> which was stripped from the living trees in sheets of about six feet long and from two to four feet wide, laid upon rafters composed of small sapling poles just as they came from being cut in the bush. The sheets of bark, having holes pierced through each in pairs, were then tied on the rafters with cords twisted of the inner rind of the korrajong (sic) tree.[430] The whole framing of the roof was secured...by wooden pins in order to save the expense of nails...
> Thus the materials of Mick's habitation were pretty much the same as those of the prisoners' huts on Emu Plains...A bark ceiling also was laid over the tie beams...
> As usual the fireplace occupied nearly the whole of one end of the hut,...being composed entirely of wood... lined with ...hard dried clods of clay built up about a couple of feet...[431]

The furniture consisted of stumps and slabs, and "the sleeping-berths were all fixtures, made of slabs and sheets of bark." The significant point is that "Mick's habitation" was also "pretty much the same" as those of some squatters, miners and selectors twenty, forty, sixty and more years later. The split slab eight or nine feet long became the basic unit of both housing and fencing in timbered areas for the remainder of the century.[432] Half a century after the period about which Harris and Tucker wrote, English readers were informed:

> In Australia the buildings of the head station are usually constructed of 'slab' walls, with bark or shingle roof. Slabs are rough planks, split out of trees, cut to about ten feet in length and one in breadth; and then they are held in position by means of grooves in beams above and below...
> The bark of the stringy-bark gum-tree is the one most in demand, though the bark of the box gum-tree is likewise very good, for roofing purposes...[433]

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430 Kurrajong, Hibiscus heterophyllus.
431 Tucker: Ralph Rashleigh, pp.112-3.
432 see Appendix IX for examples of buildings constructed of bush materials during the nineteenth century.
433 Baden-Powell: New Homes, pp.151-152.

The roof was anchored "by a rough framework of smaller logs,[434] or even stones saddling the ridge by means of ropes," and there was the usual wooden chimney. Stables, detached kitchens, "forge, men's huts, &c." all had "much the same external appearance."[435] Other buildings, too,[436] had "much the same external appearance," — churches, schools, inns, woolsheds, and even the diminutive shepherds' watchboxes. Should pit-sawn or mill-sawn, timber be available, the same general methods were followed, with a rather more sophisticated result. In the 1860s it was said of one Murray station that the feature which distinguished the owner's house from the other buildings was

> that the slabs with which it was built were sawn instead of split, and that it was shingle roofed, all the other buildings being simply covered in with bark.[437]

As in the case of fencing materials, in time certain timbers were preferred for house-building, because they "ran out" well, were easy to work, or were considered durable.[438]

As late as 1900 intending selectors were given advice strangely reminiscent of that given to intending emigrants nearly a century before, with a touch of that propriety of which Macquarie would have approved:

> In planning out and building...it is just as easy to make provision for a modicum of comfort as it is to shove together a humpy that you have to hold up with both hands on stormy nights...
> A man with his family dumped in the bush 10 miles or so from everywhere, is not always in a position to undergo an apprenticeship...It damps the fire of a man's enterprise to swelter all day and return to a dwelling that is a bung-eyed, lop-sided blot on the landscape...[439]

On the eve of Federation it was appreciated that

> in a young country, and under conditions imperfectly understood, slip-shod methods and makeshifts naturally find a place of favour, but a new era is setting in...[440]

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434 i.e. "riders" lying down the roof between the ridge and the eaves, and "jockeys" lying across these at right angles.
435 Baden-Powell: loc.cit.
436 see accompanying photographs and Appendix IX.
437 D. Ferguson: Bush Life in Australia and New Zealand, Lond., 1893, p.25.
438 see Appendix VIII for materials used for slabs, roofing, etc.
439 W. H. Clarke: "The Farm Homestead," Ag.Gaz.NSW, 1900, pp.1027 et seq.
440 ibid.

Yet there was precious little sign of the "new era" in the basic suggestions for building a farm house in developing areas:

> a very cosy place can be built of slabs, even by a man without much training as a carpenter.

This could consist of "a couple of rooms and a skilling kitchen", perhaps with planks "instead of the usual earthen floor." The walls were of vertical slabs as ever, supported by the same grooved floor plates and roof plates as described by observers in the 1820s. The suggestions for roofing such a house in 1900 reflected a somewhat reluctant advocacy for modern materials:

> There can be no question that, on the score of cheapness and comfort, the old stringybark roof cannot be excelled. But nowadays, roofing iron has become so cheap that it is scarcely worth while bothering about bark for dwellings. Besides, to the settler, roof catchment for water...is a serious consideration, and on that account alone anything but galvanized iron is not to be thought of.[441]

Other concessions to twentieth century technology were the use of ready-made doors and windows. There was now the possibility of being able to "tell the timber man" to deliver the requisite number of sawn slabs. But even in 1900, the chances were that one's timber yard would consist of "the swaying forest." This would mean the same old use of axe, saw, maul and wedges to provide slabs nine feet long, "split out very much in the same way as fencing rails." Knowledge of basic bush work remained current for a long time.

Not everyone welcomed the usurpation of the traditional plant material roofing by galvanized iron during the latter half of the nineteenth century. Despite an increase in roof pitch and the retention of old shingles under new iron to provide insulation, the high infant mortality rate was attributed to the extreme heat imposed by the "galvanized iron roof":

> Poor little things...They have never lived, and never even knew what it was like <u>to</u> live, under a thatch, or honest shingle roof...

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441 ibid.

BUSH SCHOOLS

SLAB-AND-BARK SCHOOL building at Gap View as it still appeared in 1924. Note the corner posts and ground plate supporting the tapered slabs. The gable roof is unusual in such a building; it may have been a later modification.

Photo.: Museum of Education, Armidale.

SLAB-AND-BARK SCHOOL at Moredun, near Bundarra. Here the round-backed slabs were let into the ground instead of into grooved ground plates. The roof bark on the typical hipped roof, is perhaps from Tingha Stringybark, E.tinghaensis.

Photo.: Museum of Education, Armidale.

Let galvanized iron be used for

> water tanks, and to cover flour and sugar from the rain, not babes from the sun, and let us have fewer stones in the cemetery to tell us that those who were born in 1884 died in 1888...[442]

No doubt those who had advocated the use of a double bark roof for bush dwellings heartily agreed,[443] but lack of funds and transport facilities ensured that bark was long in demand, especially for outbuildings. As late as 1872, the indiscriminate barking of trees was condemned because

> an immense number are annually destroyed by the system almost invariably adopted, of taking one sheet of bark from a tree, and leaving the rest, when if the trees were felled, and all the available bark taken, nothing like the number of trees would be killed to obtain the quantity of bark required; and fine young trees are generally selected for barking. It is not all uncommon, when teams are returning without loading, for the drivers to strip a load of bark for sale, and to obtain this they seldom fall a tree.[444]

The aborigines, on the other hand, with their ability to climb, were able to strip standing trees completely, and their special skills had been appreciated long before.[445]

Although the slab-and-bark building dominated the bush throughout the nineteenth century there was naturally more architectural sophistication in the cities and towns. By the 1830s, it was noted that

> a bark-hut near the 'metropolis' is daily becoming rarer; they are speedily giving place to neat and even elegant verandah cottages.[446]

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442 Bartley: Opals and Agates, pp.269-270.

443 Townsend: Rambles, p.163. Bark huts "...do not, unless double-roofed, afford sufficient protection from the sun."

444 William Carron: Reports on Timber Reserves, V. & P. NSW Leg. Assembly, July and Dec. 1872.

445 see illustration nearby from Atkinson: State of Agriculture; also Bennett: Wanderings, I, p.169, for aboriginal bark-strippers at Yass Plains - stringybark and box for settlers' huts.

