage of squalor and filth, their pale and emaciated features already showing that fever and ague -- the demons of these brushes -- have begun their work with them.[182]

A pit-sawyer who found himself without a work mate was seriously disadvantaged, but the bushman's traditional ingenuity could save the situation. Obliged to work alone for a time in the rainforests at Emigrant Creek near Ballina in the forties, Tommy Chilcott

> manoeuvred the logs unassisted, -- save by brute strength and leverages -- on the skids over the pit, and then, fastening a bag of heavy iron wedges to the bottom of the saw -- in lieu of a mate -- he ripped off the flitches from the top single-handed.[183]

His contemporary, George Cooper had children but no work-mate. He therefore solved the problem another way by harnessing

> his two boys to the bottom of the saw -- one on each side -- and working from the top himself cut away until he secured more serviceable and efficient help.[184]

The timber men were not easily daunted, but the nature and conditions of their work clearly pointed to the undesirability, as well as to the impracticability of attempting to work alone. This and the fact that most of them were "old hands" meant that the customary mateship of the bush was never more evident than among the timber men[185]. The dangers in working with axe, saw, maul and wedges and in the actual felling of trees and in rolling and levering heavy logs, were all obvious enough. But there were other hazards, impossible to predict, which could confront the timber man with malevolent fortuitousness. The forest worker could be struck by a "widow-maker"[186] at any time, and the lone

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182 ibid.

183 Ainsworth : Reminiscences, pp.37-38. The gravestone of Thomas Chilcott (1812-1888) a former Royal Navy sailor, may be seen in the East Ballina cemetery.

184 op.cit., p.38.

185 Alexander Harris appreciated this at Lane Cove in 1827 : "I suppose there is no class of tradesmen or indeed of any men who entertain such a brotherly feeling toward one another as sawyers..."Settlers and Convicts, p.88.

186 "widow-makers" were dead branches which suddenly dropped, sometimes unaccountably in a still forest, but more often during a wind or when a tree was being felled. See Baker : Aust. Language, p.79.

splitter of fallen logs was not necessarily so self-sufficient as to have his safety guaranteed.[187]

A more insidious threat to the sawyers was posed by technology. Although pit-sawing was still practised at Nowendoc in 1930, some sawyers were mechanised as early as the 1820s.[188] In October 1838, Kirk and Son, who customarily advertised that "Colonial Hard Wood of every description" was on sale at their yard in Sussex Street, Sydney[189], sought

> an Engineer, to take charge of a condensing steam-engine and machinery, now at work. An Emigrant and one...accustomed to saw-mills would be preferred.[190]

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187 consider for example the case of "the man who...while camping by himself, attempted to split a log with maul and wedges. When he had burst it along the top he double-banked the middle wedge, which caused another to drop into the crack. He thrust his hand in to get it, when the banked wedges flew out, and the half-burst log snapped together, crushing his hand and holding him as in a vice. How long he lingered, with his hand thus gripped, no one could tell; he was long dead when found. His axe lay a few inches from his feet, and he had rooted a semi-circular hole in his efforts to reach it, with the intention evidently of cutting off the imprisoned hand...The annals of the Australian bush are replete with such experiences..." Sorenson : Aust. Backblocks, pp.158-159.

188 e.g. John Platt readily obtained a letter of introduction from Under Sec. Goulburn in May 1821 on his departure for N.S.W. where he proposed "to erect Saw Mills and other Machinery". HRA, X, p.499. Syd. Gaz., 28 May 1825, advertised the sale at Goulburn Grove, Hunter River, of "an excellent Sawing Machine, in perfect Preservation, with 19 Circular Saws, Benches, Rollers, and Woodwork, complete."

189 e.g. SMH, 8, 10, 12 Oct. 1838, etc. The hardwood was in the form of "Joists, Scantling, Flooring Boards, Weather Boards, Battens, &c.,&c."

190 SMH, 8 Oct. 1838. Syd. Gaz., 11 Oct. 1838, reported that the machinery of Kirk and Son's steam saw mills was "now put together and complete, and in a fit state to commence operation." A note in SMH, 10 Oct. 1838, confuses the issue somewhat : Kirk and Son's "steam machinery for sawing stones is now in full operation, and is found to answer admirably." No doubt timber was also steam-sawn in the same yard. F. Girard had a steam saw-mill at Darling Harbour about 1837 (Levy : Wallumetta, p.54) and W.G. Gard's Australian Saw Mill in Bathurst St., Sydney in the late 1830s was probably mechanised. Gard, like Cutler, specialised in "Cedar Plank" up to 2½" thick and 2' wide (SMH, 2 Nov. 1838). Walter Hibble (JRAHS, 1916, pp.281-282) also referred to Girard's (or Gerard's) Mill. There was a steam saw-mill at Jamberoo by 1843 (H. Heathorn in Cornhill Magazine, 1911, p.772). In 1853 Snow & Essery established a short-lived saw-mill at Ballina. The Breckenridge Brothers moved this mill to Wyrallah in 1865. Ainsworth : Reminiscences, p.13 and RRHS Records.

SAW-MILLS

STEAM SAWMILL at Little Plains, Dorrigo District, in 1905. Note the wide area of timber cleared around the mill, and the dense rainforest in the background, where some Hoop (or Dorrigo) Pine, Araucaria cunninghamii is discernible.

Photo : NSW Govt. Printer, Nos. 2355-2356.

BECKENRIDGE'S MILL AT WYRALLAH, c.1877. Established in 1865, this mill became one of the largest on the Richmond River. The site was later occupied by Child's dairy farm. The Saucy Jack is here loading Red Cedar, Toona australis and Hoop (or Richmond River) Pine, Araucaria cunninghamii. Note the floating logs.

Photo : RRHS, from the N.C. Hewitt Collection.

It is recorded that some sawyers showed their disapproval of the usurping machinery "by such methods as driving large nails in logs consigned to the new operators"[191] who by 1842 were using both "circular and vertical saws" in their mills.[192] The depression of the forties brought more problems. In 1830 the Sydney sawyers struck work, "trying to raise their wages to a most unreasonable rate" and "threatening to smash the saws and injure those men" working for less than the rate demanded.[193] Northern cedar-cutters, on the Macleay for example, suffered because the

> cedar traffic...has been for some time very dull... occasioned in a great measure, by the unparalleled depressed state of the money market

in Sydney.[194]

The antipodean extension of the Industrial Revolution threatened not only the sawyers. By 1846, Mr. William Hickling Burnett's "Patent Planing and Moulding Machines" were being promoted by Sydney agents. The published testimonials to the efficiency of these machines must have alarmed many city joiners and moulders as they read of the mass-production of

> mouldings, flooring boards, whether plain or tongued and grooved...window-sashes, skirtings, architraves, stiles and vails of doors, panel-stuff, spoutings, &c., &c.[195]

The influx of population during the 'Golden Decade' and the subsequent building boom, especially in Victoria, enormously increased

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191 Levy : Wallumetta, p.54; also W. Hibble in JRAHS, 1916, p.281.

192 see for example SMH, 11 Sept. 1842. Woodstock Saw Mill was then seeking teetotallers as a saw sharpener and a "Circular Bench Sawyer, expert in his trade."

193 SMH, 10 Apr. 1840. The sawyers used to receive "six shillings and six-pence per hundred feet for cedar under two feet wide,and proportionate prices above that width." They then sought 8/4 per hundred for boards under 2 ft. and 10/6 "for all above." Now, two months later, they were seeking 8/4½ per hundred for boards under 1'6" and 16/8 for boards over 2'6" with intermediate rates between those sizes.

194 SMH, 17 Feb. 1841. See the graph of cedar exports on p.390.

195 SMH, 30 Sept. 1846.

SOME INTERPRETATIONS OF THE N.S.W. CEDAR EXPORT GRAPH, 1827-1877.

NOTE: The statistics for this 50-year period, covering the middle decades of the century, appear to be sufficiently reliable to provide an accurate indication of export trends of Red Cedar. Only recorded exports of Red Cedar are shown, and not the total N.S.W. production, which must have been very much higher. It was intended to show by comparison the export of "Blue Gum, Pine and other Timber" but the early figures reveal wide discrepancy, and the later ones are complicated by being shown partly in superficial feet, and partly in "sleepers", "poles", "scantlings","logs", etc. which makes it impossible to arrive at an overall comparative figure in superficial feet. It is clear, however, that the export of this "other timber" was well over 3,000,000 super. ft. in the years 1864, 1865 and 1875.

The major features of the graph would appear to be due to the following factors :

1. Before the goldrushes, most years of high export were followed by years of comparatively low export. This may have been due to a series of "local extinctions" of "handy" cedar and/or to the fact that each alternate year or so the market was satisfied, if not glutted.

