Nothing But Gum Trees:Textile Manufacturing in New South Wales 1788-1850

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...we must remember that there is a vast difference between the old country, where all machinery is ready to the hand for carrying on the work, and a country like this, where we have nothing but gum trees to begin with.
Sir Henry Parkes

Immediately after the arrival of the First Fleet efforts were made to produce textile fibres and it was not long before the government attempted to make cloth with the help of unskilled convict labour. By the 1820s a textile industry had developed to satisfy some of the colony's needs, and by the later 1840s some up-to-date factories had been built. This paper analyses the historical and archaeological evidence for the early Australian textile industry.

The business of transporting convicts and their guards halfway round the world and keeping them fed and clothed was expensive. The British had to seize any opportunity to make the new settlement useful to the Mother Country and pay for itself. When the eleven ships of the First Fleet sailed from England the first governor, Arthur Phillip, had among his instructions a section concerning the urgent production of flax fibres, 'as a means of acquiring clothing for the convicts and other persons who may become settlers ... it may ultimately become an article of export'.[1] These words reflect the serious problem the British Admiralty had in the last quarter of the eighteenth century with the shortage of canvas, cordage and cables for the Navy.

No time was lost; just over a fortnight after the arrival of the First Fleet in Sydney Cove, Governor Phillip sent Philip Gidley King, second lieutenant of His Majesty's ship *Sirius*, as superintendent and commandant with a group of twenty-three people — including a self-proclaimed weaver — to Norfolk Island.[2] Following the report of Sir Joseph Banks, who had accompanied Captain James Cook on his first voyage, great expectations were held for the flax that was growing wild and abundant there. King was given instructions to cultivate not only native flax, but also cotton as well as corn and other grains.[3] He did not know that the native flax, *Phormium Tenax,* that Captain Cook and Sir Joseph Banks had seen, looked quite different from the European flax plant (Fig. 1). John Hunter's exploring party found the plant by accident, when at Anson's Bay they came across a 'perpendicular cliff with a large kind of iris growing on the side of it ... if the iris had not been sufficiently strong to have supported our weight we must have fallen down a depth of 90 feet.'[4]

An 'expert', Andrew Hume, was sent to the island in 1890 and immediately set to work. Although he came free to supervise convicts, he was no better than his charges, according to a letter sent from the Cape of Good Hope to England about his behaviour on the voyage out.[5] Hume's efforts bore some result — after some time he managed to weave two pieces of cloth of locally grown flax at Cascade Bay. Archaeologist Robert Varman and his team discovered traces of human habitation and rural activities on this site some time ago but found no remains to indicate the original purpose of the site.

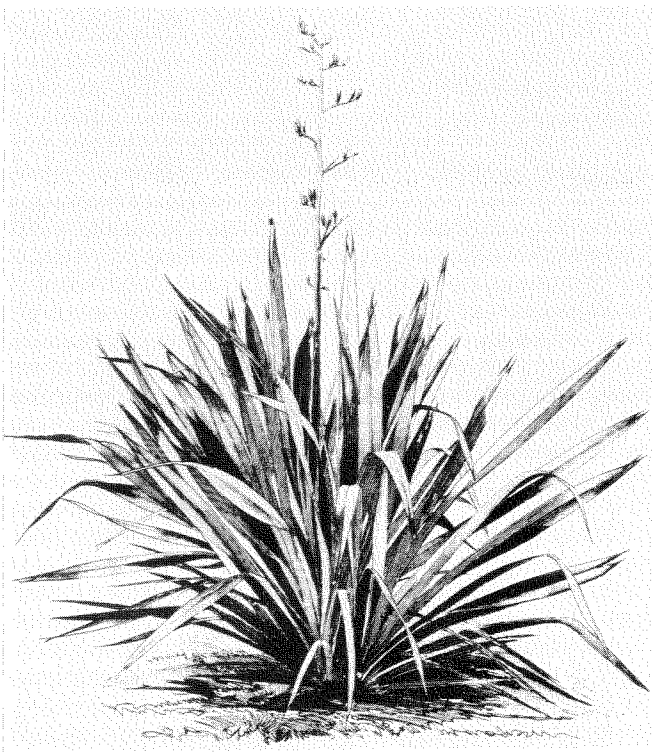

Fig.1: Phormium tenax, native flax.