446 Bennett: Wanderings, I, pp.53, 331.

BUSH SCHOOLS

WEATHERBOARD-AND-BARK SCHOOL at Gulgong, 1871. Weatherboard of Cypress Pine, which in this locality may well have been Callitris endlicheri; the roof bark is likely to have been from Red Stringybark, E.macrorhyncha. Note roof jockeys fixed by wooden pegs.

Photo.: Beaufoy Merlin.

SLAB-AND-SHINGLE SCHOOL, Hartley, 1871. Note the heavy ground plate supporting the slabs, and the glazed windows.

Photo.: Beaufoy Merlin.

Even by 1827, Peter Cunningham had noticed that at Parramatta,

> most of the houses...are built of brick, or white freestone; but no inconsiderable number are clap-board buildings, all roofed, as in Sydney, with iron-bark shingles...[447]

Shingles[448] continued to be used well into the era of plentiful galvanized iron, but then, so were sheets of bark, depending upon one's resources and the purpose for which a building was intended. By 1840, it was noted that in Sydney, "houses are almost invariably covered with shingles as in America," but even then, roof slates were being imported from South Australia[449] — and just as well, for legislation aimed at fire prevention, did not permit the use of roofing materials such as thatch, bark or shingles in the city as from the beginning of 1838.[450]

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447 Cunningham: Two Years, I, p.92. Clap-board is the U.S. term for weatherboard.

448 see Appendix VIII, for species used. Shingles were made thus: Once a tree was felled, the trunk was barked, and cut into blocks 18"-24" long; these blocks were split into billets, "about as thick as a fencing post." Supported on a firm chopping block, the billets were split by a shingle froe (or frow, sometimes called 'throw') the blade of which was hammered into the wood by a mallet. By pressing the froe handle (which was at right angles to the blade) outwards and downwards, the billet was split down its full length, taking off a shingle about ½" thick. The shingles were nailed to split or sawn batons about 6" apart. (Adapted from the reminiscences of Colin Partridge, formerly of Wyrallah and Terranora; MS. RRHS, Lismore).

449 Marjoribanks: Travels, p.21.

450 The Sydney Building Act, 8 Wm. IV, No.6, Act of Gov. and Council, passed 8 Sept. 1837 after prolonged debate, and further discussed after petitions were presented in 1838. The Minutes of Evidence taken in 1838, make it clear that some buildings, even in Hunter Street, Sydney, were at least partly roofed with bark as late as 1838; now even weatherboards were frowned upon because of fire danger. John Verge architect, advocated use of "Colonial hard wood shingles" until "such time as slates, tiles, zinc, or any other incombustible materials" could be more generally introduced. In 1837 Gov. Bourke urged "the introduction of a more secure lasting and economical description of roofing than the Shingles now in common use." (Bourke to Glenelg, 30 July 1837, HRA, XIX, p.55). Many buildings with shingled roofs (almost invariably iron-covered) are still in use, but see the photograph of the old cottage at Failford on p.292.

By mentioning "clap-board," Peter Cunningham indicated that during the 1820s walls of vertical slabs were being largely superseded (or simply covered) in the towns by horizontal overlapping weatherboards.[451] The Weatherboard Inn at Wentworth Falls was a "bush" example. In 1839 it was understood to have been

> so named from its being built, like many houses in the Colony, wholly of wood, the walls consisting of thin boards lapped one over another, nailed to upright slabs or posts, and lathed and plastered within.[452]

The fact that it took the name of 'Weatherboard' suggests that it was considered somewhat unusual in structure.[453] We do not hear of any 'Slab Inn.' In the 1840s, weatherboard buildings,

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451 horizontal slabs were also used occasionally (e.g. Ferguson: Bush Life, pp.32,38) but apparently this method was more common in Victoria than in N.S.W. — see for instance the 'squatter's hut' at the Swan Hill Folk Museum, and the reference to a shepherd's hut on the Campaspe River, 1850, in Rev. J. D. Mereweather: Diary of a Working Clergyman in Australia and Tasmania...1850-1853, Lond., 1859, p.38. On the Bendigo goldfields in 1853, some of the 40,000 miners lived in huts of horizontal logs, "in fact, the log-huts of America reconstructed", while others had huts of vertical slabs. Howitt: Two Years, I, pp.264-5. Note also Rolf Boldrewood (T. A. Browne) in The Miner's Right (Lond., 1890) Lond., 1922, p.36: "Far as the eye can see, the area of settlement...is denuded of timber...Tents, log-huts, with the walls built American fashion of horizontal tree trunks; slab-huts of split heavy boards, Australian fashion, placed vertically, and for the most part not impervious to heat or cold; bark-huts... composed of sheets of the flattened eucalyptus bark..."

452 Meredith: Notes and Sketches, p.72. On the other hand, Roger Therry referred to the Weatherboard Hut as "the name given to a slab building"! Most likely, as Mrs. Meredith implies, the horizontal weatherboards were nailed to vertical slabs—a good way of dealing with the bleak winters of the Blue Mountains. (Compare the Walcha building of slab-and-weatherboard. See photograph on p.293). Actually a much earlier inn, the Union, opened in Sydney in 1798, was of weatherboard veneer construction, with weatherboards fixed to the outer brick walls to protect the vulnerable mud mortar which bound the brickwork. Sheoak and red cedar were often used for weatherboards. Freeland: Architecture, p.23.

453 also contributing to the naming of the inn was the fact that it stood on the site of William Cox's store, built in October 1814. It was "17 x 12, with 3 ft. (sic) sides, gable-ended, all weatherboards, and a door on the east end." Cox: Memoirs, p.69. This store was later burnt down.

HORIZONTAL SLABBING

WALLS OF HORIZONTAL SLABS, although comparatively uncommon in N.S.W., were sometimes built for preference, or to meet some constructional problem, but more usually because only short lengths of timber were available. Found more in out-buildings than homesteads.

Upper: a barn at Euston. Photo.: L. G., 28 Aug. 1969.
Lower: a stable at Sofala, showing both horizontal and vertical arrangement of slabs. Photo.: L. G., 3 Sept., 1969.

> though very common nearer the capital, and in the more settled parts of the colony...are looked on as a sort of unnecessary luxury, beyond the boundaries.[454]

The splitters and fencers could speedily deal with the usual slab buildings, but weatherboards required the time and skill of pit-sawyers or the proximity of a steam saw-mill.[455] Thus the weatherboard house was long considered rather too urban or pretentious for the bush:

> The more ambitious buildings are of weather-board, sawn pine or hardwood boards, roofed with large sheets of galvanized iron. These are chiefly confined to the streets of the township proper. This is held to be the maximum of architectural solidity, elegance, and durability...beyond which no reasonable man could frame an aspiration.[456]

Although the introduction of the timber frame and weatherboard house is attributed to gold-seekers from America during the Golden Decade,[457] weatherboards were as late as 1872, still considered something of an innovation in the bush:

> Wood being usually so plentiful, the houses are, in the main, constructed of it; either of the old original 'slabs', or of the more modern 'weather-board.' The roofs are of iron, shingle...or bark...[458]

Even where trees were scarce, plant materials of some kind were required. Pisé houses often had grass binding the rammed earth in their walls, with roofs of timber and thatch, bark or shingles;[459] brick and stone houses had to be similarly roofed. On the Bathurst

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454 Haygarth: Bush Life, p.14. Balfour: Sketch (1845), pp.37,87-8, also mentions weatherboards as distinct from slabs for the more prosperous settlers' houses, but even slab houses could be "concealed by lath and plaster,...whitewashed, and 'lined' on the outside so as to resemble a stone structure..." Haygarth: loc.cit.

455 There was, for instance, a steam saw-mill at Jamberoo by 1843, so that Henrietta Heathorn's father's house "was weather-boarded and shingled." Mrs. T. H. Huxley: "Pictures of Aust. Life," Cornhill Magazine, XXXI, 1911, p.772. The new Innes house at Capertee, 60 m. from Bathurst, was "of weather-board and shingled" and "thought very good" in 1831. The old house was of slabs and bark. Herman: Annabella Boswell's Journal, p.175. Compare Thomas Walker's reaction to a house at Cavan, near Yass, in 1837: "a small weather-boarded cottage...not like the common order of bush cottages." Walker: Month in the Bush, p.11.

