

There were those who, drawing on Queensland experience, disagreed with this theory years before the life cycle of Plasmodium was discovered, notably the Rev. Julian Tenison-Woods, a respected scientist, and a settler, James Demarr, who wrote his reminiscences in 1889.<sup>148</sup> However, the fact remained that the once-despised eucalypts were widely introduced throughout the world during the latter part of the century, and notwithstanding an unhappy lack of the "salutary effect upon the atmosphere" expected by the Rev. John Dunmore Lang from "the empyreumatic oil" exuded "under the influence of the sun's rays",<sup>149</sup> they doubtless reduced the water content, and thereby the mosquito population, of many a swampy place from which feared miasmas had arisen. Those who were perhaps not sure either way, pointed out

This much is certain: that if a small quantity of any of the eucalyptus oils be sprinkled in a sick room, the pleasure of breathing an improved air is realised at once,<sup>150</sup>

and we would still agree with this.

From time to time attempts were made to correct other misconceptions, too. As early as 1827, Peter Cunningham warned against using English criteria to judge Australian scenery. Let the immigrant compare the "former barren wilds" of England "with the same land now

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148 In 1882 Tenison-Woods told the Linnean Society of N.S.W. that the Narrow-leaved Ironbark, E. crebra was plentiful "on the Peak Downs, about Clermont and Copperfield...and all around the Hodgkinson diggings. I mention this...to show that whatever febrifuge qualities the Eucalypts may possess, the mere presence of some species will not be enough to dissipate malaria. In the places... mentioned fever and ague were common enough, yet the prevailing winds used to blow through hundreds of miles of these gum-trees ere they reached the infected diggings." Proc.Linn.Soc.NSW, 1882, p.336.

In 1889 James Demarr recorded that the lowlands between the Divide and Brisbane were unhealthy; many people were "afflicted with fever and ague." Therefore, he concluded that the eucalypts which had "the reputation of being a perfect antidote to ague and... introduced into Spain and North Africa to that end" enjoyed this reputation falsely, "for here the forest was, as a rule, all eucalyptus." Demarr: Adventures (1893), pp.211-212. Thus simple observations pointed to the fact that N.S.W. criteria did not apply -- the factor of latitude had been overlooked.

149 Lang: Statistical Account, II, p.35.

150 H. Willoughby: Australian Pictures drawn with Pen and Pencil, Lond., 1886, p.199.

ECOLOGICAL VARIETY: GRASSY PLAIN AND SNOW GUM SCRUB.



GRASSY PLAIN: The Monaro at Bunyan, a vast area of natural pasture. Ribbon or Manna Gum, E.viminalis in foreground. Note the post-and-dropper fence.

Photo.: L. G., 16 Jan. 1967.



SNOW GUM SCRUB in high country near Nimmitabel. Snow Gum, E.pauciflora, also known as White Gum, Cabbage Gum, and Cattle Gum, since the foliage is eaten to some extent by stock.

Photo.: L. G., 16 Jan. 1967.

converted by cultivation into fertile landscapes." To Cunningham, it was only

he who has seen...the natural scenery of Australia...who can justly judge of the relative beauty...in this particular certainly Australia far exceeds any other new country I have hitherto beheld...<sup>151</sup>

Twenty years later, a similarly realistic view was expressed by one who sought to account for "the conflicting testimony of travellers on the subject of Australian scenery." He rightly attributed the diverse impressions as being due, at least in part, to actual changes in the scenery itself, wrought by such factors as drought and overstocking. He concluded:

The general character of Australian scenery, like that of its indigenous productions, is peculiar to itself. In many parts of the interior especially there is something in its wild singularity which defies the description of the traveller and the skill of the artist. Neither the notebook of the one, nor the pencil of the other, can convey it to the imagination; it must be seen to be understood.<sup>152</sup>

We might add, that the purpose for which one had come to the country, and his personal problems at the time of making an assessment, also affected the impressions formed. The timber men saw good 'stands' or poor 'stands' of their favourite trees; the squatter saw attractive grass or drought-seared stubble; the agriculturist saw land which was difficult or relatively simple to clear and plough; the civil officials and military officers saw a place in which a term had to be served for better or worse; the convicts saw a place of banishment; the naturalists saw a botanical wonderland. Many looked at the land with more than one of these attitudes. In fact, as Dr. George Bennett, an accomplished amateur naturalist implied in 1860, testimonies could be expected to be as varied as the very vegetation itself:

The indigenous vegetable productions of Australia are varied...some stiff, formal, and rigid, whilst others display beauty and elegance of growth, delicate combination of colour in their flowers,

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151 Cunningham: Two Years, II, p.178.

152 Haygarth: Bush Life, p.124.

and vivid green umbrageous foliage; some attain a great altitude and diameter, others merely form an underwood of dwarf trees and shrubs varied by Tree- and other ferns, intermingled with a rich profusion of elegant flowering creepers and parasitical plants.<sup>153</sup>

Bennett's travels within the colony had taken him through a sufficiently wide range of ecological regions to enable him to see that generalisations were not only unwise, but impossible. He also pointed out:

It is not long since Australia was looked upon as a country capable only of producing wool; its trees were described as arid and unpicturesque in character and growth and useless as timber.

Happily, however, such

crude and imperfect notions have, to a certain extent, given way, as the labours of travellers and naturalists have furnished a truer picture of the great Australian region.<sup>154</sup>

It has been shown, however, that notwithstanding the efforts of the explorers, the specimens they brought back, and the journals they published, many of the ideas formed in the first days of settlement, had become traditional and rather rigid.

In 1877, Frederick Manson Bailey told the Linnean Society of New South Wales:

If we look back some thirty or forty years we can scarcely now believe that it was often then said that the Australian flowers were without beauty or fragrance, yet nevertheless such was the cry, as many of us can well remember.<sup>155</sup>

There were other signs, too, of a reassessment. Anthony Trollope, who travelled in New South Wales in 1871-1872, did not consider that earlier writers had done justice to "the scenery of Sydney Harbour, or of the Hawkesbury river...nor...of the glorious defiles of the Blue Mountains." In fact, he claimed,

we hear little of Australian scenery. Consequently we, at home, in England, are inclined to believe that Australia, as a country, is displeasing to the eye. The eternal gum-tree has become to us an Australian crest, giving evidence of

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153 Bennett: Gatherings, p.292.

154 op.cit., p.iii.

155 F. M. Bailey in Proc. Linn. Soc. NSW, 1877, p.276. Bailey was Colonial Botanist of Queensland, 1881-1915.

Australian ugliness. The gum-tree is ubiquitous, and is not the loveliest, though neither is it by any means the ugliest of trees. But there are scenes of nature in Australia as lovely as...in any part of the world...<sup>156</sup>

But, as Trollope suggested, "the everlasting gum-tree" had become proverbial, and "one of the few facts that are supposed to be known about the country" was the monotony of the bush.<sup>157</sup>

There was criticism too, of the authoritative statements of transient observers:

Australian vegetation is sometimes considered monotonous in appearance. But this is the criticism of the stranger, and not of the resident. The first idea of the observer is one of uniformity...But Australian vegetation has distinctive features that quickly catch the eye. The eucalypt is always the eucalypt, with its sombre green and its peculiar adjustment of foliage...

But,

an acquaintance with the bush soon dispels the notion of monotony. The eucalypts are found to differ one from another; the handsome Banksias, the curious Casuarinas,...the graceful acacias, all claim attention and individualise the scene, while palms, grass-trees and tree ferns add charm and character to many a landscape.<sup>158</sup>

Here at last was the answer to the problem of assessing the reaction to the bush. In such a balanced, unemotional compromise, the colouring of the eucalypts could be acknowledged as being "sombre", the leaves did in fact hang vertically, there was indeed a superficial monotonous uniformity. Yet the observant settler living in the bush, soon appreciated the tremendous variety, even in eucalyptus forests, hidden from the eyes of most travellers by the subtlety of the variations. This variety would become readily apparent to one who had travelled sufficiently widely to become acquainted with diverse ecological areas, as the Reverend John Morison appreciated.<sup>159</sup>

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156 Trollope: Australia, p.136.

157 op.cit., p.204.

158 Willoughby: Australian Pictures, pp.194-5.

159 "An astonishing variety of vegetable life is certainly one of the great leading physical characteristics of Australia, but one must travel far and wide to be made acquainted with this fact."

Morison: Australia, p.17.

Towards the end of the century, William Westgarth wrote of the open forest, with the grass-clothed ground, which is at once, as I might, in seeming contradiction say, the beauty and the monotony of Australian scenery.<sup>160</sup>

Westgarth, who apparently saw little ugliness in gum-trees until bush-fires mutilated them<sup>161</sup> thus supported the realistic, compromise view which at the end of the century, was given more substance and greater clarity by a currency lad born in the bush about which he so feelingly wrote:

To me the monotonous variety of this interminable scrub has a charm of its own; so grave, subdued, self-centred; so alien to the genial appeal of more winsome landscape, or the assertive grandeur of mountain and gorge. To me this wayward diversity of spontaneous plant life bespeaks an unconfined, ungauged potentiality of resource; it unveils an ideographic prophecy, painted by Nature in her Impressionist mood, to be deciphered aright only by those willing to discern through the crudeness of dawn a promise of majestic day. Eucalypt, conifer, mimosa; tree, shrub, heath, in endless diversity and exuberance...<sup>162</sup>

Such a land needed to be "faithfully and lovingly interpreted", as by the

perfect Young-Australian...a very creature of the phenomena which had environed her own dawning intelligence...a child of the wilderness, a dryad among her kindred trees. The long-descended poetry of her nature made the bush vocal with pure gladness of life; endowed each tree with sympathy ...She had noticed the dusky aspect of the iron-wood; the volumed cumuli of rich olive-green, crowning the lordly currajong; the darker shade of the wilga's massy foliage-cataract; the clearer tint of the tapering pine; the clean-spotted column of the leopard tree,...She pitied the unlovely balah...she loved to contemplate the silvery plumage of the two drooping myalls... in the horse-paddock...she had watched the deepening crimson of the quondong...she had marked the unfolding bloom of the scrub, in its many-hued beauty; she had revelled in the audacious black-and-scarlet glory of the desert pea...<sup>163</sup>

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160 W. Westgarth: Half a Century, p.89.

161 op.cit., p.90.

162 Joseph Furphy: Such is Life, being certain extracts from the Diary of Tom Collins, Syd., 1945, p.81 (written by 1897, published 1903).

163 op.cit., p.91. Botanical names and qualities of these western plants are referred to elsewhere.

ECOLOGICAL VARIETY: MALLEE SCRUB AND SALTBUSH PLAIN.



MALLEE SCRUB, largely composed of White or Congoo Mallee, E.dumosa, a typical Mallee, with rather stunted growth and several slender stems.

Photo.: L. G., near Balranald, 8 Jan. 1967.



SALTBUSH PLAINS, well-covered with such plants as Bladder or Perennial Saltbush, Atriplex vesicaria, and another species, A.pseudocampanulata, with Small-leaved Saltbush, Cotton Bush or Leafless Bluebush, Kochia aphylla.

Photo.: L. G., 40 m. N.E. of Hay,  
8 Jan. 1967.

The Bush was at last being appreciated for what it was, instead of being condemned for what it was not.

Expanding Settlement.

When Governor Macquarie took office on the first day of 1810, settlement of New South Wales was virtually restricted to the County of Cumberland.<sup>164</sup> The heathlands around Port Jackson and the coast were avoided by farmers and graziers alike, yet as William Charles Wentworth pointed out, in terms reminiscent of Watkin Tench, even this type of country was not lacking in charm:

A few miserable stunted Eucalypti and a dwarf underwood are the richest productions of the best parts of this belt of country; whilst the rest never gives birth to a tree at all, and is only covered with low flowery shrubs, whose infinite diversity, however, and extraordinary beauty, render this forbidding heath the most interesting portion of the colony to the botanist, and make even the unscientific beholder forget the nakedness and sterility of the scene.<sup>165</sup>

One could hardly draw sustenance from this "infinite diversity...and extraordinary beauty" of the belt of coastal heathland which bordered extensive sclerophyll forests and scrubs on ridges of Hawkesbury sandstone and on beds of Wianamatta and Narrabeen shales. This country likewise hardly attracted settlers very far from the alluvial flats along creeks and rivers, but closer to the Blue Mountains,

the aspect of the country begins rapidly to improve. The forest is less dense, and the trees in general are of another description; the iron bark, yellow gum, and forest oak disappearing, and the stringy bark, blue gum, and box tree, usurping their stead.<sup>166</sup>

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164 The County, as proclaimed by Phillip on 4 June 1788, was bounded by the Blue Mts. on the west, Broken Bay and the Hawkesbury on the north, and Botany Bay on the south. In 1835 it was gazetted in enlarged form with the southern boundary extended to the Cataract River, thereby increasing its area by over 200 sq.m. HRA, XVII, p.424.