In addition to trying to make cloth the convicts used the plant to make fishing lines and anchor ropes, and for a short while even thatched roofs. Hume sent an 18–gallon keg of collected flax seed back to the mainland. It soon became obvious however that the strange flax had different properties from the one that grew in England and could not be handled by traditional means. The decision was made to make use of the knowledge New Zealand natives had of treating the flax. At first the Government wanted to send someone to New Zealand to see how it was done, but instead, two Maori men were kidnapped at the Bay of Islands. They arrived at Norfolk Island in May 1793. Unfortunately they were the wrong people to capture, for in New Zealand the working of flax was done by

women, and these men — one a priest and the other a warrior chief — could only give very sketchy advice.[6] It became clear that the procedure for treating the plant was different and so was the part of the plant used — the Maoris used the leaves, not the stalk of the plant. Even with the most determined effort Hume was not successful in making a competitive product of *Phormium tenax*. No more manufacturing of cloth was done on the island, although the finished product compared well with its European counterpart.

Meanwhile in Sydney different experiments were carried out. Food and clothes were in desperately short supply and hardly any supplies arrived by ship. The need for cordage and sails was as urgent as for clothes. Attempts were made to use the bark of the kurrajong tree by combining it with either wool or wild flax. No acknowledgement was given to Aborigines in the obvious examples they gave of using native plants for useful purposes.[7] Wool was beginning to be regarded as a possibility for producing quantities of cloth. There was even talk of it as a possible export article, but there was not enough, partly because the available sheep were used for meat and partly because the quality was not as good as that to which manufacturers in England were accustomed. Manpower was also in short supply, as people who professed to be weavers preferred to work on the land to produce food.[8] The manufacture of cloth hardly amounted to anything in the 1790s even though two men were constantly making and repairing spinning wheels and even fabricated two looms in 1798 for the use of the convict 'factory' at Parramatta.[9] Hunter — the new Governor — complained bitterly in 1799 that no clothes or blankets have been received for the last three years.[10] Some effort was made in Parramatta by the convict women to make clothes out of sacks in which vegetables were packed. When the women were not occupied with stitching these bags, they were set to work at spinning, or whatever else needed doing.

Philip Gidley King arrived in 1800 as Hunter's successor, convinced that the Government's efforts in textile manufacturing were specially important, and he took a concerned interest in the budding industry. Before leaving England he engaged a master weaver, Edward Wise, to become superintendent of the factory and ordered the long-awaited equipment. The unfortunate Wise drowned on the way to the colony having been swept overboard from the ship *Porpoise*. King had to start from scratch; not only did he have no superintendent but the equipment ordered on the advice of 'experts' was of the outdated kind used in England before the development of spinning machines in the 1760s.

Considering the handicaps, a fairly large amount of cloth was produced in 1801: over 300 yards of woollen blanketing, and almost 500 yards of linen was made from the native flax *(Gymnostachis anceps)* which grew on the banks of the Hawkesbury River.[11] After the original log gaol on the south side of the river burned down in December 1799, a substantial stone one was built between 1802 and 1804 between the river and the present Victoria Street, Church Street and Marsden Street, but the convicts of either sex who worked at producing textiles at the so-called Female Factory lived mostly in the huts along the main street of Rose Hill. At this time the convict factory still functioned without proper supervision or proper tools and little was manufactured.

In 1800 a Scottish convict George Mealmaker (1766 – 1808) was sent to the colonies for political reasons. After having worked for three years as an unofficial overseer, he was officially given the job of superintending the Parramatta 'factory' of fifty women and eighteen men. By the time of his appointment he already had four looms working, and convicts of both sexes engaged in Sydney and the Hawkesbury as spinners, flax-dressers, wool-carders and weavers to supply cloth and blankets for the needy settlement. During the following years Mealmaker increased production of both woollen and linen cloth.