456 Boldrewood: Miner's Right, p.36.

457 Freeland: Architecture, p.23.

458 Baden-Powell: New Homes, pp.130-1.

459 see Appendix VIII for plant species used.

SLABS: STRINGYBARK AND CEDAR, SPLIT AND SAWN.

KUNDERANG HOMESTEAD, Upper Macleay River. Extended at various times, this isolated home is particularly interesting since the sawn slabs in the large front section are of Red Cedar. Other sections are built of split hardwood slabs and weatherboard.
Photo.: L. G., 27 July 1969.

SHEPHERD'S HUT, at Sunnyside near Guyra. Note the heavy split slabs of stringybark forming the lower part of the chimney as well as the walls. The floor is earthen.
Photo.: L. G., May 1969.

BALALA HOMESTEAD near Uralla, c.1841. Here the stringybark slabs have preserved their colour under the protection of the verandah. Note the shingle-battens and round rafters.
Photo.: L. G., May 1969.

Plains in 1822, Barron Field found settlers who "build of turf...and roof with straw or reeds, instead of wooden shingles."[460] Thus, depending on the time, skill and funds available, individual taste and the purpose for which a building was intended, a settler might vary somewhat the shelter he provided for his family, stock and stores.[461] The foregoing evidence reveals some striking consistencies in bush buildings throughout the nineteenth century. These consistencies were due to the fact that some building techniques were demonstrably successful if only one had access to such bush materials as slabs, poles, and bark, or materials for shingle or thatch. The ultimate determinant therefore was the ecology of the country. Within the broader ecological forms of forest and woodland were available bush materials denied to the settler on the saltbush plains, but coastal skills led to the discovery of equivalents where possible. If stringybark were

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460 Field: Geog.Memoirs, p.443. Cf. the turf or sod house built by Rev. Thomas Hassall at O'Connell Plains, 12 m. from Bathurst, 1826-7: "a house...after the usual fashion in the Bathurst district then,...of sod walls and grass-thatched roof...The sods were cut out with a spade in squares, at right angles from the surface, and laid upon one another with the grass side downwards... When the walls were up, the outside was smoothed down and stuccoed with lime, so that they looked as if built of brick or stone... Ours was in good order...thirty years after. One of the same description was built for the troopers, on the Bathurst road, and the place is called 'The Sod Walls' to this day." Hassall: Old Australia, p.187. Field's reference to "reeds" suggests Typha augustifolia was used for thatching.

461 see for example the excellent work, Cox & Freeland: Timber Buildings (1969) already mentioned. W. Stacey's photographs clearly indicate variety and ingenuity in the ways bush materials were employed for building in eastern Australia. It is unfortunate that the botanical information, especially on pp.70-72 is not more accurate. Of the N.S.W. species of timbers, about a dozen botanical names are out of date; others are spelt incorrectly; species under White Beech and Silky Oak do not include respectively Gmelina leichhardtii or Grevillea robusta so commonly known by these names. Casuarina fraseriana is a W.A. species of She-oak, not found in N.S.W. On p.193 Angophora costata and A.lanceolata are treated as if they were distinct species whereas they are synonymous.

largely the mainstay of life on the coast and tablelands, then Cypress Pine and River Red Gum made life possible in many parts of the interior. The slab-and-bark pub at Bourke in 1866, (illustrated nearby appeared little different from its coastal counterparts at a proportionately early period of settlement.

Developments in technology and transport led to the more widespread application of such sophisticated domestic touches as panelled doors, moulded frames for windows and doors, skirtings and wall panelling of softwoods such as Red Cedar. These had their greatest development in the Mid- and Late-Victorian periods, but were in evidence by the 1820s.[462] Regrettably, in the case of Red Cedar,

> beautiful as this wood is, it is not uncommon to see these doors painted blue, white or other colours...[463]

The timber which was at first lauded for "taking a good polish" was soon painted or darkly varnished, to the dismay of a later generation.

In providing himself with merely temporary or emergency shelter, the European took one of his rare leads from the aborigine. Travellers in the bush, miners on new goldfields, timber cutters in the forests, squatters "sitting down" on new runs and shepherds on the move with flocks, often constructed bark gunyahs.[464] These were acknowledged as having been

> derived from those of the natives, and...shaped much like an extinguisher, with a triangular piece or wedge, cut out of it,

and a handy bushman could erect one "in a few minutes."[465] Other

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462 Atkinson: State of Agriculture, p.13. See also Herman: Annabella Boswell's Journal, p.116, which refers to cedar panelling in a small house 30 miles from Port Macquarie in 1846. Note one of the Antipodean anomalies: "the humblest house is fitted with cedar."

463 Balfour: Sketch, p.37. "The doors of all (sic) the houses in Sydney, and in the better description of cottages in the interior are made of cedar..."op.cit., pp.37-38.

464 see for example, Morison: Australia, p.119; Henderson: Excursions I, pp.292-293; Australia: its Scenery, p.131; Harris: Settlers and Convicts, p.32.

465 Townsend: Rambles, p.52.

BUSH CHURCH AND BUSH PUB

WEATHERBOARD-AND-SHINGLE Church of St. Nicholas, Saumarez Ponds near Armidale. Built 1864 of pit-sawn stringybark weatherboards and stringybark shingles, which are still in position, though covered with galvanised iron. The shingle battens are clearly visible.

Photo.: L. G., 15 Jan. 1969.

SLAB-AND-BARK Hotel at Bourke, 1866, when the town had a population of 300. Note the inn sign, the boarded chimney, and the framework of 'jockeys' or 'riders' holding down the bark roof. Materials probably from River Red Gum, E.camaldulensis.

Photo.: Bourke Historical Society.

gunyahs were shaped like a rectangular tent.[466] Such shelters served many squatters until a slab hut "of a much more substantial character" could be constructed.[467] Few squatters arrived with the necessary knowledge of bush work to construct a more or less permanent home, hence many went 'up the country' for some 'colonial experience' before establishing themselves in new country. There was a spate of published advice for those who wished to set up a home immediately. It is significant that Alexander Harris, once initiated to the nature and qualities of bush materials, suggested that "it is cheaper to get it built by contract" when offering his advice on hut-building. Here, the

John Henderson's gunyahs near the Macleay River in the 1840s. Note that one sheet of bark was removed from the base of each tree—a practice still being condemned thirty years later.
Henderson: Excursions, I, p.292.

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466 see the illustration from Atkinson: State of Agriculture, (1826) on p.283.
467 Morison: Australia, p.119; Townsend: Rambles, p.172.

vanguard of Trollope's "nomad tribe" came to the rescue of the 'new chum.' In 1841, for example, Thomas Tourle of Balala Station, near Uralla, notwithstanding a period of 'colonial experience' in the Bathurst district, had a slab-and-shingle cottage, two slab-and-bark huts and a woolshed "built by hired Splitters and Fencers"[468] who used local stringybark. Twenty-five years later, after the Golden Decade had led to a vast increase in the "tribe" and its importance, it was maintained that following the various station hands,

> the next important personage, a representative of labour following in the wake of capital, is the bush carpenter, for bush purposes—erecting huts, stockyards, fencing and making hurdles. A bush carpenter is worth at least a dozen of his more pretentious town namesakes; with no other appliances than his axe, adze, morticing tool, and cross-cut saw, he is competent, with the assistance of another man, to do almost any kind of work in the carpenter line of business required in the bush.[469]

Even in 1900, 'new chums' were still given gentle warnings sometimes with delightful understatement:

> Some people, expert with the adze of broadaxe, can sail right in and square off a log almost by instinct, but where one has had little experience...there is a certain amount of danger in using the adze.[470]