2. The economic depression immediately after 1840 is clearly reflected.

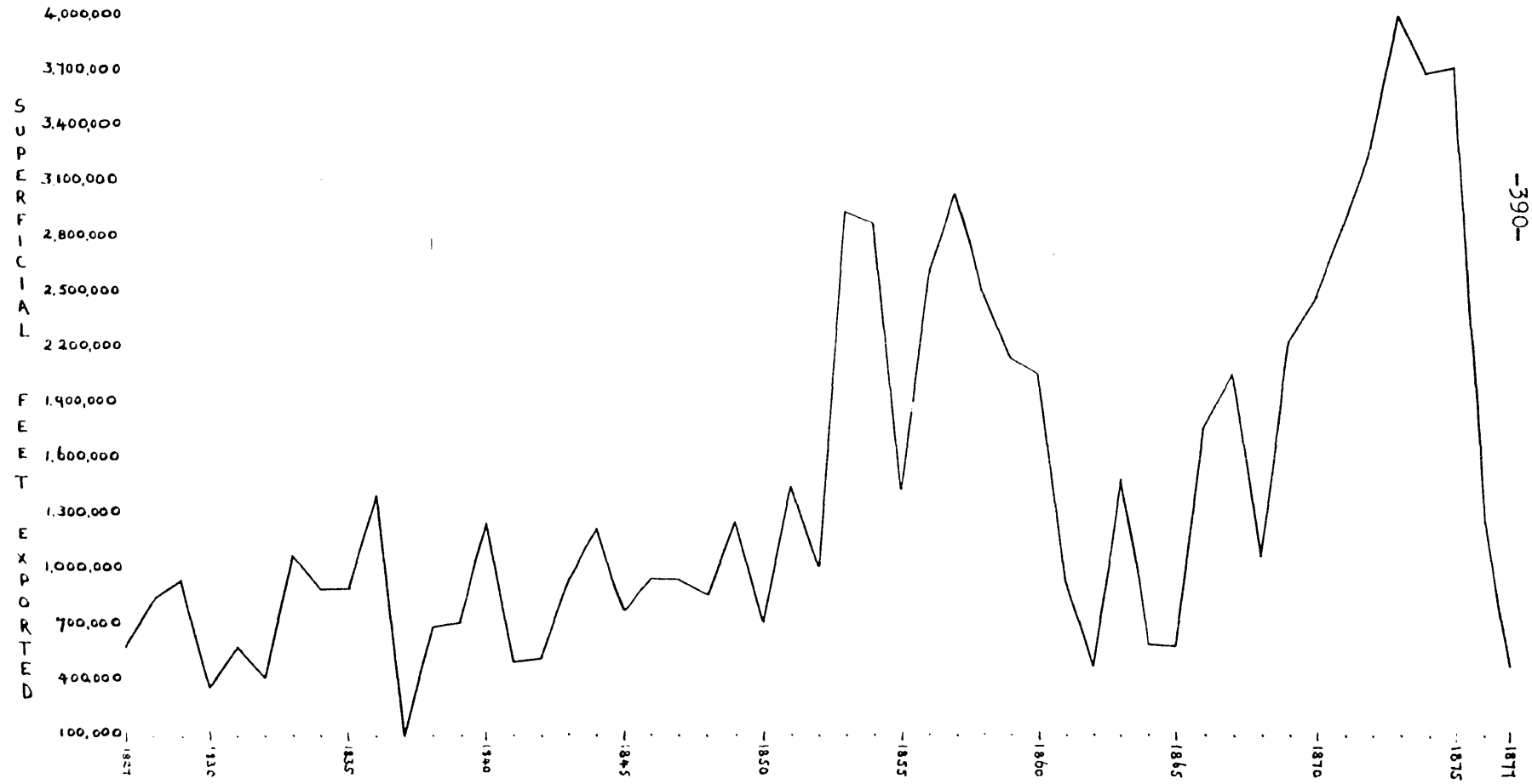
3. The year 1850 was a wet year for the coastal area, and probably many logs were "freshed out" leading to the higher export in 1851.

4. During the Golden Decade, 1851-1861, the export of cedar, largely to Victoria, reachest its highest point so far. Yet in the midst of a period of record export, 1853-1857, there was a significant fall (1855) as if a "supply bottleneck" had developed. That is, there was a shortage of labour in the midst of a period of very high demand. As additional labour became available along with improved transport facilities, the demand was probably met in the peak year of 1857.

5. After the goldrushes there was a tapering off, followed by a boost in 1863 just after the Selection Acts. Probably high local demands within N.S.W. reduced the amount available for export for a time. The severe drought of 1865 no doubt contributed to the low export in that year.

6. Further technical developments, for example, the establishment of steam sawmills in the bush, and the availability of more labour and better transport facilities, combined with a high demand, ensured that the amount of cedar for export would be increased. The overall secular trend during the first 46 years of this 50-year period, culminated in the record export of 4,000,000 super. ft. in 1873. It is likely that the flood rains of 1870-1871 "freshed out" many previously inaccessible logs to boost the 1872 and 1873 exports. Thereafter there were not enough mature trees left to maintain such an output, and exports dramatically decreased. It should also be noted that 1877 was a year of low rainfall.

EXPORT OF RED CEDAR FROM N.S.W.
1827-1877.
Compiled from Statistical Returns.



Red Cedar : Abundant or Extinct?

From the time of its discovery even to the present, the virtual extinction of Red Cedar has been alternately proclaimed and refuted. In 1819, Commissioner Bigge was told of the scarcity of Hawkesbury cedar following wholesale destruction[198], and the diminution by 1820 of Hunter cedar convenient to Newcastle[199]. He was informed that Illawarra cedar was plentiful[200], yet in 1822 Macquarie found it was "very scarce, most of it having been already cut down and carried away to Sydney."[201] Macleay cedar, first exploited about 1835, was by 1842 said to be "nearly done up"[202], and by 1845, "quite exhausted."[203] In 1852, it was claimed that Illawarra cedar was "for the most part cut down"[204] and yet forty years later the same thing was still being said about the same timber in the same locality.[205] The need for an accurate botanical survey was clear.

In 1850, Charles Moore, Director of the Sydney Botanic Gardens, told the Australian Society (after Sir Thomas Mitchell had given an address on the resources of the County of Cumberland) that he had

> examined every part of the country between Illawarra and the River Manning and felt quite convinced that not a [cedar] tree of any size was to be found either on the alluvium of the rivers or in the ravines of the mountains.[206]

This "rash assertion" was soundly attacked by Edwin Hickey who advanced evidence to show that in such places as "the cedar ranges" around certain Hunter tributaries, cedar trees were still abundant, if rather inaccessible. Railways and other transport developments would enable these resources to be utilised. In addition, there were

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198 Bigge : Report, Appendix. ML. BT. Box 5, p.2042, Archibald Bell's evidence, 27 Nov. 1819. Cf. Wentworth : Statistical Account (1824), I, p.115 : "The banks of the Hawkesbury formerly produced cedar and rosewood, but these have long since been eradicated, and none of the settlers have yet made any attempts to replace them by planting."

199 Bigge : op.cit., ML. BT. Box 22, p.4214, Robert Elwes's evidence, 6 May 1820, and Box 1, p.472, J. T. Morisset's evidence, 17 Jan. 1820.

200 Bigge : op.cit., ML. BT. Box 5, pp.2218-2219, Charles Throsby's evidence, 26 Jan. 1821.

201 Macquarie : Journals of Tours, p.240.

202 SMH, 15 Sept. 1842.

203 Hodgkinson : Australia, p.24.

204 Hughes : Australian Colonies, p.74.

205 Maiden in Ag. Gaz. NSW, 1893, p.603.

206 SMH, 26 Oct. 1850.

> still the rivers of greater magnitude to the north, and after that an inexhaustible supply in the mountain ranges of those rivers.[207]

The suggestion that cedar reafforestation projects[208] be undertaken was not justified because of expense and "because no scarcity has yet shown itself in the market."[209] Hickey could only assume that Mr. Moore had come to his erroneous conclusion because he examined only

> the mountains and waters immediately on the coast, in which the cedar is not now to be found in any quantity.[210]

Thus the argument over the profusion or paucity of supply gathered momentum while the amount of Red Cedar available for export waxed and waned with intriguing inconstancy.[211] In 1851, a Maitland Mercury correspondent maintained that there was sufficient cedar on the Clarence and Richmond to last for years, despite heavy cutting. Any scarcity was due not to the lack of trees, but to the fact that "the sawyers stand about half their time over the keg."[212] The old idea of the boundless forests with inexhaustible supplies, still persisted.

In 1869, a Tweed visitor prophesied that "in about twenty years such a thing as a cedar tree will not be found in the country."[213] In 1871, cedar was still "the staple product of the scrub" in the Upper

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207 ibid. It was claimed that the parent stands of the very best mountain cedar (always preferred "on account of its closeness of grain and... its durability") provided the seeds which were carried down by the streams and deposited on their alluvial banks.

208 it is interesting that it should then have been appreciated that "the red cedar will only flourish where abundant shelter is afforded." ibid. Cedar planting was begun in the Dorrigo Forest Reserve in 1884 and in the Gosford State Forest Nursery in 1890. In 1892, 1500 young cedars were planted out at Otford. The great problems have been provision of adequate (preferably rainforest) shelter and the ravages of the Red Cedar Tip Moth, Hypsopyla robusta Moore.

209 see the accompanying graph of cedar exports, 1827-1877.

210 SMH, 26 Oct. 1850.

211 see the accompanying graph of cedar exports, 1827-1877, and the notes thereon.

212 quoted by John McFarlane in Daily Examiner, Grafton, 4 June 1959,

213 SMH, 26 Aug. 1869.

Bellinger valley, where at some saw-pits cedar logs seven feet in diameter[214] were broken down into boards ½" to 2" thick. Loads of two thousand superficial feet, representing about ten days' work for one pair of sawyers, were then being conveyed by dray to Armidale. It was felt that cedar would "not fail in the lifetime of the present generation", but that "the objectionable method of squaring round logs" caused much unnecessary waste.[215]

In August 1875, some twenty-five years after making his assertion about the extreme rarity of cedar, Charles Moore instructed William Carron of the Botanic Gardens staff, to "report on the present and probable future supply of cedar... from the Northern Rivers." Carron found that

> on the Clarence, Richmond and Tweed Rivers where a comparatively few years ago the number of excellent trees was very great, there were now but few trees left standing of any size.

Contrary to regulations, cedar trees were then being cut "considerably less than 2 ft. in diameter although such trees are but little value in the market." Cedar logs cut "10 or 12 years ago" but not removed from the forests, were being retrimmed and resquared as "the greater part of the present supply for...Sydney and Melbourne."[216] Unless the cutting of

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214 there are records of Red Cedars with basal diameters of 6, 8 and 10 ft. or more (e.g. Byrne : Wanderings (1848), p.217; Lang : Historical Account (1852) II, p.227) and 150 ft. high, with single trees yielding 10,000 super. ft. and more. On the Richmond, "Tommy Foley was given the credit of felling and working the biggest tree...at the junction of Wilson's and Skennar's Creeks near Booyong. Something like 33,000 feet of marketable cedar was taken from the giant." (see Tom Ross in Ballina Pilot, 12 Apr. 1961, and N.C. Hewitt in Northern Star, 24 Nov. 1923). The record yield was probably that from a giant cedar cut on Heinrich Sauer's selection, Mulla Mulla Ck., 45 miles from Kempsey. It was "measured...by Messrs. O.C. Dangar and W. Nance, and found to contain 80,000 feet of sound cedar." The trunk put out its first branch at 60 ft., and the branches themselves "were the size of fair-sized trees. It is said that the selection was chiefly taken up for the sake of this tree." A.R. Crawford, Moona Plains, Walcha in Maiden : Forest Flora NSW, I, p.59 (1904).

215 Town & Country Journal, 25 Mar. 1871. At that time, a steam saw-mill was being established on Don Dorrigo Creek.

216 Draft letter and report, Carron to Moore, Oct. 1875, Carron Papers, ML. C351-2, quoted in L.A. Gilbert : "William Carron" JRAHS, 1961, p.307.

young trees was stopped, Carron warned, there was little hope of any future supply at all, and certainly within the two years immediately following Carron's report, the export of cedar dropped dramatically.[217] Yet, seventy-five years later, in 1950, "about 300,000 super feet were cut in New South Wales mostly in the ranges between Kempsey and Glen Innes."[218]

The vacillation of opinion concerning the supply of Red Cedar was due to a series of "local extinctions", each followed by successful exploration of the rainforests leading to the discovery of new stands of cedar trees. As the "handy" cedar near the rivers and bullock team tracks was cut out, the "cedar frontier" was pushed back further into remote rainforest recesses where the trees were often cut, but left because of the lack of transport facilities. Exploration of the forests was determined by the topography and by the density of the forest cover itself, and cedar trees in the trackless rainforests of ravine country[219] remained secure until the advent of steam traction engines, motor lorries, heavy duty tractors and bulldozers, the latter after World War II.