165 Wentworth: Statistical Account, I, p.111.

166 op.cit., p.112. The trees would have been: Ironbark, e.g. E.paniculata and E.sideroxylon; "yellow gum", perhaps Grey Gum, E.punctata which was also known as Yellow Gum; Forest Oak, Casuarina torulosa; Stringybark, E.eugenioides and E.oblonga; "blue gum", probably Ribbon or Manna Gum, E.viminalis; Box, E.moluccana and (to the south) Soft White Box, E.quadrangulata.

A few miles further, and one found "country truly beautiful" with "an endless variety of hill and dale clothed in the most luxuriant herbage."<sup>167</sup> Perhaps here we have one of the earliest expressions of the opinion that there was always "better land further out". The southern and south-western sections of this beautiful country, comprised

in fact, that fine waving or undulating country so much talked of in England, and which has for so many years been used as a seductive bait for the attentive listeners to Australian wonders...<sup>168</sup>

Expansion of settlement, even more than exploration, emphasised the need for botanical terms of reference to identify and describe the new kinds of country being discovered and utilized. The earliest settlers were wont to describe the tree-cover that so impressed them as "the woods." The newly-arrived Macquarie recorded over twenty years after the first settlement, that he and his companions were "lost...in the woods and wandered about in a boundless forest for upwards of three hours,"<sup>169</sup> during a tour of farms in the George's River district. However, the term "bush" was used quite early to describe the new environment. In 1803 a correspondent mentioned "the Bush" in a letter to Sydney's recently-established newspaper,<sup>170</sup> and by 1805 the term "bushranger" was in use.<sup>171</sup> In 1814 William Cox was using the word "bush" without comment.<sup>172</sup> As might be expected, the term itself was somewhat paradoxical. Newcomers could hardly be expected to be understood if they did not use the term, yet those who did use it, clearly applied the word to an incomprehensible range of situations. A bush was simply a shrub, but the bush was a much more complicated matter.

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167 Wentworth: Statistical Account, I, p.113.

168 Dawson: Present State, p.386.

169 Macquarie: Journals of Tours, p.2. (9 Nov., 1810).

170 Syd.Gaz., 17 Apr. 1803.

171 Syd.Gaz., 17 Feb. 1805. Sidney J. Baker states (The Australian Language, Syd., 1966, p.75) that the term "bush native" was used in 1801.

172 Memoirs of William Cox, J.P., Syd., 1901, p.57.

In 1830, Robert Dawson, the Chief Agent of the Australian Agricultural Company, recorded that he had "spent a good deal of... time in the woods, or bush as it is called here."<sup>173</sup> But "the bush" was a much more comprehensive term:

'Bush' is the term commonly used for country per se: 'he resides in the Bush,' implies that the person does not reside in, or very near, a town. It also signifies a forest...<sup>174</sup>

It was little wonder then, that newcomers despaired of anticipating just what "the Bush" would be like:

I became more and more perplexed by every attempt to picture...my future residence, 'the Bush'; and I anxiously wondered whether it would prove to be a tangled mass of brushwood, or a barren and desolate heath, or, again, a dense forest, where the axe alone could clear away a spot for the destined abode...<sup>175</sup>

The Bush embraced all of these, and more, as a little experience soon showed:

I began to understand the value of that hackneyed expression 'the bush', which had formerly perplexed me so much, and to see that it meant little more or less than the country at the antipodes.<sup>176</sup>

Here, then, was a vast continent, entirely composed of "Bush", except for the settled areas--but even these remained "Bush" as long as the concentration of population remained rather low. The "Bush" therefore comprised

smiling plains and barren deserts, snowy mountains and marshy fens, crowded forests and bare rocks, green pastures and sandy flats...all included under the general appellation of the Bush.<sup>177</sup>

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173 Dawson: Present State, p.48.

174 Breton: Excursions, p.46.

175 Haygarth: Recollections, p.5.

176 op.cit., p.10.

177 Pridden: Australia, pp.8-9. Cf. Mossman & Banister: Australia Visited, p.62: "The term 'bush' as it is used in Australia is indiscriminately applied to all descriptions of uncleared land, or to any spot away from settlement."

Neater definitions were formulated,<sup>178</sup> the derivation of the term was discovered,<sup>179</sup> verses dedicated to The Bush and life therein were composed,<sup>180</sup> and at least one convict offered his own definition:

...'bush', a generic term synonymous with 'forest' or 'jungle', applied to all land in its primeval condition, whether occupied by herds or not.<sup>181</sup>

The latter part of this definition was truer than the rest, for it is clear that quite early the term 'brush' was used to distinguish vegetation which resembled 'jungle'.

Anthony Trollope was still having some difficulty with the term in the 1870s:

Readers who desire to understand anything of Australian life should become acquainted with the technical meaning of the word 'bush'. The bush is the gum-tree forest, with which so great a part

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- 178 e.g. Australia, its Scenery, p.126: Bush = "the country in a state of nature"; Morison: Australia, p.13: Bush = "the natural forest or uncleared land."
- 179 W. Hughes: The Australian Colonies, their Original and Present Condition, Lond., 1852, p.120: Bush = "the uncleared country, --that is, the tracts covered either with trees or brushwood--and is derived from the Dutch word bosch, a wood or forest." The word is believed to have been introduced from the Cape. Note also, Edward Morris: Austral English, Lond., 1898, p.68: for quotation, "in the Bush, as the Virginians call it."
- 180 e.g. Lancelott: Australia, pp.263-4. The first verse runs:  
"You may talk of the dishes of Paris renown,  
Or for plenty through London may range,  
If variety's pleasing, oh, leave either town,  
And come to the bush for a change."
- Sherer: Gold-Finder, pp.242-3. Two verses are:  
The Bush, the Bush! the lonely, lonely Bush!  
With its evergreen, leave-fring'd tree,  
Though niggard of its scenes where fresh waters gush  
To the notes of our minstrelsie;  
Still it gives us a moon that is bright as the day,  
In the clime of the old countrie.  
  
The Bush, the Bush! the silent, silent Bush!  
With its wide wolds of libertie,  
Gives many a mile of blooming, flowery brush  
To the wax-laden honey bee;  
It also gives gold to the Diggers that toil,  
In the might of their industrie.
- 181 J. F. Mortlock: Experiences of a Convict (Lond., 1864-5) Syd., 1966, p.85.

ECOLOGICAL VARIETY: SALTBUSSH PLAIN AND RIVER FOREST.



SALTBUSSH PLAIN, stony and over-grazed, with sheep in background seeking the remaining pasture plants. Small trees in right foreground are Needlebush, Hakea leucoptera and Dead Finish, Acacia tetragonophylla.

Photo.: L. G., 127 m. west of Cobar, 25 Aug. 1968.



RIVER FOREST, on the Darling, with River Red Gum, E.camaldulensis, Black Box, E.largiflorens and River Cooba, Acacia stenophylla.

Photo.: L. G., 25 m. south of Wilcannia, 26 Aug. 1968.

of Australia is covered, that folk who follow a country life are invariably said to live in the bush. Squatters who look after their own runs always live in the bush, even though their sheep are pastured on plains. Instead of a town mouse and a country mouse in Australia, there would be a town mouse and a bush mouse -- but mice living in the small country towns would still be bush mice.<sup>182</sup>

In fact,

Nearly every place beyond the influences of the big towns is called 'bush', -- even though there should not be a tree to be seen...<sup>183</sup>

Ten years later, the historian George W. Rusden attempted a definitive statement:

Bush was a general term for the interior. It might be thick bush, open bush, bush forest, or scrubby bush--terms which explain themselves.<sup>184</sup>

Unfortunately neither Rusden's terms, nor the term "bush" itself, were self-explanatory; there was bush along the coast as well as in the "interior", but there was certainly much less settlement in the interior, and hence much more bush! The convict Mortlock's definition contains the most telling phrase, "all land in its primaeval condition."

Like many convenient generic terms, "bush" was quite useless in specific instances. It was totally inadequate for describing a particular kind of vegetation and for identifying a block of land. Explorers and settlers quickly appreciated that there were many kinds of "bush". This led to refinements in ecological nomenclature so that country, whether suitable for settlement or otherwise, could be fairly accurately described.

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182 Trollope: Australia, p.163.

183 op.cit., p.193.

184 G. W. Rusden: History of Australia, Lond., 1883, I, p.67. This rather unsatisfactory statement was omitted from the Australian (second) edition of 1897.

Even before settlement had spread beyond the County of Cumberland, there was clearly a need to define basic ecological forms which were easily discernible in "the bush". In 1805, for example, in order to make George Caley's notes of explorations clearer to Earl Camden, Governor King, doubtless with Caley's guidance, explained "some local Expressions that have obtained in this Colony,"<sup>185</sup> namely, "Brush,"<sup>186</sup> "A Scrub"<sup>187</sup> and

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185 King to Camden, enclosure with letter of 1 Nov. 1805, HRA, V, p.586.

186 "Brush—Is a dark impenetrable Thicket consisting of plants and herbacious (sic) Shrubs. This kind of Land is oftentimes found of a good quality owing to its being a vegetable mould." Pockets of rainforest were found as early as Phillip's time, during explorations of the Hawkesbury, and Surgeon George Bass's description of Illawarra in 1797 has already been mentioned. Providing there is adequate shelter, a high rainfall and an appropriate temperature range, rainforests will grow on a variety of soils which the vast accumulation of leaves greatly enriches. King may well have appreciated this, for he did not suggest the erroneous, but widely-held view that rainforests are found only on dark rich loams.

187 "A Scrub—Consists of Shrubs of low growth, Soil of a bad quality with small Iron gravelly Stones, in general Rocky Scrub and Brush may with propriety be called the Underwood of the Forest, but it is not infrequent on the Sea Coast for Scrubs to be void of Trees." It was unfortunate that King inserted the word 'Brush' in this definition. It seems that he had in mind the sclerophyllous thickets and heaths of the coast and sandstone ridges, where the occurrence of trees enabled the scrub, or shrub stratum to "be called the Underwood of the Forest". Cf. Cox: Memoirs, p.62: "a scrub with stunted timber". (1814). In time, specific forms came to be recognised: e.g. Mallee Scrub, Mulga Scrub, Brigalow Scrub, Tea-tree Scrub, according to the dominants. Even these caused trouble, as Andrews pointed out in Joseph Furphy: Such is Life, p.79: "When a certain class of bushman says 'mallee', he means any sort of scrub except lignum; and when he says 'mulga', he means any tree except pine or currajong. Same mental slovenliness in women."

"Forest Land"<sup>188</sup> to differentiate what we might now describe as rainforest, sclerophyll heath and open Eucalyptus woodland.

