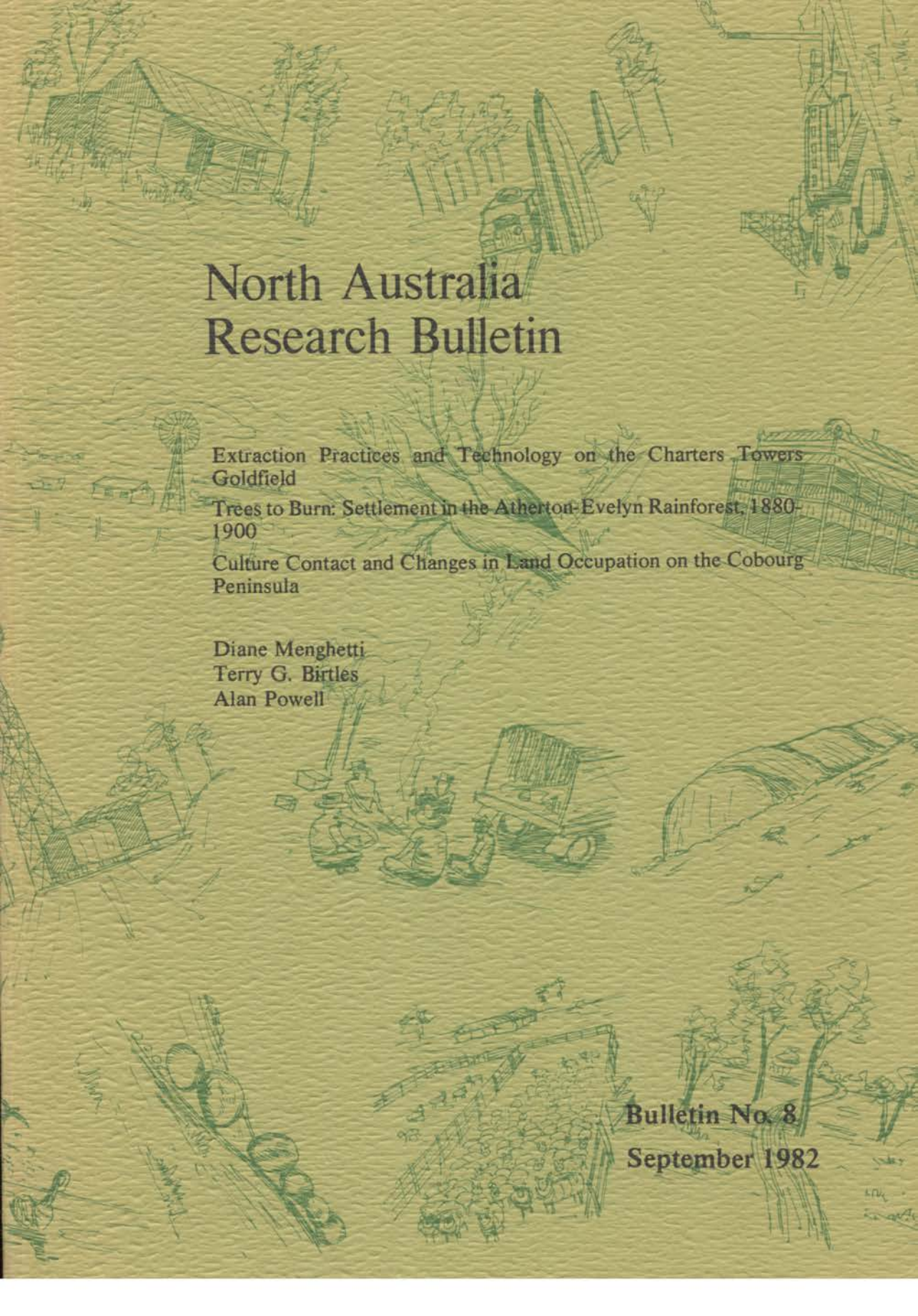




North Australia Research Bulletin

Extraction Practices and Technology on the Charters Towers
Goldfield

Trees to Burn: Settlement in the Atherton-Evelyn Rainforest, 1880-
1900

Culture Contact and Changes in Land Occupation on the Cobourg
Peninsula

Diane Menghetti
Terry G. Birtles
Alan Powell

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September 1982

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The North Australia Research Unit
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PREFACE

Bulletin No 8 is the last of a series of North Australian Research Unit publications initiated by Dr F.H. (Slim) Bauer as Director of the Unit. The Bulletins in this series attest to the wide range and quality of the work of the Unit in its formative years: topics dealt with include politics and elections in the north, early history, the management of natural hazards, cropping and agriculture and urban questions arising in mining towns and the reconstruction of Darwin after Cyclone Tracy. The work published in these volumes was done by visitors to the Unit, staff of the Unit and research scholars and the focus was on northern Australia.

A new monograph series is now being published instead of the Bulletins. The focus will be the same, but the format has been changed to allow for speedier publication and for variable pricing.

In this volume three historical studies are presented. Diane Menghetti, a scholar at James Cook University, has pieced together a thorough account of technology on the Charters Towers goldfield in Queensland in the second half of the nineteenth century. Terry Birtles, principal lecturer in Applied Geography at the Canberra College of Advanced Education, reports his detailed historical research on two linked themes, the destruction of rainforests and the destruction of Aboriginal rainforest society in the Atherton Tableland in Queensland in the nineteenth century. Alan Powell's study takes us to the Northern Territory and to a subject which has often been controversial at the present day: Aboriginal society and its changing relationship with land under pressure from a variety of outsiders. The area in question is one of the northernmost and earliest contacted parts of Australia: the Cobourg Peninsula. Alan Powell is a senior lecturer in History at the Darwin Community College.

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Culture Contact and Changes in Land Occupation on the Cobourg Peninsula

Figure 1: The Cobourg Peninsula - Nineteenth Century Lithograph

EXTRACTION PRACTICES AND TECHNOLOGY ON THE CHARTERS TOWERS GOLDFIELD

Diane Menghetti

Since its discovery late in 1871 the Charters Towers goldfield has produced some seven million fine ounces of gold, over a million ounces of silver and four thousand tons of lead. Most was won between 1872 and 1917 although the field enjoyed a small revival during the nineteen-thirties when the removal of Australia from the gold standard and the consequent rise in the price of the metal initiated a nationwide renewal of interest in gold mining. As Queensland's largest and most highly capitalised field, it made a considerable contribution to the technology of the state's mining industry. The experiments and advances in gold extraction practices made there are of particular interest, not only because their sophistication set the pattern for all North Australian goldfields, but also because their scope set them apart from other major producers. This scope stemmed from the competition engendered by the multiplicity of mills in the area, contrasting sharply with single company mining districts such as Mount Morgan, and from the fact that Charters Towers' productive life spanned an era of experimentation in milling which had largely ended by the heyday of the Western Australian mines during the early twentieth century. Despite the cannibalisation of much of the machinery by scrap-metal dealers during the inter-war years, it is still possible to reconstruct this technology from the relics of abandoned mill sites and from the Venus Mill which, as a state-owned enterprise, continued to crush small parcels of ore as late as 1972.

The Charters Towers goldfield, which covers an area of some six hundred square miles, is situated about 130 kilometres south-west of Townsville on an elevated plain 330 metres above sea level. The country rock is a grey grano-diorite which occupies about four-fifths of the field. The ore deposits occur in connection with fault fissures in this rock, the lode material consisting of crushed grano-diorite or 'formation' which contains the auriferous quartz reefs (for a description of the geology of the field, Livingston, 1974; Jack, 1879; Jack, 1885; Cameron, 1909; Marks, 1913; Reid, 1917). The field yielded little alluvial and early mining concentrated on the rich 'brownstone' deposits near the surface, consisting of quartz subjected to the oxidising effect of surface waters. There iron oxides (gossans), cerussite (lead carbonate) and copper carbonates mingled with the free metallic gold which made the brownstone the simplest of ores to treat.

Only one extraction method was used on this oxidised stone. After crushing the gold was recovered from the quartz by a hydro-metallurgical process known as amalgamation, during which clean metallic surfaces of gold alloyed with liquid mercury to form a mercury covered particle with surface properties similar to those of pure mercury. These amalgamated particles coalesced, much as drops of pure quicksilver will collect into a single puddle. When the mercury had collected as much gold as possible the result was a grey plastic mass of amalgam which, when

heated, released its mercury as a gas, leaving metallic gold in the retort (Newton, 1967:447-8; Prior, 1974:734-7). The technique was used in Europe during the seventeenth century (Tylecote, 1976:101) and later refined in the mills of Eastern Europe and America where, by the mid-nineteenth century, Californian gold milling provided a model for the industry.

By the 1870s three types of machinery had been developed to crush the ore for amalgamation: rollers, breakers and stamps. At this time, however, roller mills were used only as coarse crushers to prepare ore for concentration or for further comminution. Usually rock breakers served the same purpose although it was possible for them to do the work of the stamp mill. For service in remote mining fields they had the advantage of being relatively light and cheap; however, when used for fine crushing their power consumption was high. Further, and probably most importantly, the rock breaker was a more complex machine than the stamp battery, and replacement of broken or worn parts presented formidable problems in mining communities distant from foundries. Therefore all of the early crushing machinery introduced into North Queensland was of the stamper type (for contemporary mining and milling machinery, see Andre, 1878).

Stamps consisted of heavy pestles of iron which were lifted by means of revolving cams or arms of iron, keyed to a cam shaft, then allowed to fall upon the ore. They worked in a rectangular iron mortar which contained from three to six, commonly five, stamps set in a wooden frame to form what was usually called a battery. The ore was fed with water and often mercury into the mortar where it was crushed between the stamps and dies set into its base. If mercury was added at this stage the mortar box might be partially lined with copper plates to catch the amalgam formed there. In Charters Towers mercury was added to the mortars but no inside plates were used. The crushed material was splashed out through a metal screen onto an amalgamation table - an inclined table covered with copper plates sprinkled with mercury. As the stream of crushed rock ran down the table the amalgam adhered to the plates from which it was scraped and retorted at regular intervals (see figures 1 and 2).

The early arrival of crushing machinery was imperative for the successful establishment of a quartz mining field in North Queensland. Cartage was slow and expensive and only the richest specimens could profitably be transported to other fields for processing. A railway to Townsville was opened only in 1882. Fortunately for Charters Towers there was already a considerable amount of machinery in the colony by 1872. Since separation in 1859 gold rushes had been inspired by finds at Crocodile Creek, Morinish, Ridglands, Mount Wheeler and New Zealand Gully. In 1867 the discovery of the first of the permanent fields, Gympie, instigated the opening in 1868 of a foundry and engineering works at Maryborough by the Ballarat firm of Walkers Limited (C.E. Horsburgh, Chief Draftsman, Walkers Limited, to Ian Black and Company, 6 March 1879). The Gilberton, Cape River and Ravenswood fields

were proclaimed shortly after, followed by Charters Towers and the Broughton in 1872. However, by this year only Gympie was flourishing: all the northern fields were in a depression, even Ravenswood being at a temporary standstill due to the problems its millmen were experiencing with the field's refractory ores. Therefore crushing machinery arrived in Charters Towers with unusual rapidity and by the end of the first year Superintending Commissioner John Jardine reported the existence of five mills with an aggregate of seventy-eight stamps (John Jardine to the Secretary for Public Works, Votes and Proceedings, 1873:1073).

Buchanan's mill was operating by the beginning of May 1872 followed by the Venus and the Defiance in June; the Working Miner was crushing by September and the One and All the following month. Each new installation was greeted as a symbol of progress without regard to the provenance or the suitability of the machinery involved. For the millmen the unproven field was a speculation. Should its permanency be established the first-comers stood to profit from their registration of the few sites which had access to water for crushing; should Charters Towers fail, the machinery would have to be removed to another field. William Buchanan obtained his machine area by bringing second-hand crushing gear from Ravenswood and, after adding new batteries towards the end of 1872, he sold what was by that time a substantial plant to Thomas Mowbray early in 1873. Mowbray, however, made the mistake of removing the mill during the slump of 1873 (The Queenslander, 27 April 1872, 12 October 1872; Register of Applications for Areas, A/20767, Queensland State Archives (QSA)). Similarly Ravenswood businessmen Plant and Jackson erected the twenty head Venus Battery as an exercise in capital appreciation, selling the mill to Hutton and Whitehead at a profit of one thousand pounds before the end of the year (The Queenslander, 28 September 1872, 16 November 1872; Register of Applications for Areas, A/20767, QSA).

Although John Deane worked his Defiance Mill for several years, the battery had been intended to crush Ravenswood ore. It was freighted to Townsville in the schooner Black Dog, which was wrecked off the coast during 1871. By the time the salvage operations were complete Ravenswood had slumped and the mill was erected at the newly opened Broughton field for a short time before being transferred to Charters Towers (Port Denison Times, 3 June 1871; The Queenslander, 25 November 1871, 20 January 1872). The Working Miner was a very small concern, consisting of a single battery of three stamps, possibly one of the hand-operated prospecting units manufactured by Walkers Limited. Its owners, W.H. Norris, J.R. Robson and L.M. Harrison, removed their plant during 1873 and the site was claimed by a Charters Towers storekeeper and investor, P. O'C. Hishon, who installed an unusually grouped set of three batteries of four stamps each, plus a 'Mickey' or single stamp used for small or experimental parcels of ore. The new mill was named the 'Never Despair'. Norris remained in Charters Towers as manager of the new mill (Register of Applications for Areas, A/20767, QSA; The Queenslander, 7 December 1878). Of the pioneer millmen only the Tough brothers, William, John and George, worked their One and All mill

throughout the seventies. Their machinery consisted of three five-stamp batteries and a 'Mickey', and was situated close to the Venus (The Queenslander, 28 September 1872, 12 October 1872; The Northern Miner, 5 October 1880). In 1873 Thomas and Byrne brought their ten head Mary Louisa mill from Rishton, and the following year Deane, in partnership with William Sadd, erected five head on the North Australia line. This was moved in 1875 when it was renamed the Enterprise (The Northern Miner, 5 October 1880; Applications for Areas, A/20767, QSA).

Despite the quantity of machinery on the field the cost of milling in Charters Towers was high. Charges started at 25 shillings a ton rising to 30 shillings in October 1872; at the end of the year Jardine estimated that carting and milling absorbed the value of one ounce of gold for each ton crushed (The Queenslander, 28 September 1872, 12 October 1872; John Jardine to the Secretary for Public Works, 9 October 1872, COL/A 2340, QSA). To some extent high costs were unavoidable; both the climate and the topography of the district were inimical to efficient milling. The need for water for the stampers ensured that most of the mills - the Defiance on Mosman's Creek was the exception - were established on Gladstone and Millchester Creeks, some two or three miles away from the main reef systems. During the dry season, when fodder for draught animals was scarce, cartage from mine to mill was costly and difficult to obtain. During the wet season, when the road from Charters Towers to Millchester was often impassable, the situation was equally difficult. Further, the plants had to be sited on the flat creek banks, which precluded the use of gravity for transport within the mills. Costs were therefore increased considerably by the need to manhandle ore between each stage of the milling process.

High temperatures and water shortages would certainly have added to milling expenses by causing mercury loss. After the amalgam had been formed and caught on the amalgamation plates the battery had to be hung up for the 'clean up'. The amalgam was scraped from the plates and the inside of the mortar box, washed to remove sand and other loose waste, then stirred up with extra mercury to bring impurities to the surface. This dross was skimmed off and collected for further cleaning. The superfluous mercury was then squeezed by hand through a straining cloth and the resulting balls of amalgam retorted. In the small mills of the 1870s this process would have been carried out in a cup-shaped retort suspended over a fire. Into its lid, which was sealed on with a paste of flour or wood ash and water, was screwed a curved condensing pipe. As the retort was heated the mercury vaporised, passed into the pipe which was immersed in cool water, and condensed. Heat was maintained for about two hours until all the mercury was distilled off (Preston, 1895:45-6).

Ideally all of the mercury, an expensive as well as a very poisonous metal, was saved for re-use. In practice, however, there was always some loss to add to the cost of milling. In Charters Towers two factors would have increased the amount needed for each ton of ore. Firstly the climate: mercury is highly volatile, beginning to vaporise

at about 16 degrees Celsius and evaporating quite rapidly at 38 degrees C; in summer, when temperatures often reached this level, the loss from this source must have been considerable. Secondly, to maintain the discharge of crushed ore onto the plates a great deal of water had to flow into the batteries (Andre, 1878:209-11). Insufficient water resulted in the stone, together with the mercury, which was invariably added to the mortar boxes in Charters Towers (MacLaren, 1901: 22), remaining too long under the stamps. Thus, during the very frequent periods of water shortage, large amounts of mercury would have been lost through 'flouring', that is, being separated into minute globules which were unable to reunite and so were lost with the sands. Further, this problem would also have resulted in gold loss in slimes: material too fine to present an adequate metallic surface to the mercury for amalgamation.

The cost of milling in Charters Towers induced a group of miners to float a cooperative milling company in 1872 - unsuccessfully (The Queenslander, 9 November 1872) - but the efficiency of milling was little discussed during the first few years of the field. Probably standards were comparable to those of other Queensland fields, and the Charters Towers brownstone was rich enough to distract attention from gold losses in the mills. However, at a vertical depth of between seventy and a hundred feet, where water and air from the surface had not penetrated to oxidise the metals, more complex ores were encountered. The most common mineral of these 'mundic' reefs was pyrites (iron disulphide) occurring in bunches or veins or as small particles disseminated through the quartz. In association with the pyrites were two other sulphides: galena (lead sulphide) and zincblende (sphalerite, zinc sulphide). Although other minerals were found they were restricted to a few mines and even in these were not plentiful. Indeed the ore was remarkably consistent across the field, the only notable variation being the increasing quantity of zincblende occurring at depths in excess of 330 metres where it became more plentiful than galena (Reid, 1917:169-71; Livingston, 1974:18-19). The sulphides rarely exceeded 6 per cent of the ore. While classed as 'refractory' (not free milling) the Charters Towers ores did not present any unusual milling problems, although the absence of copper and the presence of zinc would have made local smelting a problem (the advice of members of the Geology Department of James Cook University, its former Professor, Bill Lacy, and Richard Keene of the Chemistry Department is gratefully acknowledged).

Although some of the gold in the sulphide ore was 'free milling' a portion of the values existed as metal which, during the formation of the mineral deposit, had precipitated from its solution in molten metal sulphides and was therefore disseminated through the pyrites in minute specks. Therefore the treatment of the mundic stone presented the millmen with several inter-related problems. Firstly, to release the gold mechanically from the pyrites required extremely fine comminution which would inevitably result in gold loss through sliming. Secondly, after their release the tiny gold particles were likely to be coated

with sulphide. Since only clean metallic surfaces will unite with mercury, this coating rendered the gold unamalgamable. Thirdly, sulphides of base metals cause the mercury itself to 'sicken': the drops of mercury become chemically coated and so are prevented from reuniting (Richards, 1909:112). At the end of 1875 tests carried out on a small quantity of stone from the St Patrick Block mine suggested that crushing and amalgamation released less than half the gold from this mundic ore (The Queenslander, 4 December 1875). It became apparent to even the most conservative millmen that new treatments would have to be devised.

With contemporary technology three basic methods were available. Firstly, the stone could be crushed coarsely and the metallic particles separated from the gangue for smelting. Secondly, after similar ore dressing, the concentrates could be crushed finely and amalgamated. Thirdly, the crushing and amalgamation might be carried out as for the brownstone and the 'tailings' or waste material, instead of being discarded, could be collected and retreated. As the sulphide ores became more predominant the millers of Charters Towers chose the third alternative. Indeed, until they acquired their own equipment the mills continued to operate as before while their tailings were sold outright to firms set up specifically to treat this material. These firms also bought from individuals who collected old tailings from the beds of the creeks where they had been discarded in earlier years and separated out the heavier portions for retreatment. Interestingly, of the four plants operating solely as tailings works in 1878, three were owned by men who had speculated successfully in milling during 1872. E.H.T. Plant was the major shareholder in two, the Charters Towers Pyrites Company and its sister plant at Millchester, while a third was owned by John Deane and William Sadd. The other plant came under the proprietorship of butcher, assayer and mining speculator Thomas Buckland (Dept of Mines, Annual Report, 1878:15). Between them these plants probably produced up to one seventh of the wealth of the field during the late 1870s (C. Menghetti, 1981).

After leaving the batteries the tailings were first concentrated, either by buddle (Venus, Wyndham and the Millchester Pyrites Works) or in a Brown and Stanfield concentrator (Charters Towers Pyrites Works and Buckland's plant). The buddle used in Charters Towers was the round concave Mundy's Patent (The Queenslander, 7 December 1878). It consisted of a circular pit some 8 metres in diameter with a slope of five to eight degrees towards the centre. The pit was lined with bricks covered with a smooth layer of cement. The moving parts, attached to a revolving hollow pipe standing upright in the centre, consisted of feed tubes and sweeps which extended to the outside edge of the buddle. The pulp was fed into the central pipe and ran out through the revolving feed tubes to be distributed evenly on the perimeter of the machine. As it was washed towards the centre it was kept in motion by the revolving sweeps and gradually a layer of sand was built up on the cement, the heavier concentrates remaining on the surface and the light worthless tailings being swept down the slope and discharged through a central

launder (figure 3). The buddle was an effective concentrator and sizer, but it was labour-intensive. The height of the sweeps needed constant monitoring and at the end of the process it was necessary to stop the machine and remove the concentrates from its surface with a shovel.

The Brown and Stanfield concentrator was a shallow pan just under two metres in diameter and ten centimetres deep, with a slightly convex base. Over this was a fixed convex iron plate reaching nearly to the sides of the pan. This plate acted as a distributor, spreading pulp fed in through a central iron basin with perforated sides. As the pulp was spreading, the pan oscillated, making the heavier concentrates move downwards and outwards to the edge of the pan where they collected in a groove from which they were discharged. At the same time the lighter material was carried up the convexity of the pan to be discharged through an outlet in the centre (figure 4). MacLaren noted that the millmen of Charters Towers habitually overloaded the Brown and Stanfield, a procedure which resulted in the loss of fine concentrates and the pollution of the saved values with gangue (MacLaren, 1901:23).

After separation, the heavier metallic portion of the tailings was reground with mercury in an attempt to release the specks of gold from their pyrites and to scour them clean from amalgamation. The first regrinding was carried out in Wheeler pans which were set up in every plant on the field except at the Defiance Mill (Dept of Mines, Annual Report, 1878:15). The Wheeler pan was between one and two metres in diameter and a half metre deep. Crushing was effected between dies set in the base of the pan and shoes attached to a flat plate or 'muller' which revolved on top of the dies. The speed of the muller tended to drive the particles to the sides of the pan where wings or guides were fitted to direct them back towards the centre (figure 5). Grinding in a Wheeler pan reduced the particles to about one fifth of their original size. Finer grinding was possible in the machine but because this brought the grinding surfaces into contact with each other it caused excessive wear of the shoes and dies. Consequently the pan was used mainly as an intermediate grinder whose product was then subjected to further treatment.

The contents of the Wheeler pans were discharged into a settler or iron basin about one and a half metres in diameter. A constant stream of water was added to the pulp which was gently agitated to keep the lighter particles in suspension while the metals and amalgam settled on the bottom. The stirring device consisted of a central column bearing four arms equipped with paddles which terminated in blocks of wood resting lightly on the bottom of the pan. A discharge hole near the top of the settler allowed the water carrying the lighter portion of the pulp to run off, and at successive intervals the point of discharge was lowered by removing plugs from a series of holes in the side of the settler. After about four hours only the metal and the amalgam remained. Settlers were used in only four mills during 1878, the other plants reground the product of the Wheeler pan without further concentration.

The final comminution and amalgamation was invariably carried out in Berdans. These were iron pans just over one metre in diameter fitted with two iron drags attached by chain to a central axle. Unlike the Wheeler in which the pan remained stationary while the muller rotated, the Berdan pan itself revolved at about thirty revolutions a minute and grinding was effected by the ore passing between the moving pan and the stationary drags. These machines were set at an angle which allowed the lighter particles to be slopped over the side while the gold, as it was released and scoured, amalgamated with mercury in the bottom of the pan (figure 6). The Berdan was an American invention dating from the Californian gold rushes. Although it attracted much attention during the 1850s it was never adopted in Europe and had lost favour with American millmen by the 1870s (they are not mentioned by Andre in 1878; see also Hall, n.d., 23-4). In North Queensland however, with local modifications to the original design, it was the favourite grinding pan: ninety-five of these machines were in use in Charters Towers by 1878. Other varieties of grinding pans were tried on the field but the Berdan remained the most widely favoured device. The iron balls of the original were replaced as drags by blocks of cast iron weighing about 130 kg each, or even by lumps of granite, and rejected pans on the Venus site suggest an unsuccessful attempt to fit liners to reduce wear on the pan. The popularity of the Berdan on the Charters Towers field is understandable in terms of its cheapness and simplicity: it was the first machine to be manufactured locally after the establishment of a small foundry by Deane and Sadd during 1878. Berdans were also made at Walkers Limited and at Brand and Drysborough's Townsville foundry which was set up during 1877. Moreover it fitted admirably into local milling practice which demanded ever finer crushing and continued to rely totally on amalgamation for the recovery of the gold.

With the establishment of additional mills minor variations to the crushing-amalgamating-grinding process were introduced. At Thomas Mills's Wyndham, where the batteries from the London mill at Ravenswood were set up to crush the ore from his General Wyndham mine, a reverberatory furnace was built. In this the concentrates from the buddle were oxidised to convert the pyrites (iron disulphide) into iron sulphate before regrinding. Hutton and Whitehead also introduced a furnace into their Venus mill, while Thomas Buckland used a revolving iron calciner. In 1880 E.H.T. Plant, who had bought into the Mary Louisa two years earlier, experimented with concentrating in Brown and Stanfields direct from the mortars. Nevertheless, the assayers continued to demonstrate a gold loss of up to fifty per cent (The Queenslander, 7 December 1878). To some observers, including the Charters Towers Goldfield Warden Philip Sellheim, these figures were unacceptable. With so much excellent machinery on the field, argued Sellheim, loss in the mills could not possibly exceed fifteen per cent. The assay results, he claimed, were due to faulty sampling of the tested ores (Dept of Mines, Annual Report, 1880:10). He was apparently vindicated by the disappointing yield from parcels of buddlings shipped to metallurgical works in Victoria, Swansea and Freiburg during 1883 (Dept of Mines, Annual Report, 1883:15). That he was wrong was

ultimately demonstrated in later years when chemical methods of tailings treatment harvested much of the gold lost during this period. The real significance of the smelter results was that they showed that the loss was occurring before the pulp reached the buddles - probably within the battery itself.

The strong tendency of sulphide ores to slime, as well as the more obvious requirements of mill economy, necessitated fast crushing and discharge. The longer the stone remained in the mortar the more likely it was to be pounded into slimes. In Charters Towers the method of ore preparation, the size of the mortars, the weight, speed and drop of the stamps and the depth, area and mesh of the discharge screens all contributed to the retention of the pulp in the box and the consequent production of unamalgamable slimes. Rock breakers to reduce the stone to small, evenly sized pieces before it was fed to the stamps, arrived late on the field. The first was installed during 1885 and they were not in common use until the end of the decade (figure 7). Prior to this only rough hand breaking of the largest rocks was effected, a procedure which led to uneven feeding and inefficient operation of the stamps. Because of the general practice of inside amalgamation, mortars were too large and so encouraged the pulp to remain in the box for a second, unnecessary pulverisation. The stamps themselves were too light, had too long a drop and worked too slowly. Californian stamps could be as heavy as 630 kg, and MacLaren noted that 540 kg stamps could be operated through a six inch drop at a rate of 110 blows per minute (MacLaren, 1901:20). While the type of ore crushed must ultimately determine the speed of the mill, the Charters Towers average of an 850 lb stamp dropping ten inches seventy-five times a minute must be seen as an anachronism in the late nineteenth century. Further, the depth of discharge, that is the distance between the top of the dies and the bottom of the effective discharge screen surface, was too great.