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217 see the accompanying cedar export graph on p.390.

218 Aust. Encyc., 2, p.309. Most of this would have been cut by William Hayden, the 'Cedar King' of Kempsey, later lost in the rainforests while searching for cedar.

219 note, for example, the letter in the Maitland Mercury, 14 June 1866, referring to cedar "in the almost inaccessible ravines" in the Mt. Royal section of the Liverpool Range. The extinction of cedar continued to be announced. In 1918, when "land with an average of one mature cedar tree per acre" was considered "very good cedar country" (Aust. Forestry Jour. Apr. 1918, p.38) the Chief Inspector of the N.S.W. Forestry Commission commented; "the cedar has vanished almost entirely. The young and immature stuff which one sees to-day is soft, and has neither 'flower', colour, nor size." (W.P. Pope in Aust. Forestry Jour., Jan. 1918, p.7). Six years later, cedar was still being referred to as "a rapidly vanishing tree" (A. Meston in Aust. Forestry Jour., May 1922, p.122.) Something of the old inconclusive opinions concerning the supply of Red Cedar still persist. In March 1962 one Forestry Commission publication stated that "large trees are still occasionally obtained from the gorges on the east of the New England Tableland" (G. N. Baur : Forest Vegetation in North-eastern New South Wales, Syd., 1962, p.17) while in 1964 another Commission publication stated "only a few isolated trees now remain." (Forest Resources, Regions and Trees of New South Wales, Syd., 1964, p.13). Despite the enormity of the attack upon Red Cedar resources over 180 years, the species still survives in N.S.W. although probably within an ace of extinction when rainforest reserves were finally declared.

Between the coast and the ranges, anywhere between Ulladulla and the Tweed, cedar-seekers in N.S.W. could hope to discover the rather scattered cedar trees within specialised plant communities which themselves had a restricted distribution determined by a favourable interaction of climatic and edaphic factors.[220] The transport technology at the time of discovery determined whether the trees could be utilised or not, but often this factor did not receive due consideration. Cedar thus lured men further and further from the settled districts, thereby promoting the expansion of settlement,[221] and in the 1860s many a selector was induced by the promise of cedar to take up a block of rainforest country.[222]

The waste, like the yield, was enormous[223], with the half-round flitches removed in squaring the logs,

> all the great flanges, and the great stump, all the trunk above the fork and the main branches, being left to rot.[224]

The waste did not go entirely unnoticed. In December 1854, for example, William Wilson, pioneer settler of Lismore, wrote to Governor FitzRoy,

> bringing under notice the wasteful destruction...of colonial timber and proposing that the issue of licenses to cut timber for the present year, should be delayed, until a complete reconstruction...of the existing Regulations.

The letter was written at an inopportune time, and Wilson was simply told that if he had "any practical suggestions" they would "doubtless receive due consideration from His Excellency's successor."[225]

In 1857, eighty "Builders, Timber Merchants, Cabinet Makers, Carpenters and Joiners, and Surveyors of Sydney" sent a "Petition for

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220 see G. N. Baur : "Factors affecting Rainforest Distribution in New South Wales", B.Sc. Thesis, Syd. Uni., 1954.

221 see Appendix XIII.

222 see Footnote No.214 supra.

223 see the accompanying cedar export graph on p.390.

224 A. Meston in Aust. Forestry Jour., May, 1922, p.123. Cf. "The sawyers are a most wasteful set of men. They spoil more timber than they use. They cut and square only the very best parts of a tree, leaving great masses of cedar, which would fetch a great price in the market, to rot unheeded in the brushes. They destroy young trees, too, with most culpable carelessness, and wishing only to seize present advantages, care not a button how many young trees they destroy in cutting down an old one." SMH, 26 Aug. 1869, referring to the Tweed.

225 W. Elyard for Col.Sec. to Wm. Wilson, 2 Jan. 1855. NSW CSOL, 55/1 quoted in Aust. Forestry Jour. Mar. 1927, pp.81-82. Sir Wm. Denison succeeded FitzRoy on 20 Jan. 1855.

the Prevention of Waste" to the N.S.W. Legislative Assembly. The petitioners sought a change in the law

> respecting the right to cut timber on Crown Lands under a government Licence, especially the cedar brushes of the Colony.

It was pointed out that "cedar trees are now becoming very scarce." The squaring of logs, it was maintained, caused a loss of "from 600 feet to 1,600 feet in every tree." The maintenance of the cedar supply was essential, since "no timber indigenous to the Colony can replace its loss." It was claimed, rightly, that "whole forests" had disappeared "in an incredibly short space of time" and that protective measures seemed essential.[226] A few may have nodded sagely, but as 1857 was a record year for cedar export, especially to Victoria, the argument must have seemed rather thin, and the first timber reserves were in fact not proclaimed until 1871.[227]

"...so few of the timbers...are known."

As long as Red Cedar remained "the king of trees"[228] and in good supply, investigation of the qualities and commercial possibilities of other brushwoods received comparatively little attention. Thus in 1823, Barron Field when visiting Illawarra, where cedar-cutting was well-established, "regretted that so few of the timbers...are known". Apart from Red Cedar and five other species, "the wood-cutters had no names for the many trees of gigantic growth which cover this mountain."[229] Lack of a vernacular name for a plant usually implied a corresponding lack of any use or distinguishing feature.[230]

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226 V. & P. Leg. Assembly NSW, 1857, I, p.571.

227 V. & P. Leg. Assembly NSW, 1883-1884, IV, p.881.

228 E.C. Booth : Australia, Lond., 1876 (?) II, p.147.

229 Field : Geog. Memoirs, p.463. The five species were : "wild apple" (Planchonella australis); "plum" (Diospyros australis); "sassafras" (probably Doryphora sassafras, or perhaps Cryptocarya glaucescens); "rosewood" (i.e. Bastard Rosewood, Syncum glandulosum); and "turpentine" (Syncarpia glomulifera which grows around the edges of rainforests). Of these, Turpentine is the most useful timber tree, although the timber of the other species has been used to some extent for linings and other indoor work. See Appendix VIII. See also Chapter III, p.170. The only brush trees Macquarie noted during his Illawarra visit of 1822 were Cedar, Sassafras and Fig, the latter probably Ficus macrophylla, which is not a timber tree. Macquarie : Journals of Tours, p.240.

230 although the converse was not necessarily true, for some distinguishing feature (e.g. the fruits of the Figs and of the Native Plum, etc.) often led to the bestowal of a vernacular name, whether a plant had some definite use or not. Plants which had some definite application necessarily required identification.

HOOP PINE AND SAW-PIT

Left : HOOP PINE, Araucaria cunninghamii, over 2 ft. in diameter at the base and some 80 ft. high, growing in a remnant of rainforest at Brunswick Heads, where brush trees extend right to the black sand of the sea shore. The large tree on the left is the Green-leaved Moreton Bay Fig, Ficus watkinsiana.

Photo:L.G., 6 Sept. 1970.

Below : SAW-PIT on a rocky slope overlooking Marom Ck. on Crawford's old farm at Rous Mill, near Alstonville. This pit, marked by a very distinct and deep depression, was probably last worked about 1880. The two men in the background are standing at the extremities of another, slighter depression, which could well be the site of another pit. There are many Tallow-wood stumps in the vicinity (one is obscured by the bushes at the end of the pit) and on the lower ground brush species still grow as reminders of a former rainforest.

Photo: L.G., 13 Sept. 1970.

When the Rev. Coles Child travelled down the Richmond early in 1850 to visit some cedar-sawyers, he noted

> dense brush to the water's edge -- and in some parts pine trees 100 ft high -- but not the least value.[231]

As long as there was plenty of cedar, this would have been the sawyers' view of the largest indigenous conifer of New South Wales, the majestic Araucaria cunninghamii which was known by various vernacular names.[232] In January 1825, Governor Brisbane sent to Earl Bathurst timber of this pine brought from Moreton Bay. The Governor was confident, because of the effectiveness of "a Topmast of the Pine in the Colonial Brig Amity" that it would "prove a most valuable acquisition for Naval purposes", and there were "endless quantities of these most beautiful Trees" up to one hundred feet high.[233] John Nicholson of H.M. Dockyard at Sydney, warmly approved of this timber, it "being well calculated for Masts and Yards, as also for House and inside Ship Work."[234] The Navy Commissioners in London were, however, unimpressed by Nicholson's samples,[235] and the timber apparently fell from favour except for local use, until concern at the diminution of "handy" mature cedar led to a reassessment by the 1860s.[236] In 1865 James and John Breckenridge established "the first large scale mill" on the Richmond, "in the midst of a rich pine scrub" at Wyrallah.[237] By the end of the sixties, it was claimed that

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231 Rev. Coles Child to his sister, 5 Jan. 1850 in Elkin : Diocese of Newcastle, p.427.

232 Moreton Bay, Richmond River, Colonial, Ring or Hoop Pine. See photographs on pp.237, 397, 399.

233 Brisbane to Bathurst, 1 Jan. 1825, HRA, XI, pp.456-457.

234 Nicholson to Alex. McLeay, 4 July 1826, HRA, XII, p.677.

235 R.W. Hay to Darling, 13 Nov. 1827 and enclosure, HRA, XIII, pp.620-621.

236 this is supported by Arthur Cousins (1866-1960) in his The Northern Rivers of New South Wales, Syd., 1933, p.65 and in The Northern Star (Lismore) 28 Feb. 1953; also Robert Leycester Dawson in RRHS Journal, 1938, pp.89-90, and E. Saville :"Reminiscences", MS. RRHS. See also C. Moore in Lond. Exhib. 1862, p.28.

237 Alex. Munro : "Reminiscences of the Munro Family", 1954, MS. RRHS. See photograph on p.387. Some areas of the Richmond rainforests were very rich in Hoop Pine. About 1880, a forest ranger reported that on one area of 50 or 60 acres, "over half a million feet of pine have been cut." Thomas Richards : New South Wales in 1881, Syd., 1882, p.59.

CUDGERIE, CEDAR AND PINE

Left : TWO IMPORTANT BRUSH TREES, Cudgerie, Flindersia schottiana and Red Cedar, Toona australis growing almost in union at the edge of the Lumley Park rain-forest reserve at Alstonville.