King and Caley's pioneer attempt at ecological definition was well made, and the terms are still readily understood, but further exploration and experience of the bush inevitably led to more precise definitions which sometimes clarified, and sometimes complicated the issue. In 1826, James Atkinson, the observant agriculturist and pastoralist of "Oldbury", Berrima, suggested a more precise method of ecological classification. He described, appropriately enough, the sclerophyllous coastal heathlands as "barren scrubs." These, although consisting of "a profusion of beautiful shrubs and bushes, producing the most elegant flowers," provided the settler with nothing but "materials for brooms" and the promise of honey, should hive bees become "plentiful in the Colony."<sup>189</sup> About the same time, Surgeon Peter Cunningham suggested that such land was "fit for little else than goat pasture and rabbit warrens...at present it yields absolutely nothing."<sup>190</sup>

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188 "Forest Land—is such as abounds with Grass and is the only Ground which is fit to Graze; according to the local distinction, the Grass is the determinating Character and not the Trees, for by making use of the Former it is clearly understood as different from a Brush or Scrub." This was the open eucalyptus woodland of the Cumberland Plain, including such species as Forest Red Gum, E.tereticornis; Grey Box, E.moluccana; Narrow-leaved Ironbark, E.crebra; Broad-leaved Ironbark, E.fibrosa; Cabbage Gum, E.amplifolia. It is significant that "the local distinction" meant that "Forest Land" of short-boled eucalypts really implied "pasture land" of native grasses—another paradox. Thus George Caley in 1804 referred to the "Cow Pastures" as "Vaccary Forest". (HRA, V, p.579). Cf. Sir Thomas Mitchell: "'A forest' means in New South Wales, an open wood, with grass. The common 'bush' or 'scrub' consists of trees and saplings, where little grass is to be found." (Three Expeditions, I, p.71).

189 J. Atkinson: An Account of the State of Agriculture and Grazing in New South Wales, Lond., 1826, pp.1-2. Atkinson was the father of Caroline Louisa Waring Calvert, an eminent amateur botanist who is noticed in Chapter VI.

190 Cunningham: Two Years, I, p.285. See photograph on p.149.

with a well-developed shrub stratum. "Forest Lands" on the other hand might be "good, poor, open or thick forest", but always characterised by a lack of underwood—i.e. having a poorly-developed shrub stratum, but "invariably covered with grass underneath."<sup>195</sup> We would now refer to such communities as woodlands, chiefly of the "open forest" type which had, according to Atkinson and many others, "a beautiful park-like appearance."<sup>196</sup> The term "open forest" was also used quite early to describe the grassy woodlands with well-spaced trees. Peter Cunningham noted such country "beyond Liverpool", in the Eden Forest area, and in the County of Argyle.<sup>197</sup> Others, too, had ideas on how the basic ecological forms might be distinguished. Lieut. William Breton, who made excursions through New South Wales in the 1830s recognised "open forest",<sup>198</sup> "scrub",<sup>199</sup> "vine brush"<sup>200</sup> and "brush".<sup>201</sup> Despite some inconsistency,<sup>202</sup> the term "brush" seems to

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195 Atkinson: State of Agriculture, p.5.

196 op.cit., p.6. Note the earlier mention of the favourable reaction to such country which resembled a "nobleman's park".

197 Cunningham: Two Years, I, pp.100, 118, 119. Macquarie spoke of "open forest" as early as 1810.

198 "'Open forest', is of that description where there is no underwood, and the trees in general are far asunder." Breton: Excursions, p.58.

199 "'Scrub', is dense forest with much underwood and bad soil." Breton: loc.cit. What we now call 'Tea-tree scrub' would be a good example.

200 "'Vine brush', is almost impenetrable forest, where great numbers of climbers, parasitical plants, and underwood, are found: the soil is generally good." Breton: loc.cit. Here we have rainforest, although there is hardly a well enough developed shrub stratum to suggest "underwood" in the usual sense. Probably the ground cover of ferns, mosses, palms and lianas is implied by 'underwood' here.

201 "'Brush', is forest with occasional underwood, but not so dense as 'scrub': besides which, the latter may be without large trees: 'brush' is never destitute of such." Breton: loc.cit. This is not clear, and symptomatic of the difficulties experienced in trying to describe the ecological variety of the new environment. Probably close mixed forest is implied, as for example Bargo and Wombat Brushes south of Sydney. These would have been distinct from rainforest, open forest and scrub (the latter in the sense of being thick without necessarily having any large trees). See photograph of Bargo Brush on p.25.

202 Macquarie (1810) and Oxley (1820) apparently used "brush-wood" and "brush" to imply any kind of tangled undergrowth. Sturt in Two Expeditions, I, p.62 used "brush" to mean simply a thicket—e.g. "brushes of casuarina."

have been restricted fairly early to rainforest, superseding such terms as "vine brush" and "cedar brush". The term "brush" seems to have had an earlier and wider acceptance than the all-embracing term "bush".<sup>203</sup> In 1824, Joseph Lycett referred to the Illawarra escarpment being "covered with a thick brush,"<sup>204</sup> and a little later Henry Dangar spoke of the "brush lands", alluvial strips of "excessive richness" supporting "a thick jungle" along the banks of rivers.<sup>205</sup> Surveyor Clement Hodgkinson, while claiming that "brush" was an "unmeaning name," used the term exclusively for rainforests, composed of "brush trees", which, unlike the "eucalypti and Casuarinae, which grow on the common open forests...in general possess a rich umbrageous foliage of bright shining green."<sup>206</sup> During the fifties, "brush" was still used to imply "jungle",<sup>207</sup> or places "where vegetation is of rank, and even tropical luxuriance,"<sup>208</sup> and the term continues to be used in this sense to-day. Meanwhile, however, the term "scrub" also came to mean rainforest,<sup>209</sup> as in the well-known example of the "Big Scrub"—the huge rainforest which once extended from the Tucki Swamps near Ballina to the McPherson Range.<sup>210</sup> This term, too, is still used in New South Wales to mean

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- 203 S. J. Baker agrees with this—see his Australian Language, p.77.  
204 Lycett: Views, p.8. See the photograph of the escarpment on p.70.  
205 H. Dangar: Index and Directory to Map of the Country bordering upon the River Hunter...Lond., 1828, p.99.  
206 Hodgkinson: Australia, p.3.  
207 Hughes: Australian Colonies, p.120. Cf. John Gould: The Birds of Australia, Lond., 1848, I, Introd. p.77: "Jungle, or what in New South Wales would be called brush."  
208 Henderson: Excursions, I, p.89.  
209 e.g. Mossman & Banister: Australia Visited, p.271, where they "were reminded of a tropical forest's vegetation" when looking "down on the dense masses of foliage" in the Illawarra "scrubs". Morison: Australia, pp.20-1: Coastal scrubs "are dark, dense, and impenetrable forests" resembling parts of Borneo. The term "scrub" was also applied to the Queensland rainforests. Speaking of the Wide Bay area, Frederic de Brebant Cooper maintained: "There is something impressive in those scrubs; the immense height and girth of the trees, seeming like pillars supporting the thick green roof above..." (Wild Adventures in Australia and New South Wales beyond the Boundaries...Lond., 1857, pp.44-5).  
210 "...the Big Scrub, where everything is gigantic, compared with ordinary Australian vegetation." (Willoughby: Australian Pictures, p.95.

rainforest. It is not unusual to-day to hear of someone "taking a brush-hook to clear his way through the scrub."

As the interior, or "transalpine"<sup>211</sup> country over the Mountains became better known, an extension of the terminology—or additional interpretation of terms already in use—was required. Like the open woodlands, the extensive plains of the interior were often well regarded. Present-day Australians see perhaps as much monotony on the western plains, as the early settlers saw in the sclerophyll forests—an interesting inversion. Peter Cunningham referred to the term "Plain" as having

varied meaning throughout the colony, being generally however applied only to spots of land destitute of trees, without reference to the evenness of the surface...<sup>212</sup>

The Liverpool Plains were especially attractive to the English eye:

all fine rich grassy soil without a tree, excepting where a small woody hill occasionally rises from the bosom of the plain to vary and beautify the prospect.<sup>213</sup>

Atkinson, too, referred to the "distinguishing feature in the interior of New South Wales", namely the plains country, "destitute of timber, and covered with grass." He also took the Liverpool Plains as an example, as well as the Monaro, where "the silence and solitude that reign in these wide, spreading, untenanted wastes, are indescribable." The country, however, was "dry and well adapted for sheep grazing, being covered with a sweet though thin herbage."<sup>214</sup> Inland exploration revealed areas which seemed best described as "scrubs", thereby complicating further the developing ecological nomenclature. However, by qualifying the more general term by the dominant species, a practice still followed, various ecological regions could be identified. There were, for example,

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211 Barron Field's hyperbolic term.

212 Cunningham: Two Years, I, p.147.

213 op.cit., I, p.150. Cf. the warm reaction expressed by Breton, mentioned earlier. See page 154.

214 Atkinson: State of Agriculture, p.7. See photograph on p.188.

bricklow scrubs in some parts of the northern interior, much complained of by recent pioneers as a harbour for blacks, and occasioning great difficulty in getting the cattle out of them...<sup>215</sup>

While true brigalow scrub was of very restricted extent in N.S.W. there was no scarcity of mallee scrub in the interior:

There are, in various parts of Australia...<sup>216</sup> undergrowths, called 'scrubs'; some are of vine, some of gidya,<sup>217</sup> some of 'brigalow',<sup>218</sup> some beautiful in their fern, and creeper, and orchid growth,...<sup>219</sup> while other scrubs are desolate enough for Dante's 'Inferno'. Of such last is the 'Mallee,' which covers the country for hundreds of miles, near Paika,<sup>220</sup> where I now was. If the English reader wishes to know what 'Mallee' is like, let him picture to himself a level country of poor, yellow soil, destitute, alike, of stones, water, or equalities of any kind. This soil is covered (as thickly, nearly, as they will grow) with bare saplings, 12 feet long, and two inches thick, of the Eucalyptus Dumosa,<sup>221</sup> bearing a tuft of leaves, only, on the top, and springing, perhaps, a dozen of these dreary sticks, from a root, or boll, that rises just above the ground; this only, and nothing more, whatever, of any kind...Woe to the traveller who gets lost in this terrible desolation; he can see no distance; he can climb no hill; and if the 'mallee' sticks would bear him on the top, he could only see Mallee, Mallee, Mallee, all round him.<sup>222</sup>

The most widely-spread scrub form of the interior was, and still is, mulga scrub, dominated by Acacia aneura, supported perhaps, by Umbrella Mulga, A.brachystachya and allied species. By 1865, the Rev. Julian Tenison-Woods, a notable clergyman-naturalist, considered

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- 215 Morison: Australia, p.20. "Bricklow" = Brigalow.  
216 This suggests Oxley's "Euryalean Scrub" (= Cunningham's "Cassythian Scrub") mentioned in Chapter II, p.42.  
217 Gidgee, Acacia cambagei often forms dense scrubs around western creeks, cane-grass swamps and claypans.  
218 Brigalow, Acacia harpophylla forms dense scrubs of restricted extent in the north of the western plains.  
219 "Scrub" here means "brush" or rainforest.  
220 This writer went to Paika in 1853. Lake Paika is to the west of the Lower Murrumbidgee, north of Balranald, and on the eastern edge of an enormous area of Mallee Scrub.  
221 The chief Mallees in this area are White or Congoo Mallee, E.dumosa and Red or Giant Mallee, E.socialis.  
222 Nehemiah Bartley: Opals and Agates; or, Scenes under the Southern Cross...Bris., 1892, p.62. See photograph of mallee scrub on p.166.

that Mulga was "probably...the most extensively distributed tree in all Australia."<sup>223</sup> The other inland "scrub" form was identified as Callitris "pine scrub" on sandy hills and stony ridges.<sup>224</sup> In addition, there were extensive river forests along the inland watercourses composed chiefly of River Red Gum, E.camaldulensis, usually supported by Black Box, E.largiflorens or Coolabah, E.microtheca.

Inevitably some observers, according to their knowledge and experience, demonstrated greater perspicacity than others in dealing with the rather bewildering problem of ecological classification, and new systems are still proposed from time to time. As shown, the Caley-King classification of 1805 provided a sound basic classification which observers like James Atkinson and William Breton developed and refined. Another astute observer, Dr. John Lhotsky, who explored the Monaro and Snowy Mountains in 1834, distinguished "five systems of vegetation", but precise definitions of these "systems" apparently eluded him, either because of a language difficulty or because of some uncertainty over the validity of his proposal.<sup>225</sup>

It is historically satisfying that it should have been John Macarthur's son, William, who collected and prepared for display over 240 specimens of timbers from "the southern districts of the Colony" for

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223 J. E. Tenison-Woods: A History of the Discovery and Exploration of Australia...Lond., 1865, II, p.126.