Instinctive though the movements of the bushworker appeared to the novice, his ability to identify the most suitable species of tree, and the most suitable trees of that species, his knowledge of the qualities of barks and timber grains, and his skill in preparing various bush materials for use, had been painstakingly acquired from his fathers and his fellows and from personal experience in the various ecological areas. Foresters and professional botanists eagerly sought

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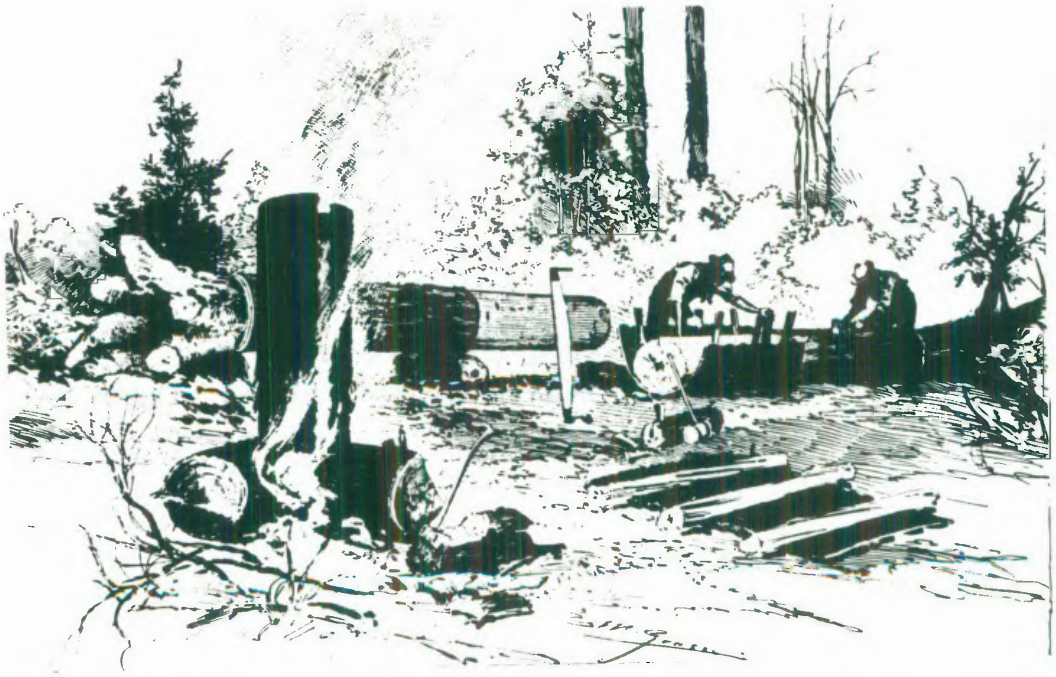
468 letter of Thomas Tourle, 19 Dec. 1841, copy in possession of Mr. Richard Hudson, Balala. See L. A. Gilbert: "Balala" in Historic Homesteads of Australia, pp.152-157. Cf. John Henderson who went to Port Macquarie in the forties and "hired a splitter and fencer, to help in building some huts" on his run on the Macleay. Henderson: Excursions, I, p.294.

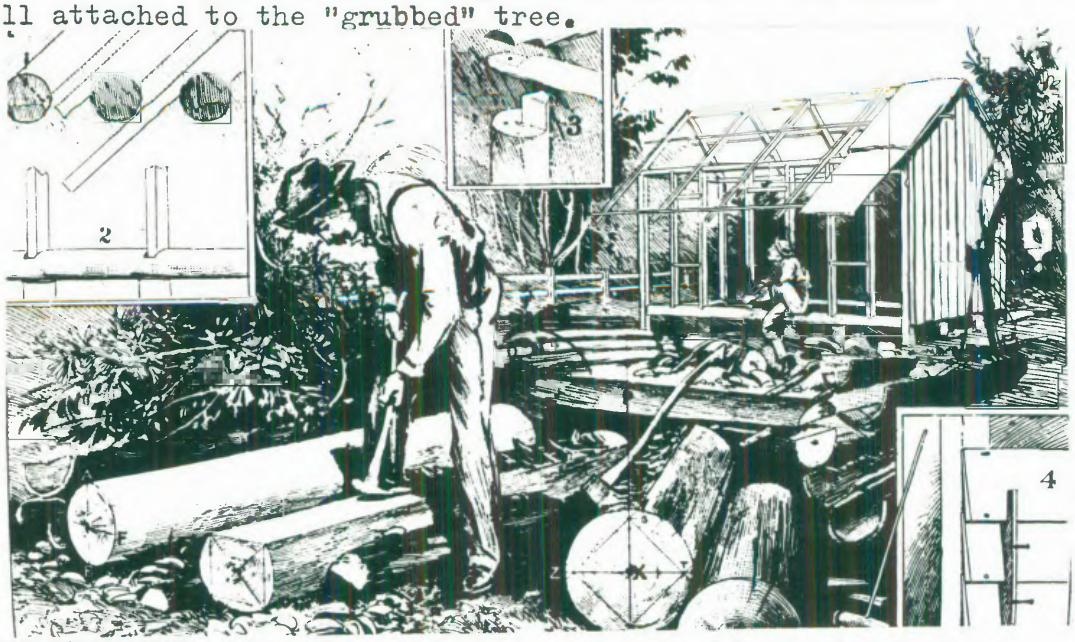
469 Morison: Australia, p.119.

470 W. H. Clarke: "The Farm Homestead," Ag.Gaz.NSW, 1900, p.1031. See also footnote No. 427.

PIONEERING IN THE BUSH



BARK STRIPPING: This was best done after wet weather when the sap was 'up'. Once removed, bark sheets, still curled were stood over a fire for about five minutes to render them pliable for flattening under weights. Some used a shovel to scrape off the surplus "outer coat of fluffy bark" to reduce the amount of moisture-retaining material. Note the roots still attached to the "grubbed" tree.



HOUSE-BUILDING: The frame of this rather sophisticated house already supports some slabs and roof bark. The man near the house clearly demonstrates the truth of the old bush adage: "The devil smiles when a 'new chum' picks up an adze."

Sketches by E. M. Grosse in Ag.Gaz.NSW, 1900.

the information which only these bushworkers could provide when the time came for botanical knowledge to be recorded and systematised.

Shelter, like fencing, took a tremendous toll of bush resources. By the end of 1893, New South Wales had over a million people living in nearly a quarter of a million houses, practically all of which contained at least some native timber if not entirely composed of it.[471] In addition, there were thousands of outbuildings, halls, shops, banks, schools, churches, hotels and shanties. Once built, most of these structures required furniture of some kind, and further calls were made upon bush resources.

There was much more to bush life than employing bush materials and skills to build a hut or fence a run. Once established in the bush, one had to understand it in order to survive. By observation and empirical investigation one had to discover bush products to meet the needs of settler and stock, especially during the frequent crises produced by such factors as isolation, vast distances and a capricious climate. Thus there quickly developed a vast miscellany of bush lore which varied with the ecology. Possession of this in different degrees distinguished the competent from the incompetent bushman, and determined the success of settlers in the various bush environments. Settlers had to know pasture plants and poison plants; plants which would assuage

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471 Coghlan: Wealth and Progress 1893, p.745. Sydney and suburbs then had 411,710 people houses in 80,935 dwellings; a further 325,300 people lived in 66,587 houses in municipalities beyond Sydney, and 460,640 people occupied about 95,000 houses in the "unincorporated portion of the Colony"—the latter especially, would have included a high proportion of structures built entirely of native bush materials. The actual population of N.S.W. at the time was 1,197,650.