Below : TRIO OF CELEBRATED PINE SPECIES in the grounds of the old sugar mill at Rous Mill near Alstonville. Hoop (or Colonial, Moreton Bay or Richmond River) Pine Araucaria cunninghamii, indigenous to the area, is on the extreme left. A Bunya Pine, A. bidwillii, a native of southern Queensland, in the centre, is flanked by two Norfolk Island Pines, A. heterophylla. A second Bunya Pine is on the extreme right. All three species have strong historical associations and the latter two have been extensively cultivated in parks and gardens. It is rare to find these widely-dispersed species forming a group outside a botanic garden where for taxonomic reasons they may have been planted together. See also Ch.III, p.237.

Photos : L.G., 13 Sept. 1970.

> the use of the pine from the northern rivers has now become very general; and that it has almost entirely superseded the American in our market.[238]

Steam mills at Ramornie on the Clarence and at Wardell on the lower Richmond were cutting an increasing amount of pine and a decreasing amount of cedar by 1871, although the uses of the two timbers by no means coincided.[239]

Hoop Pine apparently attained its greatest proportions on the Richmond and in the Big Scrub, where it grew to one hundred or one hundred and fifty feet "as straight as an arrow."[240] Just as the deciduous nature of the cedars betrayed their presence, so did the height of the pines.[241] Other brushwoods came into greater demand once their properties were appreciated. Rosewood, Dysoxylum fraseranum, second to cedar among the brushwoods since Macquarie's time[242] gained

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238 Indust. Progress NSW Exhib. 1870, p.459.

239 being, as Charles Moore said, "one of the most beautiful, durable, and most easily worked timbers in the world" (op.cit., p.635) Red Cedar was used for a wide range of purposes, from fencing to fine furniture, from house slabs to exquisite interior panelling, from rowing boats to railway carriages. Hoop Pine, like its congener on Norfolk Is., A. heterophylla, proved too brittle and otherwise unreliable for masts, but it was a valuable "utility" wood for shorter spars, flooring, linings, slabs and especially for packing cases, butter boxes, etc. Selected pine with a good figure was used on a small scale for furniture.

240 Capt. S.A. Perry so described the pines after his two trips to the Richmond in 1839 and 1842. Lang : Cooksland, p.45.

241 R.L. Dawson recorded a pine near Bungabee, just west of Lismore, 5 ft. in basal diameter and 100 ft. to the first branch. RRHS Journal, 1938, p.90.

242 as early as 30 Jan. 1810, Lieut. Wm. Lawson, Commandant at Newcastle, requested that Macquarie be informed that "the 10 logs of Rose Wood shall be forwarded immly.-- it is not to be got nearer than 60 Miles from the Settlement it is a very heavy Wood and must be flitchd on the Spot..." Letter to Macquarie, NSW Archives, 7/2736, p.44. Also Richard Rouse : Records of the Parramatta Lumber Yard, 1805?-1821, ML. FM4/2119, mentions cedar logs and "Rosewood Planks" from the Sydney Store in June 1810. If from the Hunter, this would have been Dysoxylum fraseranum, but if from Illawarra or other areas near Sydney Bastard Rosewood, Synoum glandulosum. Bigge was told of Hunter R. Rosewood, Dysoxylum fraseranum, having "been much used for making Furniture", "for veneering, as well as for turning" and for "Good Bed Posts". Bigge : Report, Appendix ML. BT. Box 22, p.4214, Robert Elwes's evidence, 6 May 1820 and Box 5, p.2273, Patrick Riley's evidence, 1820. Macquarie himself inspected a log of Rosewood on the Hastings in 1821. It was "fifteen feet long, and 2½ feet in diameter." Macquarie : Journals of Tours, p.213. William Gardner referred in 1851 to the cutting of Rosewood on "the Bulga Mountains, within forty miles of Maitland", a timber "long used for veneering." Gardner : Productions Northern NSW, UNE Archives, M20 (MF), p.53.

extra attention;[243] White Beech, Gmelina leichhardtii, Teak or Crow's Ash, Flindersia australis and Tulip-wood, Harpullia pendula were among the "other" brushwoods treated at the Wyrallah Mill in the 1860s and 1870s.[244] The same diversification of interest in rainforest timbers apparently developed in other areas too, depending on the amount of cedar still available, and on the variety of brushwood trees.[245]

Yet knowledge of these brushwoods was acquired slowly. William Macarthur, one of the most enlightened amateurs, noted in the fifties that the cedar-cutters

> in seeking out this particular tree,...would appear to have neglected all the rest. The most experienced amongst them have no names for a great number, and can give little information...with regard to the qualities of their timber. They have been in the habit of confounding together numerous species, under the general designation of 'brush trees'...[246]

This was precisely the situation described by Barron Field thirty years before. Macarthur did, however, appreciate the difficulties of exploring the rainforests :

> It requires careful and laborious investigation on the part of a stranger in these brushes, to distinguish trees even of very different families; their foliage is often so far overhead, and so intermingled with that of the neighbouring trees and climbers, their trunks are so covered with epiphytes, and the light is so imperfect, that the tree often requires to be cut down to determine its identity...It may be remarked, also, that no two brushes resemble each other precisely; fresh species of trees make their appearance in each succeeding brush, whilst others disappear...Although their qualities be so little known, it is not to be doubted that some of them would prove of great value...[247]

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243 yet much was still wasted during the final clearing of some rainforests. See Chapter III, p.243.

244 nevertheless "it was mainly a pine mill". Munro : Reminiscences (1954) MS. RRHS. The most southerly pine mill was apparently at Glenfernie Forest Reserve, about 20 m. N.W. of Dorrigo, near Tyringham. Ag. Gaz. NSW, 1894, p.223. Hoop Pine in this area was often called "Dorrigo Pine." See photograph on p.387.

245 such timbers as the following came slowly into wider use : Red Bean, Dysoxylum muelleri; Black Bean or Moreton Bay Chestnut, Castanospermum australe; Cudgerie, Flindersia schottiana; Long Jack, Flindersia xanthoxyla; Silky Oak, Grevillea robusta and Orites excelsa; Tulip-wood, Harpullia pendula; Ironwood, Backhousia myrtifolia, B. sciadophora. See for example, Town & Country Journal, 25 Mar. 1871 and Ag. Gaz. NSW, 1894, p.221.

246 Catalogue : Paris Exhib. 1855, pp.115-116.

247 op.cit., p.116. To-day 19 sub-types of rainforest in N.S.W. are recognised, according to dominant species. See G.N. Baur : Forest Types in New South Wales, Syd., 1965.

Macarthur's observations were republished nearly ten years later, for nothing significant had been published in the meantime to indicate any change in the situation.[248] Although Macarthur was thinking of the Illawarra district, his remarks were equally applicable to the northern rainforests. Speaking of the timber resources of the Big Scrub in 1861, Charles Moore lamented that

> so little is known of these woods, that beyond the Cedar... Pine...Rosewood...Ash...Beech...Tulip-wood...and Silky Oak...nearly all the others are regarded as worthless, excepting for fire-wood.[249]

Over twenty years later, the same laments, tempered with some belated tributes, were still being voiced. In 1884, it was stated that "the great majority" of rainforest trees, even apart from Red Cedar,

> though yielding timber of great beauty, strength, and durability, often exquisitely figured, veined, or marked, fragrant, taking a fine polish, and equal, if not superior, to many kinds now largely imported, are unfortunately very little known, and seldom used.[250]

Three years later the N.S.W. Government Statistician supported this contention :

> Some of the least known of the brush trees have wood grained and marked most beautifully, which is capable of receiving the highest polish, while some are fragrantly perfumed. These woods are adapted to the finest description of cabinet-making, and it is strange that their merits have so long escaped attention.[251]

As Macarthur had implied long before, this was not strange. In the rainforests it was Red Cedar which dominated the timber men's attention. What sawyer would search for unknown and untested cabinet timbers as long as Red Cedar with almost universal application and a well-established market was still available? At the professional level, botanists were then more concerned with the problems of scientific description and classification than with wood technology, and even learned amateurs like William Macarthur lacked the facilities for accurate testing, although

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248 Lond. Exhib. 1862, pp.18-19.

249 Moore in Lond. Exhib. 1862, p.27. Red Cedar, Toona australis; Hoop Pine, Araucaria cunninghamii; Rosewood, Dysoxylum fraseranum; Ash, e.g. Crow's Ash or Teak, Flindersia australis or Bumpy Ash, (Cudgerie) F. schottiana, or Bennett's Ash, F. bennettiana; White Beech, Gmelina leichhardtii; Tulip-wood, Harpullia pendula; Silky Oak, Grevillea robusta. Moore repeated this statement in NSW Catalogue Paris Exhib. 1867, Appendix p.27.

250 Nilson : Timber Trees, p.12.

251 Coghlan : Wealth and Progress, 1886-1887, p.108.

RIVER RED GUM

Left : RIVER RED GUM, E.camaldulensis. A large specimen being felled in the Mulwala Forest on the Murray River between Tocumwal and Corowa, 1905.

Photo : NSW Govt. Printer No.2202.

Below : RIVER RED GUM log from the Moira Forest on the Murray, c.1898. Note the solid jinker wheels of the same timber. The log contained some 6,000 super. ft. then worth about £36. The Crown fees amounted to £3-15-0.

Photo : Ag.Gaz. NSW, 1899.

they certainly had the interest. Even in the nineties, the lack of knowledge about brushwoods was still regretted and somewhat exaggerated by some observers, but until the problem of the correct seasoning procedure was solved, it seemed that most brushwoods could be appreciated only in small museum samples.[252]

Timbers of the Interior.

In contrast to the variety of timbers found in the coastal forests, the offering of the western plains seemed meagre indeed. George Evans had collected the first timber specimens west of the Blue Mountains in 1813,[253] but subsequent explorers of the inland soon reported the dramatic diminution of forest cover as they proceeded westward. The Rev. John Dunmore Lang felt bound to acquaint prospective settlers with the

> remarkable fact that the timber of the western country is greatly inferior, both in quantity and quality, to that on the coast.[254]

This advice was both premature and exaggerated, for the west was known, even in Lang's day, to have its compensations, chiefly in stands of Ironbark, especially Narrow-leaved Ironbark, E.crebra, and White Cypress Pine, Callitris hugelii, (found at their best in such localities as the Castlereagh and Namoi districts) and in the river forests of River Red Gum, E.camaldulensis, the "blue gum" or "yarrah" which had so impressed Sturt and Mitchell.