William Bligh arrived in Sydney in August 1806 as the next Governor. He found the achievements of the factory 'extremely trifling'. As one of the reasons for this was the extreme shortage of both wool and flax, experimentation with other fibrous materials was pursued with vigour, just as today's scientists are eager to find new raw materials to replace natural fibres. By the time Lachlan Macquarie arrived as Governor in 1810, there was an adequate food supply, people wore clothes instead of rags; there was time to take stock, and think of the future.

During the beginning of the Macquarie years (1810 – 1822) the Female Factory was working at reduced capacity, partly because of bad management since the death of Mealmaker, but mainly because of the unsuitable nature of the building (Fig. 2). In 1814 Macquarie found a 'proper and well qualified Person as Superintendent' in Francis Oakes.[12] At the time there were already 150 women working at the Factory, who between them had 70 children. Conditions were appalling in the crowded factory/bedroom/nursery/kitchen, which was upstairs. Men were working and living below, and the women not only squabbled between themselves but annoyed the men by throwing things down at them. The equipment to produce textiles was as inadequate as the conditions, specially in comparison with the well-equipped factories in Britain and in America at the time.

Those convicts who could afford it, still lived in the huts along the main street that became George Street. The footings of two of these huts were excavated by Ted Higginbotham in 1985.[13]

A new Female Factory was planned as part of Macquarie's public building program. It was designed by Francis Greenway the convict architect. Building started in 1818 north of the old one, next to the river.[14] A plan of the Factory drawn in the late 1820's shows some of the buildings. Plans of the factory drawn in 1833 were found at the Public Records Office at Kew in England (Fig. 3).[15] There are some contemporary images that show the Female Factory was a complex of fine buildings surrounded by high walls (Fig. 4). It has been changed many times since it was built, but it is probable that some of the walls that are there today were built in the 1820s. One of the buildings built in Governor Darling's time is still standing almost in its original form (Fig. 5). No archaeological investigation has been done on either of the three gaol sites at Parramatta, except for the research and survey done in the course of writing my thesis.[16]

Unfortunately, John Thomas Bigge, appointed in 1819 as commissioner of inquiry into the efficiency of the transportation system, believed that the manufacturing of wool in the colony 'is not an object that is much to be desired' so subsequent governments were reluctant to do anything with direct manufacturing.[17] It was cheaper and less trouble to contract work to private manufacturers. From the 1820s the Factory was no longer self-supporting and became primarily a penitentiary institution.

As the Factory moved to the new building in 1822, more convict women had been sent from Britain. Brisbane, the new governor, tried to cope by sending some to do agricultural labour at the prison farm at Emu Plains, but this did not alter the distressing conditions of the Factory. There was neither sufficient water, food, clothes, nor shoes. Some attempt was made to run the institution according to lines promoted in England by Elizabeth Fry which segregated women into different classes according to their character to prevent further corruption and crime, but at Parramatta the women were classified according to their economic usefulness, which defeated this purpose.[18]

The situation had become quite grim by the time Governor Ralph Darling arrived in December 1825. He made some far-reaching decisions on the future of cloth manufacturing. The most important one was about the salaries of staff at the gaol. The matron, the store keeper, and the master-manufacturer were paid a 'centage' of the total value of the product of the