thirst or hunger in an emergency[472]; plants which would feed the bees or provide material for a hat or a basket, a doormat or a thatched roof, for twine or treenails; ingredients for medicines or dyes, ink or whitewash; something to chew or to smoke; something to beautify the house, repel the insects or amuse the children; something with which to wad a gun or feed a furnace, to make a stockwhip or a bullock-yoke, a bucket or a feed-trough; something with which to make some soap or to season some food, to caulk a boat or tan a net, to repair a plough or a dray, to make a brush or a broom, to cure a ham or a hang-over, to carve a tray or a grave-marker, or to knock together a cradle or a coffin. In the years before stores, hawkers and mail-order services, the bush met these astonishingly diverse demands and many more. Even the early convicts were apt to wear slops branded with "blood" from a tree.[473] Ample evidence of this intensive investigation of the bush and of the extraordinarily wide utilisation of bush products during the nineteenth century, is appended as a major part of the findings of this study.[474] If we were seeking the origins of the Australian 'bush legend,' or proof of the traditional improvising ability ascribed to the ingenious 'noble bushman,' then these plant uses would

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472 and perhaps not always in emergency--consider for example the intriguing story of Stephen Cole, Commissioner for Crown Lands at Euston in the 1850s, "justly renowned over the Australian world for his frank hospitality and his excellent salads, in the fabrication of which he seems to have...a rare skill. And what renders these salads objects of wonder as well as good taste is, that no one can discover where the vegetable portion of the ingredients comes from; for Euston is a country which I should conceive would only produce salt bush and coarse grass one portion of the year, and sirocco and dust the other. It is well not to pry into harmless mysteries. There lay the salad on his hospitable board, in all its exquisite proportions of much oil, little vinegar, hard eggs, anchovy sauce, pepper, salt, &c. What grass or herb would not pass current with such condiments?" Mereweather: Working Clergyman, pp.187-188.

473 Scrub Bloodwood or the Blood Tree, Baloghia lucida, was tapped in the manner of rubber trees to obtain the sap for an "indelible marking ink." On Norfolk Island, the "blood-man" was expected to provide the authorities with two quarts of sap each day "for branding the prisoners' slops, and various other similar purposes" such as marking blankets, bags and canvas articles. T. W. Shepherd in The N.S.W. Medical Gazette, II, 1871-1872, pp.236-7.

474 see Appendix VIII.

lead us close to our goal. Nor were botanical activities in the bush entirely determined by practical motives. Some found a new interest:

> During my residence in the bush, I formed an attachment to botany, and geology; and in the study and pursuit after my adopted loves, I wiled (sic) away hours so gratefully and amusingly, that on my return from many a solitary ramble, I was astonished to hear others lamenting the difficulties they were enduring.[475]

Such people soon formed an energetic and enlightened band of amateurs whose contribution to botanical knowledge must be considered.[476]

Life in the remotest areas of N.S.W. was revolutionised when Francis Cadell and William R. Randell steamed their paddlewheelers[477] into the southern reaches of the Murray-Darling system in 1853.[478] It was estimated that there were then

> about 400,000 sheep on the Murray, and 50,000 on the Darling—the number on the Murrumbidgee was not stated—but on the banks of the various rivers discharging into the Murray, Governor Young estimated that there were not less than one million and a half of sheep, and numerous herds of cattle and horses, there being much country on the Darling not then stocked.[479]

The native pastures were being heavily taxed, and the river steamers soon ensured that the remainder of the Darling country was stocked, and overstocked. Cadell's Albury steamed to the town for which she was named on 2 October 1855 and to Gundagai on 16 September 1858, although the practical head of navigation on the Murrumbidgee remained at

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475 Hodgson: Reminiscences, p.127.

476 especially in Chapter VI.

477 the Lady Augusta and Mary Ann respectively.

478 "It was an era in one's life, and in that of Australia's. The engorged wool sheds were quickly relieved of their contents, and the price of Riverina station property went up 50 and 100 per cent straight away." Bartley: Opals and Agates, p.66. Goods now were "not covered with the dust and mud of 800 miles and three months of weary bush travel...but fresh and clean only a week ago from the Adelaide stores..." N. Bartley: Australian Pioneers and Reminiscences, Bris., 1896, p.30.

479 John Lewis: Presidential Address, Proc.Roy.Geog.Soc.Aust. South Aust.Branch, 1916-17, p.47. Sir Henry Young, Gov. of S.A., participated in early river navigation.

Wagga Wagga.[480] On 27 January 1859, the Albury steamed into the Darling and proceeded over 500 miles to Mt. Murchison, upstream from Wilcannia.[481] In a remarkable voyage in the Gemini, William Randell steamed over 880 miles from the Murray to Brewarrina by February 1859, and two years later he reached Walgett.[482] Pooncarie, Menindee, Wilcannia, Bourke, Brewarrina and Walgett at different times became transient river ports where enormous cargoes of wool, raised chiefly on saltbush, bluebush and Mitchell Grass, were loaded on barges towed by steamers which relied almost entirely on River Red Gum, E.camaldulensis for their fuel, and sometimes for their very structure as well.[483] The assault on the inland river-forests reached unprecedented intensity.

Other means of communication and transport made their demands upon bush resources too. Wooden bridges and culverts[484] built since the earliest days were now, with the vast spread of settlement, required in enormous numbers as a maze of bush tracks and roads developed over the country. By 1892, N.S.W. had 32,000 miles of roads,[485] including city streets which had long been paved with wooden blocks,[486] and vehicles built of native timbers were hauled over them.[487] The advent of telegraphic communication in the 1850s further modified the bush as swaths up to forty feet wide were cleared on either side of the lines. By 1892 these lines, strung between bush poles placed at 25 to 30 to the mile, ran across nearly 12,000 miles of the N.S.W. landscape.[488]

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480 I. Mudie: Riverboats, Adel., 1961, pp.66,70.
481 op.cit., p.72.
482 op.cit., p.86. The ultimate was reached in July 1893 when George 'Nobby' White steamed the Brewarrina to Mungindi, 1,967 river-miles from the sea. op.cit., pp.97-8.
483 Cutters were employed at strategic points along the rivers to maintain enormous stacks of billets from which the steamers could "wood up." Wharves, too, were made of River Red Gum, for example, the great wharf at Echuca.
484 see Appendix VIII.
485 A. G. Hamilton in Proc.Roy.Soc.NSW, 1892, p.180.
486 see Appendix VIII.
487 see Appendix VIII.
488 F. C. Barnes: "Line Construction, N.S.W." PMG. Dept. communication, Sept. 1964; A. G. Hamilton, loc.cit., and T. A. Coghlan: N.S.W. Statistical Register 1898, Syd., 1899. From time to time iron poles replaced bush poles, and vice versa.

Railway construction, too, wrought great changes in both bush life and bush environment. Between 1855 and 1889 over 2100 miles of track were laid on sleepers of native timbers placed at about 2000 to the mile.[489] Still further demands were made on forest resources by miners requiring pit-props[490] and fuel for mine engines and smelters,[491] while true bush industries such as charcoal burning, eucalyptus oil distilling and wattle-bark stripping made their impact upon the bush also.[492]

The nefarious practices employed to win land battles during the nineteenth century have not concerned us here; what is relevant is the reciprocal action between settlers and bush once the land was won. Assessed by the number and variety of ways in which bush products were used, the effect of the bush upon the settlers was to develop in them acute powers of observation, ability to discern rather fine similarities and differences, and an empirical approach to enquiry. Once accepted for what it was, the bush came to be regarded as the direct or indirect source of many of the necessities of life. To obtain these necessities, special skills, developed in the bush, were required. The competent bushworker and the successful settler were necessarily practical men, who were highly respected for their bush skills, not only by the novices, but also among the experts themselves. The versatility of the bushman did not go entirely unnoticed:

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489 The present figure is 2,600 or so per mile, the sleepers now being 8' x 9" x 4½". By 1889, lines had reached Albury, Hay, Narrabri, Bourke and Wallangarra from Sydney. See L. L. Paddison: The Railways of New South Wales, 1855-1955, Syd., 1955; C. C. Singleton in Aust.Encyc. Vol.7; N.S.W. Dept. of Railways: Railway Quiz, Syd., 1962.