The settlers attacked the thinner forest cover of the west with the same gusto as they attacked the sclerophyll and brushwood forests of the coast. Pine[255], Belah[256], Ironbark[257], Mallee[258], Box[259] and wattles[260] were ringbarked and burnt, and even "beautiful wilgas...in thousands"[261] were destroyed as settlers strove to increase the amount of fodder which

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252 J.V. de Coque in Proc.Roy.Soc.NSW, 1894, pp.215-216.
253 see Chapter II, pp.27-28.
254 Lang : Historical Account, II, p.374.
255 White Cypress, Callitris hugelii; Black or Red Cypress, C.endlicheri; Slender Cypress, C.preissii ssp. murrayensis.
256 Casuarina cristata.
257 e.g. Mugga, E.sideroxylon; Narrow-leaved, E.crebra; Silver-leaved, E.melanophloia.
258 e.g. White, E.dumosa; Red, E.socialis; Green, E.viridis.
259 e.g. Bimble, E.populnea; Black, E.largiflorens.
260 e.g. Myall, A.pendula; Yarran, A.homalophylla; Ironwood, A.excelsa; Brigalow, E.harpophylla; Gidgee, A.cambagei; Mulga, A.aneura and A.brachystachya and Cooba, A.salicina.
261 Wilga, Geijera parviflora. See reminiscences of E.H. Utley, sawmiller of western N.S.W. in Aust. Forestry Jour., Oct. 1922, p.283.

the Wilgas, and other trees, could have helped to provide.[262] The wheat men were even more thorough.[263]

White Cypress, Callitris hugelii, the most widely distributed of Australian cypresses, was, by the 1840s recognised as

> a most splendid fellow; very large, free, and odoriferous: it is used for furniture and ornaments, and is as pleasantly scented as the cedar.[264]

Known as Murray Pine in the southern inland districts, it was also used for fencing, hut-building and interior linings, and its resinous nature made it resistant to termites as well as rather inflammable.[265] In favourable seasons its prolific re-generation[266] alarmed graziers, if it gratified a few mill-owners, and large areas of pine were cleared, sometimes, it seemed to settlers, in self-defence.

The fact that White Cypress was "a most splendid fellow" did not necessarily bring timber transport facilities any closer. Despite the tremendous railway expansion between 1875 and 1885, with lines extending to Narrabri, Bourke, Hay, Jerilderie and Albury, there was little hope of timber from the greater part of western N.S.W. reaching a ready market. This point was brought out in the eighties when the Member for Forbes suggested to the Premier, Sir Henry Parkes, that

> the pine timber which the settlers are so anxious to get rid of and which is being destroyed by ring-barking, &c.-- could be taken to supply the wants of the Western Silver Mines. The timber now being used at these mines is brought from various parts of the world while the timber in our own Colony is being ruthlessly destroyed.[267]

Such sporadic indications of a stirring interest, at the political level, in the prevention of waste were encouraging to the growing number of people who towards the end of the nineteenth century urged that bush resources should be conserved if they could not be used immediately.

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262 see Appendix VIII for fodder trees.
263 see E.H. Utley in Aust. Forestry Jour., Oct. 1922, pp.282-283.
264 Hodgson : Reminiscences, p.148. The meaning of "free" is not clear -- it could mean "freely available", "freely splitting", "free-standing", etc.
265 for its various uses see Appendix VIII.
266 see Chapter III, pp.322-323 and photographs on p.326.
267 Henry H. Cooke to Parkes, 19 May 1888. Parkes Correspondence Vol.9, ML. A879, p.298. This was mentioned as one advantage of extending the N.S.W. railway system westward, but a line to Broken Hill was not opened until nearly 40 years later.

The other great mainstay of the inland, River Red Gum, E. camaldulensis, formed marginal forests along most of the western rivers. These forests were attacked from one side by the wood-cutters who guaranteed the needs of the increasing fleet of river-steamers, and from the other by settlers bent on clearing the riverside alluvial land occupied by almost pure stands of River Red Gum. This tree proved to be remarkably adaptable, providing slabs, sleepers, telegraph poles, wharf-piles, ships' timbers, fence posts and road-paving blocks, excellent charcoal for blacksmiths, nectar for first-grade honey and a kino which was introduced into the British pharmacopoeia by 1885.[268] The prevalence of such a valuable tree along the banks of the Murray helped to emphasise intercolonial trade problems in the years before Federation. In 1863, disgruntled squatters alleged, apparently with adequate cause, that some selectors were taking up riverside blocks solely to cut the Red Gum which was sent to Melbourne and thence to India.[269] The Survey Department accordingly gazetted the Murray Reserve to include a two-mile strip of forest along the river from Albury to the Murrumbidgee Junction.[270] Notwithstanding the duties paid, this did not prevent a leakage of timber revenue to Victoria. An investigation in 1889 revealed that nine-tenths of River Red Gum in the Murray forests (then believed to cover some 225,000 acres) was being cut by Victorian millers for the vast programme of public works south of the Murray. Echuca was "the main depot and centre of the Murray timber trade."[271] There were

> nine saw-mill plants on the Victorian bank of the Murray fronting our forest reserves...capable of turning out 71,000 superficial feet of timber every day.[272]

On the N.S.W. side of the river there were only three mills, and one of

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268 Wm. Martindale : The Extra Pharmacopoeia, 4th ed., Lond., 1885, pp.178-179.

269 Buxton : Riverina, p.148.

270 V. & P. Leg. Assembly NSW, 1865-1866, III, pp.99-101. Ostensibly, these reserves were made for "the preservation of the public interests from monopoly of frontage" to the river. The main point seems to have been to safeguard the interests of large pastoralists rather than the timber resources.

271 Forester Manton in Ag. Gaz. NSW, 1894, p.53. See photographs of existing river forest at Moama, Chapter III, p.233 and of the Echuca Wharf, Chapter IV p. 421.

272 Ag. Gaz. NSW, 1894, p.54.

these near Barham, was owned by a Victorian company.[273]

By the time the economic depression of the nineties filled Sydney "with homeless and foodless men",[274] River Red Gum was considered to be "the tree which produces directly to the Colony by far the most revenue of all our trees."[275] Accordingly one relief project was the establishment of "unemployed camps" on the Murray. Men were set to cleaning and thinning the river forests to promote better growth. At the time, it was thought that the ultimate in "relief works jokes" had been achieved, but the results were apparently quite spectacular.[276] In 1964, some 370,000 acres of River Red Gum forests still remained along the Murray between Corowa and Lake Victoria west of Wentworth, and along some reaches of the Lachlan and Murrumbidgee.[277]

"...no proper experiments have yet been made..."

Even at the end of the nineteenth century it still seemed to some, who based their criticism upon the lack of variety of the local timbers in the markets, that there had been a culpable lack of progress in botanical investigation, especially of the timber trees of the rainforests. Significantly referred to as "cedar brushes", these forests had come to be regarded as suppliers of only one main commodity to the

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273 ibid. "The principal means of transit for nearly the whole of the timber on the Murray forests is by river; the logs are hauled to the river bank in jinkers, thence floated down with the stream from the reserves above Moama in barges constructed for the purpose to long transverse outriggers, to which the logs are suspended, half in and half out of the water. The barges when drifting down the stream are kept in the middle of the river by means of a long chain dragging along the bottom...attached to the stern-post of the barge; this plan...was only discovered accidently a few years back. From below Moama, when the logs...are sawn in the immediate neighbourhood, they are loaded in barges and towed up stream by steamers to the different saw-mills of Echuca, and the sawn timber is sent by railway to Melbourne, with the exception of the small quantity that goes by river to the Darling and Murrumbidgee." Manton : loc.cit.

274 Aust. Forestry Jour., Jan. 1918, p.24.

275 Maiden in Ag. Gaz. NSW, 1894, p.49.

276 Aust. Forestry Jour., Jan. 1918, p.24. Richard Tycho Dalrymple Hay (1861-1943), later Forestry Commissioner of N.S.W. was associated with this project in the Murray Forests, which by 1918 were yielding about 10,000,000 super. feet of Red Gum annually, most of it still going to Victoria.

277 NSW Forestry Commission : Forest Resources, Regions and Trees of New South Wales, Syd., 1964, p.6.

timber market. Yet during the latter half of the century, even while cedar-cutting was at its peak, an intensive investigation of the rainforests, and other forests too, was undertaken. This was prompted by an interesting variety of factors. First, there were the increasing timber requirements of the rapidly developing post-goldrush Colonies of New South Wales and Victoria; second, there was a revival of official interest in having the Sydney Botanic Gardens upgraded to a fully scientific institution with a professional botanist as Director;[278] third, the development of a vast transport network, especially of railways,[279] depended upon a knowledge of timber technology not previously required, and fourth, there was a series of remarkable International Exhibitions for which comprehensive displays of N.S.W. timbers were provided. These factors ensured a conscientious investigation of trees, not only at the scientific level by being allotted a name and classification within a given system, but also at the purely utilitarian level at which the precise physical properties of timbers for particular constructional purposes were ascertained.

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278 this is discussed in Chapter V.

279 local shipbuilding continued to develop. In 1873 it was claimed that "The largest ship-building establishment in Sydney is that of Mr. John Cuthbert, who employs two hundred hands...The aggregate tonnage of vessels built in the Colony is 76,700, tons Ironbark is well suited for keels, kelsons, stringers, and, in fact any part of a ship requiring strength...The gum is well adapted for planking, and the blackbut makes first-class treenails while the non-shrinking qualities of the beech have marked it out for decks and other fittings...For a few pounds the ship-builder can cut and cart away as much timber as will last him the whole of the year, and it is estimated that the proprietors of saw-mills take 100,000 feet of timber for every £1 they pay the Government for license to cut. Shipbuilding is carried on on the Richmond, Clarence, Manning, and the Clyde Rivers, at Brisbane Water, Terrigal, Cape Hawke, and Jervis' Bay. Twenty years ago the average size of vessels built was from 15 to 50 tons, but the average now runs from 50 to 500 tons ...Mr. Cuthbert is building four fine schooners...for the Admiralty ...for service in the South Sea Islands..."C. Robinson : New South Wales ... Syd., 1873, pp.66-67. In 1871 20 vessels were built in N.S.W. (total, 1,798 tons) and in 1880, 41 vessels (total, 2,799 tons). There were 86 ship and boat-building establishments in 1871, and 81 in 1880. Richards : New South Wales, 1881, p.77. See also George Bennett's comment in Footnote No.100, p.362.