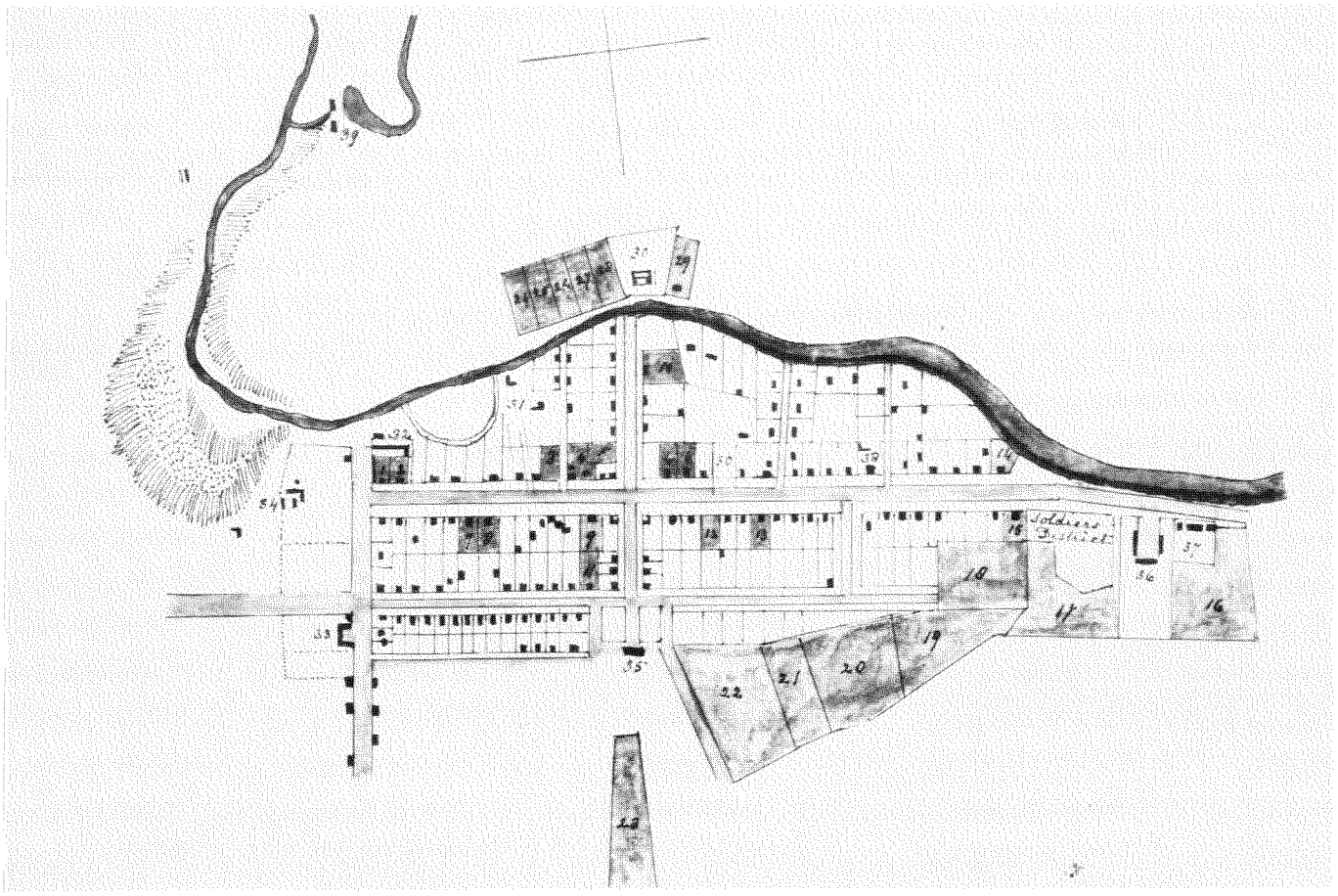

Fig. 2: Plan of the Township of Parramatta by G.W. Evans, Act. Surveyor. The number 30, designating the gaol, is marked twice on the plan. The original gaol site, presumably where the log gaol was to begin with, is marked on this plan on the north side of George Street, east of Church Street. The other one is north of the river, in line with Church Street. Copy in the Mitchell Library of a map held in the British Library, ML, M2 811.130/1813/1.