224 There were also particular areas known as "scrubs", e.g. the Iron-bark-and-Pine area still known as "Pilliga Scrub."

225 Lhotsky distinguished "coast vegetation" between Sydney and Illawarra on "extensive sandy levels and hills", i.e. what we now call coastal heathland. Within this was "a subdivision of a very striking character; and this is the vegetation of our rocky gullies" characterised by "the two sole species of palms we possess," (i.e. Bangalow and Cabbage Tree Palms). Lhotsky was here referring to the rainforests of Illawarra. Another type was "the Argyle vegetation, or that with which the grassy hills, flats, and plains of that County, and all congenial places in the Colony abound." (i.e. grassy plains and woodlands). Lhotsky: A Journey, pp.6-7. He also mentioned "the extensive downs of Menero" and Bargo Brush, "a dry, uncomfortable, shrubby piece of land...", but precise definition of the "five systems" was not developed. Lhotsky stressed the psychological effects of the bush: "there reigns a uniformity in its forest trees, that banishes imagination and scantifies experience..." He was grateful that "some Calithris [i.e. Callitris] spining (sic) as it were the flanks of...gigantic rocks with their pyrimidal (sic) crowns" provided "some variation in this mind-blunting monotony." op.cit., p.39.

the Paris Universal Exhibition of 1855. William Macarthur, born at Parramatta and educated in England, recognised three main ecological zones as the sources of his timber specimens — "Class A—Forest more or less open"<sup>226</sup>; "Class B—Barren Scrub"<sup>227</sup> and "Class C—Rich Brush or 'Cedar Brush.'"<sup>228</sup> Since this classification was considered "to be

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- 226 "Forest more or less open; generally composed of trees with little or no underwood; their trunks more or less naked and lofty, height being a more conspicuous feature than diameter; their heads small in proportion to the trunks, divided into few secondary or tertiary ramifications and thinly clothed with persistent, dry, dull-coloured, thick leathery leaves, abounding in essential oils, and in their decomposition adding little to the vegetable matter in the soil...Occasionally these dry forests pass into tracts crowded with trees, generally of a single species (still with little or no underwood), their trunks being drawn up to a great height, and of small diameter..." Paris Universal Exhibition 1855: Catalogue of the Works Exhibited in the British Section...Lond., 1855, p.114.
- 227 "Barren Scrub, covered either wholly with low shrubby vegetation without trees, or with short-stemmed stunted trees, rarely or never producing serviceable timber. The same dry character of vegetation prevails over this description of country, as over the last... 'bush-fires'...sweep over these barren Scrubs once, at least, in every four or five years...the majority of the beautiful flowering shrubs of the colony have their habitats in this sort of country, which is always more or less rocky, stony, or sandy." *op.cit.*, p.115.
- 228 "Rich Brush, or 'Cedar Brush'. Tracts of country rarely of great continuous breadth, but often alternating at short intervals with Class A [see the photograph on p.70] and prevalent only at moderate distances from the sea...They are to be found in the greatest perfection at Illawarra...They produce few shrubs but a variety of trees of considerable attitude; frequently of comparatively slender growth, almost universally clothed with beautiful dense, bright green foliage, their umbrageous character being much increased by the numerous lofty lignous climbers...At Illawarra, and in some other districts, four species of arborescent Ferns, and two noble species of Palms, add materially to the tropical aspect of this description of country. A few of the trees of Class A are to be observed thinly scattered through the Cedar Brushes. In such case they often attain the most magnificent dimensions...The extreme loftiness of the noble trees, which are thrown together in surprising variety, with stems, rarely cylindrical, but of the most picturesquely irregular forms, covered with mosses and orchids and loaded aloft with huge masses of epiphytical ferns of exquisite beauty...all these vegetable wonders...astonish and gratify the lovers of sylvan scenery. But, although the senses are charmed, the difficulties in exploring them, to ascertain of what species of trees they consist, are very great..." *ibid.* Few would question, even to-day, the accuracy of these descriptions of dry sclerophyll forest, coastal heathland and rainforest.

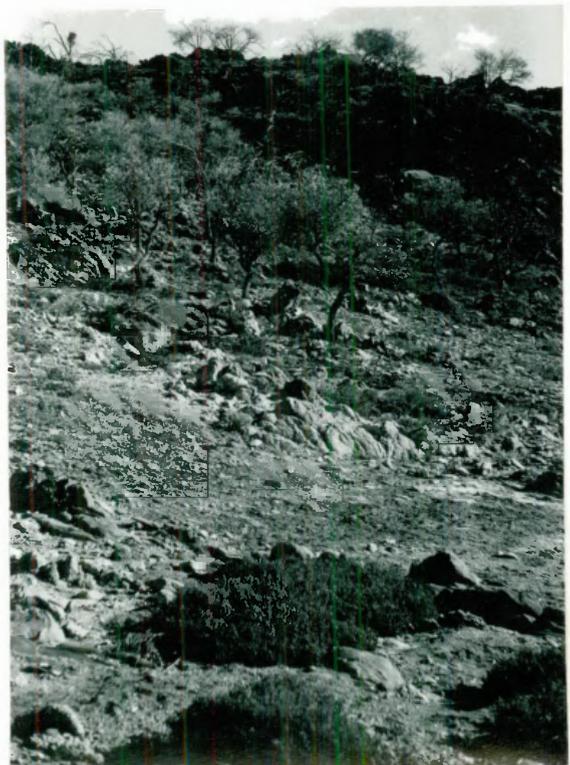
ECOLOGICAL VARIETY: ARID SCRUB OF THE INLAND



Above: Mulga, *Acacia aneura*  
and *A. brachystachya* with  
White Cypress, *Callitris hugolii*  
on a hill behind the ruins of  
the Mootwingee coach station and  
hotel. Beefwood, *Grevillea*  
*striata* in left middle ground.  
Saltbush on the flat.

Right: Mulga, *Acacia aneura*  
and Rosewood, *Heterodendrum*  
*oleifolium* on a harsh rocky  
slope near the old mining  
settlement of Euriowie, about  
45 m. N. of Broken Hill.  
Clumps of *Pachyornia tenuis*  
in foreground.

Photos.: L. G., 24 and 26  
Aug. 1969.



substantially correct, and to have answered its purpose"<sup>229</sup>, it was reprinted for the Catalogue of the London Exhibition of 1862,<sup>230</sup> for which Macarthur again collected.

By the eighties therefore, the fundamentals of ecological classification had been recognised, although there were differences then, as now, in terminology. Thus while Macarthur knew nothing of "ecotones" he did appreciate for example, that

rich alluvial lands on the margins of rivers...  
are almost always heavily timbered, and towards  
the coast their character passes from A to C.<sup>231</sup>

Similarly, the "vine brush" or "cedar brush" of the nineteenth century was the "rainforest" or "Malayan-type vegetation" of a later period, and the apt "sand-scrub" of 1880<sup>232</sup> is the coastal heathland of today. Other terms, such as "Mallee scrub" and "Mulga scrub" have defied alteration.

It was William Wilkins, one-time Chief Inspector of National Schools and Under-Secretary for Public Instruction, who perhaps best summarised the state of ecological knowledge at the conclusion of the period under review. He distinguished "brushes", "woodlands" and "scrubs", defining them in terms which would still be generally

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229 London International Exhibition 1862: Catalogue of the Natural and Industrial Products of New South Wales...Lond., 1862, p.19.

230 It was again reprinted for the Catalogue of the Paris Universal Exhibition of 1867.

231 i.e. it was appreciated that there was transition from sclerophyll forest to mixed forest to rainforest. Catalogue Paris Exhibition 1855, p.115.

232 Silver: Handbook for Australia, p.45.

acceptable<sup>233</sup>, and he also drew attention to the stratification of plants within rainforest communities,<sup>234</sup> a feature which latter-day ecologists have emphasised.

While dry sclerophyll forest, woodland, rainforest, heathland and the various kinds of "scrub" were clearly distinguished in these earlier classifications, the close, wet sclerophyll forest seems to have given some trouble. It was probably regarded as a transitional form between rainforest and dry sclerophyll forest, rather than as a distinct form, but Macarthur's "Class A--Forest more or less open" was sufficiently flexible to include it.

The 'home' County of Cumberland, was settled quite early by farmers along the alluvial flats of the Parramatta, Hawkesbury and George's Rivers, South Creek and the Nepean, and before Macquarie's arrival, Colonel William Paterson had authorised the clearing and cultivation of some of the eucalyptus woodland—the "Forest Lands"—of the Cumberland Plain. In striking contrast to the "excessively steep" country between Richmond and Kurrajong, which was covered by

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233 Brushes: "resemble largely the jungles of tropical countries, the vegetation is dense and luxuriant; and while plants are almost without exception evergreens, the foliage is varied in tint and disposition, and therefore free from the monotony which is so depressing a feature in the general aspect of Australian vegetable forms." Wilkins is here prolonging the traditional "monotonous aspect" view. Frank Fox was still modifying this view some 20 years later to cater for migrants who arrived with the idea already established: "To the casual observer the Australian bush is melancholy, even repelling...But with a closer knowledge the somewhat austere savage beauty of the gum forests is alluring." (F. Fox: Australia, Lond., 1910, p.108).  
Woodlands: "open tracts, usually clothed with grass, large trees, little undergrowth."

Scrubs: "tracts of land, usually with poor, dry soil, thickly covered with shrubs and bushes. In some cases, scrubs are composed almost exclusively of plants belonging to one family, and even to one species." (e.g. Mallee, Mulga, Pine and Tea-tree scrubs). Scrubs, although often composed of "thorny and prickly" plants, may "exhibit the most beautiful of the indigenous wild-flowers." Wilkins here meant the coastal heathlands. W. Wilkins: Australasia: A Descriptive and Pictorial Account...Lond., 1888, pp.33-36.

234 Wilkins referred to the fern layer below higher and lower layers of trees. op.cit., p.34.

leech-infested "thick brush-wood", the new Governor considered that the land between Parramatta and the Cowpastures was "very fine rich country and open forest."<sup>235</sup> In making such judgements, the most significant indicators were cleared acres and evidence of successful cultivations--and the presence of natural grass. It was noticed that grass grew plentifully in the open woodlands, and also that it "seems all to grow in detached tufts, without any of that continuity we observe in the pastures at home."<sup>236</sup>

There were in the vicinity of Port Jackson several useful fodder grasses, more especially Kangaroo Grass, Themeda australis, White-top Grasses, Danthonia longifolia and D.purpurascens and Love Grasses, Eragrostis lacunaria and E.brownii.<sup>237</sup> Away from the Hawkesbury sandstone, and on the Wianamatta shale soils of the Cowpastures country, there was doubtless more variety of palatable grasses, once again including Kangaroo Grass, Themeda australis and Love Grasses, Eragrostis spp., but with a greater number of associated species.<sup>238</sup> To Wentworth, such grasses comprised "the most luxuriant herbage" which was soon "covered with bleating flocks and lowing herds."<sup>239</sup> These same

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235 Macquarie: Journals of Tours, p.25. 1 Dec., 1810.

236 Cunningham: Two Years, I, p.196. Tench had long before noted this point: "The grass...does not overspread the land in a continued sward, but arises in small detached tufts...the intermediate space being bare..." (A Complete Account of the Settlement at Port Jackson, Lond., 1793, p.164). This characteristic was still being pointed out in the 1850s: "...the grass...does not form a connected turf, like that of an English meadow; it grows in separate tufts..." (Hughes: Australian Colonies, p.75). Also Australia, its Scenery, p.63. See footnote 188, p.201.

237 Other species would have included Water Couch, Paspalum distichum; Spreading Panic Grass, Panicum effusum; Meadow Rice Grass, Microlaena stipoides; Plume Grasses, Dichelachne sciurea and D.crinata. See Thesis I, pp.69-71.

238 e.g. Sugar Grass, Eulalia fulva; Red Grass, Bothriochloa ambigua; Mat Grass, Hemarthria uncinata; Wild Sorghum, Sorghum leiocladum; Spear Grasses, Stipa setacea, S.scabra, S.nervosa, S.pubescens; Star Grasses, Chloris truncata; C.ventricosa; Plume Grasses, Dichelachne spp. See Thesis I, pp.69-71.