As early as the 1830s some observers, who were concerned about assessing the natural resources of the Colony, scathingly criticized the apparent lack of scientific investigation of the forests :

> It will not surprise any one...that no proper experiments have yet been made, on the qualities of the different varieties of the wood of these trees; nor have either Government or individuals deemed it worth while even to make a collection of them.[280]

As we have seen, this was not a valid criticism, for many collections of timbers had in fact been made, but they had all been referred to England for testing and for "proper experiments". The real weakness lay in the lack of any published findings of such tests as were made. Broad results of tests were sometimes relayed back to the Colony in despatches to the Governor and thus were generally inaccessible. The great need was for communication through readily-available published material, either in Proceedings of learned societies or in a "handy-book" or "popular guide", all likely to be more accessible and certainly less formidable than parliamentary papers and the massive Flora Australiensis, published between 1863 and 1878. But without careful botanical classification, "proper experiments" were useless, as indeed much of the earlier experimental work had shown. Careful findings were given for timbers which were virtually impossible to identify, since only broad vernacular names were used.

The increasing amount of heavy constructional work forced the issue. In November 1848, the Liverpool Provisional Tram and Railway Company adopted a report[281] on timbers likely to be suitable for railway construction. Timbers mentioned were "three if not four descriptions of Iron Bark"[282], "two kinds of box, the real and bastard"[283], Flooded Gum[284], Tea-tree[285], Mahogany[286], Spotted Gum[287] and Turpentine.[288] Interestingly, the first train finally steamed from Sydney to Parramatta in September, 1855 on rails supported by sleepers principally hewn from Red or Broad-leaved Ironbark, E.fibrosa, much of it from a property between Homebush

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280 Henderson : Observations (1832) p.130.
281 Railway Papers, ML. A281. pp.11-14.
282 "The red white & scrub" -- probably E.fibrosa (or E.sideroxylon); E.paniculata and E.crebra.
283 E.moluccana and E.bosistoana.
284 as the report was chiefly concerned with the resources of the County of Cumberland, this would have been E.saligna and/or E.deanei.
285 Melaleuca quinquenervia or M.linariifolia.
286 E.resinifera or E.pellita.
287 E.maculata.
288 Syncarpia glomulifera.

and Rockwood.[289] In March 1858, the first significant controlled tests of N.S.W. hardwoods were conducted not by a botanist at the Botanic Gardens, but by a former Chief Commissioner of the N.S.W. Railways, Captain Edward W. Ward of the Royal Engineers, at the Sydney Mint of which he was Deputy Master. Ward's experiments were conducted to enlighten

> architects and engineers, and indeed,...all interested in the advancement of the colony...For years our builders have been placing girders and joists of iron bark and other colonial timbers, in houses, without any accurate means of estimating the strain that they will bear and what should be their dimensions.[290]

Ward conducted four experiments on each of four timbers[291] to determine their strength and elasticity. In addition, the specific gravities of the timbers were carefully calculated with the aid of the "delicate balance in the Mint." For determining the other qualities, iron trestles, weights and a screwjack were used.[292] To determine strength and elasticity, Ward applied formulae used in experiments at Woolwich.[293] Significantly, Ward's timber specimens[294] were made available by a fellow Royal Engineer, Captain H. B. Martindale, then

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289 F.H. Potts to J.H. Maiden in Ag. Gaz. NSW, 1893, p.758.

290 E.W. Ward to the Philosophical Society of N.S.W. in Syd. Mag. Sci. and Art, May 1858, p.258. Edward Wolstenholme Ward (1823-1890) also served as a Member of the N.S.W. Legislative Council, as secretary of the Philosophical Society of N.S.W. and as a trustee of the Australian Museum before becoming first Deputy Master of the Melbourne Mint which he opened in 1872. See Proc.Roy.Soc. NSW, 1890, pp.10-11.

291 The timbers, "fresh cut, taken from trees in the neighbourhood of Belford...18 miles from Maitland and 10 miles from Singleton on the Great Northern Road" were designated "Iron-bark", "Stringy-bark", "box" and"Spotted Gum", probably E.paniculata (or E.crebra); E. eugenioides; E.moluccana; and E.maculata. V. & P. Leg. Assembly NSW, 1858, II, pp.697-699.

292 Beams of timber were supported on iron trestles 4 ft. apart and weights were applied to the centre of the beam "and increased by ½ cwts. at a time, at intervals of half-an-hour till the elasticity was evidently destroyed." The interval was then increased to one hour, and at the end of each interval the beam was gently relieved of its weight by a screwjack. V. & P. Leg. Assembly NSW, loc.cit.

293 by P. Barlow.

294 W.R. Collett, who became the first Commissioner of Main Roads in 1861 did the actual collecting.

Chief Commissioner for Railways. In these tests, Box, probably E.moluccana gave the best results.[295] Ward called for samples[296] of other timbers such as Grey Gum, E.punctata and Scrub Beefwood, Stenocarpus salignus with which to conduct further experiments.

Shortly afterwards, Ward conducted a more comprehensive series of experiments at the request of Governor Denison and at the expense of the railway vote. Once again the samples were light beams[297] tested with trestles and weights. Of the eighty-seven specimens tested, nineteen came from near Berrima,[298] seven from near Albury,[299] eight from near Bowenfels,[300] eleven from Singleton, Murrurundi and Armidale,[301] four from "timber used in the construction of Mudgee Bridge"[302] and thirty-eight were from Queensland.[303] The latter were sensibly "accompanied by the flower and fruit" which enabled Charles Moore to identify them, and thereby render the experiments much more meaningful. The other specimens were identified by "the names usually given to them by the sawyers of each district", hardly appropriate in tests conducted on scientific lines! This time, Red Ironbark, probably E.sideroxylon, was revealed as the strongest.[304] Further

295 The full results of the experiments, and sample calculations to guide engineers in their choice of timber of given dimensions, are in V.& P. Leg. Assembly NSW, 1858, II, pp.697-699.

296 to be 4'6" long and 2½" square in section.

297 5' long and 2" square in section.

298 "collected by Mr. Moggridge, District Surveyor."

299 "collected by Mr. F. Adams, District Surveyor."

300 "collected by Mr. Dawson, District Surveyor."

301 collected by "Mr. Collett and Mr. Woods", District Surveyors.

302 "collected by the Commissioner for Railways."

303 E.W. Ward: "Timber of New South Wales and Queensland", 6 Feb.1861, report presented to both Houses. V.& P.Leg.Assembly NSW,1861, II, pp.339-354.

304 The full tabulated results are not repeated here. As before, four experiments were conducted with each timber to obtain mean results. The N.S.W. timbers included a fairly wide sampling of hardwoods and a few brushwoods : Red Ironbark, E.sideroxylon; White or Grey Ironbark, E.paniculata; Narrow-leaved Ironbark, E.crebra; White Stringybark, E.globoidea; Red or Blue-leaved Stringybark, E.agglomerata; Mountain or Black Ash, E.sieberi; Grey Box, E.moluccana; Yellow Box,E.melliodora: Bloodwood, E.gummifera; White Gum, E.viminalis or E.haemastoma; Blackbutt, E.pilularis; Woollybutt, E.longifolia; Smooth-barked Apple, Angophora costata; Forest Oak, Casuarina torulosa; Turpentine,Syncarpia glomulifera; White Cypress, Callitris hugelii; Red Cedar, Toona australis; Coachwood, Ceratopetalum apetalum; Sassafras, Doryphora sassafras; Brush Cherry, Syzygium paniculatum. Timbers used in the Mudgee Bridge included Slaty Box, E.dawsoni, Yellow Box, E.melliodora and White Box, E.albens. Once again the classifications were completely inadequate for scientific tests. Most species were incompletely named (especially the Eucalypts) and some were incorrectly named, e.g.Forest Mahogany, known since 1790 by Smith's name of E.resinifera, was referred as "E.mahogani".

experiments to determine the properties[305] of colonial timbers were conducted, not only in New South Wales and the other Colonies,[306] but also in England, where in 1875, Thomas Laslett, "Timber Inspector to the Admiralty" published his valuable Timber and Timber Trees, Native and Foreign.[307] Much of this enquiry was still prompted largely by railway requirements,[308] and when the Faculty of Engineering was established at Sydney University in 1884, it was a former railwayman William Henry Warren,[309] who was appointed the first Professor. By the end of 1886, Warren was able to tell the Royal Society of N.S.W. of his investigations into the strength and elasticity of unspecified Ironbark timber carried out "in the Engineering Laboratory of Sydney University by means of the testing machine."[310]

Although "testing machines" had been devised to remove much of the inaccuracy of earlier experiments, there were, as Frederick Campbell[311] saw, some factors to be watched, if experiments in timber technology were not forever to be doomed to be inconclusive. These factors included consideration of the age of trees from which samples for testing were taken; the locality of the trees (for soil, climate, etc. affect growth); the part of the tree from which samples were cut; the degree to which

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305 e.g. specific gravity, elasticity, transverse and longitudinal crushing weight, modulus of rupture, etc.

306 e.g. experiments carried out by the Victorian Railway Dept. in 1865 upon River Red Gum, E.camaldulensis; by J.M. Balfour in New Zealand, 1864; by Baron von Mueller and Johann Georg Luehmann in Victoria; by Frederick A. Campbell at Geelong in 1879 upon ten timbers, including Tasmanian Blue Gum, E.globulus; Broad-leaved Ironbark, E.fibrosa; Messmate, E.obliqua; Blackwood, Acacia melanoxylon; River Red Gum, E.camaldulensis and Red Cedar, Toona australis.

307 Laslett hoped that his work would serve as "a Handy-book on Home and Foreign Timber, for ship and house building purposes" for such "is, in the opinion of many, much required." Laslett appreciated that there were "botanical treatises" but they lacked "practical application of knowledge to the wants of the shipwright and carpenter..." In 1894, Prof. H.M. Ward revised and reissued Laslett's work, devoting Chapter XXIII to Australian timbers. Ward maintained that "among the most astonishing advances in economic Botany have been the developments of our knowledge of the timbers of the remarkable and interesting Australian Myrtles belonging to the difficult genus Eucalyptus..." See Proc.Roy.Soc.Vic. XVI and XIX, 1880 and 1883; Maiden : Useful Plants (1889); also Proc.Roy.Soc. VDL, 1852 for other early experimental work.

308 e.g. the work of John Whitton, Engineer-in-Chief for Railways and that of the Railway Bridges Inquiry Commission. Proc.Roy.Soc.NSW,1886,p.261.

309 William Henry Warren (1852-1926) who held the Chair for over 40 years, published The Strength and Elasticity of New South Wales Timbers (Syd.) in 1887. See also Warren's "Timber Physics - Treatise on Timber Tests and Summary of Results" in R.D. Hay: Forestry Handbook: Part I: Forest Principles and Practice, Syd., 1915.