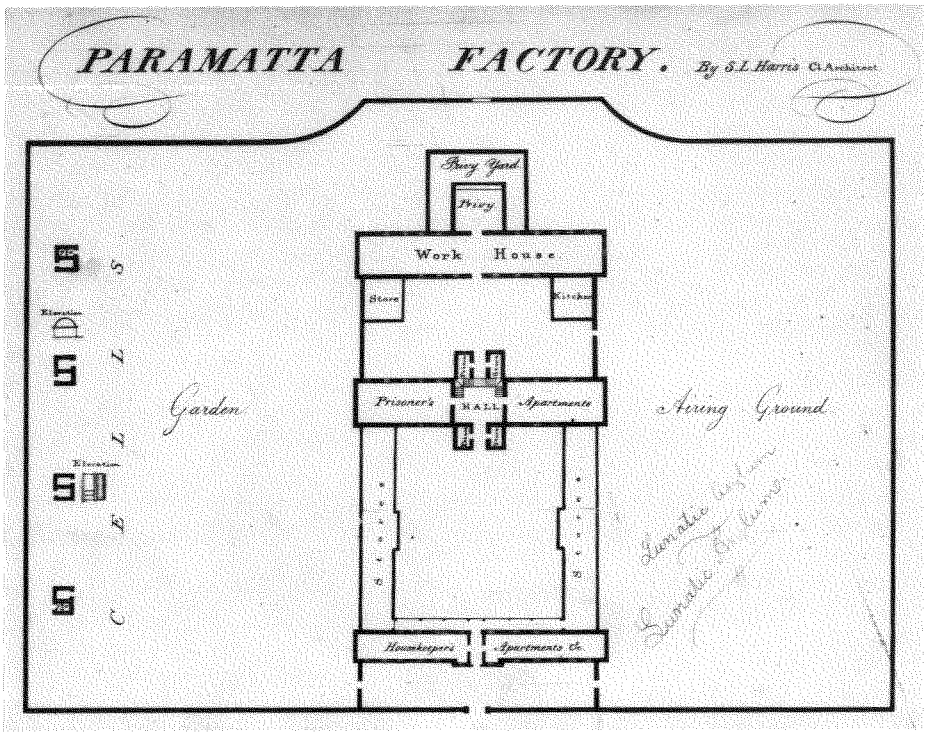

Fig. 3: Parramatta Factory. S.L. Harris, Colonial Architect. Mitchell Library, C225-6:CY reel 1035.