Because the ore particles depend on the splash created by the stamps in the mortar to wash them up through the screen, it follows that the lower the screen is set the larger will be the particle that the splash is capable of lifting up to it. With discharge depths of between six and ten inches, as in the Charters Towers mills, only the smallest particles escaped; the others fell back onto the dies and were recrushed. Finally, regardless of how quickly the ore is crushed the rate of discharge is still limited by the area and mesh of the discharge screen. In Charters Towers a divided screen with a mesh of 225 holes per square inch was used, another false principle. The entire battery was designed to crush the stone into the finest possible particles. As a result, slimes were the constant problem of the Charters Towers millmen, and a very considerable percentage of the gold was rendered unamalgamable before it reached the tables (see Andre, 1878; Richards, 1904; Truscott, 1923; Rickard, 1932 and, for practice at Charters Towers, Blane in Dept of Mines, Annual Report, 1901:37-42; MacLaren, 1901; and Clark, 1904).

Consequently, the introduction of Wheeler and Berdan pans, although somewhat increasing the capture of free gold, compounded rather than cured the problem of loss through sliming. Moreover, it is likely that the advent of chemical extraction methods to treat the tailings further delayed the examination of the fundamental problems of milling technique on the field. The first of these processes was introduced during 1886 by the Charters Towers Pyrites Company, whose engineer, D.A. Brown, had been sent to South Africa and England during the previous year to investigate alternative metallurgical procedures. On his return he designed a chlorination plant based on the Plattner method of gold extraction, which utilised the affinity of gold for chlorine to leach the precious metal from the tailings in the form of gold chloride. The process was complicated by the fact that sulphur and some of the base metals are also attracted to chlorine and so had to be expelled or 'satisfied' before its introduction. This necessitated a complex roasting process which constituted the most difficult and expensive part of the operation. To expel the sulphur from the pyrites heat was applied gradually so that the first atom of sulphur volatilised and burned at a slight distance above the finely divided sulphides. Temperature control was precise; if the heat was too low the sulphur would not burn, if too high the pyrites fused into a solid mass. The next step was to stir the roast so as to bring every atom of base metal into contact with air, oxidising the metals to reduce the amount of chlorine they could absorb. However, since the oxidised zincblende - zinc oxide - has a tendency to form a chloride when presented with chlorine in a free state, the third stage consisted of 'satisfying' this metal by feeding salt (sodium chloride) to the roast. Only then could chlorine and water be introduced to form a solution of gold chloride which was then collected and precipitated.

The Pyrites Company's plant cost some sixty thousand pounds, much of which was spent on a huge reverberatory furnace built on the side of Towers Hill. The works, which included a tramway to carry the concentrates up the hill and a chlorine generating plant, were run by electricity. From bins at the top of the tramway the ore was automatically fed into the furnace and was swept by mechanical rabbles along a hearth 3 metres wide by 11 metres long. Leaving this it began its descent at an angle of thirty-eight degrees, to be pulled up at another short horizontal floor at the end of which was a subsidiary fireplace. It was worked along this floor by another set of rabbles before making its final descent to the last horizontal hearth at the bottom of the hill. There it was fed with salt solution through a chemical spray while being worked towards the discharge door by hand rabbles. The main firebox was situated at the end of this hearth and was connected to the upper parts of the furnace by a coil of pipes through which air was forced by a Roots blower. The roasting process took three hours to complete.

On leaving the furnace the roasted sand passed through a disintegrator and was discharged into wooden vats with filter bases lined with broken glass. There it was dampened and chlorine gas was

forced through it from below. As this reached the surface a weak chlorine solution was added and the vats were left until all the gold had dissolved into the solution. This was then run off through a vertical column where high pressure steam was used to drive off the bulk of the chlorine to be saved for re-use. The gold was then precipitated from the gold chloride solution with ferrous sulphate and the precipitate caught on filter beds of charcoal and sawdust. The filters were burned in a reverberatory furnace and the ash and gold collected and smelted. Sulphur fumes left the furnace through a monumental stack, 50 metres high and over 5 metres wide at the base, sited at the top of the hill (Brown in Dept of Mines, Annual Report, 1895:53; MacLaren, 1901:29-31; Clark, 1904:260-4).

The chlorination process produced gold of about ninety-eight per cent fine and Brown's plant must be acknowledged as the most innovative technological achievement of the Charters Towers goldfield. Commercially, however, it was a failure; despite the high production of both this and a smaller plant on the Burdekin River, constant expensive improvements to the works eroded the company's profits. The last additions coincided with the introduction of a newer, cheaper chemical method of treating the tailings - cyanidisation. The idea that potassium cyanide was an effective solvent of gold was not new - indeed it had for some time been used to clean amalgamation plates. Nevertheless, despite patents taken out by Alexander Parkes in 1840 and J.W. Simpson in 1884, a commercially viable process for its use in the mining industry was not perfected until December 1887 when the MacArthur-Forrest cyanide process was patented (Dennis, 1963:269-70). The sands were mixed with a very weak solution of potassium cyanide in which the gold present dissolved. The solution was then trickled through a filter of zinc threads on which the gold was precipitated (MacArthur in Dept of Mines, Annual Report, 1892:17-20). Requiring neither expensive machinery nor large amounts of fuel, the new system spelled the death of the chlorination process on the Charters Towers field.

The first cyanide plant on the field was set up by the Australian Gold Recovery Company which had been formed in 1888 to purchase the Australian rights to the patent from its owner, the Cassell Company of Glasgow. A company engineer, Peter McIntyre, was despatched to Ravenswood where he experimented with the local ores before moving to Charters Towers in 1892. His plant, consisting of an engine, two pumps, a zinc cutting machine, agitators, percolators and leaching and waste solution vats, was in operation by October. Because of the absence of copper which has an affinity for cyanogens, cyanide treatment was extremely successful; that agitators proved superfluous further reduced the cost of the plant. At the end of 1892 the Day Dawn P.C. Company negotiated a right to use the patent in its Excelsior mill and by the end of 1897 there were about seventy cyanide plants on the field, between them treating some 25,000 tons of tailings a month (Dept of Mines, Annual Report, 1897:34).

Day Dawn, like other users of the patent, paid 5 per cent of its gross product to the patentees until 1900, although apparently it had no written agreement with them. Probably inspired by successful avoidance of royalties elsewhere (Cassell Gold Extracting Co. Ltd. v. Cyanide Gold Recovery Syndicate, England, 1895 and Australian Gold Recovery Company v. Lake View Consuls, West Australia, 1899) Day Dawn ceased payment in 1900 and was successfully sued for damages in 1902 after the patent had expired (see Votes and Proceedings, 1896, Vol 4, 271; Queensland Government Mining Journal, 14 June 1902; North Queensland Register, 19 May 1902).

The cyanide practice which developed in North Queensland consisted of sun-drying the tailings and passing them through a disintegrator - a simple machine consisting of two drums fitted with steel bars. The smaller drum was set inside the larger and they revolved in opposite directions powdering the material between the two sets of bars. During this process lime was added to counteract any acidity in the tailings. From the disintegrator the sands were run into vats the size and shape of which varied with the plant, and potassium cyanide solution (0.5 per cent) was added. This was left in contact with the sands for between twelve and twenty-four hours so that the gold formed a solution with the cyanogen. The liquid was then drawn off through zinc extractor boxes where the gold was precipitated as a black metallic powder, the solution being caught and saved. The process was repeated with two other 'washes' of diminishing strength before the sands were discarded. While most cyaniders sold the unrefined cyanide bullion to the banks, the Australian Gold Recovery Company distilled off any mercury present in a retort and smelted the powder to a base bullion, which was in turn granulated by being poured into cold water. The grains were immersed in nitric acid to dissolve the zinc, lead and silver and the residual gold was smelted into bars. The silver was saved by precipitating it with salt as silver chloride, which was subsequently decomposed by the introduction of zinc to form metallic silver and zinc chloride. Finally, the silver was smelted (MacArthur in Dept of Mines, Annual Report, 1982; Clark, 1904:27-9).

Throughout the nineteenth century Charters Towers ores were inefficiently stamped, and the gold lost in the batteries was recovered by secondary and tertiary treatment as new processes became available. During 1889 gold to the value of 1,357,517 pounds was produced in Charters Towers; only 769,849 pounds came from the mills. In the field's peak year of 1899 only 56 per cent of the gold was produced by the mills (Dept of Mines, Annual Report, 1899:35). However multiple treatment was expensive. In 1901 milling and grinding still cost fourteen shillings a ton, and cyanidation a further seven shillings and six pence for each ton of tailings (MacLaren, 1901:21-9) despite the sophistication of the recovery methods as illustrated by the flow sheets (figures 8 to 11). In the early years of the field when ore treatment was the province of small, itinerant businessmen, failure to adjust the mill to the ore was understandable. During the 1880s and 1890s, when Charters Towers was a major goldfield financed by large-scale interstate

and overseas investment, this failure is less easily explained. It was not merely a problem of piecemeal construction of the mills. During 1888 the Burdekin Mill was erected by a highly capitalised English company on a perfect site at Sellheim on the Burdekin River where it had plentiful water and a sloping site. Yet its sixty stamps still weighed only 4.5 kg each; the broken surface, 225 holes per inch discharge screen was set to give a discharge depth of 15 to 25 cm (Dept of Mines, Annual Report, 1888:28; MacLaren, 1901:18-9) and its slime production equalled that of the older mills on the field. By 1901 the company had installed a filter press in an attempt to improve its extraction rate from the slimes produced in its batteries. A contemporary critic, the South African mining engineer William Blane, complained of a lack of technical expertise on the field and noted that mine owners insisted that their ore should not be 'rushed' through the batteries (Dept of Mines, Annual Report, 1901:40). Certainly the industry suffered from an innate conservatism which was contemptuous of 'book learning' and opposed changes to established milling procedures. Nevertheless, it is likely that the field's greatest problem was the richness of its ores which, despite inadequate treatment, yielded enough gold to discourage a serious review of milling practice.

This view is supported by the changes forced upon the millers by the decline of the field during the early twentieth century. Re-treatment by cyaniding had disguised production trends at the turn of the century, and the exhaustion of the accumulated tailings dumps coincided with the discovery of the Queen Cross reef during 1902. The short but brilliant life of this reef came to a dramatic end in 1905 after which year the gold yield fell rapidly (Menghetti, 1981). In 1917, when production was only a little higher than in 1872, there were five mills left on the field. Three of these, the Brilliant Rock, the Brilliant Extended and the Burdekin, were owned by mining companies. The other two, the Rainbow and the Venus, were engaged in custom crushing. All of them had made fundamental changes to their flow sheets (Reid, 1917:65 and figure 12).

The new milling technique consisted of crushing coarsely and amalgamating to catch the free gold in the ore. The material not caught on the tables was then concentrated, the pyrites being sent to smelters in other parts of the country and the lighter particles being treated with cyanide. Fundamental to the success of this style of milling was a new invention, the Wilfley table. During the nineteenth century the Charters Towers millers had made few advances in ore dressing. Frue Vanners - endless belt concentrators - had been installed at the Burdekin Mill during 1888, but the company's staff had never learned to use them satisfactorily and the mill reverted to the Brown and Stanfields so popular in Charters Towers and so long outmoded on other fields. In the worsening economic climate of the early twentieth century however, the Wilfley table, invented in 1895, was readily accepted. It was a percussion table, five metres long and two metres wide, tapering a little at the forward end. Progressively shorter parallel wooden riffles were nailed onto its linoleum surface. The

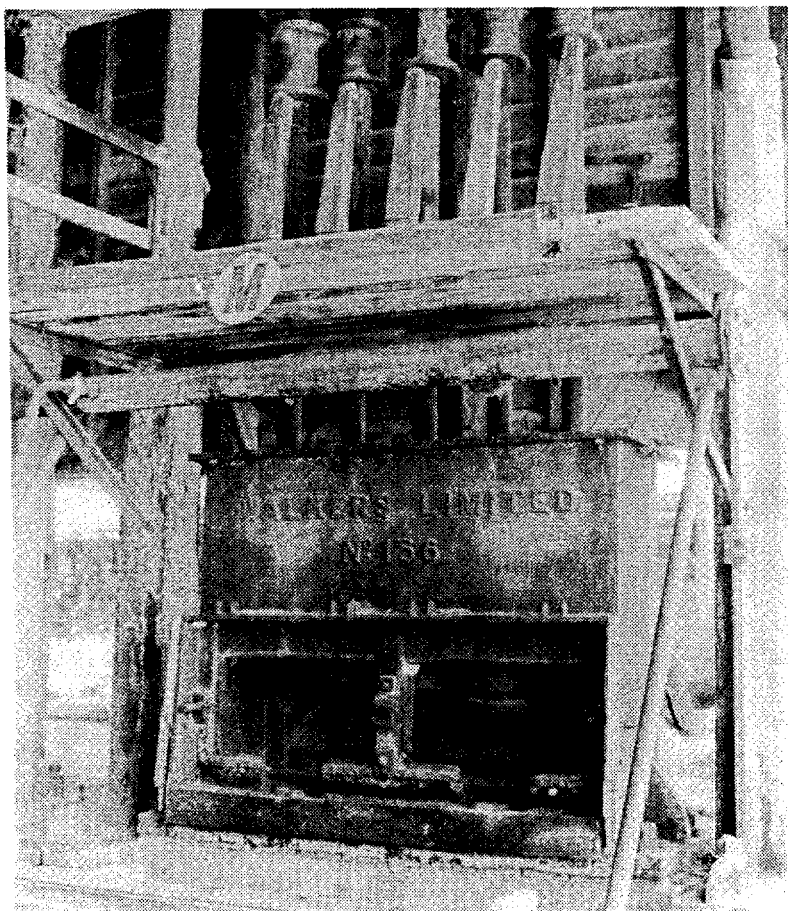
grooves so formed were shallow on the feed side of the table deepening towards the other side. The pulp was distributed and washed across the riffles assisted by the percussive jerks of the machine. The heavier particles settled quickly into the shallow grooves, the lighter ones were jerked over the riffles, to settle in the deeper ones. Rows of concentrates thus formed were arranged in order of their specific gravity (figure 13; Richards, 1907; Truscott, 1923:362-4; Chadwick, 1958:74).

At the Brilliant Extended mill in 1917 the ore was delivered by aerial tramway from the shaft a few hundred yards distant. It was discharged on to a 7.5 cm grizzly - an iron grating with bars spaced to allow ore smaller than the required size to fall through to the stamps, reserving larger pieces for the rock breaker - above a set of Blake type rock breakers (figure 7). The coarse portion went onto a 30 cm x 60 cm breaker from which it was fed automatically to 570 kg stamps running through a seven inch drop at a rate of 103 strokes a minute. No amalgamation took place in the mortars, but long plates interspersed with mercury wells were used to catch the free gold in the ore. The remaining pulp was then concentrated on Wilfley tables and two grades of concentrates were produced. The lead ores of Charters Towers, sold to local buyers of the Sulphide Corporation, were smelted at its Cockle Creek works, while the copper-gold ores mined in outside leases late in the life of the field were sold to Charters Towers agents of Queensland Copper Coy (Mount Perry) and the Electrolytic Refining and Smelting Coy (Port Kembla) (Jackson, 1909). The residues were sized, the sands being deposited and the slimes settling in pits. For cyaniding these were later mixed together in a ratio of two parts sands to one of slimes. The company's milling costs, despite war-time inflation, were five shillings and seven pence a ton, and a further four shillings and four pence for each ton of tailings cyanided (Macleod, 1911:5-12; Reid, 1917:65). Although these improvements had probably extended the life of the mine by a few years the change came too late. The Brilliant Extended, the last of the big Charters Towers company mines, brought up its final shift at the end of 1917.

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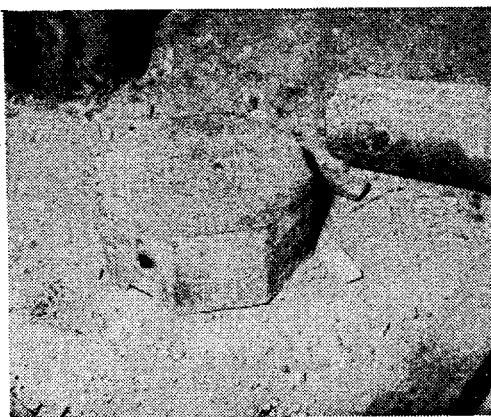
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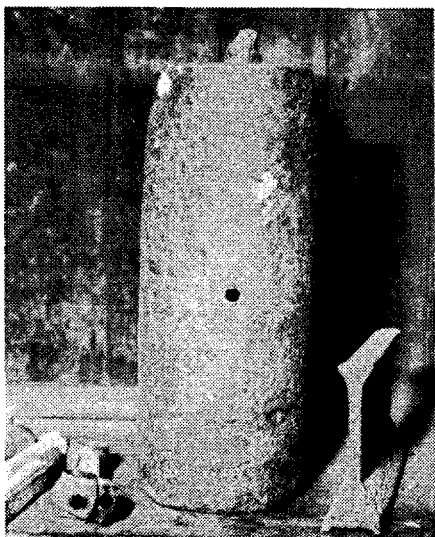
Mortar boxes, Venus Mill, Charters Towers



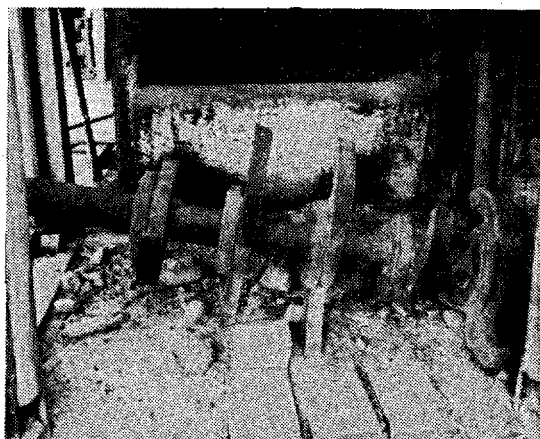
Stamp shoes, Venus Mill,
Charters Towers



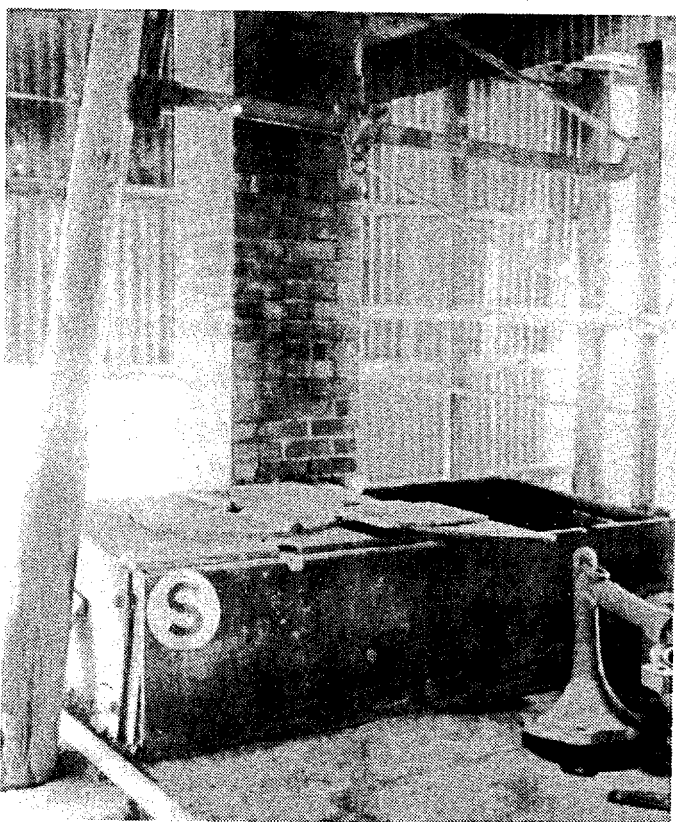
Die, Venus Mill,
Charters Towers



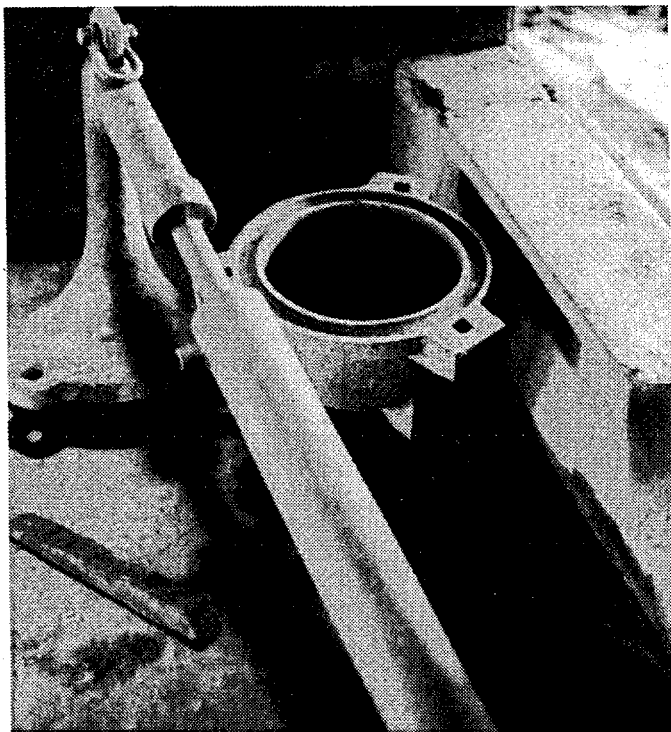
Mercury bottle, Venus Mill, Charters Towers



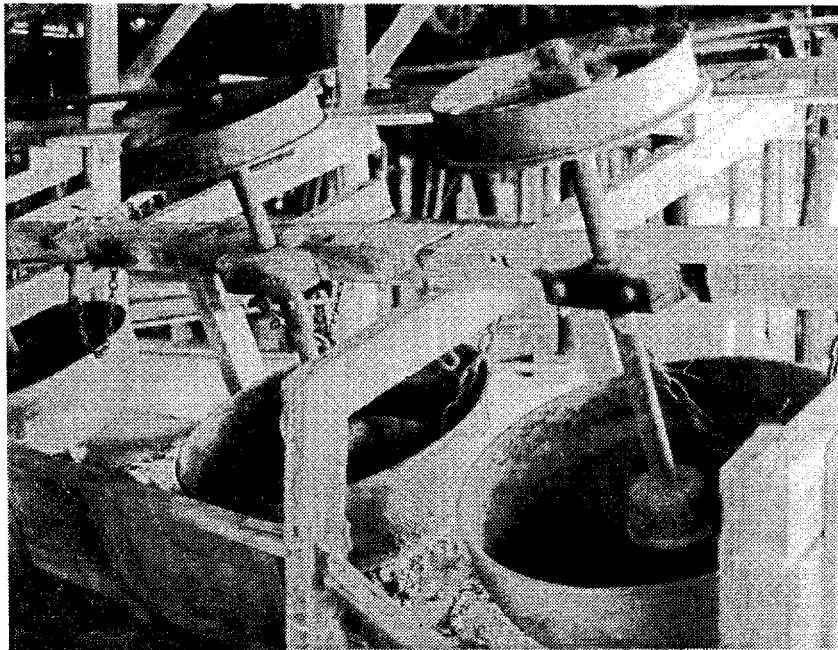
Cam shaft, Venus Mill,
Charters Towers



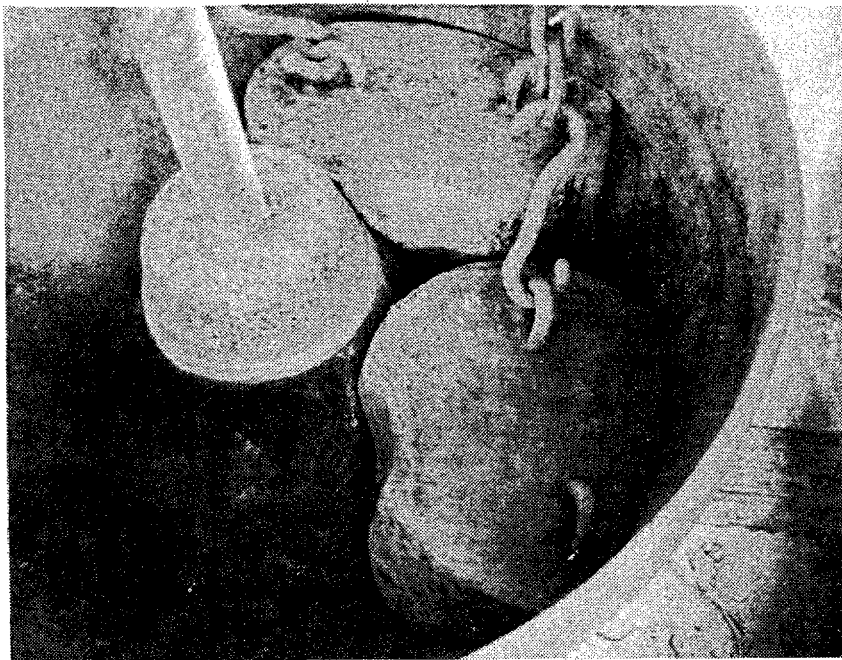
Retorting furnace,
Venus Mill,
Charters Towers



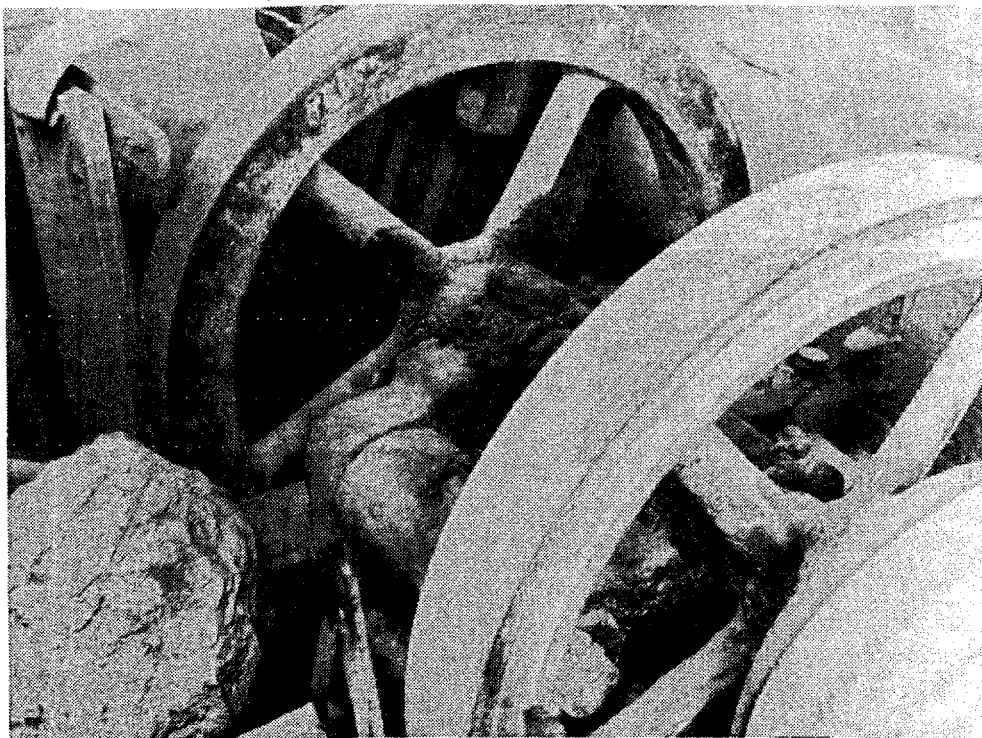
Retort, Venus Mill, Charters Towers



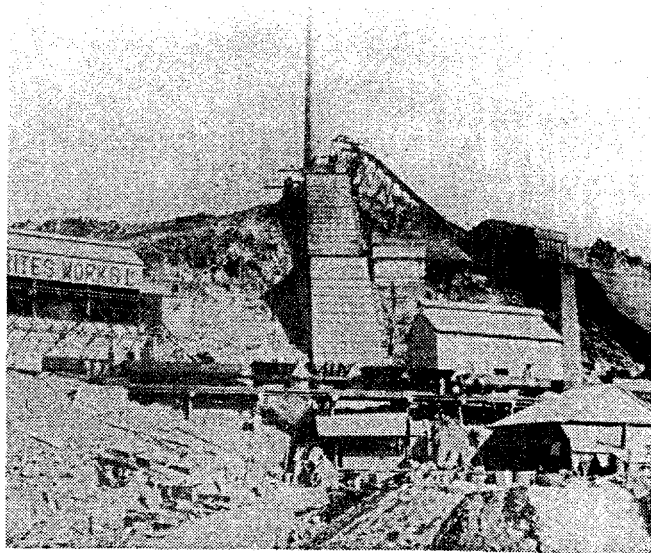
Berdan pans, Venus Mill, Charters Towers