310 Proc.Roy.Soc. NSW, 1886, p.261.

311 Proc.Roy.Soc. Vic., XXIII, 1887, pp.244-249.

the samples were seasoned; the size of the samples tested. Campbell also rightly pointed out that notwithstanding the "establishment in our University of a complete testing machine",

> the particular species of timber to which each piece tested belongs must be thoroughly established. Local or popular names are almost valueless for the purpose; the true botanical nomenclature must be used.

Yet, Campbell did not dismiss the efforts of the unscholarly. The advent of the testing machine

> should not prevent others...who have no apparatus from assisting in the work, for the more numerous the experiments the nearer to the truth do we arrive. All that is necessary is the inclination for the work, coupled with care and patience in carrying it out. The roughest bushman in the interior, breaking a few sticks with weights, and telling us all that is to be known about these sticks and about these weights, adds to the knowledge of the world, and his rough work, if only careful, true, and full, may rank with that of high officials who work in dockyards or laboratories with perfect machines and paid assistants. He may even rank before them as a benefactor if his work be complete, theirs imperfect, in the respect that complete knowledge, however limited, is truth, and is established for ever, whilst imperfect knowledge, however extensive, may only lead us into error and confusion.[312]

Like his contemporary, J. H. Maiden, and like J. T. Bigge long before, Frederick Campbell, civil engineer, respected the practical knowledge of the man in the bush.[313]

It was inevitable that "the man in the bush" would sometimes revolt against opinions imposed upon him from above, even if they should come from the Railways Department which had long taken a lead in the field of wood technology. The Sydney Mail was pleased to publish an irate letter of 29 Dec. 1890 from John L. Ruthven of Port Macquarie evincing surprise and alarm that the Railway Commissioners should still be insisting upon hewn, rather than sawn sleepers despite the waste, and upon ironbark timber. Ruthven continued,

> Tallow-wood, bloodwood, grey gum, mahogany, and matured blackbutt are far and away more lasting than ironbark...

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312 F.A. Campbell : "The Want of a Uniform System in Experimenting upon Timber". Proc.Roy.Soc.Vic., XXIII, 1887, p.249.

313 cf. R.T. Baker : The Hardwoods of Australia, Syd., 1919, p.24 : "Laboratory tests must...be studied in conjunction with the empirical knowledge of the practical man."

> it is high time this Government fad and belief in ironbark was 'busted up', and if the Commissioners won't take the matter in hand, here is a chance for one of our baby politicians doing something towards earning his much too liberal screw by insisting that searching inquiries should be made, not from theorists, but from practical men, as to the suitability of our hardwoods, other than ironbark, for railway sleepers.

Extreme differences in opinion over the merits and demerits of timbers from various places suitable for various purposes, only emphasised the importance of the variables to which Campbell had drawn attention in 1886.[31] Ironbark, in its various forms, retained its reputation as "king of New South Wales hardwoods" lasting "for an indefinite period"[315] as railway sleepers, even if it were prone to termite attack,[316] but it is interesting to note that it is Blackbutt, so warmly admired by Alexander Harris in the 1820s, which remains "the 'bread and butter' tree of the forest services" to-day.[317]

To some extent, the problem of bridging the gap between Ruthven's "theorists" and "practical men" remains, and among timber men it is easy to precipitate an argument about the best timber to use for a certain purpose. In 1884, however, a significant contribution was made to bridging this gap, once again not by a professional botanist, but by a draftsman in the Surveyor-General's Department. This investigator, Arvid Nilson,[318] in submitting The Timber Trees of New South Wales for publication by the Forest Conservancy Branch of the Department of Mines, laid claim to "no originality" save in "the general arrangement of the matter". The "matter" was considerable, and admirably summarised. It included ecological notes, hints on seasoning and preserving timber,[319] the qualities, classification

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314 Campbell : op.cit.

315 Maiden : Forest Flora NSW, I, p.177.

316 Ag. Gaz. NSW, 1893, p.753.

317 S. Kelly : Eucalypts, Melb., 1969, p.47. In 1895, J.H. Maiden stated, "If I were asked to name the three most valuable timbers of New South Wales, I should say Grey Ironbark, Cedar and Beech." On the other hand "some people" considered Blackwood, Acacia melanoxylon "to be the most valuable". Ag. Gaz. NSW, 1894, p.130 and 1895, p.288. It largely depended on the purpose and had in mind.

318 Arvid Nilson (1844-1890) entered the public service in 1868, and in 1874 was appointed draftsman in the Dept. of Mines. He became a draftsman in the Surveyor-General's Dept., Dept. of Lands, in 1879 and remained so until his death, 10 nov. 1890. Lands Dept. Records; SMH, 11 Nov. 1890.

319 using such compounds as iron sulphate, copper sulphate, zinc chloride, mercury bichloride, and "by Mr. Bethell's process of saturation with the liquid called 'creosote'...a kind of pitch oil." Nilson : Timber Trees, p.17.

and uses of timbers, where known, and descriptions of nearly 400 species.[320] The results of the experimental work of E. W. Ward and others were also given, and although Nilson stressed the derivative nature of his work,[321] there were many refreshingly original touches and hints likely to appeal to the "practical men". The great value of Nilson's work was that it synthesized the essentials, as then understood, of botanical classification and wood technology.[322]

As the "Mother Colony", New South Wales would have lost much prestige had it not contributed displays to the great nineteenth century Exhibitions[323] which began with the World's Fair held in the Crystal Palace,[324] London in 1851. The collecting of timber samples for the "natural productions" exhibits very significantly affected the investigation of the forests. Foremost of the amateur collectors was William Macarthur,

320 i.e. 367 species plus about 30 varieties. Many of the names both vernacular and botanical, have long been superseded, but Nilson clearly attempted to give as wide a range of vernacular names as possible. Many of the uses of the timbers remained unknown, and some were dismissed as being of little value.

321 "I have made free use of everything that has been published on the subject, including the incomparable Flora Australiensis...and the meritorious writings of the Reverend Dr. Woolls, of Parramatta, and Charles Moore...of the Sydney Botanic Gardens, besides valuable Manuscript Notes on the timbers of the Murrumbidgee and Lachlan Districts kindly lent me by Mr. John Duff, Inspector of Forests." Nilson : op.cit., Preface.

322 Builders, engineers, architects and other "practical men" soon had the benefit of the results of experimental work in the tables relating to weight, specific gravity, elasticity, breaking weight, strength etc. in such builders' handbooks as C.E. Mayes : The Australian Builders & Contractors' Price Book, 7th ed.Syd., 1908 (1st ed. 1862); W. Jeffries : The Australian Building Estimator, Syd., 1907; J. Mangle : Australian Building Practice, Syd., 1911 (1st ed. 1900) -- these publicised the work of Ward and Warren.

323 these had their roots in the ancient local fairs, and were forerunners of the enormous "Expo" displays of our own time. Notable among the Exhibitions were those held in London, 1851 and 1862; Dublin, 1865; Paris 1855, 1867 and 1878; Vienna, 1873; Philadelphia, 1876; Calcutta, 1884; Colonial and Indian held at Liverpool, Eng., 1886; Glasgow, 1888. The first Australian International Exhibition was held in Sydney, 1879-1880 (see Chapter V) followed by one in Melbourne, 1880-1881; Adelaide, 1887, etc. In addition there was in Australia a series of Intercolonial Exhibitions held in Melbourne, 1866; Sydney, 1870, 1873, 1875; Brisbane, 1876. Sometimes previews of exhibitions to be sent overseas were held in the Australian capitals.

324 the building itself had botanical associations. The Crystal Palace was designed by Joseph Paxton (1803-1865) who as head gardener to the Duke of Devonshire, had designed the great conservatory at Chatsworth, 300 ft. by 145 ft. for the Duke's collection of exotic plants. Paxton's Botanical Dictionary, a register of "the names, history, and culture of all plants known in Britain" was first published in 1840 and went through various editions.

one of the N.S.W. Commissioners[325] for the Paris Exhibition of 1855. Macarthur meticulously collected 249 specimens of timbers from all three of his ecological "classes" in "the Southern Districts"[326] paying special attention to plant names used by aborigines and sawyers, and to the habitat and uses of the trees, where known.[327] Botanical classification was attempted, with 95 of the 249 samples being allotted specific names,[328] over 120 others their generic names, and most of the remainder their family classifications -- a remarkable achievement for the time.[329] Macarthur's collection far surpassed that of the professional Charles Moore's 92 samples from "the Northern Districts."[330] Strangely, Moore did not visit the rainforests "on the banks of the Clarence, Richmond, Tweed, and other of the northern rivers." He maintained that

> so little is yet known of the timbers growing in these localities, that, beyond the pine and the cedar, scarcely any others are at all appreciated by the sawyers, or by the settlers...[331]

Moore at this stage did not consider it "advisable to take any notice" of aboriginal nomenclature since names for trees tended "to vary, more or less, with each tribe."[332] Compared with Macarthur's list, Moore's botanical classifications were lamentably weak. Most samples were allotted no name at all, a few were given generic names (e.g. Acacia, Grevillea, Casuarina) and a few family classifications, but only one was given a

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325 the others were Edward Deas Thomson and Matthew Henry Marsh, both mentioned elsewhere in this study. Further notes on Macarthur are contained in Chapter III pp.207 et.seq. and in Chapter V, pp.466,467.

326 see Chapter III, pp.207-208.

327 see Macarthur's MS working list of the first 107 specimens in Macarthur Papers, Vol.109,ML. D185, pp.124-126.

328 not all of which would be now accepted. There were duplicates of some samples.

329 it is worth noting that William Macarthur's nephew, Edward Macarthur Bowman (son of Dr. James Bowman and Mary Macarthur) collected timber specimens at Ravensworth and Camden in 1844 and 1845. He also noted aboriginal names of trees, localities, soil types, dimensions, uses, etc. and attempted some botanical names. See Edward Bowman : Misc. Letters and Papers, 1843-1851, ML. A4297, pp.172-173 where 17 specimens are listed, chiefly Eucalyptus, Acacia, Casuarina and Exocarpos. It is likely that Bowman assisted his uncle later.