490 It was estimated that in 1891, for example, the N.S.W. coal mines used some 10,385,500 cubic feet of timber for pit-props, etc. drawn from 51,942 trees. Hamilton, loc.cit.

491 At Cobar alone, for example, during the 1880s about 1000 tons of wood per week were used for smelting copper, and it was estimated that during this decade, 850,000 tons of wood were so used. J. Jervis in JRAHS, 1956, p.82. This meant a tremendous reduction of such trees as Ironwood, Acacia excelsa, White Cypress, Callitris hugelii, Mulga, A.aneura and Bimble Box, E.populnea.

492 see Appendix VIII.

> On an average the bushman is very wideawake. Nothing in his native surroundings comes amiss to him; he can cook his dinner, wash his clothes, patch his pants, darn his socks, plait a whip, mend his own harness and boots, build his own house; he is musterer, drover, shearer, fencer, miner, bullock-driver, trapper, horse-breaker, hunter, what-not...
> He is a naturalist and botanist of the aboriginal class, well learned in the habits and characteristics of his native fauna and flora...he points out the straight-grained and cross-grained trees by the bark...
> ...he loves his wild surroundings with the love of the true child of Nature; for the bush is bright, fragrant, invigorating, interesting...
> To the old hand the bush is an open book...Bird and animal life, botanical and physical characteristics are all so many chapters in it, read and studied, re-read and understood...[493]

While never underestimating the possible harshness of the bush, the currency lads showed that knowledge and experience of it could be used to dispel many of the old fears and to reduce some of the old revulsion.

By 1880, N.S.W. had a population of nearly three-quarters of a million people, some of whom had over 35,000,000 sheep, 2,500,000 cattle and nearly 396,000 horses depastured over the country, and over 700,000 acres under cultivation. The settlers had proved their adaptability.[494] The effects upon the bush of this adaptability were

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493 Sorenson: Aust.Backblocks, pp.19-22. Edward S. Sorenson (1869-1939) born near Casino, was a naturalist with wide experience of bush work and the author of many bush stories.

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Comparative figures are (from Coghlan: N.S.W. Stat.Reg. 1898)

Year	Popul.	Cult.Area (acres)	Sheep	Cattle	Horses	Pigs
1860	348,546	260,798	6,119,163	2,408,586	251,497	180,66
1870	498,659	426,976	16,308,585	2,195,096	337,597	243,06
1880	747,950	710,337	35,398,121	2,580,040	395,984	308,20

generally catastrophic. Botanically, enormous tracts of country were wellnigh completely transformed, as squatters, selectors, miners, bushworkers and construction-workers with their stock of various kinds,[495] moved across the land, chopping, sawing and burning, ploughing digging and eating their way over most of the 198,000,000 acres comprising N.S.W. The original ecologies of the country occupied by 1880 for grazing, farming, timber-cutting and mining, varied tremendously.[496] The 'Big Scrub' of the far North Coast, the rainforests of Illawarra, the coastal dry and wet sclerophyll forests, the mulga and mallee scrubs, the saltbush, Mitchell grass and box-and-pine country of the west, the alpine herbfields of the Snowy Mountains, were all penetrated, 'tamed,' and exploited to meet the settlers' demands. As we have seen, this penetration required the possession of some botanical knowledge, and led to the acquisition of more. Some of this was theoretical but most was practical, some was recorded but most was not, some was scientifically tenable but some not, but all of it pointed to the need for testing and systematising, for experiment and publication.

A rare observer saw bush life as truly idyllic, so classically primeval as to be remarkably like the life described by Virgil in his Georgics,[497] but most observers, and settlers, lacked this classical

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495 Competition between different animals was noted early. In 1837, Thomas Walker, speaking of conditions on the Yass Plains, noted: "Cattle...are the pioneers for sheep, they prepare and also ameliorate the country for their reception, eating off the long coarse grass, and hardening the ground; but as fast as sheep come, cattle must retire before them, for they eat so close that they soon starve out cattle. The cattle are indeed now almost driven out of the colony, sheep encroach so fast, and it is difficult to find where to put them, without going beyond the boundary line." Walker: Month in the Bush, p.10.

496 see the photographs entitled 'Ecological Variety' accompanying this chapter.

497 Townsend: Rambles, p.16. Even the climate reminded him of Rome. Cf. William Howitt's attack on Caroline Chisholm's descriptions of "the homes and lives of shepherds in the bush as the most delicious and Arcadian" as she "invited young women to go out and share their felicities. If there be a desolate and comfortless abode of humanity anywhere...it is the shepherd's hut in the Australian bush...I have seen no single exception: a little slab hut, with a mud floor, and a log or two or a stool, a single bed..." Howitt acknowledged Mrs. Chisholm's declared disillusionment when "she had boldly gone up the country." Howitt: Two Years, II, pp.135-6.

insight. They believed that

> the wild life of a bushman presents few charms to tempt the cockney dwelling amongst and enjoying the luxuries of civilization, to desert the quill and the ledger for the shepherd's crook.[498]

True, a squatter, with adequate means and manpower might send home accounts of "the Australian bush as a terrestrial paradise," far different indeed from the cries of despair heard when the bush was firs sighted, but let him take a term as a shepherd, living on the standard scorbutic diet of mutton, damper and tea, and sleeping in a slab hut "alive with fleas," then a more realistic picture might be painted.[499]

The bush was no place for

> poetical dreamers, lazy loungers, frequenters of theatres, balls, clubs, tavens, political meetings, and coffee houses, and hard drinkers,

for such were doomed to "a sure, swift, and horrible death in delirium tremens."[500] Yet they did come, one way or another, along with their better counterparts,

> individuals of no extrordinary gifts or acquirements, but of hale constitutions, of acute discernment; industrious, frugal, quiet, and temperate habits; having a jack of all trade knowledge of mechanics, of tillage, and of stock-rearing; a general acquaintance with matters of everyday life; and a hope-on perseverance that cannot be daunted by adversity.[501]

All of these made their various contributions to an ever-increasing understanding of the bush and its plants, whether in the rowdy timber-cutters' camp deep in a rainforest, or in the quiet country mansion of a gentleman squatter, ever-alert for material for his hortus siccus. The bush influenced all, with its scenery and produce, and with the scope it provided for the hobbyist and amateur

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498 Lancelott: Australia, I, p.262. One "charm" however was "this sensation of absolute freedom, which is one of the chief attractions of this sort of life, some might say its only one..." Haygarth: Recollections, p.21.
499 Lancelott: op.cit., I, pp.262-3.
500 op.cit., II, p.146.
501 ibid.

scientist. Only one living a most urbanised existence could escape its influence in the nineteenth century, and then only if he closed his eyes to the bush materials used all round him, but it was not until 1912 that a poet felt constrained to speak of "Mother Bush."[502]

To some, of course, this ready adaptation to a new, mournful-looking and rather harsh environment was quite understandable. After all, motley crew though they appeared, the settlers and bushworkers had in common

> the aptitude of the Anglo-Saxon for the task of colonizing, and developing the resources of a new country.[503]

But a later generation was to consider that once the bush had met the essential and reasonable demands of settlement, the Anglo-Saxon showed rather an aptitude for "cupidity, wickedness and waste."[504] The old notion of an immense continent with endless bush resources was slow to die; there always seemed to be plenty of land and too much bush. A land which provided so many harsh environments, did not elicit immediate appreciation of, or mercy for the bush, but they came with knowledge.

The more perspicacious appreciated something of the wider significance of what was happening. Although "the first steps towards a settlement are destructive of natural beauties," compensations would surely follow:

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502 Bernard O'Dowd: "The Bush," 1912. Probably the most interesting recent poetic appraisal of the plants of the bush is "The Coming of the Flowers" in Rex Ingamells: The Great South Land: an Epic Poem, Melb., 1951. Note also the poetical warning of Ernest George Moll, born in Victoria in 1900:

The Bush Speaks

I will be your lover
If you keep my ways.
All delights I'll give you:
Gum-tree scented days,
Skies where kestrels hover,
Nights with stars ablaze.