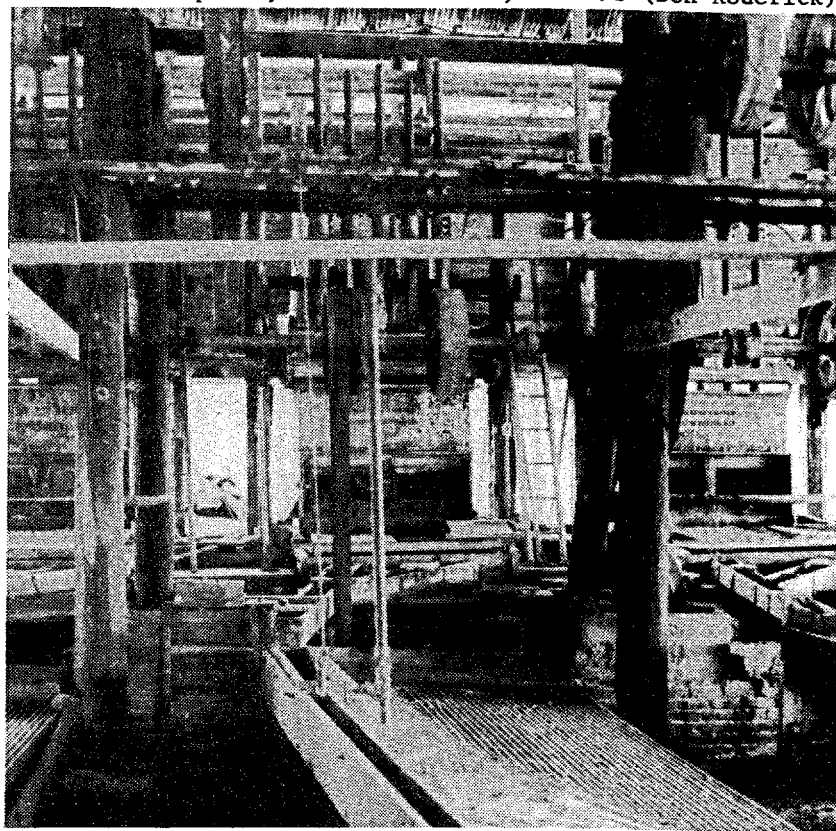
Detail, Berdan pans, Venus Mill, Charters Towers



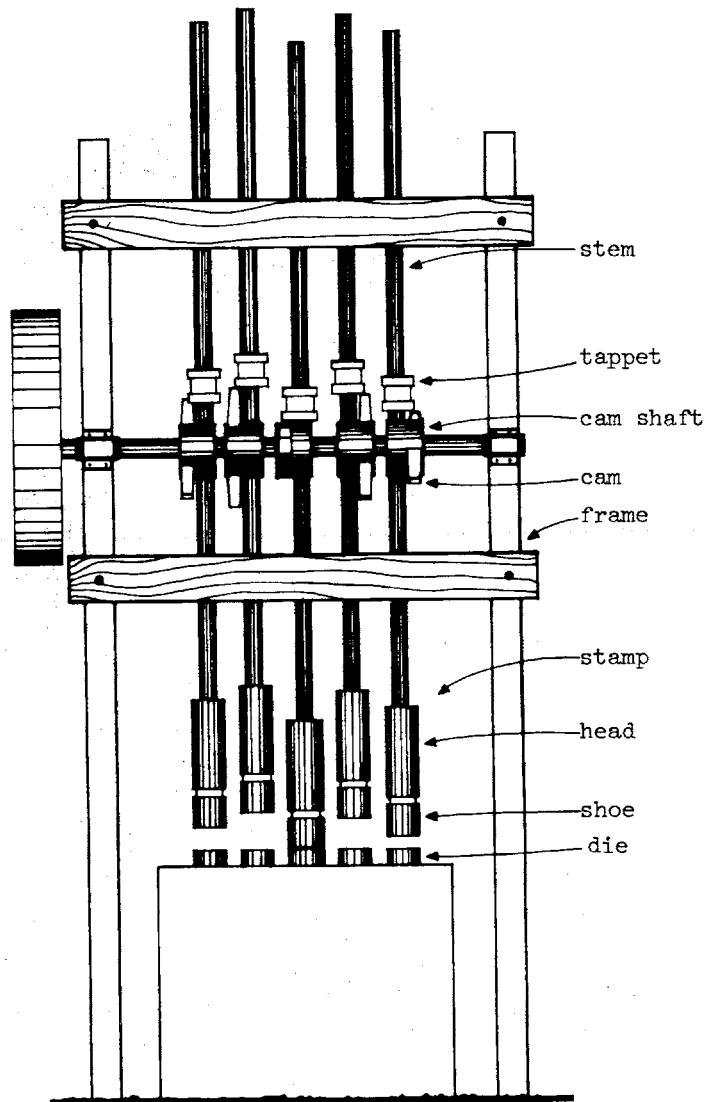
Black-type rock breaker, Venus Mill, Charters Towers



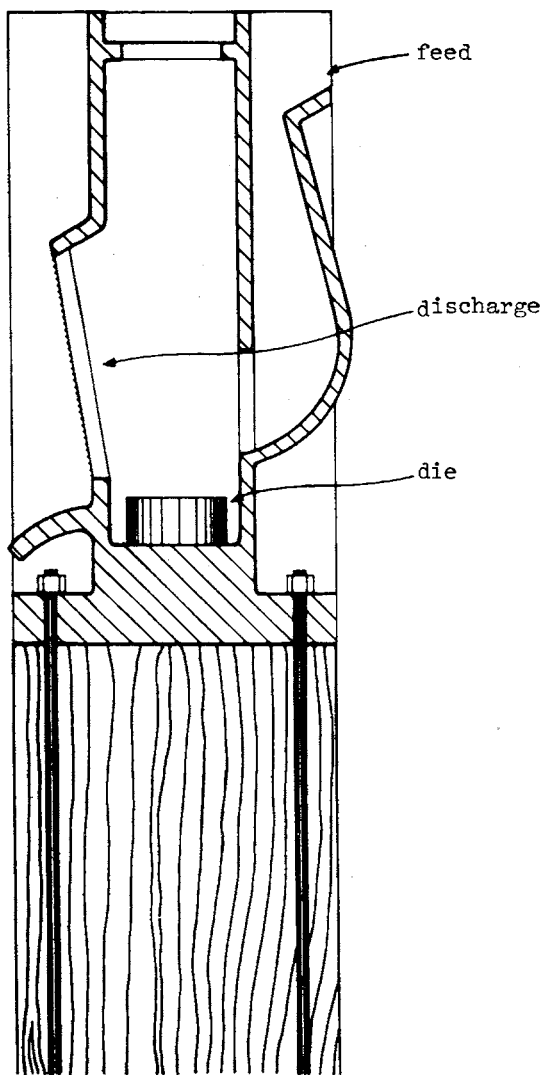
Chlorination plant, Charters Towers, c. 1892 (Don Roderick)



Wilfley Table, Venus Mill, Charters Towers



® Figure 1 Stamp Battery



©Figure 2 Mortar box

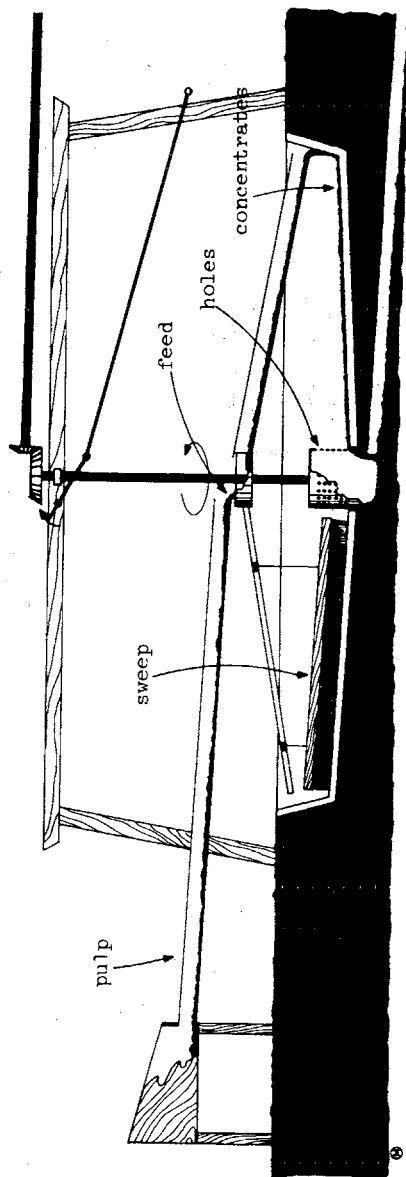
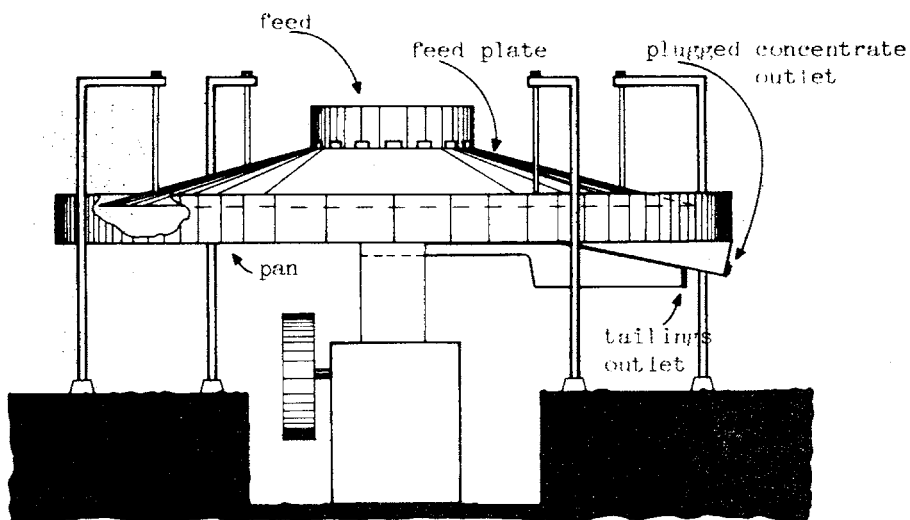
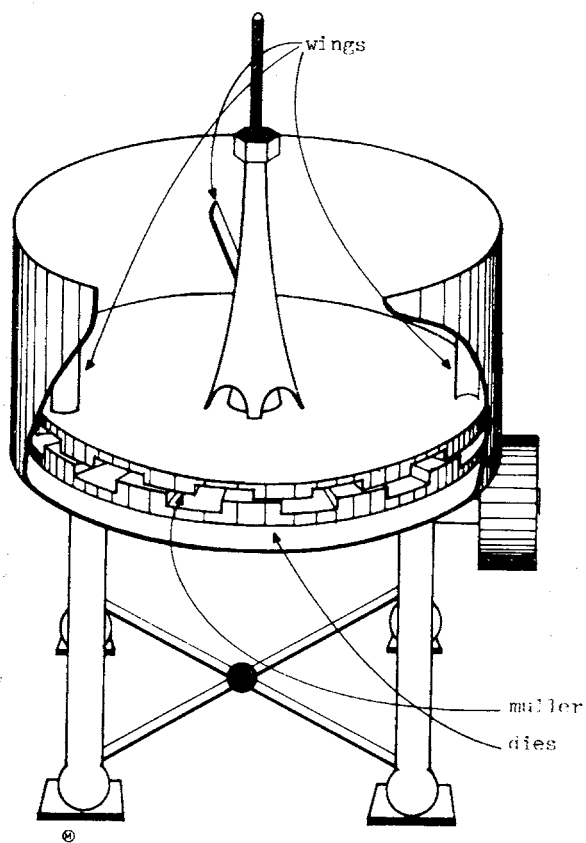


Figure 3 Concave buddle



© Figure 4 Brown and Stanfield concentrator



© Figure 5 Wheeler pan

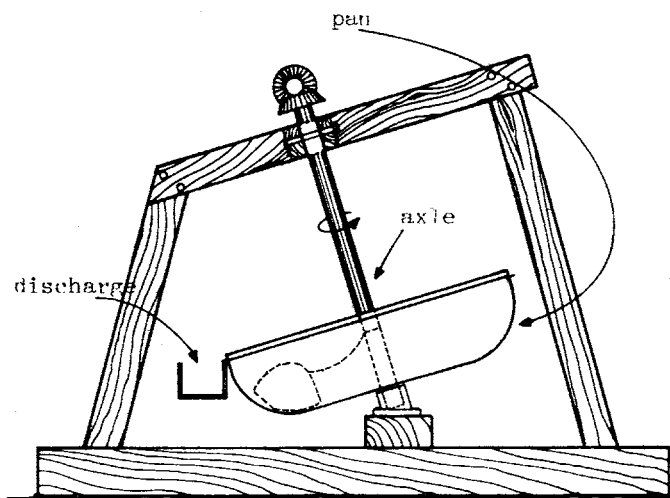


Figure 6 Berdan pan

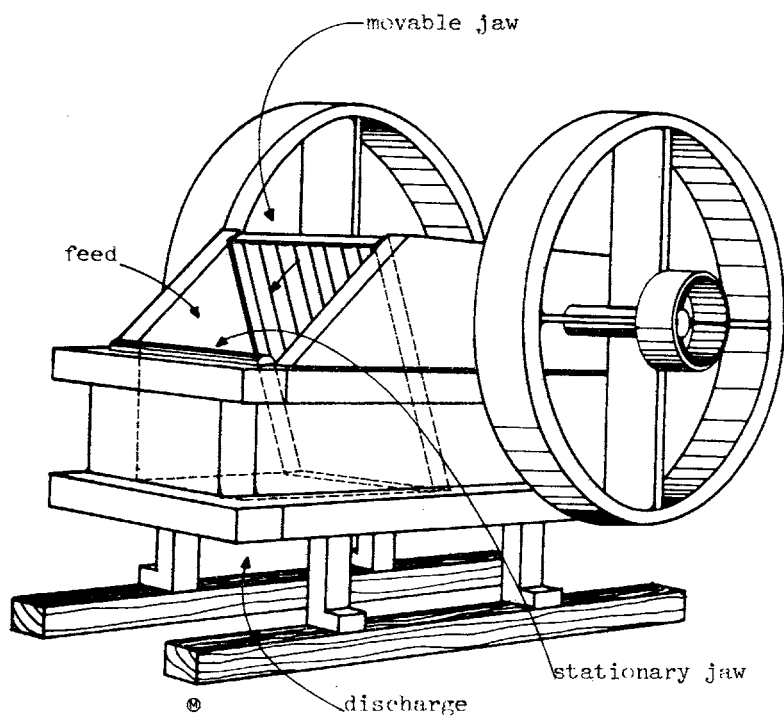


Figure 7 Blake Rock Breaker

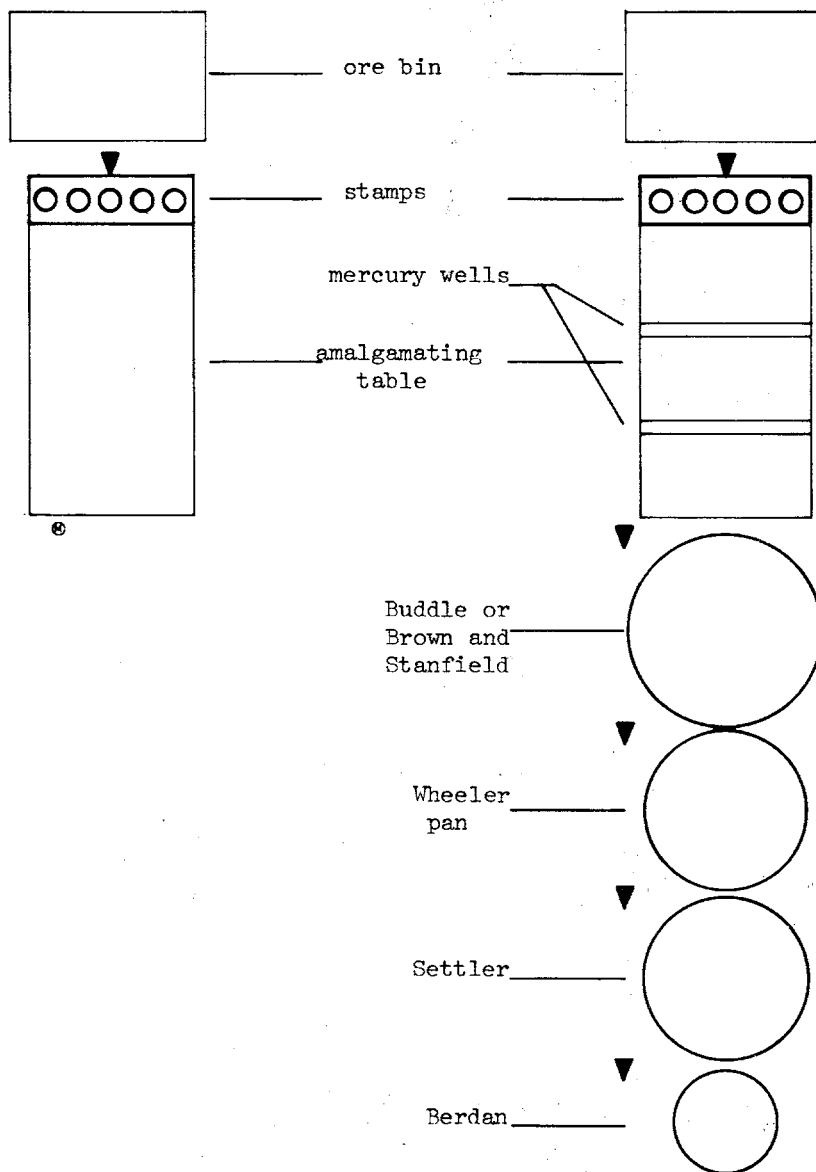
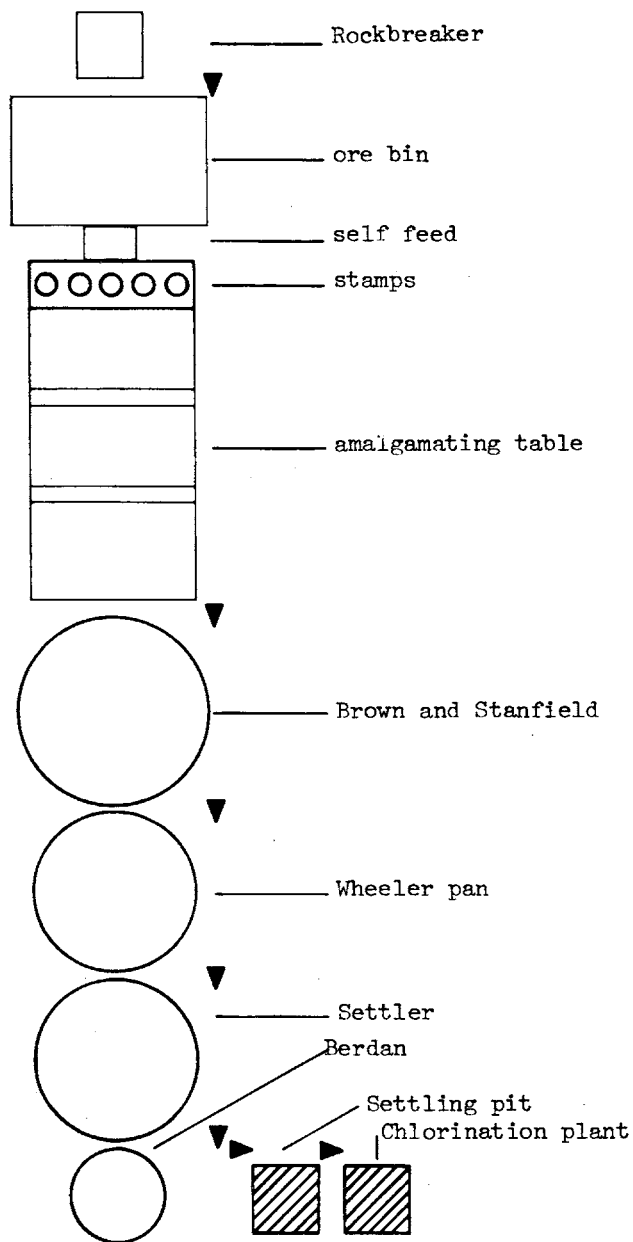


Figure 8 Flowsheets 1872 and 1878



® Figure 9 Flowsheet 1886

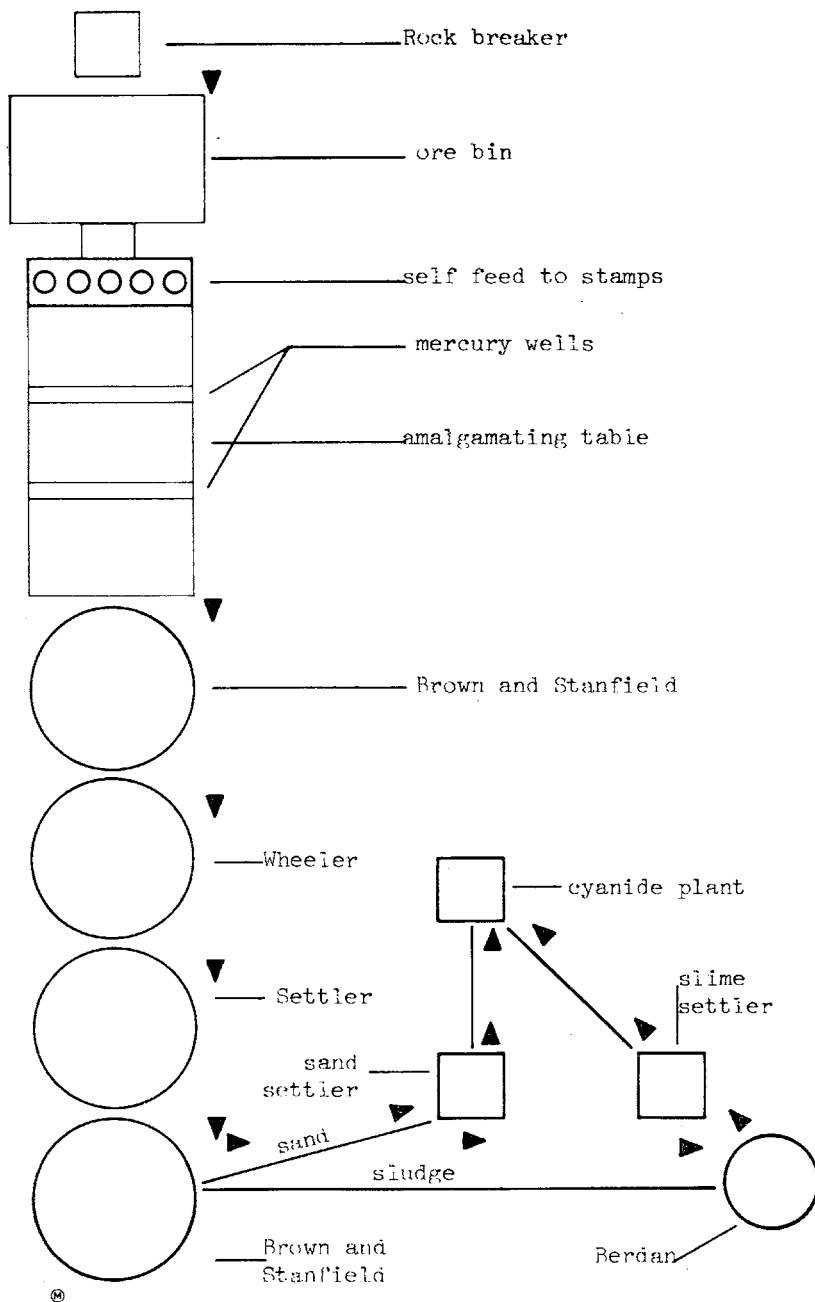


Figure 10 Flowsheet 1901

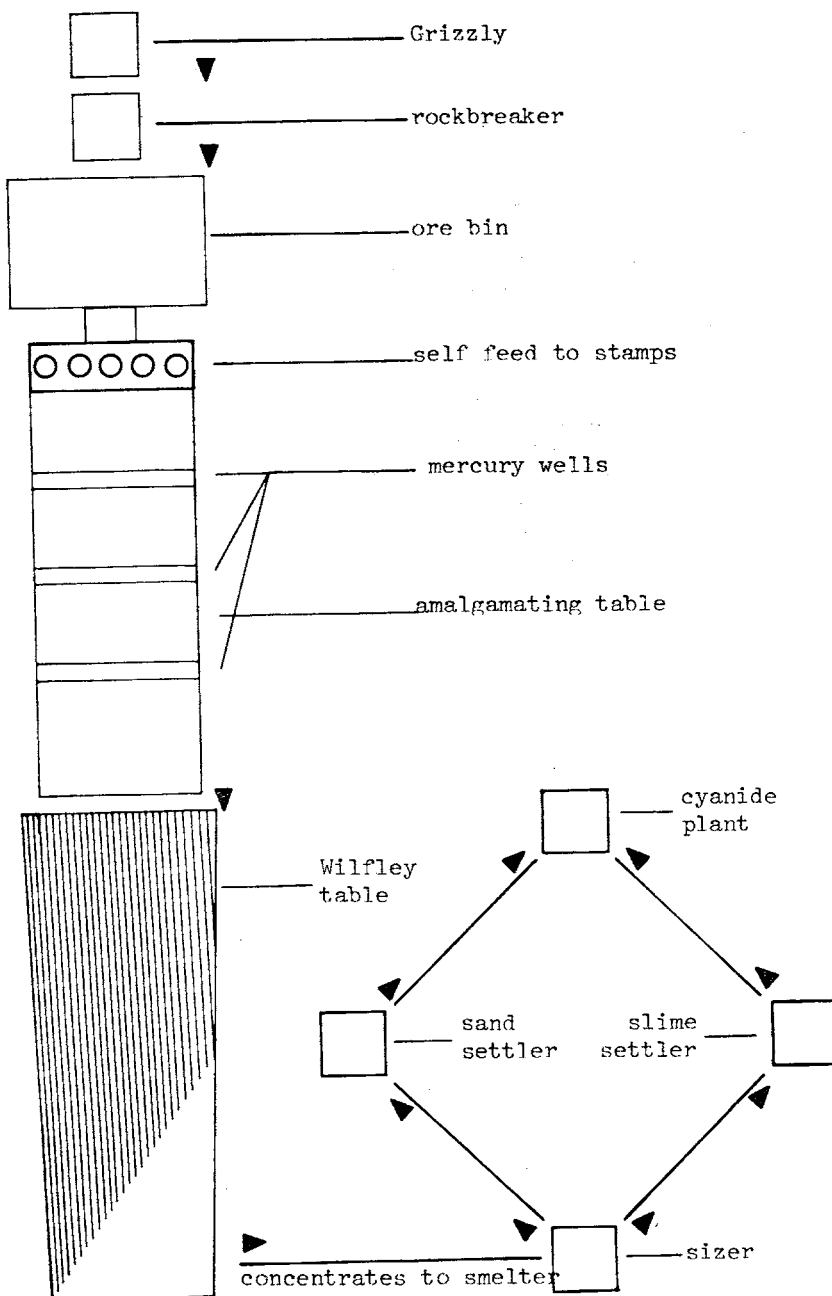


Figure 11 Flowsheet 1917

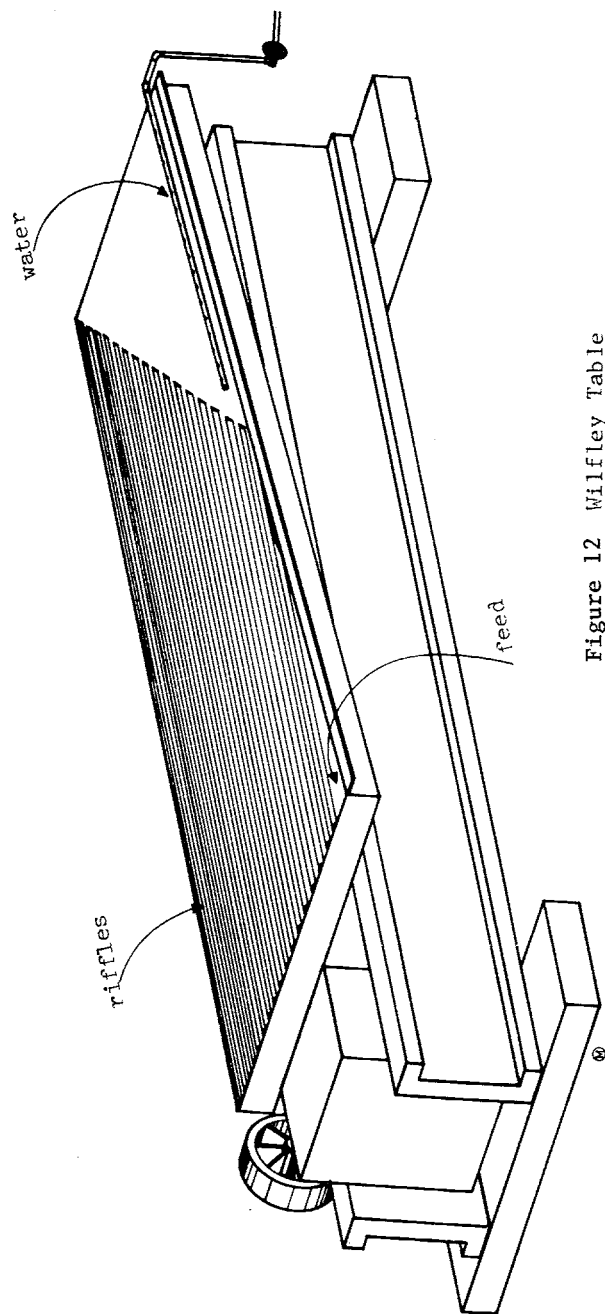


Figure 12 Wilfley Table

TREES TO BURN: SETTLEMENT IN THE ATHERTON-EVELYN RAINFOREST,
1880-1900

Terry G. Birtles

The Europeanization of part of the north Queensland rainforest environment entailed major changes in the Aboriginal society there and in the structure of the rainforest (Birtles, 1967). The following reconstruction of what happened is based on evidence collected from a variety of sources, including the first geological and land survey plans, early observations recorded by travellers, prospectors and naturalists, official reports to governmental authorities, and regional newspapers. The memory and documents preserved by representatives of dozens of pioneer families interviewed between 1961 and 1965 have been of particular value. A comprehensive collection of photographs has been assembled and a small selection is included. Regrettably, since only the sketchiest hearsay comments could be obtained from Chinese and Aborigines of the district, the viewpoints of their forebears were beyond recapture.