330 Moreton Bay and Wide Bay. Both Northern and Southern collections were "accompanied by dried specimens."

331 Catalogue : Paris Exhib. 1855, p.123.

332 ibid. George Caley however had long before used such names to some benefit during his pioneer work on the genus Eucalyptus. See Thesis I, pp.124-125.

specific name and that was probably wrong.[333] From the wide range of timber samples, "a selected set of specimens from the hard durable carpentry woods of the collection" was transferred to Captain Fowke, Secretary to the British Department of Science and Art, to be "subjected to a series of experiments to test their strength, flexibility, &ca."[334] Macarthur's industry earned him the Médaille d'Honneur and a knighthood.[335]

Macarthur and Moore again submitted timber collections for the 1862 London Exhibition, the former[336] sending 193 specimens from the southern districts and Moore 115 specimens from the Clarence and Richmond districts. This time Moore had full botanical classifications[337] for all but a few of his specimens, the aboriginal names of several and notes on habitat (most were from rainforests) and uses. Macarthur's notes revealed his customary care and erudition. Captain Fowke's services were once again requested and twenty samples of Eucalyptus timbers went to him for testing.[338] Timbers from Macarthur and Moore were displayed once more in Paris in 1867. Macarthur again had the assistance of the Rev. James Hassall and Edward S. Hill in collecting 195 specimens from "the Southern Districts". Moore submitted 156 samples from the Clarence and Richmond.[339]

By 1870 Moore's knowledge of the forests had so developed that he was able to supply for the Sydney Intercolonial Exhibition an account of seventy species of rainforest trees,[340] fifty-four hardwoods from the

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333 Acacia pendula, an inland species. Moore, whose botanical knowledge was at one stage seriously questioned, had been in the Colony only since 1848. He acknowledged that "the genera and species of the several kinds have not yet been accurately determined." See Chapter V. Macarthur on the other hand, was then a "currency lad" in his mid-fifties.

334 Wm. Macarthur in Macarthur Papers, Vol. 109, ML. D185, p.106.

335 Moore's collection won a silver medal.

336 with the acknowledged assistance of the Rev. James Hassall (then Rector of Berrima) and of "Messrs. Hill & Hanaghan." For correspondence between Macarthur and Hill concerning the specimens, see Macarthur Papers, Vol. 41, ML. A2937, pp.244-247 and 306-313.

337 i.e. family, genus, species. Dr. George Bennett saw the significant point here. Writing to Sir Wm. J. Hooker, 20 Nov. 1861, Bennett mentioned that Moore "has made a fine collection of woods from the Northern District", adding, "but what is more important Mr. Moore is at present in the Clarence & Richmond river Districts collecting flowers or fruits or both of the woods collected." Bennett Papers, ML. FM3/237. Classification of the trees was thus made possible.

338 for specific gravity, breaking weight, crushing weight, etc. The tabulated results of some of Fowke's experiments were published. See Lond. Exhib. 1862, p.33.

339 NSW Catalogue Paris Exhib. 1867, Appendix pp.1-26 and 27-48.

340 Moore supplied the full botanical classification of all but four, for which he gave generic, but not specific names.

sclerophyll forests[341] and two species of Cypress pine, with notes on distribution and on such uses as were known.[342] Macarthur and Moore sent similar collections to the Philadelphia Exhibition of 1876. To widen the range of specimens, Moore sent the Botanic Gardens collector, William Carron to the Clarence where in August and September 1875 he "collected in all 74 species of timbers with specimens of the leaves, flowers and fruits..." Carron thereby "collected about double the number of species contained in the list" he was given, "many of which were not obtained for the Exhibition in London of 1862, or the Paris Exhibition of 1867..."[343] Here is clear evidence of the stimulus given to forest exploration by the Exhibitions, and of the desire to make new discoveries especially for these displays.[344]

For the great Sydney International Exhibition of 1879, the N.S.W. Department of Mines prepared "a most magnificent, extensive, and instructive collection of 320 specimens of the various timbers indigenous to this Colony",[345] doubtless obtained chiefly through Moore. This widely representative collection included over forty samples of Eucalyptus timber as well as many brushwood timbers from both southern and northern rainforests. The Melbourne International Exhibition of 1880

> displayed...a collection of 277 specimens, arranged by Mr. Charles Moore...Each specimen was labelled with its natural order, scientific name, local name, height of tree, diameter of its stem and habitat.

This collection also contained "upwards of forty eucalypts."[346]

These Exhibitions not only stirred "official" investigation of the forests. The "practical men" and interested amateurs were encouraged to display the timbers they had been accustomed to using, even if on a

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341 principally Acacia, Angophora, Banksia, Casuarina, Eucalyptus, Melaleuca, Syncarpia and Tristania.

342 C. Moore : "On the Woods of New South Wales", in Indust. Progress NSW Exhib. 1870, pp.633-661.

343 Carron to Moore, Oct. 1875, Carron Papers, ML., C351-2.

344 about this time, Carron brought to botanical notice his discovery on the Bellinger River of the Negrohead or Antarctic Beech, which Moore named Fagus carroni. The tree is now known as Nothofagus moorei. See photograph Chapter III, p.167.

345 Syd. Exhib. 1879, p.719.

346 Melbourne International Exhibition. 1880-1881 : Official Record, Melb., 1882, p.cxxxix.

small scale within a restricted area.[347] Never before had there been such opportunities for people interested in timber to appreciate the

347 e.g. to the 1855 Paris Exhibition, John Blaxland of Liverpool Plains, W. Busby of Cassilis and C.C. Forbes of Bathurst all sent specimens of "Myall wood" (Acacia pendula); James Chisholm of Goulburn sent specimens from his district; John Humphries of Kincumber sent a Rosewood log; Wm. Wilson of Lismore sent "barks and woods" from the Richmond, and others sent specimens of Red Cedar, Tulip-wood, etc.

to the 1862 London Exhibition, Harry Thompson of Camden sent "21 specimens of various woods adapted for posts, rails, beams, plough feet, felloes, spokes, laths, batten, shingles, &c."; "the M'Leay River Committee per J.B. Casey" exhibited "seventeen specimens of wood, from the M'Leay River" and E.W. Rudder of Kempsey sent another collection; Thomas S. Mort sent a "Log of Brigalow" (Acacia harpophylla); A. Dawson, Colonial Architect, Sydney, sent two collections of building timbers, and others exhibited specimens from posts which had been long in the ground, parts of fences, and even a piece of Spotted Gum (E.maculata)"from the hull of steamer William the Fourth" built at Clarance Town in 1830. Fibres, barks, gums, manna and specimens of cabinet work were also exhibited.

to the 1867 Paris Exhibition, E.W. Rudder of Kempsey sent 69 timber specimens, including Red Cedar, Rosewood, White Beech, Flooded Gum, Turpentine, Bloodwood, Forest Oak, etc.; John Cuthbert, ship-builder of Miller's Pt., Sydney sent a case made from 30 species of native timbers; other timber samples were sent by William Jolly and Lyall Scott of Ourimbah, and by James Barnet, Colonial Architect.

to the 1879 Sydney Exhibition, A.R. Crawford of Walcha sent "nineteen varieties of timber" with vernacular names and uses; the Clarence Pastoral and Agricultural Society sent "fifty-four varieties of timber, embracing numerous useful and ornamental specimens" but unfortunately no information accompanied them; similarly T. Bryant of Camden submitted "an extensive collection of 285 specimens of indigenous timbers...in neatly polished blocks" but all were unnamed and no information was sent; the Australian Agricultural Co. of Newcastle sent "an interesting and instructive collection of 186 specimens, comprising seventy varieties of timber grown on the Port Stephen (sic) and Warrah Estates" -- these were "neatly labelled" and accompanied by "information regarding size and uses"; the Mudgee Committee sent specimens of Myall (Acacia pendula), Yarran (A. homalophylla) and various Eucalypts (including Slatey Gum, probably E.dawsoni; Yellow Box, E.melliodora; White Box, E.albens; Ironbark, probably E.sideroxylon); some "gentlemen of the Illawarra district" sent timbers but "no instructive information"; the Parramatta Road Trust Commissioners submitted "an interesting exhibit of 23 specimens of old timbers" used in various ways for 36 to 60 years, and W. Stewart of Sydney exhibited "roughly sawn cedar timbers in first stages of manufacture" for furniture.

to the 1880 Melbourne Exhibition, P. Magrath of Yass and T. Page of Grafton both sent timber exhibits.

range of native timbers, whether or not some use had been found for them. Neither had there ever been such opportunities to assemble for local and international publication the virtual sum of botanical and practical knowledge of colonial trees. Fully classified or not, useful or not, polished or unpolished, the specimens dispelled forever the notion that the Australian bush was without variety. The completeness of knowledge of some trees was revealed as clearly as the lamentable ignorance of others. These assemblages of specimens, notes and descriptions not only indicated the fields in which botanical investigation had been effectively pursued, but also promoted research into areas previously neglected. The Exhibitions thus served as notice-boards indicating both achievements and needs, and their overall impact upon the more thorough and directed investigation of the bush can hardly be exaggerated.

"No country has been more favoured..."

Cook, Banks and the first settlers had had much to say about the hard, heavy, unyielding timbers given to shrinking, warping, rending and "the shakes". A century after Cook, the director of the only Government botanical institution in the Colony claimed, on the basis of his own experience and of other evidence, that

> no country has been more favoured by Nature with a greater variety and abundance of trees yielding strong, beautiful, and durable timbers than the Colony of New South Wales.[348]

Furthermore, "trees possessing these qualities abound in more or less quantities" over "the greater part" of the Colony,[349] although "the necessary requirements for building and fencing...for public works and for exportation" had "considerably diminished the supply of several valuable kinds."[350] Free selection was seen as the great evil as far as the diminution of timber resources was concerned.[351] Regret was still

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348 Moore in Indust. Progress NSW Exhib. 1870, p.633. George Reid quoted this encouraging claim in his An Essay on New South Wales, Syd., 1876, p.62.

349 ibid. Moore did except "some parts of the Manero, Murrumbidgee, and Murray Districts." Strangely he made no mention of the dearth of timber trees in the far west.

350 ibid.

351 Moore pointed particularly to "the forests of Illawarra, and those clothing the banks of nearly all the rivers north of it", but did not mention the wasteful methods of cutting timber. Wm. Carron also referred to the selectors' clearing activities, and how these had forced him into the upper reaches of the Clarence when collecting timber specimens in 1875.

TIMBER SOURCES, COASTAL AND INLAND.

REMNANT OF THE 'BIG SCRUB' on the northern side of the Brunswick River, where cedar-cutting began in the 1840s. Note the proximity of the sea, and the tall Hoop Pines, Araucaria cunninghamii, standing high above the rainforest canopy. As late as 1890 there were still some Hoop Pines in this vicinity about 200 feet high and four feet in basal diameter. (Town & Country Journal, 1 Nov. 1890).

Photo : L.G., May 1970.

ECHUCA, on the Victoria side of the Murray, became "the main depot and centre of the Murray timber trade". Linked to Melbourne by rail, in 1864, Echuca had a wharf and a number of boat-building yards soon after, all of them dependent upon the ready supply of River Red Gum, Eucalyptus camaldulensis. The little P.S.Etona and the enormous Red Gum wharf are reminders of a time when Echuca was the busiest Victorian port after Melbourne.

Photo : L.G., 9 Jan. 1967.