239 Wentworth: Statistical Account, I, p.113.

grasses were also cut and hawked around the towns for the benefit of travellers' horses.<sup>240</sup> Certain factors quickly threatened the continuing supply of such valuable botanical resources. Some were natural: devastating floods, fearful droughts, and plagues of ravenous larvae of the cut-worm moth.<sup>241</sup> Others were man-made: over-clearing and over-stocking. The most fearsome threat could be attributed to both man and nature--the bushfire. Sturt spoke for many settlers when he claimed "there is no part of the world in which fires create such havoc as in New South Wales."<sup>242</sup> Where the explosive eucalypts were not so plentiful, as on the western slopes and plains, most settlers maintained that such fires

are beneficial to the settler, as they burn the long and hard grasses which, after the first shower of rain, is (sic) replaced by other more fresh and more nutritious.<sup>243</sup>

Thus the settlers felt constrained to "burn off", if the aborigines, an enthusiastic neighbour or a fortuitous lightning strike did not

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- 240 Alexander Harris recorded that during the 1820s there was no hay at the Sydney Markets, but "bundles of green grass, much of it almost as coarse as reeds." (Settlers and Convicts, (Lond. 1847), Melb., 1953, p.182). Robert Dawson noted: "The stables in Sydney are supplied chiefly with a species of coarse grass from the shady dells and low grounds about the harbour, and from the banks of the creek which runs from Sydney to Parramatta: this is sold in small bundles at an excessive price by boatmen, who make a livelihood by the employment..." (Present State, p.408). Also Lang: Historical Account, II, p.101: "Hay, of the native grass ...is sold in Sydney market by the cart-load." In Macquarie's time convicts were employed in cutting native grasses "on the banks of the Parramatta river, or the tracts of unoccupied land adjoining." Bigge recorded that each man's task had been "raised lately from 40 to 60 bundles of grass" per day. J. T. Bigge: Report of the Commissioner of Inquiry into the State of the Colony of New South Wales, Lond., 1822, p.28.
- 241 All considered as reasons for the expansion of settlement in Perry: First Frontier. The Australian Army Worm is the larva of a Cut-worm Moth, probably Pseudaletia convecta Walker. See also Bigge: Agriculture and Trade, p.13.
- 242 Sturt: Two Expeditions, I, p.xxviii.
- 243 Balfour: Sketch, p.36.

oblige.<sup>244</sup>

According to Gregory Blaxland, the most valuable fodder grass was "oat grass", which, because of the factors just mentioned—especially over-stocking—had by about 1820 "nearly disappeared" from districts long subjected to grazing.<sup>245</sup> There was general agreement over the great value of this "oat grass" which apparently grew in lush stands widely over the Colony.<sup>246</sup> This grass was almost certainly

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- 244 There is clear evidence that the aborigines burnt off grass to provide fresh growth to attract game, but "some of the colonists contend that these fires originate in the friction of the boughs of the trees during the high winds." (Balfour: loc.cit.) Cf. Wentworth: Statistical Account, I, pp.438-9: "This custom of setting fire to the grass is most prevalent during the months of August and January, i.e. just before the commencement of spring and autumn...however repugnant the practice may seem to the English farmer, it is...very often...both necessary and useful." Also Atkinson: State of Agriculture, p.21: "In dry seasons these periodical burnings sometimes assume a truly awful appearance... It is no doubt the means of destroying a great quantity of useful feed, but in the interior districts the practice is unavoidable; in the more settled and cultivated parts...it is frequently dangerous, and always injurious, and should be put a stop to by every possible means." Atkinson also referred to the burning off activities of the aborigines. Note also Cunningham: Two Years, I, p.197: "The old withered grasses are usually burnt off in the spring, and often at other periods...if you have an extensive run for your stock...it is astonishing to see how quickly and how luxuriantly the new grasses will push up after these burnings, if a shower of rain should...follow them. When judiciously accomplished, they certainly produce most beneficial effects..." Lieut. Breton was probably referring to the results of burning not "judiciously accomplished" when he recorded: "It is a grand and magnificent spectacle to observe the fire spreading itself" over the Blue Mountains. (Excursions, p.293). See also Bennett: Wanderings, I, pp.132-3: "The custom of setting the dry grass on fire is very prevalent...the young grass shooting up soon after affords fine feeding for cattle, &c." Also Haygarth: Recollections, p.73; M. H. Marsh: Overland from Southampton to Queensland, Lond., 1867, pp.41-2.
- 245 Blaxland to Bigge, quoted in Perry: First Frontier, p.28. See also Bigge: Agriculture and Trade, p.13.
- 246 Cunningham mentioned this grass in the 1820s (Two Years, I, p.195) Townsend recorded it growing on the upper Clyde R. in the 1840s "rising to...six feet." (Rambles, p.54); In the 1850s, it was still claimed that of the "principal grasses...the oat grass is the most widely diffused." (Australia; its Scenery, p.63), but this had been literally filched from James Atkinson's work of some 30 years earlier (State of Agriculture, p.20).

Kangaroo Grass, Themeda australis.<sup>247</sup> Because of the deterioration of such a nutritious species and the corresponding increase of inferior species in the natural pastures, men like Gregory Blaxland, Charles Throsby, John Howe and Archibald Bell had searched successfully for ways through the sandstone highlands beyond the County of Cumberland to new sources of water and grass for their stock. Some graziers tried to make up the deficiency by introducing English fodder grasses and legumes, but the indigenous grasses were too well respected for their ability to withstand the climatic extremes for the exotic species to gain immediate favour. Wentworth maintained in 1824, that

the natural grasses of the Colony are sufficiently good and nutritious at all seasons...for the support of each description of stock, where there is an adequate tract of country for it to range over.<sup>248</sup>

Here was another reminder of the fact that the tufted nature of Australian grasses meant a comparatively thin cover which necessitated large runs. Four years later, Henry Dangar pointed out that few introduced species "will resist the drought of a New South Wales

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247 George Bennett made this clear in 1860: "Kangaroo-grass of the colonists (Anthistiria australis), resembling the Oat-grass of England...extends over the open downs and plains of the interior and is the grass which squatters chiefly depend upon as food for their cattle." (Gatherings, p.372). This plant is now known as Themeda australis and is still known as Kangaroo Grass. Bennett mentioned the same species in 1834 as growing to 4 ft. in the Tumut area (Dec. 1832), "the most lofty and luxuriant among the native grasses." (Wanderings, I, pp.252, 259). The same species was recorded in the Murrumbidgee district in 1852 as growing "as high as your saddle-girths." (Mossman & Banister: Australia Visited, p.147), and in the same year Lancelott referred to this species as "perhaps the most nutritious." (Australia, I, p.61). In 1859, Sir Joseph D. Hooker described this species as "the best fodder-grass of Australia" (J. D. Hooker: Introductory Essay to the Flora of Tasmania, Lond., 1859, p.cxii.) Maiden supported this view forty years later. (J. H. Maiden: A Manual of the Grasses of New South Wales, Syd., 1898, p.93). Some writers, however, referred to both Oat Grass and Kangaroo Grass (e.g. Cunningham: Two Years, I, p.195, and Australia, its Scenery, p.63). It seems therefore that two closely allied species were confused, viz., Themeda australis and T.avenacea the latter of which was known as both Oat and Kangaroo Grass. (Maiden: loc.cit.). T. M. Perry: op. cit., p.14, refers to Themeda australis and Anthistiria australis as if they were different species, whereas the names are synonymous. See photograph on p.155.

248 Wentworth: Statistical Account, I, p.437.

summer,"<sup>249</sup> and about the same time, Robert Dawson of the A.A. Company maintained that the establishment of English grasses in Australia had "at best, only partial success." He advocated the rejuvenation of pastures with native species:

The cultivation of some of the native species of grasses which resist droughts, and upon which cattle and sheep have been found to thrive, would be productive of much greater benefit to the colony than the fanciful attempts at imitating English pastures upon a soil which is in general ill calculated for their production, even though the climate were favourable.<sup>250</sup>

Nearly forty years after this, it was still being claimed that "the naturalisation and the rapid diffusion of English grasses" were not

wanted in Australia...as it is already stocked with natural grasses, of sorts exactly suited to the particular districts in which they are found growing...<sup>251</sup>

Nevertheless, there was general lament that the native grasses, however nutritious when young, tended to become coarse and rather unpalatable when over-grown, and also that they could not withstand the situation "where avarice...overstocked the pastures" as one observer boldly put it.<sup>252</sup> Thus English fodder plants were introduced fairly early. Commissioner Bigge maintained that

it is only within the last two years, and upon a very few estates of the more opulent settlers, that any attempts have been made to introduce

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- 249 Dangar: Index and Directory, p.105. Bigge also pointed out that while "the natural grasses...have not the verdure or succulence of the English grasses,...they resist the heat of summer..." Bigge: Agriculture and Trade, p.13.
- 250 Dawson: Present State, p.404.
- 251 Morison: Australia, p.16. Marsh: Overland, p.54 also refers to "English clovers and grasses" sown on the tablelands, but "none have done well except the white clover" which he first sowed "in New England in 1841, but it never spread very much until bees were taken up there."
- 252 Haygarth: Recollections, p.124. See Appendix VIII for Fodder Plants generally.

the cultivation of artificial grasses. Lucerne,<sup>253</sup> saintfoin<sup>254</sup> and burnet<sup>255</sup> are found to succeed in the alluvial lands; and rye grass<sup>256</sup> and meadow fescue<sup>257</sup> are considered as the best species for resisting the heat of summer, even on the clay land.<sup>258</sup>

White clover had

for some time been scattered in different parts of the colony; but, either from insensibility to or ignorance of its value, it has been in very few instances cultivated...It is much affected by the summer heats and long continued drought, but quickly recovers on the return of moisture.<sup>259</sup>

Wentworth in 1824 stated that "English grasses...particularly the eye-grass, rib-grass, cocksfoot, and meadow-fescue, are beginning to be introduced pretty generally."<sup>260</sup> However, such introductions appear to have been sporadic, and not very successful at first. It has been suggested that in 1834, William Howe, of Glenlee, near Camden, "was the only farmer in the colony cultivating English grasses to any extent,"<sup>261</sup> and that it was not until 1866 that "the first extensive

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253 Medicago sativa, a legume.

254 Sainfoin, Onobrychis sativa, a legume.

255 Garden or Sheep's Burnet, Poterium sanguisorba, Family Rosaceac.

256 Lolium perenne.

257 Festuca arundinacea.

258 Bigge: Agriculture and Trade, p.13.

259 ibid. White Clover, Trifolium repens.

260 'Eye-grass' is doubtless "Rye-grass", Lolium perenne. The other plants are respectively, Plantain, Plantago lanceolata (not a grass), Dactylis glomerata and Festuca arundinacea. Cf. Atkinson: State of Agriculture (1826) p.49: "Nearly all the English grasses, clovers, &c. have been introduced, and some of the principal Settlers have sown considerable quantities; but in general the process of laying down the land to grass has been very ill executed." Enough had been done to show that European fodder plants could thrive and withstand winter, but white clover which was "spreading every where...withers and almost disappears with the summer's drought." op.cit., p.50. Some old residents (e.g. Robert D. Barton: Reminiscences of an Australian Pioneer, Syd., 1917, p.116) actually believed clover was indigenous.