The Physical Setting

Two plateaus constitute the Atherton-Evelyn study area. These form part of a series of stepped surfaces characteristic of the faulted and uplifted landforms of this part of Queensland (figure 1). The term tablelands traditionally has been applied by local usage but great variations persist in the boundaries identified for the 'Atherton Tableland'. For this study, the geographical limits are taken to coincide with the steepest slope of several marginal scarps because this obstacle to transport, from the time of the first European visitors, has created the impression of a tabular landform. With the exception of the watershed delineation of a northwestern boundary and a rise in relief to the Lamb Range and Bartle Frere (Queensland's highest peak, 1622 metres above sea level) a scarp of from 100 to 300 metres borders the two plateaus. The Evelyn Plateau with a mean height of 975 metres above sea level and an area of 435 sq kilometres is higher and smaller than the Atherton Plateau (760 metres above sea level and 710 sq kilometres in area). An escarpment generally exceeding 200 metres divides the two plateaus as a prominent obstacle to east-west traffic.

Structurally, the district consists of uplifted granite intrusions, or batholiths, over which an extensive outpouring of Tertiary olivine basalt lava has flowed from a series of vents (see figure 2). Atherton basalt covers most of the plateau of that name, the eastern portion of the Evelyn Plateau and the deep subsidence valleys east of the study area. Several scoria cones, composite cones and a shield volcano have been built from alternate accumulations of flow and pyroclastic material near the vents. Debris from late stage explosive outbursts has cast a mantle over part of the basalt (Best, 1960). The Tertiary peneplain has been fractured with consequent readjustment of the drainage pattern.

Rainforest appears to have reached a climax form on the red-brown krasnozen soils which formed on this basalt to depths of up to 20 metres. A variety of less fertile permeable red earths also developed under rainforest but in association with metamorphics, some granite exposures and the rhyolitic Glen Gordon and Walsh Bluff Volcanics. In many places, these earths do not appear to have supported rainforest. In the west of the Evelyn Plateau, granitic shallow to skeletal solonized soils are associated only with sclerophyll forest and open grasslands. Elizabeth Creek Granite has been found to contain ores of tin, wolfram and molybdenum (White, 1961).

The natural dispersion of rainforest flora has been controlled by heavy rainfall, adequate drainage and soil fertility. A century ago, the western periphery of the rainforest coincided with the fringe of the drier rainshadow zone to the lee of the coastal slopes - a margin which approximates closely to the 1300 mm isohyet of mean annual rainfall. Only east of this apparently critical limit does mean annual rainfall remain in excess of the mean potential evaporation-transpiration loss of moisture. Locations within this zone where rainforest has not flourished can usually be identified as swampland or as rocky ridges with skeletal soils. Kershaw (1978, 1980) suggests Atherton rainforest to be no more than 12,000 years old, dating back to the most recent glacial period. Webb and Tracey (1981) associate north Queensland rainforest with Gondwanic origins, although many genera and species may have been lost through subsequent climatic change.

The botanical term of tropical rainforest was coined only as recently as 1903 by Fisher in his translation of Schimper's notion of 'tropische Regenwald' (Schimper, 1903). For the period of study, the word 'rainforest' was never applied, the preferred term being vine scrub, although an occasional English visitor sometimes substituted jungle. 'Scrub' is still locally used to distinguish rainforest from more open areas of 'heavy' or 'light' hardwood sclerophyll 'forest'. Such terminology may bewilder persons accustomed to the more typical Australian practice of reserving 'scrub' for more stunted vegetation forms. 'Vine scrub' is now outmoded but it has always been reserved for rainforest and it should not be mistaken for turkey-bush scrub, a description used to embrace a wide variety of melaleuca and leptospermum associations found in more northerly parts of Cape York Peninsula.

The rainforest of the Atherton-Evelyn district consisted of a highly complex, prolific growth of evergreen, together with a few deciduous, hardwood trees but the vegetation was not closely similar to the eucalyptus associations which dominate Australia. Distinctive characteristics of undisturbed rainforest include a wide variety and dense spacing of tree species, an overwhelming majority of woody plants and a pronounced floristic affinity with Indo-Malesian species, including associated lianes (vines) and herbaceous plants. Webb (1981) provides a more detailed description of Australian rainforest characteristics. On the richest soils of the Atherton Plateau, as many as forty tree species per acre have been recorded while at least fifteen

species per acre would be expected on less fertile soils. Species do not follow any uniform pattern of spatial distribution but relate closely to microtopography. Emergent giants of several species, especially red cedar (*Toona australis*), kauri (*Agathis palmerstonii*) and various forms of 'strangling fig' (*Ficus* spp.) once protruded above the canopy. The density of growth created a closed ecosystem with its own microclimate and lower air temperatures, an increased level of humidity and a reduced seasonal variation in available soil moisture. Within this environment, the only perennial streams of the Atherton-Evelyn district found their source.

Early European Conceptions of North East Queensland

The first impressions of the Cape York Peninsula by Iberian mariners led them to dismiss this environment as arid, barren, economically useless country inhabited by 'extremely cruel, savage and barbarous natives, who surprised and murdered nine of our men' (Carstenzoon, 1623). It was left to Cook to map the east coast with its 'woody' sections and its Aboriginal inhabitants who were 'the colour of wood soot or a dark chocolate' (Beaglehole, 1955:358). The Barrier Reef and remoteness from Port Jackson discouraged colonial interest in north east Queensland and early coastal surveys did not include orders for inland ventures until after Leichhardt's overland journey from Darling Downs to Stokes' 'Plains of Promise' and Port Essington (1844-45). The first Europeans to traverse the Atherton-Evelyn district were the members of Edmund Kennedy's ill-fated expedition.

In May 1848, Assistant Surveyor Kennedy landed from a small barque on the northern beach of Rockingham Bay. On the assumption that the country to be covered would be open eucalypt forest similar to that observed only sixty miles to the west by Leichhardt, the supplies and equipment accumulated for the thirteen men was judged as 'amply sufficient' and included 28 horses, three carts, a flock of one hundred sheep for food, attendant sheep dogs as well as a ton of flour, 600 lb of sugar, a quarter cask of ammunition and 150 lb of gunpowder and shot (Carron, 1849). Kennedy did not realise that rainforest enclosed the lowland upon which he had landed and he was to 'confess a viler looking country never looked me in the face before' (Beale, 1970:155). When the barque and its escort, HMS *Rattlesnake*, sailed there was general anticipation of success and a sketch (figure 3) by Thomas Huxley, the Assistant Surveyor on board, depicts Kennedy accompanied by two spirited horses sauntering somewhat casually through a woodland along a path from which it was necessary to hack only an occasional impeding vine. The sketch illustrates the degree to which difficulties of penetrating the 'scrub' were underestimated. Kennedy initially established friendly relations with the Aborigines who assisted with several creek crossings. One vacant camp was visited but the shields, wooden 'swords' and other implements examined were left where they were found.

By the time Kennedy had scaled the escarpment of the Cardwell Range and reached the western margin of the rainforest, the party was exhausted, the carts had been discarded, more than half of the flour was consumed, the sheep were dying from lack of suitable pastures and intestinal disease, a decision had been taken to eat the fatigued horses as they collapsed and relations with Aborigines had deteriorated to the point that four had been shot. During the ensuing months, the weakened men were vulnerable to reactions from Aborigines who sought to drive the trespassers from tribal preserves by firing the grass and by a few desultory spear throwing incidents. The final tragedies impressed the southern press, the colonists and the government of New South Wales with the dangers of venturing into the Peninsula country.

It is significant that whereas the barbarity of a 'ferocious tribe of savages' was highlighted as the primary reason for the expedition's lack of success (NSW Government Gazette, 9 March 1949) the Sydney Morning Herald (6 March 1849) stressed 'that the black natives are only answerable for one death, that of Kennedy himself, and that the other unfortunate men died from other causes'. The main result of public vindication of this episode was to create an unjustly distorted belief in the hostile motives of 'giant myalls' of north-east Queensland - a belief which discouraged further European interest in the rainforest until the pastoral occupation of the tropics two decades later. News of the Kennedy disaster coincided with the report that Leichhardt's party was missing, presumably annihilated by Aboriginal savagery, and the NSW Legislative Council voted to form a native police force to provide protection for settlers advancing northwards.

When Queensland was proclaimed a colony, only the south-east 'corner' was occupied by European settlement. Rockhampton was the northernmost town and port. The majority of settlers were squatters who provided 70 per cent of the colonial revenue and nearly 94 per cent of the exports (Queensland Statistician, 1861). Soon after the return of an exploratory party from the Burdekin valley, the new ports of Bowen and Mackay were established and much of north Queensland was thrown open to pastoral selection. During the next five years as families of pioneering sheep pastoralists moved northwards, the margin of European culture advanced so rapidly that by 1865 the area of occupation had increased twentyfold. The taking up of the Mt Surprise and Fossilbrook runs brought this pastoral fringe to within a hundred kilometres of the Atherton-Evelyn rainforest. Copper deposits were discovered near the Einasleigh River and Townsville and Cardwell were proclaimed ports of entry to the newly occupied land. Graziers, soon conscious of the unsuitable quality of the pastures, high labour costs and the unpredictable climate, began to relace their stock with cattle. Along the coast, cedar cutters moved into the rainforest of the Pioneer and Herbert valleys and sugar cane plantations were cleared on these alluvial lowlands (Bolton, 1963).

By 1870, a series of gold discoveries had lured prospectors northward as far as the Gilbert River headwaters. Georgetown became the frontier town of the north with crushing mills attracting ores carted from more than 120 km away. Two years later, a government-assisted exploratory team, led by William Hann, mapped the headwaters of the Mitchell, Palmer and Normanby Rivers, but access to the coast was halted by the formidable obstacle of 'vine scrub'. Hann reported the existence of 'native paths' through the rainforest and followed one of these to the coast north of the Bloomfield River. It was necessary to clear the path, chop through fallen logs, cut out roots and vines and bridge small creeks in order to coax the pack horses along. Even with the assistance of voluntary Aboriginal guides who directed the party to grass patches, the feed was sour and bad for the horses. Eventually, Hann decided to skirt the rainforest because 'there is not the ghost of a chance of finding a track to thread these mazes, and to endeavour to penetrate them would have been madness' (Hann, 1873:1041).

Nevertheless, Hann's report of gold traces in the Palmer River alluvium triggered a rush of prospectors which led to the opening of Cooktown as a port and commercial centre. Those fortune-seeking fossickers living in boisterous free-living camp communities were largely uneducated men who brought with them the highest illiteracy rate in the colony. Their contact with Aborigines resulted in many tragic massacres of this 'despised race' (Jack, 1921:421,423). Some sites are perpetuated as Battle Camp, Revolver Point and Cannibal Creek. Police 'protection' was provided by a detachment of Aboriginal troopers but many Europeans preferred their own methods of 'reprisal' on a 'copper-coloured race of natives who are fierce and warlike, very treacherous, and have no more fear of a bullet than a spear. They will show fight in the face of odds and seem perfectly indifferent to the chances of being shot' (Queenslander, 29 November 1873).

The transport of supplies from the coast to the goldfields proved an expensive and difficult operation, as Hann had forecast. Floods and malaria became the curse of the wet season and, because of a scarcity of suitable pack animals, the Chinese seized the opportunity to establish a cheaper and often faster coolie freight service. Commander Douglas-Douglas (1909:91) recalls the bondage ties which enabled Chinese men to leave their families in Kwangtung and emigrate to the Palmer goldfield:

The course of procedure was this: A steamer landed 400 or 500 Chinese, nearly all of whom belonged to the coolie class, who were in debt to the Chinese guilds for their passage, and for which their wives and children were in pawn until the debt was liquidated. This was done in two ways - by carrying loads of goods up to the fields and by the weaker ones, on arrival, being placed to dig, and their findings being appropriated until the debt was paid; after which they worked on their own account. The stronger coolies were kept carrying stores until they had cleared themselves, which was generally in two trips.

These 'Asiatic aliens' arrived by the shipload and began to concentrate on discarded claims, often with substantial success (Cooktown Courier, 15 September 1875). By 1877, the Chinese population on the Palmer goldfield had climbed to a peak of 17,000 and outnumbered Europeans by 52 to one. Historians have suggested that 'hundreds of Chinese were killed in ambush' by Aborigines along the tracks to the Palmer (Stoodley, 1951) but only a handful of attacks can be substantiated from police records which also suggest that most blame was better directed towards unscrupulous European opportunists. The exaggerated risks of being speared have been preserved by colourful folk tales of the period (Pike, 1978). Norman Lindsay's more recent sketch depicting a slaving, blood-thirsty paleolithic predator loping in for the kill (figure 4) portrays the distorted outlook which Europeans and Chinese in north Queensland once shared towards their common 'foe' - the Australian Aboriginal.

The Hodgkinson rush of 1875 demonstrated the need for shorter access to the coast. Efforts to open routes along 'niggers' tracks' through the rainforest to Trinity Bay were discouraged by the steep scarps and continued skirmishes with the Aborigines (Collinson, 1939; Pike, 1956). An official port site was known as Thornton, Smith's Landing and Dickson before the town was surveyed and named in honour of Cairns, Governor of the day. However, a dray road blazed by Christie Palmerston and Billy Lakeland to the alternative port of White Cliffs (later renamed Port Douglas) proved more satisfactory than the pack trails to Trinity Bay and the postmaster, land office and district courts of Cairns were transferred. Only the completion of a telegraph line to Thornborough and the arrival of cedar loggers gave reason for the survival of Cairns as a village.

Cairns was not lacking in speculators and land boosters who began to contemplate the untapped timber wealth and agricultural potential of the coastal lowlands. In a bid for prosperity, they successfully petitioned the Lands Commissioner to survey the new town of Redbank as a possible deepwater 'harbour' for ocean steamers. This opened in time for a brief gold rush to the Mulgrave Valley and it exposed the coastal lowlands to teams of loggers who floated the cedar downstream as rafts. No control and very few records were kept of cedar logging. By 1880, in the vicinity of Cairns alone, three years of activity yielded more than a million super feet of timber for export. A year later the Under Secretary for Lands, W.A. Tully, appealed to the Queensland parliament:

We are exhausting the stock of some of the most valuable timber trees more quickly than it can be replaced by the natural growth of young ones, and this is going on all around us. In some districts the cedar has disappeared, and the young trees before they have attained maturity are cut down without scruple (Tully, 1881:145).

Tully's attempt to introduce restrictions to preserve the cedar remnants was passed over, and in the year of publication of his report the cedar

cutters invaded the Atherton-Evelyn district, the last untouched domain of the red cedar tree in Australia.

West of the rainforest, the lucrative goldfield market for meat attracted graziers from the south, particularly from runs resumed for agricultural settlement. All available grassland was quickly taken up and stocked with cattle under the terms of the Pastoral Act of 1869 which established a minimum stocking capacity to prevent 'dummy' selection. In July 1877, one overlander, John Atherton, took up a selection of runs immediately north of the plateau which now bears his name (Queensland Government Gazette, 17 August 1882). Two years later, Atherton and James Robson located a deposit of alluvial tin on this property and several tons exported by Gin Sing & Co. through Cairns from Tinaroo, Jack's Camp and Fiddler's Gully (Clarke's Camp) reached the unexpectedly high price of 60 pounds per ton (Cairns Advertiser, 26 June 1879; Hodgkinson Mining News, 6 December 1879). For the first time, European prospectors began to search for non-auriferous metals. Within a few months, discovery of a major stanniferous lode in the Wild River Valley prompted Australia's first tin rush to the mining camp of Herberton, a settlement distinguished by its proclamation as a 'white man's town'.

The Crown Lands Alienation Act of 1868 provided for two kinds of timber licence but very few limitations were imposed upon loggers. Worse, insufficient officials were appointed to inspect cedar cutting operations. A lone harassed Crown Lands ranger based in Cooktown and equipped only with a horse was unable to keep track of the elusive raftsmen operating along the coast between the Daintree and Johnstone Rivers. The only other authority in the vicinity was the Herberton Crown Land Commissioner who combined the duties of Police-Magistrate, Mineral Lands Commissioner and High Bailiff and who was kept fully occupied with demands for mineral leases as fossickers extended their interests westwards from Herberton.

Very little has been written about the early operations of north Queensland cedar cutters, partly because many of their activities were illegal. It is known that in the years 1881 and 1882, at least twelve pairs of pit sawyers operated on the northwest margins of the Atherton-Evelyn rainforest cutting no other timber than red cedar (Fox, 1923). Because thirty general timber licences were registered in Herberton, it is likely that the number of cedar cutters was higher. Loggers' camps on the banks of The Millstream and at Mill Creek, further north, marked the first penetration of 'vine scrub' at Cedar Creek but most logging operations took place in the 'Tinaroo district', the first official description applied to land immediately east of the Herberton Range. Here the first logging camps were set up at Mazlin Creek and along the north western rainforest fringe close to the Port Douglas road (see figure 5). As the sawyers moved towards the Barron River, particularly dense stands of cedar were located, with access provided by Robson's Track, the packers' trail to Cairns. The cedar trees were considered to be larger than those of the coastal valleys and individual

specimens yielded as much as 25,000 super feet from the barrel (Fox, 1923).

The pit sawyers depended upon Kanaka axemen to assist with tree felling operations (figure 6). The first operation was to cut down all likely trees as close to the ground (i.e., above the buttresses) and as quickly as possible. Once the cedar trees had been felled, the most suitable were pit-sawn by cross-cut saw into boards (figure 7). The remainder of the fall was abandoned to rot in the rainforest debris. As soon as a stand was depleted, a new pit was hurriedly set up close to the next stand. The tradition of extravagant cutting was followed in the region.

A clause in the Crown Lands Alienation Act entitled the Crown to confiscate all timber not removed within twelve months but, unless the logs were sawn, no practical means was available to transport the timber over the range to Herberton. As an effort to provide some control, in August 1882, an area of 134 square miles of rainforest immediately east of the Barron River was declared a timber reserve (Queensland Government Gazette, 19 September 1882).

In 1882 timber cut from the Atherton-Evelyn rainforest was sold to the mining camp market. Several pairs of sawyers were employed by a Herberton agent, but most of the pit sawn cedar was purchased by dray carters who realised their profits when the timber was delivered to one of the western townships. Some cedar was purchased for house frames and as weather boards. Cedar shingles were 'chipped' for roofing and the timber was used in mine shafts. Cedar boards were cheaper than alternative building materials which were made uncompetitive by heavy freight charges. Pit sawyers charged five shillings per hundred super feet for boards and, by common agreement, part of this amount was often paid in spirits, clothing and provisions. The Kanaka axemen were awarded from 2 pounds to 2 pounds 10 shillings per month in addition to rations (Fox, 1923).

The sawmill at Martin's camp became a popular loading point for drays heading back to the Hodgkinson towns. Each shanty hotel along the route was considered a convenient half-day journey. At Peterson's hotel on Scrubby Creek pit-sawn boards were marketed. Garland's camp was permanent enough to be applied for as an agricultural selection (see figure 5). Some cedar loggers were employed by intercolonial firms who sold on the Sydney and Melbourne markets for prices ranging from 25 shillings to as high as eighty shillings per hundred super feet. Years later, a resident of the district recalled:

The most appalling waste of cedar was that on the Atherton country .. When the town of Herberton first started, nearly all the timber came from the Atherton scrub. Red Cedar was the most abundant, and the most easily obtained and cut, so Herberton is chiefly built from beautiful red cedar, even the stables, closets, and fowlhouses being of what is now our

rarest and most priceless timber. It was mostly cut by pit sawyers at Scrubby Creek, and charged at a pound per hundred feet at the pit, regardless of the cost of haulage to Herberton. In 1882, a young lawyer at Port Douglas, Ernest Milford, now of Bond Street, Sydney, drew an agreement whereby two timber-getters, Tom Thomas and Phil Garland were to cut three millions of feet of cedar for Captain Foulis and Blair of Melbourne. That was the first Atherton cedar to be cut for sending to the coast ... Burns, Philp and Co. came into the cedar-cutting business and amongst them, about 15 to 20 million of feet of red cedar were cut before all concerned knew how they were going to get a log of it to the coast. There was only one possible outlet, and that was down the Barron River in flood, an insane idea, considering the terribly rocky channels, the 500 feet plunge on to solid rocks at Barron Falls, a further plunge of another 150 feet on to more rocks and then that awful journey down the Barron Gorge to the open river. About a dozen logs came down in a state fit only for a pulp mill. All the rest of that magnificent cedar rotted in the Atherton scrub, except about a million feet recovered by Captain Foulis and sent to Cairns by train. At least 15 millions of feet were destroyed. I was living on the Barron all through that period, 1882 to 1889, and know the whole story so there is no mistake (Meston, 1934).

Agricultural Land Selection

A feature of the early European settlement in north Queensland was the absence of unwelcome interference by government officials beyond the imposition of mining licence dues and a benevolent attitude towards law and order. The provision of geological and land survey teams, mining wardens, district land commissioners, police protection and educational, hospital, quarantine and immigration services was organised from Brisbane. With the exception of the enforcement of discriminatory legislation against the Chinese, there is little indication that the colonial government was aware of all aspects of land occupation in north Queensland, more than a thousand miles away. Queensland government policies towards settlement were protective of small farmers and were influenced by the considerable assistance given to attract immigrants after 1861. The Homestead Act of 1872 was designed to promote agricultural settlement but distance from markets limited the influence of this Act to the interests of land speculators who relied on tenants, usually Chinese, to meet the conditional clauses of occupancy. Most agricultural land north of Bowen was selected as sugar cane estates, particularly by Irishmen and Brisbane investors (Queensland, Department of Public Lands, 1880). The goldfields markets stimulated some interest in the small scale cropping of maize (or corn as it was known throughout Queensland) under the monopoly of Chinese tenant farmers in the Cooktown police district. Palmer provides an important record:

In some parts of the district systematic farming has commenced. In other parts it has commenced in the most rude and rough manner imaginable, by merely burning off the undergrowth, and planting the grain with a planting stick among the growing timber at Cairns; and such has been the productive quality of the land that it has given a return of 140 bushels per acre (Palmer, 1879).

Until 1882, cultivation in the Atherton-Evelyn district was restricted to small market gardens tended by Chinese near Scrubby Creek and along the Wild River downstream from Herberton (see figure 5). These gardens, leased under provisions of the Mineral Lands Regulations, supplemented the inadequate pack supply of corn and vegetables from Cairns. The total cultivated in 1882 did not exceed twenty acres. Heavy summer rain provided several periods of insecurity by breaking coastal transport connections and threatening food stocks.

In Brisbane, the Government was aware of the urgency of establishing northern settlement on a more secure basis. Following a hasty survey, the Department of Public Lands opened 123,350 acres of 'basaltic tableland' in the Tinaroo district for agricultural selection (Queensland Government Gazette, 19 August and 23 September 1882). This area included all rainforest west of the Barron River. An eastwest survey line immediately north of Mazlin Creek (line AB - figure 5) was chosen to separate 'rich agricultural land covered with vine scrub' from land described as 'lightly timbered'. Selections in the former zone were limited to a maximum of 320 acres but, from the survey line north to John Atherton's Emerald End head station, 'blocks' of up to 1280 acres could be applied for at an upset price of ten shillings per acre. For the administration and sale of land two parishes, Barron and Tinaroo, were defined suitable watersheds providing their boundaries (see figure 5). Much of the Parish of Tinaroo was land withdrawn from John Atherton's lease because it was located within thirty miles of the coast and, hence, lay within the new zones of the Settled District.

The scheme invited selection before survey but high prices were set as a deliberate policy to discourage speculators. Nevertheless, the quality of cedar on the land guaranteed a good sale and, by December 1882, approval was granted to 58 selections totalling 17,460 acres either as freehold agricultural homesteads or as conditional selections purchased for the 'purposes of bona fide settlement' (see Appendix). The mean average price of one pound and two and a quarter pence per acre was higher than for any other land sale of the year and compared favourably with the colonial mean average price of 12 shillings and two and a quarter pence per acre for all homestead land sold in 1882. Because of the interest of coastal settlers in the development of alluvial land in the new sugar cane districts of the Cairns-Johnstone lowlands, most of the land sold at the Herberton auction was bought by local residents. To convert a selection from leasehold to freehold, conditional selectors were required to pay farm survey fees and provide visible evidence of the improvement of the property within five years by

the removal of part of the rainforest, construction of a 'vermin-proof fence', cultivation of the soil and the erection of a dwelling.