But if you diminish
Care and think me won,
Other gifts I'll give you
Edged with thorn and sun,
And the crows will finish
What I have begun.

503 Haygarth: Recollections, p.146.
504 Marshall: Great Extermination. (sub-title).

> Fresh attractions, of a more pleasing and permanent character, succeed to those which have been destroyed. Order, utility, comfort, enjoyment, luxury, follow each other step by step...[505]

But such compensations, comforting though they were, did not necessaril manifest themselves in the landscape. In fact,

> there is a signal want in Australia, even among the higher classes, of that just appreciation of the beauties of nature, and that innate taste in taking advantage of them, to enhance the picturesque effect of their neatly-arranged dwelling-houses, which, according to Washington Irving, characterize the English nation, from the peer to the peasant. There are some places in New South Wales...where considerable taste has been displayed in the arrangement of the grounds, but in general, the ne plus ultra of colonial landscape gardening is a square patch of land, laid out in straight walks, and surrounded by hideous pailings (sic), whilst no flowers, or even culinary vegetables, enliven the dwellings of the labouring classes, unless some stray melon or pumpkin sends its long shoots round their huts.[506]

--and this, in a land where some places resembled a "nobleman's park."

Some were aware of more subtle aspects of the change. At the end of 1845, Thomas Mitchell noticed on one of Ben Boyd's stations near Wellington

> that Horehound grew abundantly; and I was assured ...that this plant springs up at all sheep and cattle stations throughout the colony, a remarkable fact, which may assist to explain another, namely, the appearance of the Couchgrass, or Dog's-tooth-grass, wherever the white man sets his foot, although previously unknown in these regions.[507]

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505 Edwards: New South Wales (1837) pp. (186-7).
506 Hodgkinson: Australia, (1845) p.94.
507 Mitchell: Tropical Australia, p.8. Horehound, Marrubium vulgare, a native of Europe and W.Asia, has recurved teeth on the calyx which ensure ready dispersal. Couch, Cynodon dactylon also known as Dog's Tooth or Doub Grass. Maiden considered the plant indigenous, and many still agree, yet it certainly spread within the colony as settlement expanded. As one man put it, "Its presence is one of the surest signs of settlement." Maiden: Grasses, p.150.

James Demarr made similar observations in northern N.S.W. in 1842.[508] Although most changes made in the vegetative environment were destructive to native species,[509] there appeared to be some rather unexpected developments at times. For example,

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508 "It was the custom on these extensive sheep 'runs,' to move the she to fresh stations, for...new herbage, leaving the old station ground vacant for some months, in order that it might recover its former luxuriance. During these resting times, where the sheep had been folded, a variety of herbs would spring up never previously seen, and amongst them, white clover and wild parsley. How came these last to be a growth on a deserted sheep station, four hundred miles up in the interior? Most certainly the white clover and parsley did not grow from seeds sown. But there they were. Horses were very fond of this new growth, and should any have strayed... they were sure to be found on these old deserted folding grounds." Demarr: Adventures, p.190. Such queries did much to motivate botanical investigation, in this case, into such matters as seed dispersal mechanisms and seed viability after passing through the alimentary canal of stock. White Clover, Trifolium repens; Wild Parsley could have been one of several umbelliferous exotics - e.g. Fennel, Foeniculum vulgare; Hemlock, Conium maculatum (which however is poisonous to man and stock); etc.

509 Not only was the vegetation, chiefly tree-cover and natural pasture plants, destroyed in the ways and for the purposes already indicated, but it was fundamentally changed in other ways too, because of such factors as:

a. destruction of the balance between strata of vegetation so that removal of trees permitted more sunlight to reach the ground, thereby promoting growth in some species, and destroying light-sensitive species (e.g. ferns) altogether.

b. the ground flora being affected also by the introduction of stock; of rabbits and hares (which not only ate herbaceous matter, but also barked young trees.) John Sidney claimed to have seen the Barwon district "change, like many other Australian discoveries, from a savannah of rich grass, up to my horse's withers, well watered by a broad and rapid river, to an arid desert, through which trickled a thin thread of water..." J. Sidney: How to Settle and Succeed in Australia, Lond., 1848, p.11.

c. construction of dams attracted native herbivorous fauna from the vicinity of river-banks and natural waterholes, thereby bringing them into competition with stock for native pastures.

d. introduction of exotic pasture plants.

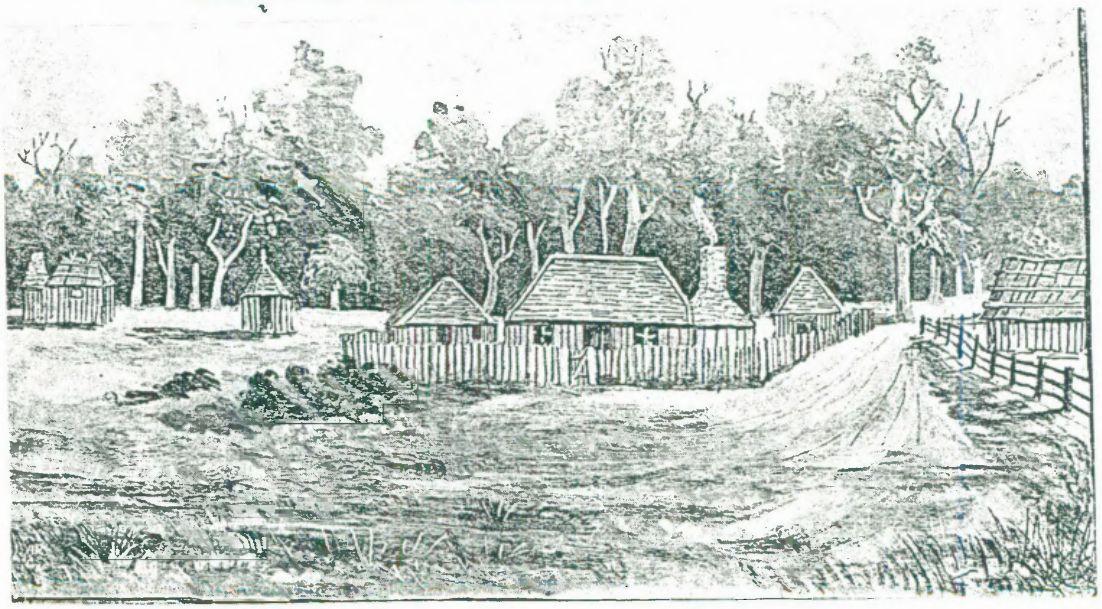
e. introduction, accidentally, of noxious plants, e.g. Bathurst Burr, Xanthium spinosum, Noogoora Burr, X.chinense, etc.

f. introduction of exotic plants for hedges, ornamental purposes or fruit, e.g. Lantana, L.camara, Water Hyacinth, Eichhornia crassipes, Blackberry, Rubus vulgaris, Prickly Pear, Opuntia stricta et al.spp. Some thistles probably come into this category as well as in that of accidental introduction.

g. disturbance of natural drainage and absorption of water, because of clearing, roadwork, cultivation, dams, mines, rabbit warrens.

h. disturbance of the more of less 'natural' bushfire cycle, not only by the checking of fires to protect property, but also by the creation of fire in wholesale 'burning off' activities. Both affected the setting and germination of seed of many species.

in 1863 there was little or no pine scrub (callitris) in the Lachlan district. In 1883 the pine had taken possession of the district and was rapidly superseding the Angiosperm trees which previously formed the forest in that district.[510]



PIONEER HOMESTEAD OF SLAB, BARK AND SHINGLE - Old Warbreccan Station, Murrumbidgee Pastoral District, 1848. Note the outbuildings of slab and bark, the post-and-rail paddock fence, and the heavy split paling fence enclosing the main buildings of slab and shingle. The chief source of building material would have been River Red Gum, E.camaldulensis, probably depicted in the background. from A Pioneer [John Phillips?] : Reminiscences of Australian Early Life, Lond., 1893.