261 J. N. Whittet: Pastures, Syd., c.1964, p.3.

farm sowings of improved pastures in New South Wales" were made at Thomas Sutcliffe Mort's direction on his Bodalla estate. Twelve species were sown, including cocksfoot and perennial rye, as well as red and white clovers,<sup>262</sup> which Robert Dawson had unsuccessfully sowed around Port Stephens forty years before.<sup>263</sup> James Atkinson of Berrima supported Dawson's idea of conserving the native species:

No person, to my knowledge, has yet tried any experiments to ascertain how far any of the native grasses might be improved, or made more useful by cultivation, or in what proportion they are nutritive, when compared with European grasses...certain it is, that keeping them close fed, so as to prevent them from perfecting their seeds, will soon totally destroy them. In many parts of the country, formerly most abundant in grass, there is now scarce a blade to be seen. I am of opinion, however, that some of them might, upon trial, be found worthy of cultivation.<sup>264</sup>

Unhappily, avarice long continued to overstock the pastures, and the progressive suggestions of men like Atkinson and Dawson were barely heard, and rarely heeded.<sup>265</sup>

Large-scale penetration of the western pastures was made feasible by William Cox's road. This was a track, twelve to sixteen feet wide formed within a twenty feet swath through the bush<sup>266</sup> from Emu Ford on the Nepean, over the Blue Mountains, "10 $\frac{1}{2}$  miles to the flagstaff at Bathurst."<sup>267</sup> Cox made considerable use of native trees

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262 *ibid.*

263 Dawson: *op.cit.*, pp.405-6. Dawson did, however, have success with "a species of fiorin called doob-grass,...introduced from India, the herbage of which is much liked by animals." (*op.cit.* p.407). This was Couch, *Cynodon dactylon* which Brown had noticed around Sydney, 1802-4. (*Journal of Botany*, xliv, p.234.) Now considered as "possibly introduced."

264 Atkinson: *State of Agriculture*, pp.21-2.

265 See Appendix VIII for Fodder Plants in general.

266 Macquarie's Instructions to Cox, 14 July 1814, in Cox: *Memoirs*, pp.50-1.

267 Macquarie's Proclamation, 10 June 1815, in Cox: *Memoirs*, p.117. The road was cleared between July 1814 and Jan. 1815 by a convict gang of about 30, supervised by about 8 soldiers.

for constructing numerous bridges and post-and-rail fences for his road, but he seldom identified them. Apparently he left the choice of timbers to the convict carpenters entrusted with bridge-building once sites had been selected. It is clear, however, that either Forest Oak, Casuarina torulosa or River Oak, C.cunninghamiana was used for bridgework over the Cox's River.<sup>268</sup> Cox was also impressed by a Blue Mountains tree

which appears to bear all the property of the ash in its young state...It grows quickly, tall and straight, bends to anything. When large it splits well, and will, I have no doubt, make very good hoops.<sup>269</sup> In its appearance it is like the black butt,<sup>269</sup> but the leaves are unlike. The bark ties much better than stringy bark<sup>270</sup>... in order to try it I cut a small one down, and quartered it, which I mean to send to Clarendon<sup>271</sup> and try them for light cart or chaise shafts.<sup>272</sup>

Another plant which attracted Cox's attention was useful for making "good walking-sticks".<sup>273</sup>

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- 268 16 Dec. 1814: "One of the side pieces is an oak tree, with girth of 9 ft. at least 6 ft. above where it was fallen, and was good 50 ft. long. I never saw such a tree of that sort before."  
Cox: op.cit., p.93.
- 269 E.pilularis.
- 270 e.g. E.eugenioides; E.globoidea; E.capitellata; E.oblonga.
- 271 Cox's property at Windsor.
- 272 Cox: Memoirs, p.75. 5 Nov. 1814. Probably this was Black or Mountain Ash, E.sieberi. Barron Field apparently saw the same tree in October 1822 near Mt. York: a "species called the ash, of which good white-coopers' work might be made, and perhaps ships' smaller spars." Field: Geog. Memoirs, p.430. In Sept. 1832, Dr. George Bennett noted this tree near Blackheath, where "saw-pits had been erected...for...cutting it into planks it being much valued for shafts of gigs..." Wanderings, I, p.105. It long continued to be "recommended for shafts." Maiden: Useful Plants, p.520.
- 273 Cox: op.cit., p.82. 24 Nov. 1814. "There is a handsome shrub here, very like the laylock. It grows larger, but is a pretty flower. The stems of them make good walking-sticks." "Laylock" = Lilac. It is difficult to suggest what this was—perhaps Pittosporum undulatum or P.revolutum.

In April 1815, Cox's road was put to the test by the Governor, who in characteristic fashion

fixed on a site suitable for the erection of a town at some future period to which he gave the name of Bathurst.<sup>274</sup>

The witnessing company included the "painter & naturalist", John William Lewin, coroner of Sydney Town.<sup>275</sup> Although Macquarie in the course of a week of "daily excursions" found "plenty of water and a sufficiency of grass", "fertile soil and rich pasturage" and "not less than 50,000 acres of land clear of timber",<sup>276</sup> half of which was "well calculated for cultivation", he was loath to permit any immediate rush to the west, drought and caterpillars notwithstanding. A military guard<sup>277</sup> was charged with ensuring

that no person, whether civil or military, shall attempt to travel over the Blue Mountains, without having previously applied for and obtained permission...<sup>278</sup>

As previously shown, Evans and Oxley were sent to determine more clearly the nature of this new country and its resources, while Macquarie awaited "the commands of His Majesty's Ministers" concerning grants west of the mountains. Nevertheless some grazing occupation of land beyond the County of Cumberland was permitted:

In Consequence of the Very great Mortality... in the Government Herds, as well as in those of Individuals, during the last three Unfortunate Years of Droughts, I was induced to grant Permission to several of the great

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274 Govt. and Gen. Order, 10 June 1815, HRA, VIII, p.574.

275 J. W. Lewin (1770-1819) natural history painter and coroner, accompanied Col. Wm. Paterson to the Hunter R. in 1801. He is remembered chiefly for his pioneer illustrated works on insects and birds. Macquarie commissioned him to illustrate certain plant specimens for Earl Bathurst. See Chapter II, p.48.

276 Yet there was "a sufficiency of timber of tolerable quality, within the district around Bathurst, for the purpose of house-building and husbandry." HRA, VIII, p.575.

277 stationed near the present town of Blaxland. HRA, VIII, p.677.

278 Govt. and Gen. Order, 10 June 1815, HRA, VIII, p.576. Note Barron Field's criticism: "The fact is, that the transalpine country was treated by Governor Macquarie like a gold or diamond mine, and reserved till government should be pleased to use it itself." Field: Geog. Memoirs, p.446.

Stock-Holders...to send their Horned Cattle across the Blue Mountains to Graze in the New discovered Country and I also sent Some Herds of the Government Cattle thither as an Experiment ...both the Government Cattle, and those belonging to Individuals, have greatly benefitted Already...owing to the Abundance of rich Grass and Water to be Met with in all parts on that Country.<sup>279</sup>

Thus began the assault on the fodder plants of the "forest lands" and "plains"<sup>280</sup> of the interior. Such grazing penetration was not confined to the country due west of Sydney. As early as 1812 there had been a movement of stock into the Macarthur domain of the Cow-pastures,<sup>281</sup> soon followed by another down the brush-covered escarpment to the Illawarra Plain, which by 1836 "was considered to be the most important dairying area."<sup>282</sup> In the north, Macquarie permitted John Howe to depasture stock at Patrick's Plains on the Hunter River in September 1820.<sup>283</sup> By 1821, when Sir Thomas Brisbane arrived to implement certain of Commissioner Bigge's recommendations concerning government and settlement, only a little more than one-third of the million-odd acres in the County of Cumberland had been occupied, chiefly for grazing.<sup>284</sup> However, by the time Brisbane had completed his first year as Governor, there was widespread occupation of land within the area bounded by the

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279 Macquarie to Bathurst, 1816, HRA, IX, pp.60-61.

280 "Plains" implied a botanical rather than a topographical classification. They were grasslands. See Atkinson: State of Agriculture, p.6: "Extensive plains are a distinguishing feature in the interior of New South Wales. These tracts, although termed plains in the Colony, are very seldom level, but generally a gently undulating surface, destitute of timber, and covered with grass."

281 Govt. and Gen. Order, 11 April 1812.

282 Whittet: Pastures, p.3.

283 John Howe: MS Journal. ML.C330. Some 50,000 cattle were grazing on the Hunter Valley grasses by 1823. S. H. Roberts: The Squatting Age in Australia, 1835-1847, Melb., 1964, p.133.

284 388,000 acres out of 1,043,000 acres in the County. See K. W. Robinson: "Population and Land Use in the Sydney District, 1788-1820", in New Zealand Geographer, Oct. 1953, pp.153-4.

Hunter River in the north, Bathurst and Wellington in the west, the Goulburn Plains in the south-west and Jervis Bay in the south.<sup>285</sup> As the stock invasion rapidly advanced towards the Murrumbidgee in the south and the Macleay in the north, the inadequacy of the Surveyor-General's Department became even more painfully obvious. Such factors as the wholesale granting of land since Phillip's time, Macquarie's failure to submit land returns for nine years,<sup>286</sup> Brisbane's relaxation of restrictions upon land occupancy over the Mountains, and the head-long rush for land, not only by individuals, but even by a chartered company authorised to secure a million acres<sup>287</sup> all helped to plunge the understaffed survey department hopelessly in arrears. Clearly the limits of occupation had to be officially fixed. On 5 September 1826,<sup>288</sup> and again on 14 October 1829,<sup>289</sup> settlement boundaries were proclaimed. Pasture plants in the forbidden territory beyond these boundaries immediately assumed a greener and more nutritious appearance. Addition of Macquarie as the twentieth county in 1830 enabled stock to be grazed legally upon the King's grasses as far north as the Hastings River, but this concession gave little relief to the needs of gentlemen wishing to be proprietors of grand estates of natural pastures for the stock their capital enabled them to purchase. Thus during the 1830s the squatting movement gained tremendous momentum.

The intricacies of land policy and the historical details of the spread of settlement are beyond the scope of this study.<sup>290</sup>

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- 285 S. H. Roberts: History of Australian Land Settlement, 1788-1920, Melb., 1968, pp.30-1.
- 286 1812-1821, Goulburn to Macquarie, 15 Mar. 1821, HRA, X, p.408.
- 287 The Australian Agricultural Company, 1824.
- 288 Government Order, 5 Sept. 1826, HRA, XII, pp.539-541. Boundaries were: Cape Hawke in north to Bateman's Bay in south, and inland to Wellington Valley.
- 289 Syd. Gaz., 17 Oct. 1829. Boundaries were: Manning R. in north to Moruya R. in south; inland to Wellington Valley. Within these boundaries were the Nineteen Countries, comprising 34,505 sq.m.
- 290 These have been competently dealt with in S. H. Roberts: History of Australian Land Settlement, 1788-1920, Melb., 1924 (reprinted 1968) and in the same author's The Squatting Age in Australia, 1835-1847, Melb., 1935, (reprinted 1964); C. J. King: An Outline of Closer Settlement in New South Wales, Syd., 1957. Details of the spread of settlement are given in a growing host of local histories.

Briefly, Oxley's Liverpool Plains, which so impressed the early writers, remained protected for a time by the Liverpool Range, but the discovery by Allan Cunningham of Pandora's Pass in 1827 soon enabled the squatters and the Australian Agricultural Company to squabble over the best pastures. In the mid-thirties, the New England Tableland was occupied, and by 1840, Patrick Leslie's sheep were grazing on the Darling Downs. During the 1820s and 1830s there was a parallel penetration of the coastal plain northward into the domain of the cedar-cutters from the Hunter River to the Tweed, and southward to the Shoalhaven River and Twofold Bay. South and west of Sydney, some followed the tracks of Hume and Hovell and Charles Sturt, and the example of Henry O'Brien, to take up land in the much-lauded Murrumbidgee country, or beyond, along Currie's track to the Monaro. Others followed the tracks of Oxley and "the Major's Line" into the Lachlan district. By 1840, the central western strip from the Macintyre River to the Riverina Plain (with the exception of the area between the Namoi and the Gwydir, where there was a rather arid area rendered more forbidding by aboriginal hostility) contained squatters' runs.<sup>291</sup> In the same year, squatters from the Namoi sought relief from drought on the Upper Darling, but owing to the long history of rather successful attacks by aborigines in the north-western rivers district, settlement of the Bogan, Lower Barwon and Upper Darling blocks was not permitted until the late fifties.<sup>292</sup> Brewarrina and Bourke were laid out in 1861 and 1862 respectively.<sup>293</sup>

In connection with the squatting expansion into the Northern Tablelands—"the North countree"—and into the far western interior—"the ever-grey country"<sup>294</sup>—it has been claimed that

since the saltbush lands of the Darling seemed to offer no advantage in going west, north alone remained, and for over a decade the squatter's goal was 'the north countree'.<sup>295</sup>

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291 Roberts: Land Settlement, p.104 (map).