Most of the selectors were single men, usually prospectors and packers, who recognized the agricultural potential of the basaltic soil but branded the rainforest as 'scrub' because it was considered useless once cedar trees were cleared. Very few men possessed previous farming experience and only a small proportion was prepared to tackle the exhausting task of clearing the land. Instead, the tenancy system practised by sugar cane farmers near Cairns and Geraldton (later renamed Innisfail) was introduced to fulfil residence requirements and Chinese began to be attracted to Scrubby Creek by five year leases offered by absentee European land holders. A further seventy-five square miles of land were resumed from the Evelyn and Eve Linn West pastoral runs south of Herberton. Part was sold in 1883-84 as agricultural selection and suburban lots in the vicinity of the Nigger Creek police troopers' camp (figure 5). Many homesteads along the trial railway surveys from Mourilyn to Herberton were withdrawn a year later (Queensland Government Gazette, 31 May 1884) and land for a proposed Cairns to Herberton railway was also reserved.

The principle of selection was altered by the Crown Lands Act of 1884, often known as the Dutton Act, in an attempt to reform land law. The Act was not considered a success (Roberts, 1924:302-3). The Chinese tenancy system of the Atherton-Evelyn district contradicted the intention but not the terms of the Dutton Act which endeavoured to encourage new immigrant European settlers. Agricultural land could consequently be leased for fifty years or converted to freehold at any stage of the period provided that an annual rental was paid, the selection was enclosed by a vermin-proof fence of slab timber within five years and that 'the Lessee must occupy the land continuously and bona fide during the term of the lease' (Pain and Woolcock, 1889). According to other specifications of the Act, it would seem that Chinese could not qualify as agents. Nevertheless, as Chinese migrated from exhausted claims on the goldfields, many took up tenancies on rainforest selections.

Early European selectors cleared the rainforest to expose the soil, usually confining their activities to five acres, the limit which one man could crop on his own. The task of clearing the 'scrub' was simplified by the practice of cutting a deep nick in all trees for an area of up to an acre and then chopping one tree to topple the rest as it fell. Since the 'drive' of fallen logs was oriented in the same direction, the procedure of 'burning off' the timber and other debris was easier. Usually only cedar was recognised as commercially valuable but in a few instances logs of walnut and black bean were pit sawn for the construction of a small rough slab hut. 'Grubbing' the soil with a hoe to remove the tangle of roots was back-breaking and time-consuming, with discomforting exposure to scrub-itch mites (*Trombicula* spp.) and land leeches. Wherever possible, this duty was delegated to Chinese tenants. Stumps were left in the ground to rot, a process which prevented the use of the plough for at least six years after clearing.

Many selectors did not consider the exposed 'scrub soil' to be as immediately productive as 'forest soil' north of Martin's camp - possibly because of interference from the tangle of roots and the heavy cover of leaf debris. Maize was planted among the stumps.

Maize, or corn, was the staple crop of practically all agricultural districts throughout Queensland. Its advantage was that it was a poor man's crop which could be sown among the stumps and ashes of burned debris. It required the simplest of appliances and, if it could not be sold for fodder, it was easily diverted to human consumption as a wholesome meal. In 1888, it accounted for two-thirds of the area cultivated in the Atherton-Evelyn district (see Appendix, Table 2). Yields averaged less than thirty bushels per acre, which was only slightly higher than the colonial mean yield. Local prices of eight to ten shillings per bushel were assessed an economic return, although oats was recognised as more valuable, despite low yields, with command of high prices ranging from 15 pounds to 20 pounds per ton. Maize cropping was supplemented by the cultivation of English and sweet potatoes, pumpkins and chokoes.

The first selectors were impressed by the cool climate and experimented with a variety of crops. Lucerne found an immediate market. Table grapes grown near Herberton sold at one shilling and sixpence per pound and oranges proved so popular in mining towns that sixteen acres of orange groves were planted. Local fruit produce included apples, peaches, apricots, lemons, limes, bananas and pine-apples (Cairns Post, 29 December 1888). Frosts hindered efforts to raise sugar cane near Nigger Creek but it was hailed as a successful crop in the protection of the 'scrub' alongside a wheat crop which yielded 42 bushels per acre (Cairns Post, 5 March 1885).

A more unusual venture was an attempt by one selector to plant young cedar trees which he observed grew 'with great rapidity wherever the light and air is obtained in the jungle' (Land Commissioner, Herberton, 1885). Near Nigger Creek, at least two dairy herds supplied milk for Herberton, even though many miners kept goats (Herberton Advertiser, 4 October 1884). Another selector at Nigger Creek erected steam pumping machinery to irrigate as much as thirty acres in order to obtain a constant supply of green fodder during the dry season. Plans to import dairy cattle from Bega and to open a cheese factory at Carrington, the village which grew around Peterson's hotel (Cairns Post, 29 December 1888) were announced but they did not eventuate.

The years 1884 to 1886 brought misfortune: most maize crops were destroyed by blight and plagues of caterpillars. The fruit fly and other insect pests infested the orange groves and a prolonged wet season in 1886 spoiled the hay. To add to these hardships, the Aborigines had become attracted to the crops. The Herberton press in 1885 provided the first report of the havoc created on Scrubby Creek selection by Aboriginal 'pilferers' who discovered a taste for roasted maize (Herberton Advertiser, 4 April 1885).

The Rainforest Aborigines

Records concerning the livelihood and culture of north Queensland's rainforest dwellers are patchy but there is clear evidence that they differed dramatically from grassland tribes. The most complete account is the perceptive insight provided by Carl Lumholtz, a Norwegian zoologist who chose to live amongst rainforest Aborigines west of Cardwell for fourteen months in 1882-83, prior to any serious disturbance by European immigration and settlement (Lumholtz, 1887-88, 1889, 1921 and Birtles, 1976). Considerable added detail is given by Roth's ethnological notes (1898, 1901-10). More recently, the memories of an early European settler have been published (Woolston and Colliver, 1975) with comments similar to information given to this writer during interviews with Atherton-Evelyn pioneers. A number of important observations are contained in the journals of explorers such as Dalrymple (1874), Mulligan (1877), Christie Palmerston (1885-86), Jack (1888) and Johnston (1903-04). Official reports were prepared by Meston (1889, 1896) and Parry-Okeden (1897) and anthropometric studies of the rainforest dwellers were conducted by Roth (1898-99), Mjoberg (1918, 1925), Tindale and Birdsell (1940, 1941) and Macintosh and Larnach (1976). Several studies of linguistic and tribal boundaries, particularly in the Atherton district, have been completed by Dixon (1966, 1976).

The most distinctive feature of rainforest Aborigines was their short stature and pygmy characteristics (figures 8 and 9). Tindale (1976:14) notes that these people developed particular skills in tree climbing 'plus knowledge of how and when to gather products in the canopy of the forest, as well as detailed knowledge of how to eliminate the several poisonous alkaloids, saponins, and other deleterious principles inherent or seasonally present in some of the foods'. He concludes that 'such specialised skills gave them positive advantages over any invading or potentially usurping peoples from the grasslands of the west who might try to make entry into their domain'.

The first map of the distribution of north Queensland Aborigines suggested that more than 500 lived within the Atherton-Evelyn district (Parry-Okeden, 1897). Camp sites were relatively permanent and linked by well-beaten tracks to a seasonal cycle of migration. During the wet season, the Aborigines moved away from the rainforest to avoid leeches. Leaf or grass-clad huts (mia mias) were more elaborate shelters than the gunyahs of grassland Aborigines and they gave protection during down-pours. Each mia mia was constructed on a framework of vines (figures 10 and 11). When they were occupied, small fires protected from wet weather by a drain and a small leaf-covered framework were maintained at the entrance. Fires were lit in the usual Aboriginal manner by firesticks which, in the Atherton-Evelyn district, consisted of a flat, elongated, oval piece of hard wood, such as a piece of 'cotton tree' used as the base for a thin 'twirling rod' of lawyer cane. Personal warmth was provided by blankets of possum skin or by a cloth of beaten bark. No other garments were worn.

The rainforest environment prevented the use of boomerang or spear and on foraging excursions the Aborigines depended on nets, pit traps and fish and animal traps made from lawyer vine, coiled grass, bark fibre twine or plaited human hair. Flying foxes, parrots and small birds were caught by smearing the roosting branches with sticky gum from fig trees. The bark of the mangosteen (Garcinia cherryi), used as a fish poison, was placed in stream pools for a few hours in the afternoon. The most important implement, unique to the rainforest Aborigines, was a flat stone axe, usually chipped from basalt and bound on to a lawyer cane shaft. This device was applied for removing bark, for digging into the soil and for chopping open the hives of wild bees. It was not suitable for felling trees. Honey was a delicacy and beeswax, as well as various wood resins, was valued as a glue and binding agent in the manufacture of implements. In order to reach the less accessible bees' nests and the nuts and fruit of the taller trees, the Aborigines scaled the trunks with the aid of a knotted piece of lawyer vine (Lumholtz, 1889c:88-91).

Meat was not as plentiful as in grassland areas. Diet included the berries and young shoots of lawyer vines, kauri seeds, the nuts from such trees as Cycas media (Queensland nut or 'Zamia'), walnut bean (Endiandra palmerstoni syn. Cryptocarya palmerstoni) and black bean (Castanospermum australe) as well as rootstocks of wild yam (Dioscorea spp.). Although some of this food could be eaten in a raw state, many seeds and nuts contained actively poisonous alkaloids which the Aborigines made edible by roasting or steaming, after which they were cut into chips with a snail shell or stone flake knife and then subjected to pounding, sifting, washing and a lengthy process of leaching and fermentation.

The design and decoration of sieve baskets of the rainforest Aborigines were completely different from other Aboriginal tribes. Other unique implements to the rainforest people were broad, flat-bladed wooden clubs and large decorated shields carved from tree buttresses and used only for ceremonial purposes (figure 8). Wood was removed by the use of stone wedges or celts and hardened by a process of repeated soaking and drying. The implement was then shaped, trimmed and polished with various stone scrapers, including the mena or oyurka, a particularly uncommon T-shaped stone artefact which can be traced only to rainforest culture (Kennedy, 1949; Mack, 1961).

A reconstruction of the geography of Aboriginal settlement has been attempted for the north-west fringe of the rainforest (figure 12) but the map gives only a minimum of data. Early European settlers suggested that Oonda means 'little swamp' and Yeetcham (now Lake Eacham) was an Aboriginal word for water. The western perimeter of the rainforest was described clearly by Mulligan in 1877:

... the native track passed on the west side of the scrub right between the range of hills and the scrub. A splendid track, the best native track I ever saw anywhere. There are

roads off the main track to each of their townships, which consist of well thatched gunyahs, big enough to hold five or six darkies. We counted eleven townships since we came to the edge of the scrub, and we have only travelled four miles along it. At certain seasons this must be a crowded place with blacks, which seem to live principally on nuts, for there are barrowsful of nutshells at their camps. ... The natives, I think, abandon this country at the long grass, wet season of the year. Their paths are well trodden and we follow them sometimes for miles (Mulligan, 1877:399).

The Atherton-Evelyn rainforest was the last sizeable refuge for Queensland's Aborigines. The large semi-permanent camp of Cur Cur survived less than four years of contact with European culture. Initially, the Port Douglas road bypassed the 'forest pocket' named after Thomas Prior, the first cedar cutter to camp there (McGeehan, 1951) but the route was shortened by cutting through the rainforest from Martin's camp to Kelly's hotel to avoid the steepness of Bones Knob and to take advantage of more reliable water (figure 5). Bones Knob, at the head of Mazlin Creek, is said to be the location of a massacre of Aborigines.

There is an abundance of records of the violent reaction of north Queensland Europeans to Aboriginal 'depredations' on stock and property. Official 'protection' from Aboriginal 'savagery' was provided by several detachments of Aboriginal troopers allotted the task of 'dispersing' Aboriginal camps - a policy which disguised a multitude of tragedies. A graphic illustration from the Herbert River district was sketched by Lumholtz (figure 13), a scene supported by a contemporary account in the Sydney Bulletin:

He was known as 'Jango', and was a lithe, intelligent boy with no more conception of European ethics than of the atomic theory. Jango's life was possibly like that of many black boys we have known. One day, perhaps, a detachment of 'native police' arrived at the camp of his tribe, made in his father's chest half-a-dozen holes into which you could put your fist, with Snider bullets. Then they outraged and cut the throat of his mother, knocked out the brains of his brother and sister, who were either too old or too young for their purposes, and turned their horses' head towards civilization. One of these hired murderers carried before him on the saddle a little weeping black boy. That was Jango; the inspector commanding the detachment had perhaps promised a friend that he would 'get him a boy' when next he 'dispersed' any niggers; and so he kept Jango instead of grabbing him by the legs, and swinging him against a cedar tree and smashing his skull to jelly. Then Jango was kept at the shanty and made drunk 'for a lark'. Brutal N.Q. ruffians, sweepings of the colonies, the scum of the earth, poured rum down his throat, and the dance-room echoed with their drunken laughter as he,

parrot-like, lisped the blasphemies which they had poured into his ears. Then they sat him down cross-legged beside the table while they took their meals, and made him dispute with the dogs, as he had done in the camp of his murdered parents, for lumps of meat (Bulletin, 27 October 1883).

The Queensland legal code provided for the imposition of the death penalty upon any settler convicted of Aboriginal murder but there is no record that this legislation was either applied or sought in north Queensland. Rather, part of the European population was not averse to 'assisting' the troopers. In interviews, one pioneer settler of the Mulgrave valley recalled with an evident sense of achievement his record tally of nine 'niggers' in one day. A Herberton identity claimed an overall score exceeding twenty-five 'kills' and a third selector remembered the havoc caused by galloping through an Aboriginal camp as a teenager with his stirrup iron swinging. A more effective method of exterminating the 'vermin blacks' of the open grasslands was the practice of laying poison bait in animal carcasses. Evidence of the miscarriage of police responsibility is provided by Lumholtz (1889c:248-50) and, in Cairns, a 'tame black' was publicly horsewhipped by a European policeman for 'demanding rations, tobacco and coin' (Cairns Post, 23 April 1885). Soon afterwards all Aborigines were expelled from the town and the Cairns press proposed that the local volunteer rifle corps, mustered to repel an anticipated Russian invasion, should be deployed to 'brush the niggers' (Cairns Post, 21 May 1885).

Some Europeans displaying higher moral scruples recorded expressions of disgust (Palmer Chronicle, 20 December 1884, Herberton Advertiser, 24 January 1885). Yet by 1885 all grassland tribes between Herberton and Cooktown had been dispersed or subdued. There has been no instance recorded of a concerted Aboriginal retaliation despite suggestions that Aboriginal hostilities rivalled even the Maori and Zulu Wars. On the other hand, it has been estimated that three Aboriginal tribes of the Western Hodgkinson district, totalling 600 members, dwindled so rapidly that only twenty survivors remained forty-five years later (Richards, 1926).

Depleted Aboriginal communities formed notoriously smelly flea-ridden encampments in a parasitic relationship a few miles from Chinese or European settlements. With the absence of tribal discipline, traditional moral laws collapsed. Exposure to syphilitic infection reduced the birth rate. The Aboriginal population continued to decline as the result of respiratory complaints and introduced diseases such as typhoid, smallpox and leprosy. Near Herberton, one such Aboriginal camp was located at Nigger Creek, under the direct oversight of the troopers (figure 14).

The application of a policy of dispersion marked the most violent phase of European-Aboriginal contact. Because the 'natives' were all naked and unwashed they were treated as uncivilized; because they

carried weapons for hunting they were considered 'war-like'; because they challenged rights to occupy the land they were shot; because they appreciated the superior food value of grazing stock, the Chinese market garden and the stores of the miner and cedar cutter, and stole when they were not asked to share, many were exterminated as pests; and because they possessed no resistance to the degradation of strange diseases and acquired an addiction to the unaccustomed narcotic drugs of tobacco, opium and alcoholic spirits which they received as 'payment' for services, including the availability of their gins, they were shunned.

Unusually wide publicity was given to the shooting of a camp of Aborigines by the Nigger Creek police troopers late in 1884 (Cairns Post, 20 November 1884) and in Brisbane public and parliamentary criticism were aroused. Considerably mixed feelings were expressed elsewhere throughout the colony. In Herberton, the action of the troopers was accepted as overdue justice and protests were organized upon discovery that the native police were to be removed. Even while court action was proceeding against the troopers in Brisbane, the Herberton press reported another incident:

With reference to the shooting of the gin and black boy by a woman at Union Camp, an occasional correspondent furnishes us with the following. The blacks resident in the place were the first to give the alarm and on going down to the spot a sickening sight met our gaze. An old gin was lying dead with a bullet wound between the shoulders and a little boy, about 8 years old, was in a dying condition with a bullet wound in the head. The boy died the next morning. The floor was deluged with blood. The woman, on being questioned about the matter, said that she was throwing the revolver into a box when it went off and inflicted the injuries. A bystander said, 'I heard five shots go off at any rate' (Herberton Advertiser, 24 January 1885).

Since the European woman was considered 'defenceless', court proceedings were not even considered.

In 1885 the Queensland government extended to the Cairns district the gesture of providing blankets to the Aborigines as an annual Queen's Birthday gift. One such presentation was described in terms inviting scepticism that 'each myall when presented with a blanket, as they stood ranged in single file, distinctly said "Thank you", and before dispersing endeavoured to give three cheers for the Queen' (Cairns Post, 27 May 1886). The annual 'blanket day' was the only official reported action to ameliorate the conditions under which north Queensland Aborigines lived. Besides causing a 'good deal of amusement to the spectators assembled', the event was abused by an irresponsible element of the European community which acquired, illegally, many of the issued blankets in exchange for tobacco, opium or adulterated spirits.

Blanket distribution did nothing to reduce the incidence of foraging raids upon selectors in the Atherton-Evelyn rainforest. Considerable resentment was aroused (Cairns Post, 27 June 1887) and personal losses of crops and property varied in value from 15 pounds to over 100 pounds (Wild River Times, 12 April 1889). Cedar cutters found that the rainforest Aborigines were partial to cross-cut saws which were easily converted to ceremonial 'swords' by chipping off the teeth. Instances were reported of some selectors who took the law into their own hands by shooting at Aborigines found thieving the crops (Cairns Post, 1 February 1888) but other settlers were more restrained and sought official assistance by posting a petition to Brisbane (Cairns Post, 27 June 1887).

As a result, a police constable and black tracker were stationed at Prior's Pocket as a 'temporary measure' and the Herberton postmaster was given authority to supply rations to local Aborigines. To some rainforest selectors, this policy seemed too short-sighted as it only catered for Aborigines living near the Europeans. One suggestion proposed that rainforest gins and piccaninnies from as far as the Russell Valley should be encouraged 'with the promise of free rations ... to camp in one of the grass pockets near the Barron' (Cairns Post, 1 February 1888) and another Atherton settler claimed that 'if the blacks were collected for sometime into a camp and fed, instead of being a trouble they would soon be a benefit to the settlers' (Cairns Post, 18 January 1888).

The new appointee, Constable Hansen, impressed the European community with his energy and enthusiasm. The problem of crop thefts was reduced by the expulsion of all Aborigines to the east side of the Barron River, with the exception of a camp kept under close supervision adjacent to the Atherton school reserve. A selector reported 'not only has he broken up several camps and rescued a great deal of property stolen from the whites, but he has brought several natives in and these in a short time will be of use to the settlers' (Cairns Post, 29 December 1888).

Cedar for Export

Prior's Pocket was surveyed as the site for the town of Atherton in 1885, along the route of the proposed railway from Cairns. The first sale of town land proved popular and 84 lots were sold (Cairns Post, 3 March 1886). Nearly three years later, a correspondent reported:

The township may be taken as the very centre of the world-famous Barron Valley, and the railway is surveyed to run right through it, so that, with the completion of the work thus far, it needs no great stretch of imagination to foresee a grand future before the place as a terminus for agricultural produce and the timber trade. With regard to water, that great desideratum for agricultural country, Atherton is singularly favoured. A spring rises in the centre of the pocket, and has

never been known to fail, even in the driest season, in supplying the adjacent creeks with an abundant supply of fresh water (Cairns Post, 12 December 1888).

In 1888, Herberton ranked as the centre of the most prosperous district of north Queensland. A succession of discoveries of tin, silver-lead and copper ores to the west appeared to guarantee continued prosperity. International mining investment had been attracted and many overseas immigrants boosted the population of the mining camps. The town was granted municipal status as the centre of the 'Cornwall of Australia' (Birtles, 1980).

An increase in the intercolonial demand for red cedar and the depletion of this timber from much of coastal New South Wales directed renewed interest in the Atherton-Evelyn rainforest in the late 1880s. The greatest handicap to the development of a timber export trade was the high cost of transport to the coast. Bullock and horse teams could shift logs at a pace which rarely exceeded five miles per day, especially as the load balance needed adjustment at every change of gradient. The descent of 'the Bump' near Port Douglas was particularly hazardous and the steep scarps excluded Cairns as an export outlet until the railway was built.

Two steam sawmills were operating by 1888 (at Martintown and on Mill Creek) but they could not meet local demand and teams of pit sawyers were kept fully occupied. Railway construction was heralded as the salvation of the Atherton timber industry and exaggerated reports of the wealth of timber resources reflected local opinion. The engineer responsible for railway construction, Willoughby Hannam, forecast the prospect of 'twenty trains per week running for one hundred years' to bring the Upper Barron timber to Cairns (Ivimey, 1889:141) and a letter by A. Forsyth to the Brisbane Courier was used as further argument to hasten the railway project. He said:

The importance of the industry bears largely upon the decision ... the Cairns route will tap a country on the Upper Barron River comprising 1000 square miles of scrub, closely timbered with cedar, kauri, pine and other less known but, in many cases, valuable timbers. Roughly estimated, there are 6,000,000,000 feet of timber in these scrubs. From these scrubs 40,000,000 feet of timber could be shipped annually for the next 140 years. The wages expended would be 80,000 pounds per annum, while the freight accruing to the railway would not be less than 40,000 pounds per annum (quoted in Herberton Advertiser, 23 April 1884).

These calculations appear to have been based upon guesswork and imagination. There was no evidence that the timber resources of the Atherton-Evelyn rainforest had been carefully examined to estimate their true potential nor was there any indication of any rigid control of logging activity. Within the rainforest cedar cutters continued to

brand and stockpile their logs in anticipation of the promised railhead even though the Herberton land commissioner had been instructed to issue no more cedar cutting licences. Proclamation of a State Forest and a small Crown lands reserve around Lake Barrine was issued too late because it was reported that 'on this ground almost all the heavy cedar had been felled', although a strong growth of young cedar was evident (Herberton Advertiser, 25 June 1884).

The Dutton Act provided new timber regulations which imposed royalties of two shillings per hundred super feet for cedar and a shilling per hundred super feet for kauri. The legislation included several prohibitions on log size and appeared sound in theory but broke down in practice, chiefly because no forest ranger was appointed to the district. A protest in the Cairns Post echoed the sentiment of a port which looked forward to timber trade with southern cities:

No man is harder worked or more poorly paid than the timber-getter. Crown Land rangers are constantly on the scent in and out of season to keep him within the strict margin of the law, and as we have said already, the mill owner is not making a rapid fortune, being in many cases as poor as his labourers (Cairns Post, 16 April 1885).

Widespread disapproval forced parliament to rescind many of the timber regulations a year later. In the absence of close supervision in the rainforests, cedar-cutting continued to be wasteful. By late 1887, so many cedar logs clogged up the Barron River near Atherton that the postman considered the crossing to be unsafe and was obliged to return to Herberton (Cairns Post, 30 June 1888). The depression of the 1890s brought the most exploitative phase of cedar-cutting to a conclusion and completion of the railway to Granite Creek township (later Mareeba) in June 1893 attracted only a very small proportion of the stacks of logs awaiting export.

The Upper Barron timber industry did not revive until 1895 when the organization of regular shipments of cedar and kauri to Western Australia stimulated four mills near Atherton and Herberton into maximum activity with three eight-hour shifts per day (Morning Post, 5 December 1895). A year later, Queensland cedar reached the London market as a substitute for the failure of Cuban cedar supplies for cigar-box making and cabinet-wood (Morning Post, 3 Decembr 1896). During 1897, more than one million super feet of Atherton cedar valued at fourteen shillings per hundred super feet were shipped from Cairns wharf. Most of the logs were dragged or carted to Mareeba station by horse or bullock teams although one novel idea was the purchase of traction engines (figures 15 and 16). By 1900, cedar accounted for two-thirds of the value of Queensland timber exports with about half of this cedar traffic despatched from the Atherton Plateau directly to the London market. The Upper Barron cedar cutters reserved the largest logs for export since those with the largest girth commanded the highest price. London buyers began to complain about the difficulty of selling logs too big for most

English mills to handle but no immediate attempt was made to curtail the size of export logs (Morning Post, 20 January 1900). Individual trees totalling more than 25,000 super feet and valued in excess of 75 pounds continued to be felled.

In Brisbane, parliamentary concern in 1889 over the rapid depletion of cedar and kauri forced the Department of Lands to pay heed to the need for a policy of forest conservation. One result was the first attempt to assess species of trees in the Atherton-Evelyn district, with a catalogue of uses of the more valuable timbers, including many varieties of Eucalyptus, the extensive cypress stands west of Herberton and numbers of rainforest species. The very valuable and very large quantity of walnut trees extending from the Barron River to Evelyn station received special mention and the list of potentially productive rainforest timbers included maple (locally known as red beech), rosewood, scrub mahogany, pencil cedar, coachwood, black pine and kauri. A press comment noted that many Barron Valley selectors possessed holdings of cedar measured in terms of millions of super feet (Herberton Advertiser, 27 June 1890).

No further action was taken to extend the new policy of forest conservation to the Atherton-Evelyn district. Responsibility for the timber cutting industry rested with the Herberton lands commissioner who was handicapped by the small size of his staff. Nevertheless, he managed to curb the unsatisfactory practice of selling cedar 'by the log' and prices returned to the standard measure of superficial feet in 1892. He was particularly concerned over the timber-cutting privileges accorded to owners of mining licences and selection permits. Very few miners or selectors appreciated the timber value of trees and were easily tempted to pass off these resources for next to nothing. In the Atherton rainforest, selectors followed the practice of exchanging their rights to remove cedar on their selection in return for sufficient sawn planks to build a dwelling. Clearly, sawmill proprietors earned disproportionate profits at the expense of the selectors.

For most of the 1890s, the Upper Barron Valley selectors provided the sawmills with the bulk of the cedar supplies but, in 1897, the true value of cedar was discovered and selectors stopped selling. This forced the cedar cutters to move into the timber reserves where their profit margin was reduced by the payment of royalties. Local prices for log cedar rose to three shillings and sixpence per hundred super feet and sawn cedar sold at from twelve shillings to sixteen shillings per hundred super feet.

The imposition of royalties reduced the use of less wasteful logging methods but nearly all other species of Atherton rainforest trees were regarded as an obstacle to cultivation. Almost without exception, these timbers which included the valuable walnut stands were burned. One notable exception was the bean tree which was found extremely difficult to burn and was chosen for slab-fencing and slab hut construction (Royal Commission on Land Settlement, 1897:1059).

Queensland maple also became recognized as a fine cabinet-wood and shipments of timber from Cairns in 1898 included several thousand feet of maple, silky oak and silkwood.

During 1900, the colonial Inspector of Forests toured north Queensland and submitted a report containing a digest of valuable timbers located in each land agent's district. He observed the alienation from the Crown of 'a very large quantity of most valuable cedar ... principally in the Herberton district' and he recommended that a forest ranger be sent to the area to assess the timber resources as well as prospects for replanting cedar (Morning Post, 30 November 1900).

Chinese Tenancy and the Maize Industry

The years 1889 to 1898 formed a period of setbacks and profound disillusionment with mining, pastoralism and agriculture in north Queensland. The international market for base metals slumped, the desired capital investment did not materialise, mines closed and many unemployed men joined the rush of fossickers to the New Guinea goldfields, where a high death rate resulted from disease, starvation and native hostility.