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510 R. von Lendenfeld: "Recent Changes in the Forest-Flora of the Interior of N.S.W.," Proc.Linn.Soc.NSW, 1885, pp.721-2. On 25 Mar. 1885, von Lendenfeld exhibited specimens of White Cypress, C.hugelii (then known as Frenela robusta) at a meeting of the Linnean Society in Sydney. The larvae of the Cypress Pine Beetle, Diadoxus erythurus White, had so affected the specimens that it was considered that "this insect...may thus render great services to the settlers in back country." op.cit., p.124. It was claimed that the beetle larvae controlled the pine in drier seasons (e.g. the period 1840-1863) but not in wet seasons (e.g. the period 1863-1880, during which the advance was noticed.) With reference to footnote 511 following, note the reminiscences of John Bourke, who remembered the Pilliga Scrub area as "like a plain" and of W.C. Cormie, who claimed that cypress first appeared in the Pilliga Scrub after the drought-breaking floods of March, 1879. The Pines then "came up like a crop of wheat". Forest and Timber, VI, 3, 1969, p.13.

The same phenomenon was reported from other sources,[511] and apparently some stations had to be abandoned because of the advance of pine scrub.[512] Whereas there had been retreats from hostile aborigines,

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511 Sydney Mail, 23 July 1887 reported an area 200 miles by 250 miles overrun by Cypress Pine. Bishop J. S. Moyes once told the Armidale Historical Society that he had been informed of a time when there was "no Pilliga Scrub" as we know it. In a letter of 22 Oct. 1966, the Bishop advised that his informant (probably about 1930) had been a Mr. Worrall, who lived some 12 m. from Baradine, and who "was referring to a time not later than 1870." There are still old residents in the Baradine district who agree that before 1903 White Cypress in the Pilliga area occurred only as scattered large trees, and that between 1903 and 1910 (when the rabbit is said to have first infested the area in large numbers) there was a widespread regeneration of pine. This would correspond to the better seasons which followed the drought of 1895-1902. Other factors doubtless involved the occurrence of fire, and the arrival of sheep and the rabbit. Cypress, especially if standing free, in open woodland, seeds prolifically, and where the arrival of stock coincided with a series of favourable seasons, there would have been a substantial reduction of grass cover. This in turn would have checked the spread of fires which would have reduced the number of seedlings. In bad seasons, when feed is scarce, sheep will eat pine seedlings, and rabbits, too, eat them. It is interesting that since the introduction of myxomatosis in the early 1950s, there has been another discernible advance of Cypress Pine which is continuing throughout the western division of the State to this time, much to the concern of some graziers. It has been found that both within State Forests where grazing is restricted, and on grazing land outside the forests, the pine is regenerating rapidly. These trees are mainly 6-12 feet high, but some are 20 ft. or so. There are in the Pilliga Scrub some quite old pines, affectionately known as "old greys" which possibly date from the advance which so alarmed the settlers in the eighties. Doubtless "burning off" activities, the advent of sheep and rabbits, etc. affected pine growth, but it seems most likely that what the settlers witnessed was the regeneration phase of what had long been a normal cycle — a regeneration made more successful by some of the settlers' activities, such as ringbarking and thinning out the pines, thereby rendering the survivors much more prolific seeders. Once dense "whipstick" stands or spindly thickets subsequently developed, cones were no longer abundantly produced, seed production dwindled and many years would elapse before natural thinning or fires, or clearing by the settlers enabled the more free-standing trees to become prolific and effective seeders once more, following favourable seasons. Fire, drought and the Diadoxus beetle were doubtless effective agents in this thinning process. I am indebted to Mr. Stan A. Martin, District Forester, Baradine, for many interesting observations made during 25 years in the "pine areas" of western N.S.W. See Forest and Timber, IV, 4, 1967, p.9.

512 J. Jervis: "The Exploration and Settlement of the Western Plain," JRAHS, 1956, p.10.

from droughts and floods, and, after 1880, from the rabbit invasion, a retreat from the advance of the native bush was unusual. The normal process involved the retreat of the bush, not of the settler, who by 1890, it is estimated, had in New South Wales some 2,688,480 acres[513] under cultivation or cleared for it, and another 21,823,690 acres ring-barked or cleared to increase stock-carrying capacity.[514] Thus more than one-third of the estimated original forest cover of N.S.W. had been effectively removed for grazing and agriculture.[515] Yet even then, the conquest was not considered complete.

Throughout the nineteenth century there were those who had either abandoned, or never pursued, the search for rich soil, lush pastures or payable gold; men who, with a few

> necessary tools, consisting of a cross-cut saw ...maul-rings...wedges, saw-files, adzes, felling, morticing and broad axes,[516]

moved into those "endless forests" to become the apotheoses of the practical bushman and the acknowledged authorities on trees and their products. Their contribution will now be considered.

THE OLD BARK HUT.

SLAB AND BARK HUT. Note the bark ridge-capping and the 'jockeys' and 'riders' holding down the roof. The caption indicates the use of the term "bark hut" to describe a slab-and-bark structure. See footnote no. 413.
from Sorenson: Aust. Backblocks, p.27.

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513 this included 1,241,419 acres actually under cultivation. Coghlan: NSW.Stat.Reg. 1898.
514 A. G. Hamilton in Proc.Roy.Soc.NSW, 1892, p.180.
515 ibid.
516 Henderson: Excursions, I, p.294, speaking of the necessities for bush life he bought at Port Macquarie in the 1840s.

RICH GRASSLANDS AND THE EXPLORERS' 'AMARYLLIS'

LUSH GROWTH of Native Millet, Panicum decompositum and Early Spring Grass, Eriochloa pseudoacrotricha during a good season on the north-western plains.

Photo.: L. G., near Walgett, 7 Feb. 1970.

DARLING LILY, Crinum flaccidum, the "Amaryllis" of the inland explorers who took care to collect the bulbs of such a likely horticultural prize. (See Chapter II, pp.27,48, 108, 115.) The plant was introduced to English gardens in 1816 according to Joseph Paxton.

Photo.: L. G., near Moree, 6 Feb. 1970.

ECOLOGICAL VARIETY: PINE REGENERATION

PROFUSE REGENERATION of White Cypress, Callitris hugelii, at the edge of a clearing just south of Pilliga at the northern end of the Pilliga Scrub. Such regeneration is popularly attributed to the scarcity of rabbits, which used to feed upon the seedlings in drier times, but doubtless there are other factors. The same rapid regeneration drove some settlers off the land during the 1880s.

Photo.: L. G., 7 Feb. 1970.

PILLIGA SCRUB, really a close dry forest, contains some 1,163,000 acres under State control. To-day, about 15 sawmills cut the two main timbers here shown, Narrow-leaved Ironbark, E.crebra and White Cypress, C.hugelii. About 165,000 Ironbark sleepers are produced each year. Note the regeneration around the free-standing White Cypress on the right. Photo.: L. G., near Kenebri, 7 Feb. 1970.

ECOLOGICAL VARIETY : MANGROVE SWAMP.

TWO VIEWS of a mangrove mudflat at Terranora Inlet near the Tweed River. Dominant species are the Grey Mangrove, Avicennia marina var. australasica and the Black Mangrove, Brugiera gymnorrhiza. Having few admirers, these swamps, once common around estuaries, have been widely used as dumps and often reclaimed. The Grey Mangrove was significant as being a source of good knees for boats, and of wood ash "soda" for soap-making. See Appendix VIII.

Photos. : L.G., June 1970.