292 Bourke Historical Society: The History of Bourke, Vol.I, Bourke, 1967, p.21; J. Jervis in JRAHS, 1956, pp.5-6.

293 Heathcote: Back of Bourke, p.107.

294 Roberts's term. Land Settlement, p.171.

295 Roberts: op.cit., p.170.

This should not be taken to imply that the "saltbush lands" were not early and readily appreciated. In December 1845, Mitchell was told by a shepherd in the Bogan River district that the

country is considered excellent as a fattening run for sheep;...they there find a salt plant, which keeps them in excellent condition and heart for feeding.<sup>296</sup>

Furthermore, in drought times, it was

a practice of stockmen to cut down the *Acacia pendula* (or Myall trees, as they call them) for the cattle to feed on.<sup>297</sup>

Mitchell himself considered that "the plains to the westward" of Hervey's Range "afford the most nutritive pasturage in the world for cattle."<sup>298</sup> The ubiquitous saltbushes had further advantages:

It appeared that the saltwort plants, which were numerous, were not only efficacious in keeping the cattle that fed on them in the best possible condition; but as wholly preventing cattle and sheep from licking clay, a vicious habit to which they are so prone, that grassy runs in the higher country nearer Sydney are sometimes abandoned only on account of the 'licking holes' they contain.<sup>299</sup>

The saltbushes thereby obviated the need to supply stock with rock-salt.<sup>300</sup> Mitchell asked

As the superior excellence of these runs for fattening cattle is admitted on all hands, as compared with others more abundant in grass on the eastern side of the range, would it not be advisable for the colonists to cultivate this salt-supplying bush, and thereby produce a vegetable substitute for rock-salt...?<sup>301</sup>

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296 Mitchell: Tropical Australia, p.15.

297 Mitchell: op.cit., p.12.

298 presumably the Bimble Box-Pine and Grey or Mallee Box (*E.woollisiana*) country in the Condobolin-Trundle area. op.cit., p.11.

299 op.cit., p.53. Mitchell was speaking of the saltbush country near Duck Creek between the Bogan and the Macquarie.

300 The matter of clay-licking by stock remains something of a mystery. Some say that "licks" of rock salt do nothing either for the stock or the habit; others maintain that rock salt is essential. Neither the "vicious habit" nor the provision of salt "licks" seems to have any noticeable effect. (Prof. G. L. McClymont, U.N.E., 19 Aug., 1968.)

301 Mitchell: op.cit., p.54. The plant in question was Old Man Salt-bush, *Rhagodia parabolica*.

ECOLOGICAL VARIETY: SAND DUNES ON THE DARLING



SAND DUNE near the Darling River. Black Box, E.largiflorens in the background, with Poached Egg Daisy, Myriocephalus stuartii growing on the dune in the foreground, and Bluebush, Kochia pyramidata on the right.

Photo.: L. G., 40 m. S. of Menindee 27 Aug. 1969.



SAND DUNE near the Darling River at Pooncarie. Shrubs are Hop-bush, Dodonaea attenuata. Black Box, E.largiflorens in background.

Photo.: L. G., 27 Aug. 1969.

In the light of such published accounts, the saltbush country of the far interior did not go unappreciated for long. In 1845, George Hobler, who ultimately had stations in the Namoi, Hunter, New England and Goulburn districts, established the first far western station at Lake Paika on the lower Murrumbidgee where the river passed through Black Box country between saltbush plains on the east and mallee country on the west, the latter "desolate enough for Dante's 'Inferno'."<sup>302</sup> During the forties, land along the Murray and Murrumbidgee was wellnigh completely appropriated, and by 1850 penetration from the south into the belah, mulga, mallee and saltbush country of the lower Darling had been effected as far north as Wilcannia.<sup>303</sup> In December 1851, it was estimated that

in the Murrumbidgee district there were about  
4,800 horses, 134,000 cattle, and 732,600  
sheep...

while in the Lachlan district there were

about 4,800 horses, 138,500 cattle, and  
347,700 sheep, and...the squatters were  
looking forward to the steam navigation  
of the Murray as of paramount importance  
to them, and also to a large community  
occupying an extensive territory on the  
Murrumbidgee and elsewhere.<sup>304</sup>

The Golden Decade, 1851-1861, not only rearranged much of the population of New South Wales, but also increased it by 87%,<sup>305</sup> and John Robertson's Selection Acts of 1861 attracted thousands to the land, so that by 1883, "selectors had occupied 16,354,000 acres" in addition to nearly 3,000,000 acres which "had been taken up by other means."<sup>306</sup>

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302 Bartley: Opals and Agates, p.62, referring to a visit in 1853.

303 Roberts: Squatting Age, p.179. Sturt had predicted in October 1844 that "the whole line of the river will sooner or later be occupied, and that both its soil and climate will be found to suit the purpose both of the grazier and the agriculturist."  
Sturt: Central Australia, I, pp.144-5.

304 John Lewis: Presidential Address, Proc.Roy.Geog.Soc.Aust., S.A. Branch, 1916-1917, p.29, quoting indirectly from a report of Edward Bate Scott who had "overlanded" from Sydney to Moorundee, S.A., 1851.

305 R. Ward: The Australian Legend, Melb., 1960, p.104.

306 Roberts: Land Settlement, p.238.

ECOLOGICAL VARIETY: THE ALPINE COUNTRY



ALPINE HERBFIELD on the summit of Ramshead Range, about 6,500 ft., and  $2\frac{1}{2}$  miles S.E. of Mt. Kosciusko. This kind of country was first investigated scientifically by Dr. John Lhotsky (1834) and Count Paul de Strzelecki (1840). Ferdinand von Mueller collected on the Kosciusko Plateau in January 1855. Such herbfields have been used as summer grazing grounds since the 1840s by settlers south of the Monaro.



SUB ALPINE BOG near the old cemetery at Kiandra, about 4,500 ft. Such bogs are characterised by sedges (e.g. Carex gaudichaudiana) rushes (e.g. Restio australis), small heaths (e.g. Epacris paludosa) and mosses (e.g. Sphagnum cymbifolium). The surrounding tussock grassland contains such species as Snow Grass, Poa caespitosa sens.lat. while Snow Gums, E.niphophila dominate the ridges.

Photos.: L. G., 31 Aug. 1969.

Sixty years before the alienation of land had reached this stage, Barron Field, aware of the exploratory work of Oxley and Cunningham, and of the expansionist policy of the earliest holders of vast estates, observed that "the great graziers are obliged each to go beyond the other", and that their "stock-keepers will be the best and cheapest explorers of the country."<sup>307</sup>

In many districts, it was just as Field prophesied, but whether new country was explored and assessed by the graziers themselves or their stockmen, by small free settlers, or by the selectors of a later time, it was often chosen or rejected on the grounds of widely-accepted botanical indicators. The principal factors which determined the selection of a site for home, farm or run, were adequate water and likely soil or pasturage, although aesthetic considerations also influenced some.<sup>308</sup>

As mentioned earlier, Charles Sturt appreciated "the apparent connection between...geology and vegetation",<sup>309</sup> and Peter Cunningham understood in 1826 that

in Australia, you may always quickly tell, by the species of timber you see growing, what the quality of the land for agricultural purposes is,—the appletree marking the good, and the spotted gum and stringy bark the bad.<sup>310</sup>

Here was a clear suggestion that intending settlers should become familiar with the trees they encountered. Yet despite a growing appreciation of the close affinity between many plant species and soil types, experienced observers like James Atkinson were cautious, while apparently supporting the general opinions:

No very certain inference of the quality of the soil can be drawn from the species of timber found growing upon it.—The iron bark, and spotted gum generally grow in poor gravelly land. The box, blue and white gums, grow in good clay or loam; swamp oak abounds where

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307 Field: Geog. Memoirs, p.448.

308 e.g. Dr. Murray's home site near Canberra. Mossman & Banister: Australia Visited, p.176.

309 Sturt: Two Expeditions, I, p.xxx. See Chapter II, p.144.

310 Cunningham: Two Years, I, pp.78-9. He also claimed that "the rankness of the grassy sward is the best criterion to go by..." op.cit., II, p.152.

the land is wet, cold, and generally poor... in general...the best lands are least encumbered with timber; this, however, does not hold good of granitic soils, which are generally open and free of timber, and sandy weak land.<sup>311</sup>

Atkinson was not the only one who allowed for exceptions to general 'rules'. Lieut. Breton also sounded a warning to the 'new chums' of the 1830s:

...I take it for granted, that every person, intending to become a farmer, knows, at once, the difference between that which is productive and that which is not. As to certain trees indicating the quality of it, this is merely a general rule liable to many exceptions. I have seen trees growing in very bad soil, when, according to some...they are found only where it is good, and the apple is said by many to indicate the best of land; but by others, that which is...the worst. So much for a contrariety of opinions upon a point which might be decided with the greatest facility without reference to trees of any kind.<sup>312</sup>

Breton also advised that those lacking "a moderate knowledge of agricultural matters...had much better remain in England." Such suggestions solved nothing for intending settlers, who eagerly and thankfully used whatever botanical, and other guidance might be proffered to assist them in land selection.<sup>313</sup> No doubt the whole matter was complicated further by many an error in the identification of plants growing on both "good" land and "bad". Yet the traditional indicators of "good country" were strongly recommended. In 1851, for example, William Gardner gave clear advice on choosing a squattage on

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- 311 Atkinson: State of Agriculture, p.18. Cf. Dawson: Present State p.187: "...the tall ugly gum-trees every where increasing in number and size in proportion to the poverty of the soil..." (near Port Stephens, Nov. 1826).
- 312 Breton: Excursions, pp.55-6.
- 313 Cunningham pointed out that guidance offered by other settlers was the least reliable, "it being the interest of every settler to keep others at a distance...When...you hear a settler abusing a tract of land as very bad, you may generally assume it to be very good." Two Years, II, pp.152-3.

ECOLOGICAL VARIETY: THE ALPINE COUNTRY



LOW FOREST of Snow Gum on the slopes of the Ramshead Range. Here at 5000' to 6000', E.niphophila assumes a dense mallee-like habit.

Photo.: L. G., Thredbo, 31 Aug. 1969.



ALPINE HERBFIELD dominated by composites (e.g. Snow Daisy, Celmisia longifolia) and grasses (e.g. Snow Grass, Poa caespitosa). Snow Gums in background, about 6000 ft., Ramshead Range.