Transport difficulties and high cartage rates remained the chief obstacles. Also, the financial instability of the colonial government brought the extremely costly Herberton railway to a standstill at Mareeba. Only a small local market remained for agricultural produce and crop cultivation was discouraged by other problems. For several years, maize blight devastated the Atherton Plateau maize crop. The infestation of vegetables by caterpillars remained out of control. Wallabies and 'white-tailed scrub rats' (bandicoots?) proved a nuisance and fruit fly infested the orange groves. The sugar and wheat experiments failed.

After visiting the district in 1895 the colonial land valuator reported that:

Atherton is, in the opinion of the residents, and with which my experience there enables me to concur, the bleakest spot in the whole scrub ... During my stay in this locality, I visited nearly every farm ... and without exception found this state of affairs, viz:- great clearings almost entirely overrun with the ink weed, and almost complete bankruptcy among the farming population (Morning Post, 21 November 1895).

Disillusioned selectors had left the district in search of work, usually arranging for Chinese tenant farmers to hold their selections. However, approximately a fifth of the conditional selections were forfeited (see figure 17). The men who stayed tended to be family men.

The annual tenancy rent paid by Chinese was usually one pound per acre. Once a few acres were cleared on a leasehold selection, the selector erected a rough slab dwelling and then installed a Chinese bailiff to fulfil the occupancy condition of five years. If the selector became interested only in land speculation, the Chinese tenant was then paid off and cultivation was abandoned. In 1897, a total of 27,000 acres of selected agricultural land remained idle or uncleared and only five per cent of the freeholders lived on their selections (Royal Commission on Land Settlement, 1897:1053). The task of clearing an area of 160 acres amounted to at least ten years of continuous manual labour. It was partly for this reason that local authorities permitted Chinese tenancy of cleared land while the selector, usually with the assistance of other Europeans, persisted in the tasks of felling, clearing and burning the rainforest on his property (figure 18). The employment of Kanakas or Aborigines in scrub gangs was prohibited by legislation passed in 1897 (Morning Post, 18 August 1903). The more industrious homesteaders replaced primitive slab huts with more substantial dwellings (figure 19) and in 1898 a sign of permanence was the construction of 400-gallon grain tanks from smooth iron to store the maize crop for periods up to three years in order to sell at better prices (Morning Post, 14 August 1903).

Many homesteaders realised that the returns from Chinese rent were more reliable than crop prices. In some instances, whole selections were cleared and sublet to up to eight Chinese tenants. An annual rent as high as 120 pounds was known to have been collected while the selector engaged in an alternative occupation to supplement his income (Royal Commission on Land Settlement, 1897:1055). The Chinese were considered worthy tenants because they were 'so plodding and industrious' and several managed to earn their ship passage back to their homeland. The short term nature of Chinese leases did not encourage the development of any sense of permanence amongst the Chinese and tenanted farms were easily identified by 'the ill-kept places of Chinamen, stumps, trees and weeds being very prominent' (Morning Post, 14 August 1903).

At a settlement located immediately south of Atherton but cut off from it by Piebald Creek, a tributary of Prior's Creek, about two hundred Chinese resided as a Chinatown community on land leased from a European selector. It was unlikely that the separation was a conscious exclusion of the Celestials or Mongolians by Atherton residents. Rather, the operating factor was colonial legislation which prohibited Chinese from owning land either as town lots or as agricultural selections. Chinatown was an orderly little village of single and double-roomed cedar-plank huts arranged on either side of a short main street (figure 20). The style of huts matched nineteenth century dwellings in the hills of Kwangtung and differed from primitive European huts by the smaller dimensions and considerably lower roof pitch. The settlement lacked the pak-ah-pu 'banks', lottery houses, fan tan gambling schools and brothels which characterised Chinese settlement near Cairns. Opium was smoked without any official restrictions until

outlawed by the Opium Act of 1897.

In 1897 Atherton's population was almost four hundred people of whom 115 were children and only 72 were adult females. Irish surnames were especially common. Two or three general stores, a butcher's shop, a blacksmith's shop and two hotels straggled along Main Street, the most imposing structure being the two-storeyed Barron Valley Hotel which functioned as the main coach stop. A school and small divisional hall had also been built. An attempt to form an Anti-Chinese League in Atherton failed through lack of support and a proposal to form an exclusively European produce market lapsed for similar reasons (Wild River Times, 2 December 1892). The high degree of Chinese cohesion merely emphasized the absence of marketing coordination amongst Europeans.

Despite opposition from Herberton residents, Atherton selectors succeeded in transferring the headquarters of the Tinaroo Divisional Board to their town in 1894. The Board set up five-acre reserves for a hospital and town market. It also offered a financial guarantee for construction of the twenty-one miles of railway from Mareeba to 'serve the rich agricultural lands of the Upper Barron and adjacent lands, the greater portion of which is unsurpassed in Australia for the qualities of its soil, its climate, its wealth of natural timbers, and its suitability for close settlement by the white races' (Queensland Legislative Assembly, 1897). One unusual motion presented by two Methodist members of the Board advocated an opening prayer to each session but the proposal was defeated by a less pious majority (Morning Post, 13 June 1895). The Barron Valley Progress Association was formed to advertise local agricultural opportunities although one hardship never publicized was the recurrence of dengue fever during the wet season (Morning Post, 3 December 1896).

The attitudes of Atherton Europeans towards the Chinese were varied. Those who knew Chinese personally came to regard them as a kindly, courteous group. The economic worth and industry of the tenant farmers were generally admired. On the other hand, this competition was responsible for bitterness among men attempting to farm their own land.

By 1897, several 160-acre selections had been completely cleared for cultivation. Most of these were north of Martintown on land not under rainforest. It was there that the largest acreages were farmed with sixteen farms cropping more than fifty acres. There, too, Chinese tillers could earn three pounds per week although it was generally conceded that the Chinese tenant would 'give way to the European when the plough goes to the land' (Cairns Post, 3 May 1890). In 1888, as enticement to the poorer selectors, surveyors were directed to mark out forty acre blocks at two agricultural communities named Allumbah and Lake Eacham (figure 17). They attracted almost no attention until 1893 when an application for the Lake Eacham area was lodged by eighty miners from Charters Towers. However, by 1897 only three of the blocks were taken up (Wild River Times, 21 December 1893).

Maize occupied four-fifths of the cultivated land (Appendix, Table 2). The blight problem disappeared after 1893, possibly due to greater familiarity with the local climate and care to avoid the crop ripening during the humid wet season. Details of maize blight are not clear but there was a suggested association with a weevil pest which could be controlled by leaving the maize on the cobs and storing the crop in open shingle-roofed sheds (Royal Commission on Land Settlement, 1897:1059). The 1897 maize crop broke all records with the highest mean yield of the colony (37.75 bushels per acre) and with some Europeans harvesting as much as sixty bushels per acre. Moves were initiated by the Atherton Agricultural and Pastoral Association to start an experimental farm of 800 acres (McGeehan, 1951:9). Farms north of Martintown, a settlement in name only, produced potato yields of eight tons per acre as well as arrowroot (figure 21), pumpkins and such homegrown fruits as strawberries, apples, oranges and grapes. The European rat arrived in 1897 to increase the crop losses already inflicted by marsupials and caterpillars. Coffee plants were introduced by a German selector who observed the successes of Kuranda coffee growers and employed Aboriginal labour to assist him (figure 22).

The two dairy farmers near Nigger Creek met unexpected disaster when cattle tick arrived and redwater fever decimated their herds. The nearby cheese factory was forced to close and most of the Evelyn Plateau selections were abandoned (figure 23). In the protected rainforest clearings, the occasional cow remained unaffected and a small export of hand-made butter to Herberton stimulated thoughts of a future dairy industry in the district (Wild River Times, 7 October 1897).

A court of inquiry of the Royal Commission on land settlement held at Atherton revealed that the most serious local problems were the inadequacy of the market and the need to attract more experienced farmers. European agriculturalists could not compete with Chinese tenants with their co-operative monopoly of crop transport and sales. One court commissioner observed that the predominance of Chinese appeared to belie the productive nature of the soil and the high prices. But prices did not always remain high and the selling price of eggs fluctuated from three shillings to ninepence a dozen.

The report of the Royal Commission was used to prepare the Land Act of 1897. All legislation since 1888 was repealed and selections were reclassified, in order of preference, as conditional agricultural farms, conditional agricultural homesteads and unconditional selections. Terms of lease were reduced from fifty years to ten years (homesteads) and twenty years (the other two forms of selection). A fourth class of selection, scrub selection, was not applied to the Atherton-Evelyn district. Far more significant was a reduction of land rent and the transfer of all timber on conditional selections to the responsibility of the selector. The only control was that, during the first five years of the lease, a permit was necessary for a selector to ringbark, cut down or destroy any trees 'except for the purposes of the land occupied by him'. One achievement of the new Land Act was a revival of interest

in agricultural selection on the Atherton-Evelyn district, particularly during 1900 when work began on extension of the railway from Mareeba (Appendix).

New tracks were opened into the Atherton-Evelyn rainforest after newcomers arrived. The pattern of surveyed selections and roads showed very little regularity in shape or size (figure 17), a characteristic which can be explained by surveying practice of the time. Survey parties were not awarded a fixed salary but were paid directly by the selector according to an established scale of fees. Since blocks were surveyed after selection, the shapes were determined partly by the whims of each selector. It was often not convenient to orient the boundaries to the four basic compass points, particularly where selections were linked to the direction of existing tracks or proposed roads. Survey fees for the roads were paid according to each mile surveyed and the heavily-worked surveyors could not afford the time to stop and consider the best of several choices. Neither the Herberton Borough Council nor the Tinaroo Divisional Board possessed any jurisdiction over the roads until surveys were completed.

Many roads followed Aboriginal trails which, in turn, connected the forest pockets, more open patches of sclerophyll trees within the rainforest. The 'pockets' were usually the result of poor environmental conditions such as wind exposure or shallow soils. European settlers usually pitched their first tent camps in the drier locations while they cleared the adjacent 'scrub'. Each pocket was identified by name as a major landmark (for example, Halfpapp's Pocket, Petersen's Pocket, Oval Pocket, Dinner Pocket, Pinnacle Pocket, Dingo Pocket, Boar Pocket). Some such as Allumbah Pocket (now Yungaburra) and Ziegenbine's Pocket (surveyed as Carrington) became the logical sites for village settlement. Other identifiable landmarks before the rainforest was cleared were steep gradients along the track (for example, Purcell's Straight, Gentle Annie, Slippery Dick). Creek crossings acquired equally significant names (for example, Putt's Crossing, Picnic Crossing) but, apart from minor engineering to control waterflow (figure 24), no bridge construction was attempted before 1900.

Aboriginal Protection

East of the Barron River, the pygmy Aborigines were left relatively undisturbed by the selectors even though tracks were cut to connect the Atherton and Evelyn districts with the Russell River alluvial gold claims and the sugar cane town of Geraldton. Many residents of the Atherton and Evelyn plateaus felt compelled to share in the responsibility for Aboriginal welfare and community opinion voiced favourable support for the creation of Aboriginal reserves in the rainforest. Some European families won the confidence of groups of Aborigines and gave them food in return for the completion of such duties as wood splitting, weeding and stock management. Two letters to the Colonial Secretary from Atherton residents in 1889 outlined details of the local proposal for an Aboriginal reserve of 200 to 300 acres

'partly forest and partly scrub lands', close to running water where a mission station would be set up. A letter from F.T. Wimble, M.L.A., recorded that 'there are numbers of the selectors of the Barron Valley who would readily enter into the project of assisting to establish a feeling of confidence between the myalls and themselves, and who would willingly hire their services under proper agreement with the superintendent of the reserve' (Cairns Post, 4 April 1889).

The diminutive stature of the rainforest dwellers caused frequent comment, especially when these people were compared with the Aborigines of adjacent districts, notably the taller, more muscular men of the Russell Valley. There is evidence, also, that Aborigines displaced from the coastal areas had moved into the Atherton-Evelyn district on foraging ventures. One newspaper reported that:

We understand that Constable Hansen has brought in sixteen of the blacks who have for so long been a source of annoyance and loss to the settlers about Evelyn. They belong to the Karamia and Lower Johnstone River tribes, and are described as powerful and well-conditioned people, beside whom the aboriginals of the scrub about Atherton look miserable beings (Cairns Post, 26 June 1889).

In Brisbane, the proposal to settle Aborigines on reserves near Atherton was not favourably received. The Relieving Police Magistrate, J. Murray, when asked to present a report to the Colonial Secretary, rejected any attempt to assimilate 'the blacks' as a 'waste of money'. Instead, Murray recommended the re-establishment of a strong detachment of native police in the neighbourhood of Herberton 'as now the blacks have been allowed into civilization, after having been kept out for years, the real danger will commence' (Cairns Post, 30 November 1889). Murray was undoubtedly influenced by agitation from Herberton residents upset by the objectionable sight of Aborigines wandering about the town. Also, an Aboriginal raid on the Pioneer Cheese Factory at Flaggy Creek inflamed local resentment over the removal of Aboriginal police from Nigger Creek (Cairns Post, 15 May 1889). The Colonial Secretary, Sir Horace Tozer, approved Murray's recommendation; Atherton's police constable was transferred and Aboriginal police camps were opened at Nigger Creek and in the Mulgrave Valley late in 1889 (Cairns Post, 21 December 1889). Almost immediately, an outbreak of 'depredations' was reported, especially in the Russell River district. Many served merely as excuses for a return to the intimidatory practices of Aboriginal 'dispersions' (Cairns Post, 1 January 1890). Frequent protests were voiced by agricultural selectors, as well as the Cairns press, and there is little doubt that Murray's policy, besides being unpopular with settlers, was unnecessarily provocative of people in tribal communities (Cairns Post, 4 January, 15 March, 1890; Wild River Times, 13 February 1891; Cairns Post, 21 July 1892). Even as late as 1897, when Murray arrived in Atherton as chairman of the Royal Commission of Land Settlement, there was a strong public display of anti-Murray sentiment (Morning Post, 19 May 1897).

The sympathies of the Atherton-Evelyn selectors were aroused and many increased the voluntary support offered to rainforest Aborigines. Not all of these efforts were prompted by compassionate motives since a prevailing philosophy was that the friendship and trust of the Aborigines served as a form of protection from stock and crop losses. Others encouraged Aborigines to assist with scrub-felling, burning and crop-harvesting, while several families introduced Aboriginal women into the household for training in domestic chores and child-minding.

Throughout the 1890s, Atherton functioned as a blanket distribution centre (figure 25). The attraction of this event to some Herberton residents is recaptured in the contemporary account:

A somewhat numerous cavalcade left town in the morning of the 12th instant to witness the distribution of blankets to the aborigines at Atherton by the Police Magistrate. The day was beautifully fine and everyone seemed to enjoy the outing.

From 130 to 140 niggers, including gins and piccaninnies presented themselves as recipients of the Queen's bounty. Some time was lost after the arrival of the Police Magistrate through the non-arrival of the blankets

Meanwhile collection was made amongst the whites and several pounds of tobacco purchased, to be given as rewards to the niggers for climbing large trees, corroborree, etc. The way they went up the straight stems of a large tree and came down again was an eye-opener to some who had not seen such feats of agility before.

After an hour or so, Host Kelly announced that dinner was served, and whilst discussing the substantial fare some one sang out 'Here comes the blankets', so that all anxiety on that score was dissipated.

After dinner, with the assistance of Constable Higgins, the officer in charge at Atherton, the niggers were formed into a group in order that our local artist, R. James, might photograph them, he having come down for the special purpose. It was a somewhat difficult matter to keep them quiet for the time required, and it is questionable whether the picture will be a very good one.

It was rather amusing to notice several of the niggers hiding behind trees and trying to make off into the bush, evidently distrusting Mr. James and his camera, probably thinking it some infernal machine of destruction.

The blankets were then distributed by the Police Magistrate, every black receiving a single blanket. The next item on the programme was ki-ki or the supply of rations, each

nigger receiving a couple of pannikins of flour, but the piece de resistance was reserved for the last, viz., the distribution of tobacco and cigars. Half-a-dozen or more cigars, with a junk of tobacco to each one, finished the proceedings, after which the Police Magistrate mounted a stump and addressed the niggers. He informed them in language suited to their understanding that if they refrained from stealing the farmers' crops and did not kill whitefellow or spear his cattle, the Government would continue to give them rations and blankets for the cold winter

They seemed to quite understand what was said, and replied 'Baal steal him corn: Baal kill 'um whitefellow, altogether budgereee fellow whitefellow'. Led by one or two white men, an attempt at a cheer was then made, but they were not quite educated to this point yet, and the cheer was a prolonged shout.

It must be mentioned that the cigars distributed were kindly placed at the disposal of the Police Magistrate by Mrs. William Walsh, the local manager for Messrs. Walsh & Co. They were damaged cigars, but will make a fine smoke when mixed with a little tobacco.

Contable Higgins stated that not more than half of the blacks usually camped at Atherton were present. Owing to the non-arrival of the blankets he had not prevented the large number from going to the scrub for the day as he did not expect the Police Magistrate down. Many had also cleared into the scrub, being afraid when they saw so large a number of horsemen arriving.

... On the whole a most enjoyable and pleasant day was spent, and to the niggers it must have been a real red letter day (Wild River Times, 3 May 1890).

In many instances, Atherton-Evelyn selectors undertook to act as unofficial guardians of small groups of Aborigines who camped on the fringes of their selections. The Herberton lands commissioner commented favourably upon the improved relations between the Europeans and Aborigines although he inclined to the belief that the issue of blankets should be restricted to those Aborigines who were unemployed. The latter comment appears motivated by abuses of methods of blanket allocation as well as European misappropriations. A.L. Meston, one of the colony's most outspoken champions of the cause of Aboriginal protection, was appointed as special commissioner to investigate the conditions of north Queensland Aborigines in 1896. After his return to Brisbane, Meston wrote:

I have been in houses where all the beds had aboriginal blankets; on stations showing a similar spectacle; in rooms

and offices carpeted with them, and places where all the saddle-cloths and horse-cloths were made out of blankets that should have been in possession of the local aborigines (Meston, 1896:733).

Meston undertook the first comprehensive survey of more than seventy Aboriginal tribes north of Cardwell focussing most attention on the rainforest dwellers. He commented upon the spread of disease, especially the deadly effect of syphilis, in those communities but highlighted Aboriginal addiction of opium as the most serious problem, 'aggravated by the vile quality of opium supplied by the Chinese which they sell to the aboriginals as "charcoal opium" which has been smoked by themselves until the more active principals are destroyed, leaving an abominable residue far more demoralizing physically and mentally than the pure article' (Meston, 1896:734). Meston's report advocated the total abolition of all Aboriginal police forces, the exclusion of all Aborigines from townships unless they were employed by reputable Europeans who could guarantee good wages and fair treatment, the imprisonment of persons involved in distributing opium or liquor to the Aborigines and penalties for the illegal possession of Aboriginal blankets. Above all, Meston called for prompt action, claiming that 'even acceptance of the "doomed race" theory can in no way absolve a humane and Christian nation from the obligations they owe to this helpless people' (Meston, 1896:727).

Meston's report was followed up by a police survey of the work of the 'native police'. The results were submitted to Tozer by W.E. Parry-Okeden, Commissioner of Police (1897). Parry-Okeden's report included a census of the Aboriginal population and the first attempt to map tribal territories (figure 26).

The two reports achieved five immediate results. Several reserves were created throughout the colony to permit Aborigines to retain their 'pristine habits' in complete isolation from European communities (Morning Post, 19 May 1897). Government financial support was allocated to several church mission stations (including an Anglican mission on the Bellenden Ker or 'Yarrabah' reserve which dated back to at least 1893). Dr. W.E. Roth was appointed as Aboriginal Protector for north Queensland. Major amendments were made to the role of Aboriginal police who, at least in theory, were now interpreted as 'an impartial tribunal entrusted equally with the defence of the whites and the protection of their own countrymen' (Morning Post, 28 October 1897). Finally, the sale of opium and alcohol to Aborigines was declared illegal by the Aboriginal Protection and Restriction of the Sale of Opium Act of 1897. This legislation was the first official attempt in Queensland to consider seriously the question of the 'amelioration' of the Aboriginal population. In a memorandum to the Premier, Tozer remarked:

It deals with the question of the improvement of the aborigines and aboriginal half-castes and their future protection in a comprehensive manner. It not only aims at

effectively preventing a continuance of the errors of the past, but contemplates preserving the aboriginal race from extinction (Queensland, Legislative Assembly, 1897a).

In 1897, it was generally accepted that the largest concentration of the Aborigines left in the colony were the tribes of the rainforest country bounded by Cairns, Mareeba, Atherton, Herberton, Ingham, Cardwell and Geraldton. Each town operated a blanket distribution station and, in addition, the Atherton police station was allocated an allowance of 120 pounds to finance the distribution of food and tobacco.

This policy of issuing food to Aborigines was not universally acceptable amongst Atherton selectors, some claiming 'that there is plenty of work ready for them among the selectors, who will feed and treat them well, whereas by encouraging them to loaf about Atherton they are being subjected to contamination and immorality by association with the Chinese and Malays' (Morning Post, 13 June 1895). Such motives were probably genuine but the availability of food and blankets must have been only small compensation for European disturbance of the rainforest habitat (figure 27). The traditional method of subsistence had been disrupted. Only in the south of the Atherton Plateau, in the vicinity of Millaa Millaa Falls, were a few Aboriginal family groups able to preserve any semblance of tribal livelihood. Yet, even here, patrols of Aboriginal troopers had proved detrimental to Aboriginal security and welfare.

It is to the credit of the solitary policeman stationed in Atherton and the Herberton police protector that, in 1899, Roth was able to report that the Aboriginal Protection Act was enforced more closely in the Atherton-Evelyn district than in many other parts of Queensland. Roth impressed upon the police the need to follow a policy of issuing blankets only as 'a medical adjunct and comfort for the aged, the young, and the sick'. Roth was concerned over the apathy of the rainforest Aborigines since 'the promiscuous gift of blankets in past years has tended to the utter desuetude of the native-made opossum-skin and barkcloth rugs: during the past seven or eight years, I have not come across a single specimen of the former, and but with only a few of the latter' (Roth, 1900). Both visited several camps in the 'Atherton scrub' and commented on the elaborate methods of food preparation:

At Atherton, the shells [of the Moreton Bay Chestnut] being broken, the kernels are commenced to be baked about sunrise, the covering leaves and earth being removed about mid-day. They are then cut up into very fine chips with a sharp shell, etc. and at about sunset are put into a lawyer-vine dilly-bag, through which the creek (i.e., running) water is made to percolate, and there it remains until the following morning, when it is about ready to eat (Roth, 1901).

For several years, two or three convictions were obtained against European selectors for illegal possession of blankets or for 'harbouring' or employing Aborigines without obtaining the requisite permit. Annually, about a dozen Chinese were arrested and fined for dispensing opium to Aborigines but the same regular offenders were picked up each year. Roth considered them to be exceptional culprits and he wrote that generally a sympathetic understanding and close economic association had developed between Chinese and Aborigines of the Atherton Plateau:

Atherton forms a case in point. Here there are some 250 aboriginals occupying from time immemorial some 64 square miles of rich scrub, which was full of native food, both animal and vegetable. Unfortunately for the autochthonous population this land is rapidly being felled and cleared, and the blacks have accordingly to travel further and further afield to find a sufficient supply of their natural food. There are upwards of 230 Chinese employed by, or renting land from over seventy out of the seventy-six European selectors, with the result that the blacks are, necessarily, mostly employed by Asiatics. If only to prevent the able-bodied aboriginals from starving - these rich lands being now all of them taken up, and most of them fenced - I cannot instruct the local Protector to prevent Chinese employing them (as was urged by the Atherton Progress Association some two and a half years ago). At the same time I have given orders that blacks are not to be allowed to work for any coloured alien once convicted of supplying opium (Roth, 1901b).

In order to legalize a few instances where Aboriginal girls were living with Chinese, it was proposed that the Chinese be required to take out marriage licences. Several mixed marriages were officially registered in Cairns before it was discovered that such marriages legalized the supply of 'gins' as prostitutes to other Chinese - a circumstance of some embarrassment to Protestant clergy who had good-naturedly agreed to perform the marriage rites. The incidence of syphilis and gonorrhea reached such critical proportions that Roth recommended no further encouragement to mixed marriages. The infected women, including a number from the Atherton district, were deported to the government's Aboriginal reserve at Fraser Island.

The protection policy gained no overwhelming support from Europeans in north Queensland, particularly because it was difficult to administer and appeared 'farcical' (Morning Post, 31 October 1902). Nevertheless, the Protection Act checked the scale of abuses directed towards Aborigines during the nineteenth century and it may have provided opportunities for a more humanitarian European response towards Aboriginal welfare.

Conclusion

The century closed with an apparently more secure economic future for the Atherton-Evelyn district. Cedar prices began to climb and agricultural land sales on both plateaus began to attract newcomers. Scrub-felling operations picked up and a mining revival in Herberton's back country increased the market for Upper Barron produce, particularly in the new settlement of Mt. Garnet, a boom town which also attracted cedar at a price of only two shillings per hundred super feet from a new water-powered mill at Cedar Creek (now Ravenshoe).

Socially, the population exhibited a hierarchical structure of racial groups. The Aborigines were the lowest group and the Chinese tenants on European land stood somewhat above them. But neither group was accepted under terms any better than sufferance. Neither group held any land rights and, in 1900, it was a common belief amongst Atherton-Evelyn selectors that they were only temporary neighbours. Once 'white' society became economically stable, it was considered only a matter of time before those unacceptable people would be rejected from the area as effectively as the rainforest had been removed from the landscape. Aboriginal use of the rainforest environment had no place in nineteenth century European conceptions of land use (figure 28).

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APPENDIX

Table 1:

NUMBER AND ACREAGE OF APPLICATIONS FOR FREEHOLD SELECTION OF AGRICULTURAL LAND IN THE ATHERTON-EVELYN DISTRICT, 1882-1900*

Selections approved under Crown Lands Acts and Amendments passed between 1882 and 1896

<u>Year</u>	<u>Homesteads</u>		<u>Conditional Selections</u>		<u>Unconditional Selections</u>	
	<u>Number</u>	<u>Acreage</u>	<u>Number</u>	<u>Acreage</u>	<u>Number</u>	<u>Acreage</u>
1882	33	5,020	25	12,440	-	-
1883	43	6,720	11	3,930	-	-
1884	23	3,620	3	2,120	-	-
1885	2	320	2	1,920	-	-
1886	-	-	11	1,689	-	-
1887	-	-	16	3,718	-	-
1888	-	-	21	3,366	-	-
1889	-	-	34	4,522	-	-
1890	-	-	21	3,782	-	-
1891	-	-	16	1,722	-	-
1892	-	-	3	425	1	1,288
1893	-	-	5	579	2	240
1894	-	-	10	1,022	-	-
1895	-	-	5	496	-	-
1896	-	-	1	117	-	-
1897	-	-	2	269	5	837

Selections approved under the Land Act of 1897 and subsequent Amendments

	<u>Agricultural Farms</u>		<u>Agricultural Homesteads</u>			
1898	-	-	4	572	-	-
1899	7	1,102	11	2,830	1	80
1900	6	1,659	17	2,214	1	80

* Selections listed are those applied for at Herberton and Atherton Land Offices. Several selections included in this table were taken up in the Parish of Tinaroo just beyond the northern margin of the Atherton-Evelyn District.

Source: Government Statistician's Office, Queensland, Statistics of the State (or Colony) of Queensland, Brisbane, Government Printer.
All years from 1882 to 1900.

Table 2:

ACREAGE OF AGRICULTURAL LAND CULTIVATED IN THE HERBERTON
PETTY SESSIONS DISTRICT, 1885-1902

Year	Area under		Area of Land under Crop	Area planted with Important Crop			
	Area under Culti- vation	Permanent Pasture of Artificially Sown Grasses		----- Maize	English Potatoes	Sweet Potatoes	Pumpkins
1885*	917	0	911	512	76	77	-
1886	1,087	0	942	475	67	81	-
1887	819	0	749	366	49	77	-
1888	1,015	74	905	495	59	58	-
1889	1,279	48	1,252	625	120	82	-
1890	1,648	406	1,562	1,083	110	71	-
1891	2,492	485	1,820	1,302	113	96	-
1892	2,660	962	2,654	1,929	158	137	-
1893	3,418	758	3,407	2,481	190	179	-
1894	2,519	666	2,468	1,868	130	114	-
1895	2,200	720	2,087	1,590	111	87	-
1896	2,646	834	2,521	2,110	76	87	-
1897	2,979	898	2,896	2,375	72	81	-
1898	2,934	1,215	2,903	2,436	62	71	33
1899	3,179	1,097	3,060	2,756	59	10	9
1900	3,741	1,207	3,608	3,131	69	42	48
1901	5,204	490	5,145	3,875	59	73	123
1902							
(Evelyn Plateau)	88	-	88	4	-	5	1
(Atherton Plat.)	4,829	1,002	4,733	4,040	50	36	18

* Statistical data prior to 1885 has been incorporated in Cairns Police District returns.

Source: Government Statistician's Office, Queensland, Statistics of the State (or Colony) of Queensland, Brisbane, Government Printer.
 All years from 1885 to 1902.

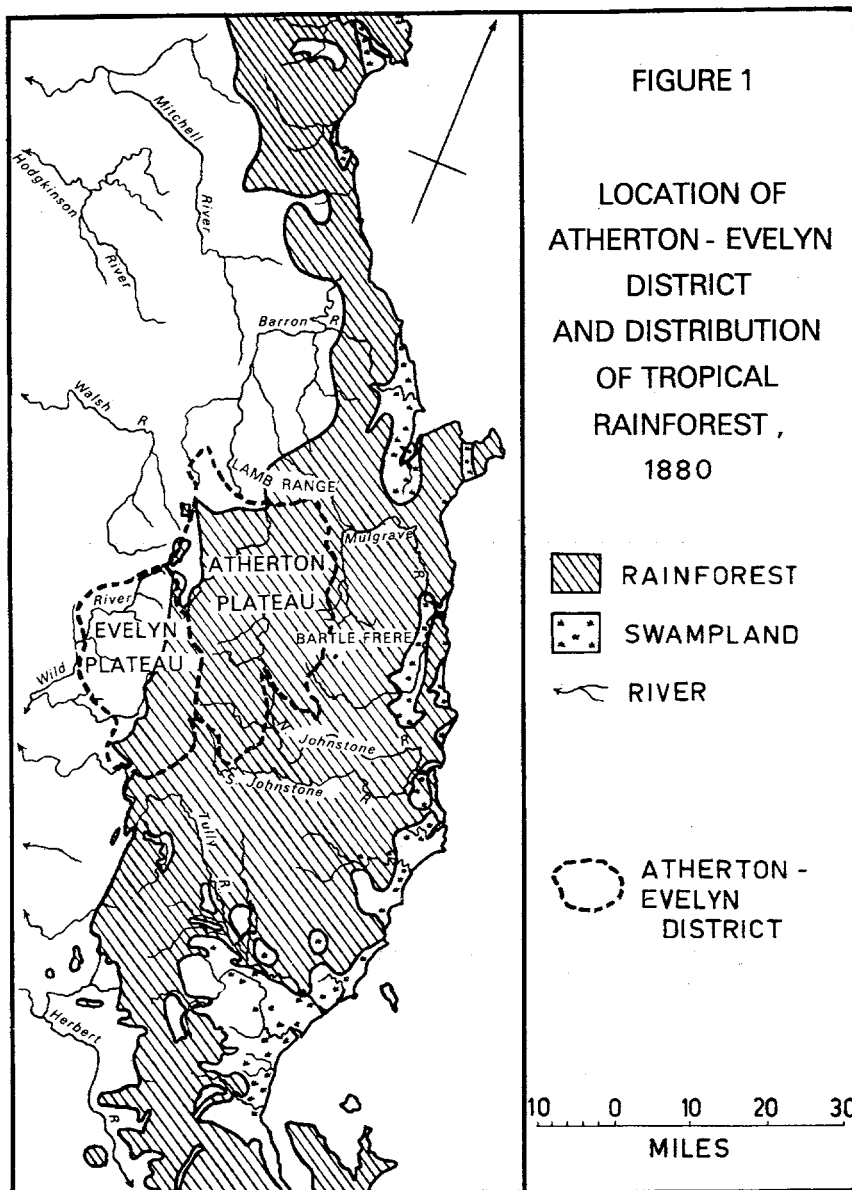
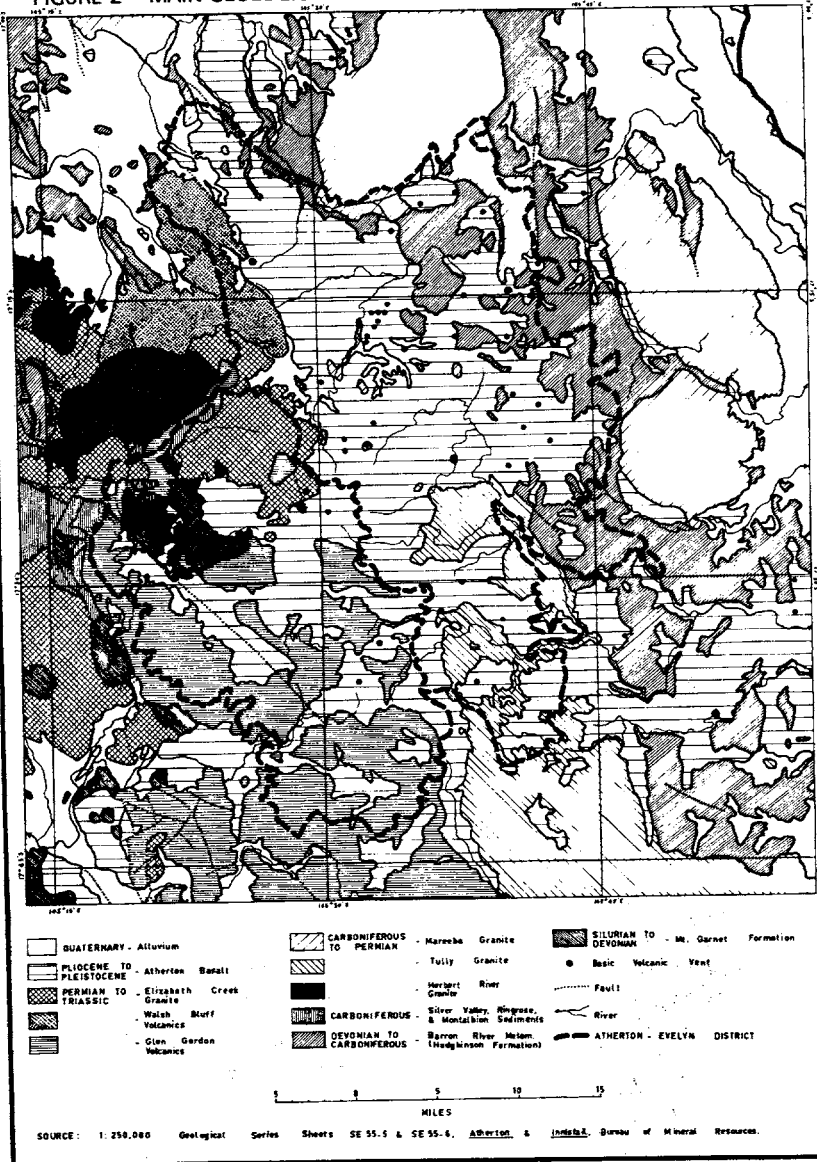


FIGURE 2 - MAIN GEOLOGICAL FORMATIONS, ATHERTON - EVELYN DISTRICT



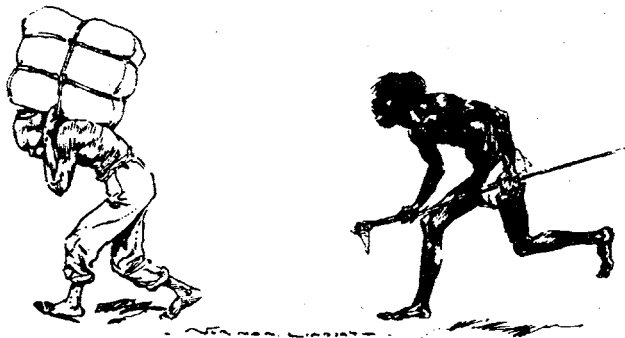
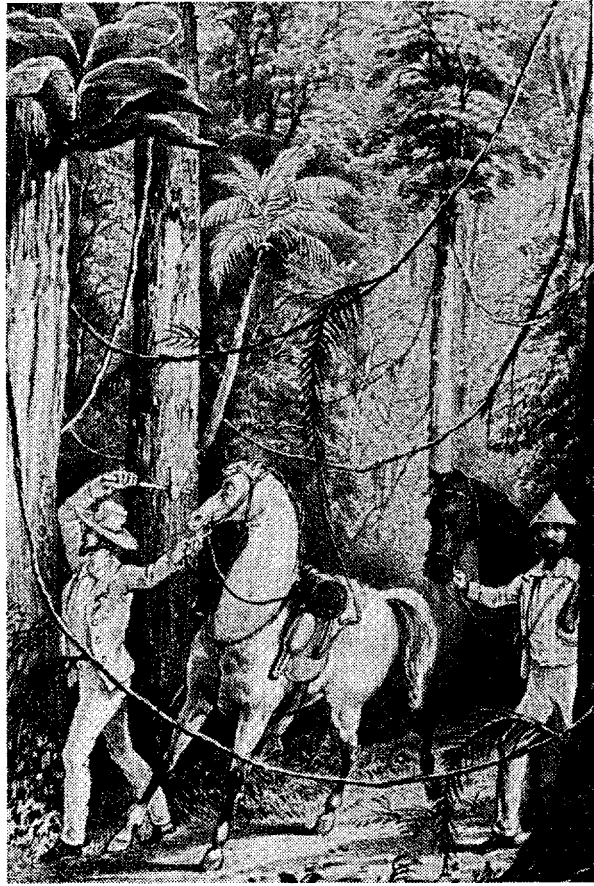
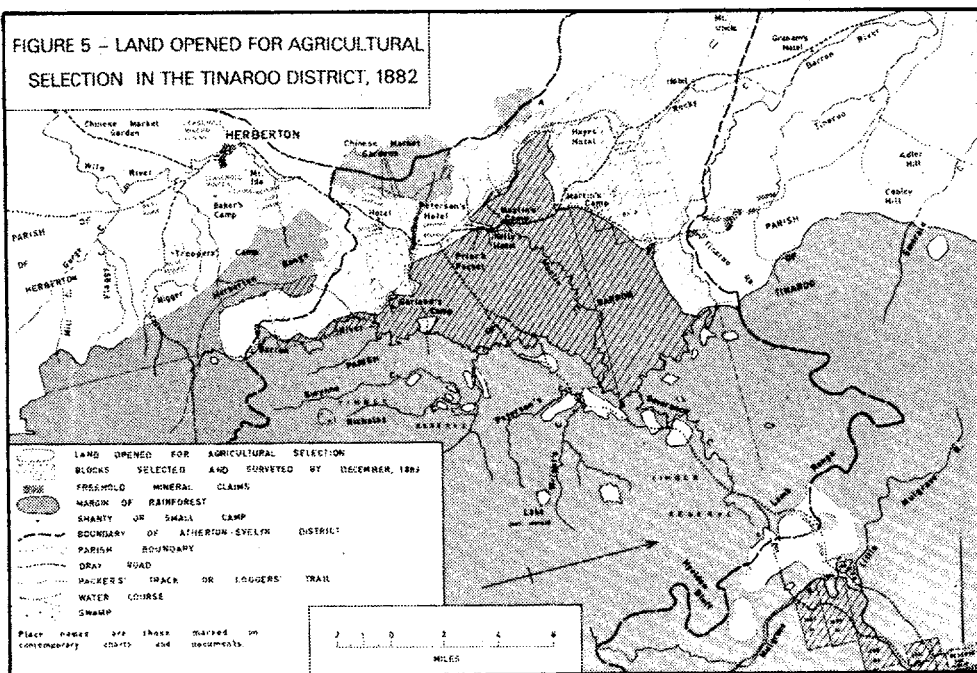
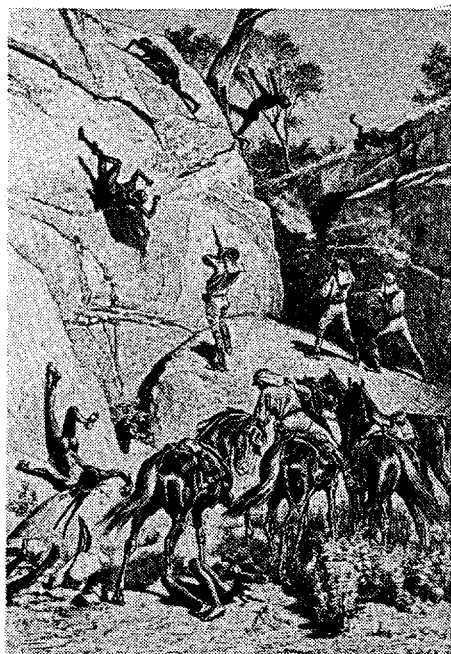
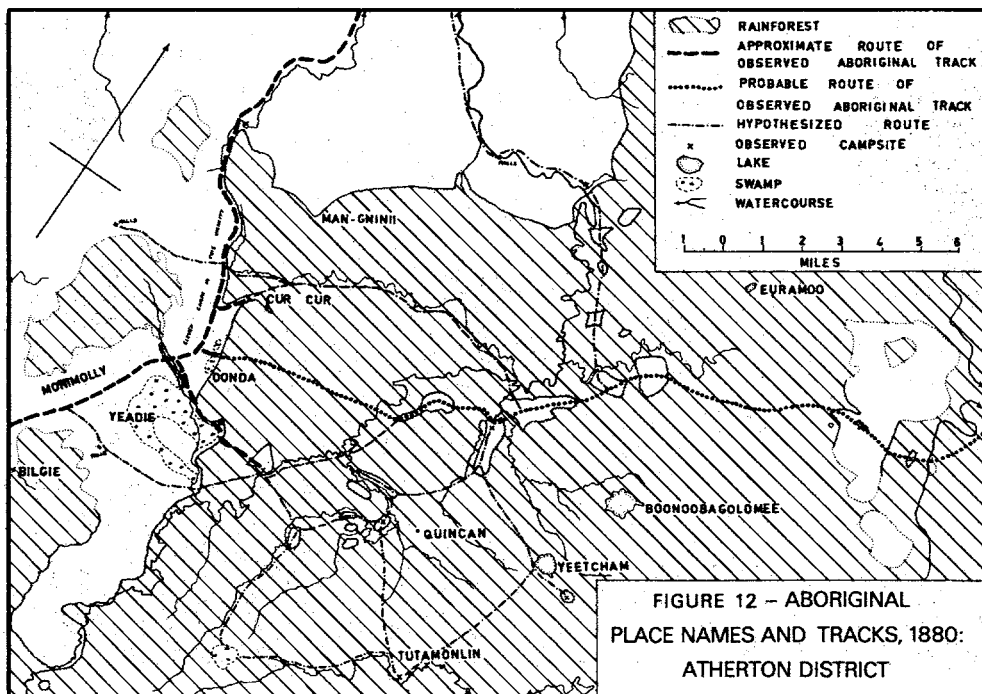


FIGURE 5 - LAND OPENED FOR AGRICULTURAL SELECTION IN THE TINAROO DISTRICT, 1882









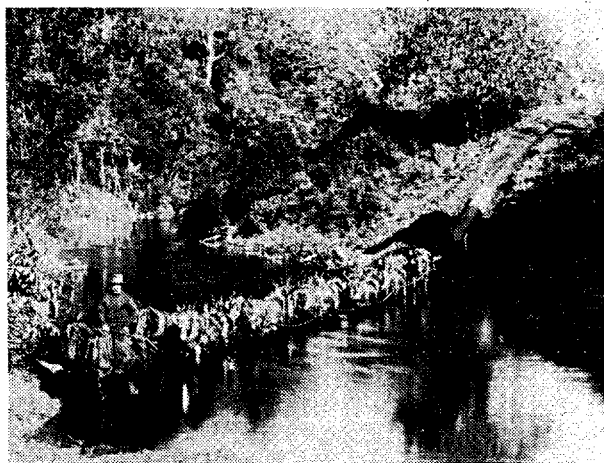
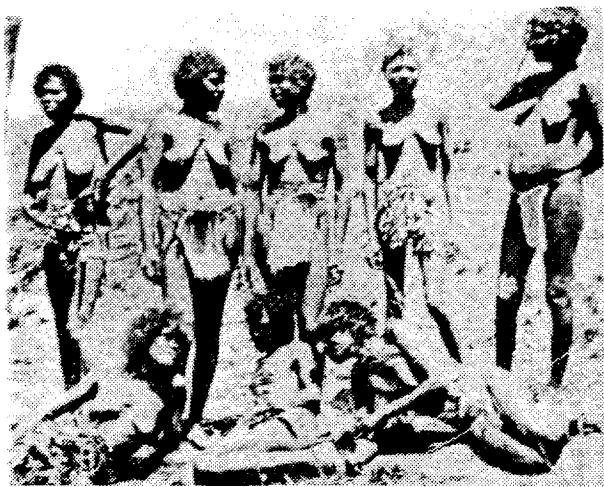
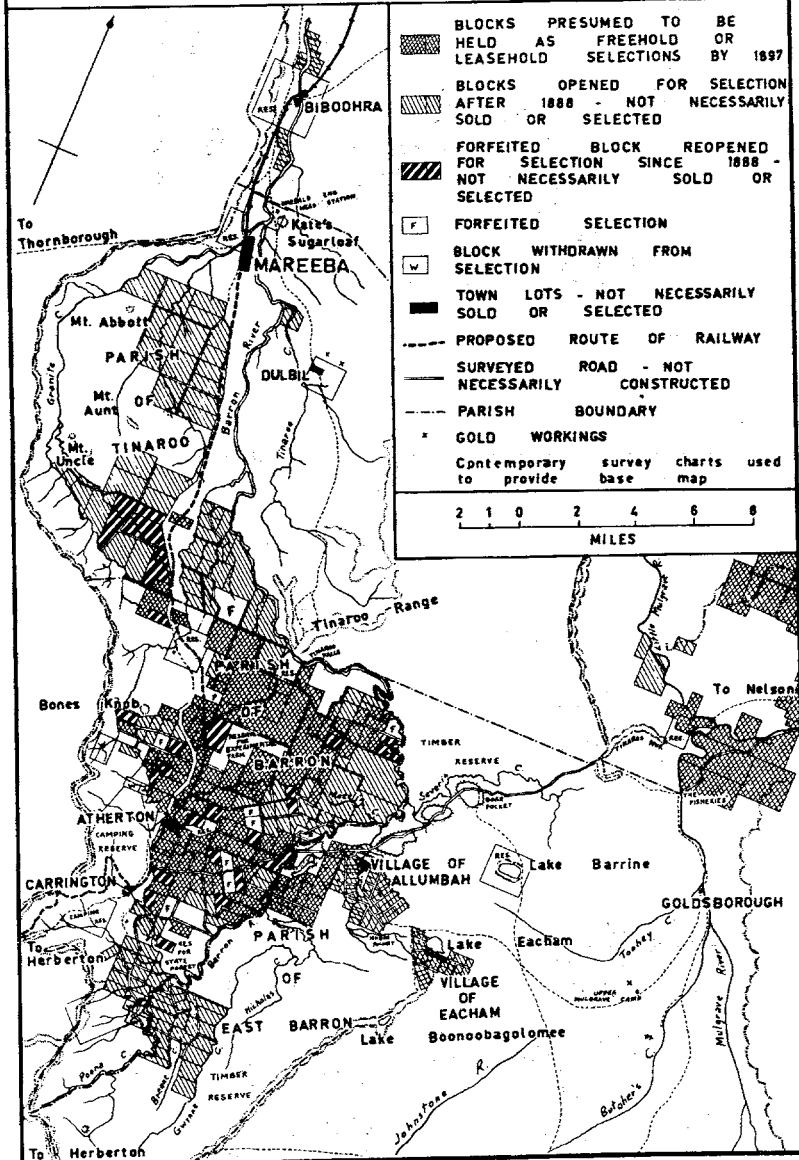


FIGURE 17- LAND SELECTED OR SURVEYED
FOR AGRICULTURE, ATHERTON PLATEAU, 1897





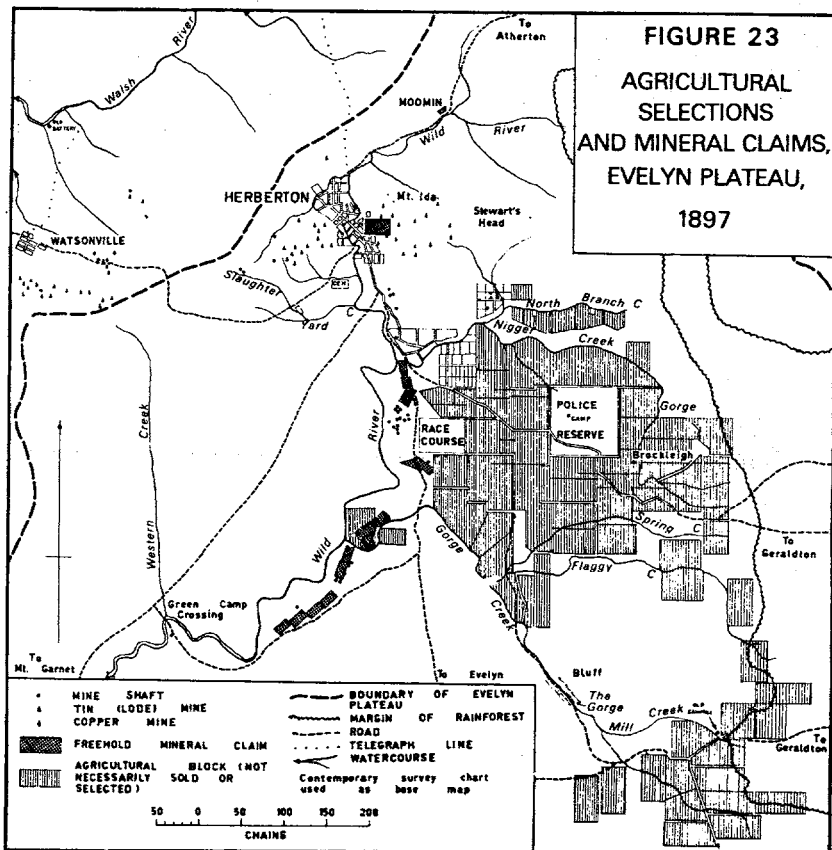
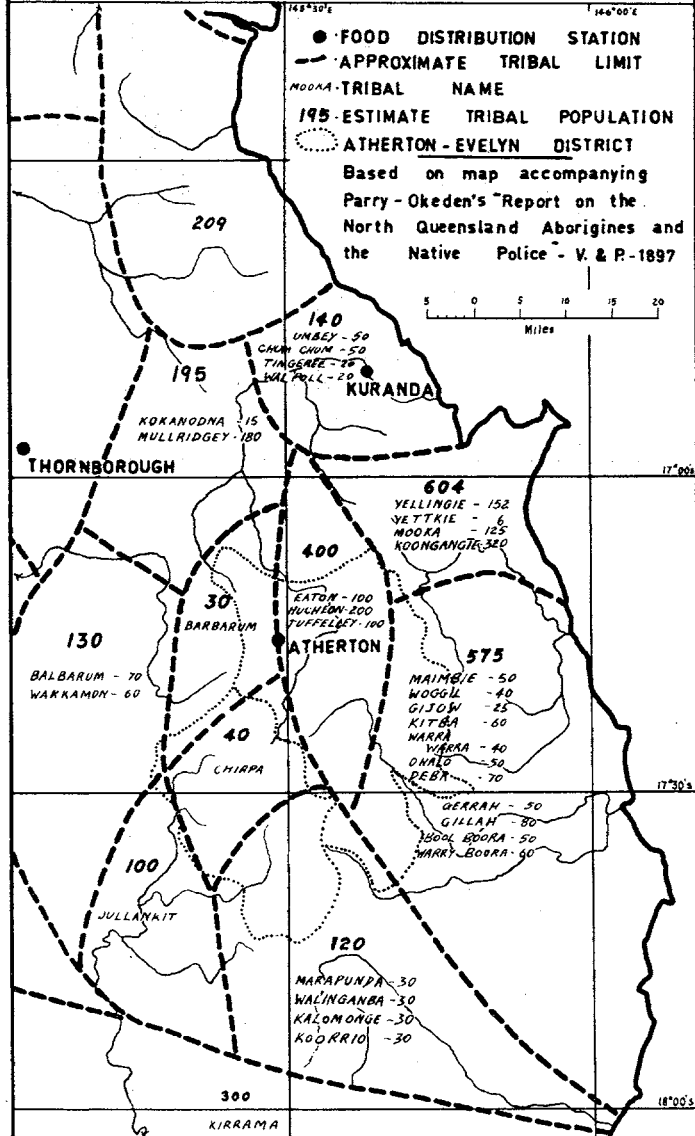




FIGURE 26 - ABORIGINAL TRIBAL BOUNDARIES
AND POPULATION ESTIMATES,
ATHERTON - EVELYN DISTRICT, 1896







CULTURE CONTACT AND CHANGES IN LAND OCCUPATION

ON THE COBOURG PENINSULA

Alan Powell

Recent literature on the Australian Aborigines tends, quite fairly, to highlight the part played by massacre and forced dispossession in the breakdown of Aboriginal society. But even where peaceful contact with other races was the general rule, great change took place in the traditional order of things. In the long run the attractive elements of new societies could prove to be no less destructive than slaughter to such an introspective and delicately balanced social order as that of the Aborigines. In 1965 W.H. Stanner wrote:

Contact with Europeans could bring about, often surprisingly quickly, conditions appearing to suggest that the Aborigines lived a wholly free-ranging life. Often at a far remove from the actual place of settlement a radical change of territoriality took place. What happened was that groups near the settlement moved towards it and sought to monopolise its attractions. This had two effects. It set up larger and more lasting ad hoc groups at or in the vicinity of settlement, and made a rift with back-lying groups less advantageously placed. The latter, usually weakened by the seepage of individuals and parties with claims (by kinship, friendship, marriage, trade, etc.) on members of the settlement-groups, tended to make common cause with, and sometimes join physically, other groups in their own position. The formation of such ad hoc collections of distinct kinds, under conditions, in localities, and with membership ill-connected with the tradition, was for all of them a great change of external as well as internal social structure. The fabric of life was affected over whole countrysides. The mystical-jural-ritual links between specific descent-groups and localities weakened in practice. In a short period the old optimal ecology - the ratio between population and resources, and the physical distribution, which allowed a once-connected set of territorial groups to maintain themselves ... on definite tracts systematically exploited ... virtually disappeared (Stanner, 1965, 18).

While this process of change is recognised by anthropologists, well-documented examples are not easily found, because the Aboriginal oral tradition has become lost or confused and European observations have been usually scanty and ill-informed. In a few areas European records have a timespan and continuity sufficient to allow some reconstruction of major changes. One such area is the Cobourg Peninsula. From the north west tip of Arnhem Land the peninsula thrusts out long fingers of land into the Arafura Sea. Here Australia comes closest to Asia: the Tanimbar Islands of Indonesia are less than 300 sea-miles to the north. The bays of the peninsula's north coast formed

a fine base for sea-foraging Aboriginal groups. They also provided a landfall, and a base for the Macassan trepang-gatherers who yearly sailed their praus to the Arnhem Land coast on the north winds of the wet season and returned home under the drive of the dry season south easterlies. Evidence gathered by C.C. Macknight suggests that Macassan trade with Arnhem Land began not earlier than 1650 A.D., and possibly as much as a century later (Macknight, 1976, 93-9).