Photo.: L. G., Thredbo, 31 Aug. 1969.

the basis of botanical indicators:

The most valuable lands for grazing sheep in the Northern Districts are the lands where the Box tree is found...on the ridges & the apple tree on the flats & plains. Skillful flock-masters in selecting a run in New Country pay attention to this...<sup>314</sup>

By 1880, many botanical indicators had long been used, apparently proven, and confidently recommended.<sup>315</sup> In 1900, the Depart-

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- 314 W. Gardner: "Productions and Resources of the Northern Districts of N.S.W.", UNE Archives, M20. (MF) p.42.
- 315 e.g. "Good grazing country" indicated by Grey Box, E.moluccana (Woolfs in Proc.Linn.Soc.NSW, 1880, p.455; A. Nilson: The Timber Trees of New South Wales, Syd., 1884, p.64; Maiden: Useful Plants, p.470 (1889)); and by Broad-leaved Apple, Angophora subvelutina. (Maiden in Ag.Gaz.NSW, 1895, p.587); "Good country" (undefined), "Good soil", "Rich soil", etc. by Apples generally, Angophora spp. (Cunningham: Two Years, I, p.78 (1827); Henderson: Excursions, I, p.133 (1851); Dawson: Present State, p.108, (1830)); Blue or Flooded Gum, E.saligna and Blackbutt, E.pilularis (Woolfs in Proc.Linn.Soc.NSW, 1880, pp.449, 455); Tallow-wood, E.microcorys. (J. A. Despeissis in Ag.Gaz. NSW, 1891, p.693); Red Cedar, Toona australis, "a sure proof of the goodness of this land" (Hastings R.) (Wentworth: Statistical Account, I, p.95); Myall or Boree, Acacia pendula. (Maiden: Forestry Handbook, Syd., 1917, p.95). Blue Grass, Dichanthium sericeum (Fred. Turner in Ag.Gaz.NSW, 1891, p.717.) "Bad", "poor" or "indifferent" soils were indicated by Grey Ironbark, E.paniculata (Nilson: Timber Trees, p.68); Broad-leaved and Narrow-leaved Ironbarks, E.fibrosa and E.crebra. (Woolfs in Proc.Linn.NSW, 1880, pp.504-5); Grey Gum, E.punctata. (Woolfs, op.cit., p.452). Spotted Gum, E.maculata (Cunningham: Two Years, I, p.78 (1827); Nilson: Timber Trees, p.66 (1884)); Woody Pear, Xylomelum pyriforme (Hodgson: Reminiscences, p.151 (1846)); Grass Trees, Xanthorrhoea spp. "universal signs of poverty" (Dawson: Present State, p.347 (1830), also Henderson: Excursions, II, p.225 (1851), and Willoughby: Australian Pictures, p.201 (1886); Honeysuckles, Banksia spp. "almost sure sign of sand and poverty" (Dawson: op.cit., p.347); Aquatic plants of various species indicated "land is not above flood level or... spungy (sic)...and unfit for sheep" (Dawson: op.cit., p.382). In 1890, Angus Mackay, "Instructor in Agriculture, Technical College, Sydney", stated: "The native grasses, herbs, shrubs, and trees offer a capital index to the quality of the soils...It is simply impossible to find a heavy growth of rich herbs and grass upon poor land. ...The softer woods are on rich soil, the harder on poorer soil." A. Mackay: The Australian Agriculturist and Colonists' Guide, Syd., 1890, p.9.

ment of Agriculture gave information which in some respects hardly differed from the traditional views,<sup>316</sup> and even to-day, when land is advertised in terms of ample stands of White Box, E.albens or Yellow Box, E.melliadora, it is assumed to be potentially good wheat country, and other botanical indicators are similarly followed for good reasons.

Not only grazing and agricultural land, but also the presence of minerals or underground water, and specific edaphic factors have been linked, sometimes on the basis of scientific fact, sometimes on the basis of rather spurious bush lore, with the occurrence of certain plants.<sup>317</sup> Quite often, however, too little was known in the nineteenth century of the wide range of climatic and edaphic conditions tolerated by some of the species which were used as indicators,<sup>318</sup> and the study

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- 316 W. H. Clarke: "The City Agriculturist", Ag.Gaz.NSW, 1900, p.483: "As an index to the character of soil and the suitability of a site for orchard culture, the natural timber is a fairly good guide. For instance, wherever the red apple, or... 'red-gum'... stands, you may be sure the land is a light clay, the subsoil is fairly stiff, and there is a good deal of loose ironstone gravel... Where the bloodwood is found in conjunction with straggly dark-gray barked tea-trees, the soil is midway between gravelly clay and sandy loam. The small local turpentine is usually in stiff and deep clay, while the blue-gum, black-butt, and forest-oak will usually be found where the braken (sic) ferns grow tallest—i.e., in the places where there are 7 or 8 inches of good dark loam over a clay subsoil. Where the box-trees do well the soil is inclined to be stiff, of a chocolate colour, and pretty good. Ironbark seems to flourish in hard patches of gravel, though occasionally you will find... it in good soil. The tea-tree... is a danger signal, and the tea-broom indicates rocks close to the surface. Grass-trees, gnarled messmate, or peppermint gum, white gum, and all sorts of thorny undergrowth generally clothe a soil of a spummy, bilious colour, and of poverty-stricken composition."
- 317 e.g. Veronica perfoliata said to indicate "auriferous formations" in the Mudgee District (A. G. Hamilton in Proc.Linn.Soc.NSW, 1886, p.290); Mugga, E.sideroxylon, "considered by Bendigo miners to be a sure sign of auriferous country" (J. H. Maiden: Forest Flora of New South Wales, 8 Vols., Syd., 1904-1924, V, pp.138 et seq. for this and other plant indicators of minerals in Aust. and elsewhere); Scented Mat-rush or Iron-grass, Lomandra effusa, first described from a specimen collected by Mitchell, is still known as "Copper Grass" at Cobar; it was exhibited at the Linnean Society, Sydney in July 1883 as "a sure indication" of copper (Proc.Linn.Soc.NSW, 1883-4, p.386), although not then fully identified. (Identification from a specimen sent from Cobar by Miss R. Lewis, Mar. 1969). In the far west of N.S.W. the wattle, Acacia sentis was "considered a sure indication of underground water". (Maiden: Useful Plants, p.366).
- 318 See N. C. W. Beadle: The Vegetation and Pastures of Western New South Wales, Syd., 1948, pp.49-52 for a critical assessment of the significance of plants as soil indicators in the far west of NSW.

ECOLOGICAL VARIETY: RIVER FOREST AND PALM THICKET



RIVER FOREST OF RIVER RED GUM, E.camaldulensis on the Murray River at Moama, opposite Echuca. Note the cut logs on the bank. Many river steamers, like the Rodney, burnt by strikers in August 1894, were built of River Red Gum and launched in this vicinity.

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



BANGALOW PALM THICKET near Lennox Head. Here the palms, Archontophoenix cunninghamiana are very spindly, being crowded together in a small isolated pocket on the site of a former rainforest, long since cleared for dairy pastures.

Photo.: L. G., Sept., 1966.

of trace elements lay far in the future.

Having chosen land, whatever the criteria used, the next step was to utilise or "improve" it, and so the devastating assault on the bush began. The earliest efforts to clear the land have been considered elsewhere.<sup>319</sup> In 1822 Governor Brisbane reported:

...in order to accomplish the first process towards improvement I have a Thousand men employed in clearing the Country of the excess of its Forest Timber and Brushwood. These men fell at least an acre a week each, and therefore your l'd'p will perceive a vast extent of Country will be laid open.<sup>320</sup>

Some actually appreciated the enormous change which was inevitably wrought in the landscape by the expansion of settlement:

The first steps towards forming a home amidst the wilds are not only toilsome, but in some degree disheartening. Even the natural beauties, which may have influenced the settler in his selection of a site, are converted into deformity. The forest must be hewn down; and, in its immediate effects, nothing can be more desolating than this operation. By degrees, however, the felled timber and the stumps are burnt off; the unsightly gap in the forest, with its forbidding barrier of trees with branchless stems, gradually gives way before the woodsman's axe, and becomes blended in a more distant and mellowed outline.<sup>321</sup>

This was a rare view indeed. Most were hardly concerned about the obliteration of sections of the "interminable forest."<sup>322</sup> As new country was occupied,

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319 Thesis I.

320 Brisbane to Earl of Buchan, 30 Aug. 1822, HRA, X, p.723. The settlers paid for this convict labour 5 bushels of wheat per acre from the first crop. See HRA, XI, pp.324-327 for Brisbane's clearing scheme, and op.cit., pp.623-624 for a statement that between March 1822 and April 1825, the gangs had cleared 20,031 acres.

321 [Edward Edwards]: New South Wales; Its Present State and Future Prospects...Lond., 1837, p.(186).

322 Compare, for example, Trollope: Australia, p.194: "...the home-paddock was partially cleared of timber, and was pretty enough."

each one who settles must go through the same process as those who have gone before him. He must build a slab hut--fell and clear off timber--fence in his paddock--muster his cattle--and count out his sheep.<sup>323</sup>

Those who had indeed gone through this back-breaking initiation to bush life, sometimes won the admiration of the newcomers:

It seems strange to meet with such parties in the wilderness; they seem out of the world, and as nothing, compared with the boundless forest they inhabit. One wonders how they can have courage to set down at such a distance from a civilized community, and to attempt to bring such a wild into use, or under cultivation--<sup>324</sup> they seem so disproportioned to the task...

This was, in fact, all the more remarkable when it is considered that many of these settlers had been

seduced by flattering assertions, deluded by splendid misrepresentations, excited by hopes too soon to be crushed.<sup>325</sup>

The lot of the settler, whether farmer, grazier, miner or bushworker, varied according to the ecology of the country in which he sought to make his home. Settlers in the eastern areas had ample scope for demonstrating their repugnance for the bush and for working off their frustrations as they moved, axe in hand, into sclerophyll forests, woodlands and rainforests. Those in the far west were often hard put to find sufficient trees to supply the basic needs of pioneer life.

The settlers' clearing operations were usually rather heavy-handed, as Mrs. Louisa Meredith scornfully pointed out:

The system of 'clearing' here, by the total destruction of every native tree and shrub, gives a most bare, raw, and ugly appearance to a new place. In England we plant groves and woods, and think our country residences unfinished and incomplete without them; but here the exact contrary is the case, and unless a settler can see an expanse of bare, naked, unvaried, shadeless,

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323 Henderson: Excursions, II, p.7.

324 Walker: Month in the Bush, p.7.

325 Hodgson: Reminiscences, p.13.

dry, dusty land spread all round him, he  
fancies his dwelling 'wild and uncivilized.'<sup>326</sup>

The reason for this heavy-handedness is not hard to find. As Commissioner Bigge explained to Earl Bathurst in 1822, "the greatest part of...the county of Cumberland, is encumbered with trees." Thus the hoe, rather than the plough had been the more convenient implement of cultivation. The great amount of root growth meant that the land could not be fully utilised; according to John Oxley, one-eighth of the land had to remain uncultivated because of "the roots of the trees that yet remain." The "advantages of good cultivation" could not "be obtained without a previous and perfect eradication of the roots of trees."<sup>327</sup> To effect this, Bigge recommended the use of convict clearing gangs.<sup>328</sup> The procedure simply involved chopping down the trees,

burning off the timber, collecting it into  
heaps, and eradicating the stumps or roots by  
piling green sods around and over them for the  
reception of fire.<sup>329</sup>

Bigge saw no great loss in this method for

the value of the timber when cut is generally  
very inconsiderable, as it chiefly consists of  
the eucalyptus or gum tree,<sup>330</sup>

although there were some "more valuable species" which "the wood-cutting gangs" would be well advised to set aside during their operations.<sup>331</sup>

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326 Meredith: Notes and Sketches, p.56.

327 J. T. Bigge: Report of the Commissioner of Enquiry into the State of the Colony of New South Wales, Lond., 1822, pp.158-9.

328 op.cit., p.159.: "...there was no description of convicts that could not be employed in the simple operation of cutting down wood, and in the subsequent one of burning it off and taking up the roots."

329 Bigge: State of Colony, p.159. The "sodding up" of stumps was long advocated. See Cunningham: Two Years, II, p.164, and Joseph Dyer to Agricultural and Horticultural Society, June 1857, in Syd. Mag.Sci. and Art, July 1857, pp.23-4. Dyer also mentioned "that some bushmen use gunpowder to blast the stumps out", but suggested the hydraulic press as the best device for clearing operations in N.S.W.

330 Bigge: op.cit., p.160.

331 ibid. "The species...denominated stringey bark, iron bark, blue gum, and cedar, are those which have been found to be most useful in the colony; but from specimens lately imported into England, their value, especially that of stringey bark, is very questionable, and yet remains to be proved. The beef wood is the only timber of an ornamental kind...discovered." (Beefwood was applied to Casuarina and Banksia.)

ECOLOGICAL VARIETY: "PINES", INDIGENOUS AND EXOTIC.



Left: Colónial, Hoop, Moreton Bay or Richmond River Pine, Araucaria cunninghamii, long recognised as a valuable timber tree of the North Coast in and around rainforests. Right: Norfolk Island Pine, Araucaria heterophylla on which great hopes were fixed for a plentiful supply of masts and spars. The timber turned out to be rather too brittle, but the tree has been a favourite for cultivation since Macquarie's time, and probably earlier. The red flower in the foreground is of Coral Tree, Erythrina sp. Note the post-and-rail fence.

Photo.: L. G., Alstonville, near Richmond R., Sept. 1968.



Coastal Cypress Pine, Callitris columellaris which forms a distinctive part of the vegetation around Brunswick Heads. Like other species it is resistant to termites, the timber is pale and aromatic, and sometimes used for cabinet work.

Photo.: L. G., Brunswick Heads, June 1967.