Whatever the case, it is certain that the Aborigines of the Cobourg Peninsula had regular contact with the Macassans long before Lieutenant James Cook discovered the east coast of Australia. The Macassans apparently left no records of their early intercourse with the Aborigines. Most present knowledge of it stems from European records of the nineteenth century, when fleets of more than sixty praus and 1000 men annually visited the Arnhem Land coast. At that time relations between the two peoples were often friendly and Aborigines are known to have travelled to Macassar. In 1876 there were said to be about seventeen Aborigines there, nearly all from Port Essington, principal harbour of the Cobourg Peninsula (Macknight, 1976, 86). The Macassarese language became something of a *lingua franca* for the coastal Aborigines, Macassan objects are well represented in Arnhem Land bark and rock paintings and the visitors had some influence upon Aboriginal songs, legends and ceremonies. There is no reason to doubt Macknight's general conclusion that the fundamental bases of Aboriginal society in coastal Arnhem Land were not changed by Macassan contact; but it seems certain that, indirectly, the Macassans brought changes in land occupation to the peoples of the Cobourg Peninsula.

European contact with the peninsula peoples probably began with the Dutch seaborne explorers of the seventeenth century. Pieter Pieterszoon, commanding Cleen Amsterdam and Wesel, cruised briefly along that coast in 1636. He saw no Aborigines. Eight years later Abel Tasman with three ships, Limmen, Zeemur and Brucq, found the strait (now known as Dundas Strait) between the Cobourg Peninsula and Melville Island. He named and partly explored Van Diemen Gulf to the south of the peninsula and passed on to explore the coast along nearly the entire north western shores of Australia. Tasman's records are lost and all that is known of his relations with the Aborigines is contained in a sentence from the official summary of his voyage. 'They did not discover anything important', commented the Batavia authorities, 'but only found wretched naked beachcombers without rice or other valuable produce and in many places wicked men' (Schilder, 1976, 187). If Tasman did encounter the people of the Cobourg, it seems that the meeting was not to the benefit of either. In 1705 three small Dutch vessels, Vossenbosch, De Waijer and Nieuw Holland, cruised along the north coast of Melville Island and, almost certainly, the Cobourg Peninsula. Skipper Martin van Delft and his crews made a prolonged and generally successful attempt to fraternise with the Aborigines they met until, on the point of departure, two sailors were attacked and wounded by blacks. The Dutch sailed away, lamenting that 'the nature of these tribes is foul and treacherous' (Major, 1859, 169). The Aboriginal viewpoint is

unknown. Later Dutch voyagers did not touch at the Cobourg. The next meeting of Europeans and Aborigines of the area took place in 1818. In April of that year Lieutenant Phillip Parker King, in the little cutter Mermaid, charted the whole of the peninsula and named most of its prominent features. King had no great interest in the Aborigines. He noted that they appeared to be numerous at Port Essington, warded off an attack made by warriors on his ship's boat without damage to either side and sailed on (King, 1969, 87-92).

Partly on King's advice the British government chose Port Essington as the site of a trading settlement in 1824. Lack of water led the military settlers to establish the first British settlement at Melville Island instead. By 1827 this settlement was failing, not least because the local Tiwi people were hostile; and in June 1827 men of the 39th Regiment under Captain Henry Smyth formed another settlement at Raffles Bay, a few miles east of Port Essington. A contemporary described Smyth as 'a Gentleman of good sense, great zeal and experience' (Captain James Stirling to Darling, 20 June 1827, H.R.A., III, V, 815), but he had no idea how to cope with the local Aborigines. Race relations went from bad to worse. In October 1827 'fifty or sixty' blacks surrounded and speared a soldier. Smyth sent out a punitive party. According to his report, the party killed one man and wounded several others (Smyth to Darling, 30 October 1827, H.R.A., III, V, 818). The Aborigines continued to harass working parties and the settlement to gain the iron and other goods they wanted. On 11 February 1828 a patrol of Smyth's men fired on a large group of blacks when they met in the bush. There are several versions of this massacre. According to Smyth's official report, relayed by Governor Darling of New South Wales to the Secretary of State for the Colonies, a man, a woman and a child were killed and two or three others wounded (Darling to Rt Hon W. Huskisson, 29 August 1828, H.R.A., I, XIV, 350-1). T.B. Wilson, a surgeon who arrived at the settlement more than a year later, gave a more lurid account. 'A party of the military (and, I believe, also of the prisoners) were dispatched in search of the natives', he wrote. 'They came unexpectedly on their camp at Bowen's Straits, and instantly fired at them, killing some, and wounding many more. A woman, and two children, were amongst the slain; another of her children, a female, about six or eight years old, was taken, and brought to the camp, and placed under the care of a soldier's wife' (Wilson, 1835, 148). (This child, Rivera, eventually became so alienated from her people that she was taken to Sydney by the Commandant when the settlement closed.) By the time the story reached John Sweatman, clerk of the survey ship Bramble, in 1843, the number of victims had soared to thirty (Allen and Corris, 1977, 135). The tale may have grown in the telling or Smyth may have been trying to conceal the extent of the massacre. Governor Darling condemned it as 'a very gross Outrage' (Darling to Huskisson, 28 August 1829, H.R.A., I, XIV, 350), yet Smyth went unpunished and the Aborigines thereafter 'kept aloof' (Wilson, 1835, 148) from the settlement with very good reason.

This depressing pattern of racial antagonism was reversed by the example of one man, Captain Collett Barker, last Commandant at Raffles Bay. In only a year (1828-29) spent at the settlement he won the trust and confidence of the Aborigines through consistent, tactful treatment of them and the force of his own personality and courage. His was a lone effort for, as surgeon Wilson remarked, 'no other individual in the settlement could be brought to consider these poor beings in any other light than wild beasts' (Wilson, 1848, 77). Barker was remembered long after the settlement closed late in 1829. Ironically, he was killed by Aborigines at the mouth of the Murray River in 1831. His surviving diaries have little to say on the numbers and distribution of the Raffles Bay Aborigines. His friend T.B. Wilson wrote of their personal characteristics and behaviour and noted that on one occasion fifty 'mostly athletic and active-looking' men from Croker Island visited the settlement (Wilson, 1835, 76). Apart from this indication of considerable numbers, good health and the drawing power of the settlement, Wilson's writings are not helpful to demographers and he mentions no tribal divisions. He did assert that the Raffles Bay Aborigines were divided into three social classes, Mandro-gillie, Manbur-ge and Mandro-willie (Wilson, 1835, 163). These three divisions, with wide variations in spelling, were confirmed by G.W. Earl in 1846 (Earl, 1846a, 240-1) and by the anthropologist Baldwin Spencer in 1914 (Spencer, 1914, 46). Nicolas Peterson and Myrna Tonkinson have recently noted that these named, exogamous groupings have now increased to four and that the present matrilineal moieties and subsection systems amongst the Cobourg people are probably a development of the twentieth century (Peterson and Tonkinson, 1979). Neither Earl nor Spencer mentions them.

George Windsor Earl was the first European to study carefully the Cobourg peoples. Observant and well read, he came to the peninsula in 1838 with Captain J.J.G. Bremer of HMS Alligator when that officer established at Port Essington the third and last British military outpost in the Northern Territory. Earl remained in the north for the greater part of six years and found no lack of opportunity to examine and interrogate the Aborigines, for race relations were consistently good. Earl attributed this to everyone at the settlement being 'in the employ of government', i.e., the settlers consisting of a detachment of marines - and thus being under strong control (Earl, 1846a, 239). He also noted that Collett Barker was still affectionately remembered by Aborigines (Earl, 1846b, 34-5). Moreover, the Commandant, Captain John McArthur, was well-disposed towards the blacks, his little settlement of Victoria took up little of their land and they were thoroughly accustomed to dealing with outsiders. McArthur never had need to fortify Victoria against them. The only defence position, described by T.H. Huxley as 'a ruinous looking blockhouse with a few pieces of cannon mounted on its top' (Gibson-Hill, 1959, 124) faced the sea to ward off unfriendly whites, not blacks. In April 1839 the French explorer Dumont D'Urville paid a brief call on the settlement with his two ships Astrolabe and Zelee. He noted the 'peaceful intentions' of the Aborigines towards the whites. He also noted that relations between the Port Essington Aborigines and the Macassan trepangers were not so good;

the two groups had recently clashed and the blacks had decamped into the interior (Macknight, 1969, 98).

Earl's interrogation of the local Aborigines convinced him that great changes had recently taken place in the control of peninsula lands. 'Indeed', he said, 'it would seem that at no very distant period, the pressure of a powerful people in the interior of the continent had driven one tribe in upon another, until several distinct communities have been crowded up within the Cobourg Peninsula, where, until very recently, they have been making war upon each other to such an extent that two of these have, within the memory of natives now living, been reduced from numerous bodies to mere scattered remnants' (Earl, 1846a, 242). The attraction of the Macassan trepang camps may have been the prime cause of such population shifts and disease could well have played a greater part than war in decimating Aboriginal groups. Malaria, leprosy, smallpox and venereal disease were all endemic in the Indonesian islands and could easily have been passed from the Macassans to the Cobourg tribes.

Earl distinguished four tribes on the peninsula, defining them as:

Yaako, inhabiting Croker Island and the country around Raffles Bay,
Yarlo, the Port Essington tribe,
Iyi, who inhabited lands west of Port Essington,
Oitbi, occupying the southern shore of the peninsula, the islands of Van Diemen Gulf and the upper part of Port Essington.

Earl - and nearly every European who followed him - used linguistic criteria to define Aboriginal groups: an imperfect criterion, but one sound enough to allow the tracing of broad changes in group dominance in an area. Earl's comments indicate that the dialects spoken by his four groups had some similarities but were not closely related and he believed that the tribes were still in the process of change. He considered the Yaako to be a recent amalgam of two tribes, termed the Yarlo and Iyi 'broken' and thought the Oitbi to be numerous, powerful and in the process of expansion (Earl, 1846a, 241-4, for his assessment of the tribes). His tribal distribution pattern was broadly confirmed by another observer, Father Angelo Confalonieri. Confalonieri, a Catholic missionary, reached Port Essington in 1846 after a harrowing trip from Sydney. Travelling with two catechists on the supply schooner Heroine, he reached Torres Strait where the ship tore her bottom out on a reef and sank in a few minutes, taking with her his two companions. Confalonieri, rescued by an accompanying vessel, reached the settlement in a state of total destitution. McArthur gave him support and he soon moved to a solitary hut at Black Point, on the outer harbour of Port Essington. He learnt the local dialects with an ease that amazed the British and settled down to convert the Aborigines to christianity and study their culture. In the first object he failed entirely; in the second he was more successful, compiling a vocabulary of Aboriginal

words and a map showing tribal distribution on the peninsula. This map shows a tribal distribution similar to that described by Earl. Oddly, considering his reputed fluency in Aboriginal tongues, Confalonieri listed his tribes by their Macassarese names - or, more probably, in what Earl called the 'horrid patois' of Macassarese which was the lingua franca of the coast. Thus the Croker Island people were identified as the 'Territon Tribe', the Port Essington Aborigines as the 'Limbaregio Tribe', the western peninsula group as the 'Limbapui' and the southern people as the 'Binanolombo' (Confalonieri, 1914-15, 77). The latter name accords reasonably with the alternate name, 'Bijnalumbo', which Earl gave to the Oitbi (Earl, 1846a, 213). Confalonieri died at Port Essington of malaria, in 1848, leaving his anthropological work incomplete. But he had done enough to confirm Earl's earlier delineation of linguistic groups on the Cobourg Peninsula at that time. Earl's speculation about the fluidity of the group distribution pattern on the Cobourg was reinforced by his own observations, and those of others amongst the British. The settlement proved to be a powerful attraction. 'A large party of the natives had established themselves on the sandy beach to the south of the settlement immediately after our arrival, and they held constant intercourse with us' remarked Earl (Earl, 1846b, 42). This camp remained for the whole of the eleven years that the British settlement survived and became the focal point of commerce.

The Cobourg Aborigines traded their labour as food-gatherers, servants, guides and seamen on British ships - Captain Mackenzie of the Heroine employed five of them and thought them amongst the best seamen he had - for European food, clothing and iron tools. As knowledge of the settlement spread, visitors came. 'Parties of warriors, headed by their chiefs, occasionally came from the remote interior to pay us a flying visit', said Earl, 'and nearly every Macassar prahu that arrived from the Gulf of Carpentaria brought two or three individuals from one or other of the tribes that are distributed along the intermediate coast' (Earl, 1846a, 239-40). Ludwig Leichhardt, nearing the end of his epic journey from Moreton Bay to Port Essington in late 1845, found cloth and an iron tomahawk, apparently from Port Essington, as far out as the South Alligator River, 100 miles from the settlement; and by the time he reached the East Alligator, tribesmen were asking 'What's your name?' in lucid English (Leichhardt, 1846, 238).

Unhappily, disease soon appeared amongst the unnaturally high concentration of Aborigines near the settlement. In September 1841, Captain McArthur recorded that 'the natives suffered severely ... from catarrh, inflammation of the chest and ophthalmia' (McArthur, in Peterson and Tonkinson, 1979). Early in 1843 a malignant form of malaria, probably brought in by crewmen of supply ships from Timor, struck both settlement and Aboriginal camp, causing several deaths. Four years later McArthur noted that bronchial disease had 'carried off ... great numbers' of Aborigines, including sixty from one area (Mountnorris Bay) alone. 'Nothing but our assistance preserved them from an exterminating mortality', he asserted. 'We heard wretched accounts of those beyond our reach' (McArthur, in Peterson and Tonkinson, 1979).

At Port Essington the destructive elements of attraction, concentration and disease were clearly to be seen. The other elements defined by Stanner on the breakdown of Aboriginal group organisation were, by their very nature, less visible; but though European records of the Cobourg people have been often sketchy since the Port Essington settlement ended in 1849, they are sufficient to indicate continuing and drastic change in the distribution of dominant language groups within the peninsula to the present day.

The failure of British attempts at settlement on the Cobourg Peninsula probably lessened, but did not end, the high degree of Aboriginal concentration in the area. The Macassans continued to use the bays as one of their main concentration areas. In 1871 John Lewis applied for a pastoral lease over the western half of the peninsula and finally took it up in 1874. His Cobourg Cattle Company was little more than a buffalo-shooting camp, but it soon attracted some 250 Aborigines (R.M. and C.H. Berndt, 1954, 94-5) whom Lewis found 'friendly and useful' (Lewis, 1922, 148). These people included a number of 'old hands' from the days of the Victoria settlement; but as Peterson and Tonkinson have suggested, it is likely that most of these people were visitors from outside the immediate area (Peterson and Tonkinson, 1979) because, when Paul Foelsche visited the area in 1880, he found only 'a few friendly natives' (Foelsche, in R.M. and C.H. Berndt, 1954, 127) at the Cobourg Cattle Company and he later commented that 'though the Unalla tribe was at one time numerous, it was reduced in 1881 to seven men, twelve women, nine boys and two girls' (Foelsche, in Curr, 1886, 270).

Foelsche, police inspector, photographer, firearms expert and botanical collector of considerable repute, had a great interest in the Aborigines and studied their customs over many years. The country of the Unalla, he asserted, extended 'from Raffles Bay to Port Essington harbour and thence midway up the Cobourg Peninsula to Popham Bay'. This area incorporated lands which Earl had defined thirty-five years earlier as belonging to three tribes - or linguistic groups, since both Earl and Foelsche used language as the basis of their 'tribal' division. Foelsche's remarks suggest rapid expansion by the Unalla at the expense of others; but, if so, their small numbers imply that they were nearing the end of their dominant period. Who were the Unalla? Norman Tindale, in his monumental Aboriginal Tribes of Australia, considers 'Unalla' to be synonymous with Earl's 'Iyi' and the modern 'Iwaidja' (Tindale, 1974, 226-7). This may be an error, since Foelsche listed the 'E-i-wai-ja' as a neighbouring tribe to the Unalla, along with the Yiarik, Angara-Pingan, Ajakoot and Warooko (Foelsche, in Curr, 1886, 273). Foelsche gave no information on the lands of these people, but if his positioning of Unalla country was correct, all their five neighbours probably held some lands on the peninsula. Identification of these groups is difficult. Tindale identifies Earl's Yaako with Foelsche's Ajakoot, Yarlo with Warooko, and suggests that both Iyi and Yarlo [Ja:lo] may be older sub-tribal designations of the Warooko [Wurango] (1974, 227, 238). None of this is certain. Tindale aptly remarks that the Cobourg

peninsula 'is an old area of tribal fragmentation' (1974, 235). It is clear that such fragmentation continued in the period between the closing of Victoria settlement and Foelsche's visit. An Aboriginal informant gave Foelsche at least one good reason for this; he claimed that the Macassans had brought a smallpox epidemic to the Unalla in 1866 (Foelsche, in Curr, 1886, 271).

The Cobourg Cattle Company was not the only place of attraction for Aborigines. From 1874 and possibly earlier, European trepangers worked in the Cobourg bays, a second buffalo-shooting camp existed on the peninsula for a time from 1876 and thereafter customs men were constantly in the area, policing the trepang trade under regulations gazetted by the South Australian government. Alfred Searcy used Cobourg Aborigines extensively during the 1880s to help in his customs operations and came to have a deep respect for their intelligence, courage and adaptability (Searcy, 1912, 113). After four years as manager of the Cobourg Cattle Company, E.O. Robinson joined the Customs Service and manned the revenue station at Bowen Straits from 1884 to 1899. He was succeeded by Alf Brown, who remained in the peninsula working trepang until World War II. Both employed local Aborigines, got on well with them and made their camps the centre of local trade. The Macassans continued to come until the South Australian government excluded them from the trepang trade in 1906. Brown and other trepangers, European and Japanese, took their place. In 1917 the federal government built a lighthouse on Cape Don, at the extreme western tip of the peninsula. Two white families manned it. It soon became another place of concentration for the Cobourg Aborigines. So did the sawmill set up by Reuben Cooper at Mountnorris Bay during the 1930s and operated after his death in 1942 by Lee Brothers. This mill continued to operate until 1962; according to Peterson and Tonkinson (1979), it drew from people as far afield as Cape Don and the Liverpool River to work there.

The image of the Cobourg peoples continued to be very much as it was when G.W. Earl first observed them; that of groups in a constant process of change and movement and - in European terms - quite highly sophisticated. Joe Cooper, father of Reuben, turned that sophistication to considerable advantage. In 1895 he and his brother Harry risked the fabled ferocity of the Tiwi people of Melville Island and set up a buffalo-shooting camp there. All went well for two years; then the Tiwi killed Harry and drove out Joe. He fled to the Cobourg, enlisted the aid of the Iwaidja Aborigines and returned to Melville Island in 1900 with his well-armed new allies at his back. Cooper stayed for sixteen years and gained a powerful influence over the Tiwi. In 1911 the anthropologist Baldwin Spencer visited Cooper's camp and later commented: 'it is entirely due to him ... that white men can land on Melville Island'. But, as Valda Krastins has pointed out, 'the real agents of social change were Cooper's Iwaidja aboriginals' (Krastins, 1972, 43-4).

Spencer included a brief note on the 'Iwaidja or Port Essington Tribe', in his book Native Tribes of Northern Australia, published in 1914. He probably gained his information from Cooper's Iwaidja followers, for he did not visit the peninsula. His comments imply that Iwaidja-speakers were then dominant in the Port Essington area and he remarked that 'this tribe is evidently much modified' (Spencer, 1914, 46), but gave no details.

Little can be said of Cobourg land occupancy in the period between the two World Wars. George Sunter worked the area for trepang from 1926 to 1932 and based a lively book Adventures of a Trepang Fisher upon his experiences. His stories of the Cobourg Aborigines tell us a little about the pattern of interaction between black and white and nothing at all about tribal movements. In recent years the Cobourg peoples have again become the subject of anthropological study, through the interest in western Arnhem Land of R.M. and C.H. Berndt and because the peninsula became the subject of a land claim in 1979. The conclusions of the Berndts are based on two periods of fieldwork in Arnhem Land, the mid-to-late 1940s and the 1960s. Their books, Arnhem Land: Its History and Its People (1954) and Sexual Behaviour in Western Arnhem Land (1951) give information on the Cobourg during the earlier period. In the former publication they noted, as had almost every previous writer on the area, that in western Arnhem Land many of the original tribal groups and their territorial boundaries had become vague (1954, 26). In the latter book, the people of the Cobourg came under detailed discussion. The Berndts discussed tribal distribution in the 1940s but did not show tribal boundaries on their maps 'because of group movements and displacements' (1951, 33). They commented that 'the whole of the ... area under consideration [including all of the Cobourg Peninsula except Cape Don; but Cape Don people are discussed specifically elsewhere in the book] contains today remnants of tribes having a common cultural heritage but speaking different languages' (1951, 33). They noted that some original groups had become extinct and that others had become culturally submerged. The Marigu of Croker Island (identified by Tindale as Earl's 'Yaako') (1974, 227) then numbering only five persons according to the Berndts, fell into this category (R.M. and C.H. Berndt, 1951, 33, 37).

The Berndts stated that 'the Ji:wadza [Iwaidja] ... were located in earlier days around the Cobourg Peninsula, Cape Don, adjacent mainland country, on the mainland opposite Croker Island, around Port Essington and Malay Bay' (1951, 34). No time span was given. Possibly, with the constant ebb and flow of peoples, the Iwaidja had reached at different times all the named sites. If so, they did not occupy the whole peninsula in the 1940s. The Berndts remarked that 'the Cape Don people, although allied to the Ji:wadza, spoke u:ru:ku and were known by that name' (1951, 34n). Elsewhere the Berndts listed the Cape Don people at Auwulwarwak (presumably a non-linguistic name) and put their numbers at twenty-five (1951, 37). The eastern neighbours of the Auwulwarwak/U:ru:ku were listed progressively as:

Ka:ri:k.
Ngadalwuli
Mandu:wit.

Tindale identifies Auwalwarwak/U:ru:ku with Wurango and, more tentatively, with the Yarlo whom Earl stated to be the Port Essington tribe (Tindale, 1974, 238) and, drawing on the Berndts, suggests that the Ka:ri:k, Ngadalwuli and Mandu:wit may be sub-tribal divisions of the Iwaidja (Tindale, 1974, 236).

Some twenty years later the Berndts returned to the area. They noted again the difficulties of establishing tribal boundaries in western Arnhem Land, adducing two main reasons: 'One is the presence of small language or dialect units within or between the larger units, and the other is the difficulty of establishing exact references for certain of these names' (R.M. and C.H. Berndt, 1970, 9). They went on to say, 'for example, although Iwaidja are most closely associated now with Cape Don and with Croker Island, both of these places were traditionally owned by others: Croker mainly by Margu, some small neighbouring islands by Yilga, and the Cape Don area by Garrig, Wururgu [Wurango] and Adawuli - and, of these, only a few Margu survive' (1970, 9).

So, twenty years after the Berndts' visit of the 1940s, the occupants of the Cape Don area had changed again. With the demise of the Ka:ri:k/Garrig, Ngadalwuli/Adawuli and the Auwalwarwak/U:ru:ku/Wurango groups - or, rather, the patrilineal descent line of these peoples - it seems that Iwaidja speakers have, in this generation, extended their sway westward over the Cape Don area and eastward onto Croker Island. However, the whole of the peninsula was declared a wilderness conservation area in 1961 and, under persuasion of the welfare authorities, the local Aborigines gradually moved away, mainly to Croker Island or Darwin. The last of them left in 1970. In that year, R.M. Berndt wrote of the Iwaidja, Maung and Gunwinggu people who then lived on Croker Island, 'all these people are relatively sophisticated in European terms and have had intensive mission and other contacts; few avail themselves of indigenous foods to any marked extent or travel over the immediate "tribal" areas' (R.M. Berndt, 1970, 13). Berndt concluded that the diversification of interests which had affected these people as an inevitable consequence of their settlement existence had set in train a gradual psychological estrangement from the country. This would almost certainly be denied by the Aborigines, wrote Berndt; 'in fact, even the younger ones among them still assert their traditional concern with their country - even when, if cross-questioned, they demonstrate an appalling lack of knowledge about the mythological details of what they insist is their own country' (1970, 53).

The shortcomings of human memory and the written evidence have made it difficult indeed to distinguish even the major movements of broad linguistic groups on the Cobourg Peninsula, let alone the changes which must have taken place in the patrilineal land-owning clans ('*yiwurumu*') (Peterson and Tonkinson, 1979, for the term). Thus, anthropologists

Nicholas Peterson and Myrna Tonkinson faced a formidable task when in 1979 they undertook to develop a land claim on behalf of the Cobourg peoples. Their work has confirmed the earlier evidence of growing Iwaidja language dominance during this century. It is now the lingua franca of all the Cobourg people, though Peterson and Tonkinson have noted that, of five identifiable clans, four traditionally spoke either Wurugu, Garrig or Margu and that older claimants still know these dialects. This evidence is not inconsistent with Berndt's belief that the male descent lines of the Wurugu and Garrig had died out before 1970. Peterson and Tonkinson estimate that the pre-European population of the Cobourg was between 200 and 250 persons; they list forty-eight persons as claimants to the area in 1979. Even without taking group movements into account, a population decline to one quarter or one fifth of the original would have decimated many clans; and the claim document notes that two clans are known to have become recently extinct and that one of the two Garrig-speaking clans, the Madjunbalmi, consists only of two elderly women. It is also noted that population decline has led to numbers inadequate to maintain distinct religious cults and thus to a merging of the religious life of the peninsula peoples with that of western Arnhem Land.

The overall picture of great and continuous change on the Cobourg Peninsula continues - dynamic change, according to Peterson and Tonkinson; they have given brief details of ways in which the Cobourg Aborigines have adapted traditional law in recent years to cope with the decline and extinction of land-owning clans. These include the passing of land to the male children of the female line and adoption of a boy by a childless member of the male line. The status of those receiving land in this manner is uncertain. In discussing migration of new groups into the country of extinct clans, A.P. Elkin has noted that 'until a mythology grows up, or is transplanted, linking the migrating group to its new tribal home, it regards itself as a sojourner only, for the true tribal home is the territory in which the old time mythical tribal heroes travelled and performed exploits and instituted rituals' (Elkin, 1974, 60). W. Lloyd Warner has put the point even more plainly: 'the land will continue to belong to the dead clan until in several generations the memory of it is lost and new traditions [arise]' (Warner, 1969, 17). Traditionally, then, the new occupants are custodians only and given the rapidity of change on the Cobourg Peninsula, some may be custodians for custodians. Alternatively, the Cobourg position can be seen as an example of dynamic response in order to preserve a traditional society in the face of outside pressures which have been long and severe but which, unlike the course of events in most of Australia, have not resulted in the dispossession of the Aborigines from their land. Perhaps fortunately for his peace of mind, Mr Justice Toohey did not have to sort out the tangled thread of land ownership on the Cobourg Peninsula. In 1981 the Northern Territory government and the claimants amicably settled the land claim by agreeing to turn the area into an Aboriginal National Park under the control of a Board of Management with a membership shared equally between the claimant groups and the N.T. Conservation Commission.

The people of the Cobourg Peninsula have had a fairly continuous contact with Europeans for more than 150 years and with Asians for several generations before that. With rare exceptions this contact was peaceful and, except for the rather dubious case of the 1960s, the Aborigines were never dispossessed. Such a pattern is unusual in Australian history: unusual, too, was the close study of the local peoples by some of the earliest European arrivals, the discontinuous but useful flow of information about them in later generations and the recent anthropological studies of the surviving Aboriginal groups. The evidence supports Stanner's broad conclusions on the effects of European-Aboriginal Contact. Drastic change came to the society of the Cobourg Aborigines without need for the aid of massacre and dispossession by Europeans. It was enough that Europeans were there.

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