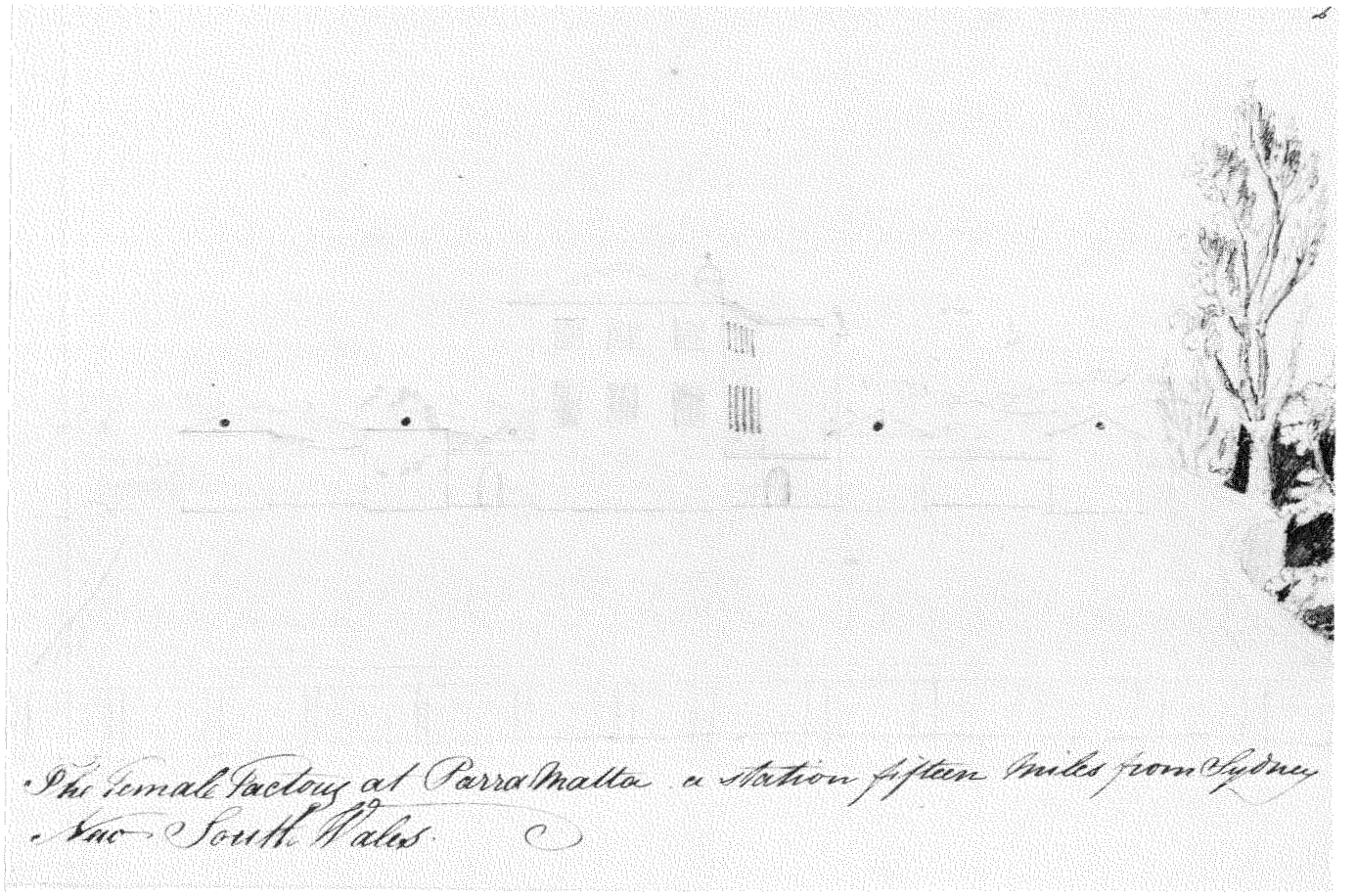

Fig. 4: The Female factory at Parramatta, a station fifteen miles from Sydney, New South Wales. Drawing by C.H. Roberts. National Library R4846.

Fig.5: This building, still standing, was built in Governor Darling's time as part of the Parramatta penitentiary. Both levels of the building were used for sleeping accommodation, (E. Stenning 1984)

factory above their yearly salaries. Now that the Factory's main function was its penitentiary role, it was unseemly and objectionable to pay a percentage on production and the practice was abandoned after having produced good results for the last decade.

In the late 1820s Darling was hopeful that the supply of raw materials would increase, and that wool, flax and even cotton were going to be available, but cloth manufacturing declined and as the numbers of convict women increased, it was a real struggle to find work for them.[19] In July 1831 the weaving establishment was discontinued and only spinning was done in the Factory. A hundred new spinning wheels were ordered but the supply of wool was still sporadic. In the following seventeen years it became clear that the Female Factory would not be the main producer of textiles in the colony as had been hoped. It finally became a Lunatic Asylum in 1848.

After the Bigge report in the early 1820s, only one government venture worked at a profit, the small convict settlement at Maria Island, off the east coast of Tasmania, producing 100 yards of good woollen cloth a week from 1826 to 1832.[20] Nothing much remains today of the small settlement, although the manufacturing area included a weaver's shop, a spinning shop, a fulling mill, a carding and pressing room, a dye house and a turner's and a carpenter's shop. The buildings were surrounded by a log and paling fence. The yard contained a tenter frame and two dyeing frames. Some of the traces of the buildings, parts of the road, and the diverted water race can still be seen (Fig. 6).

In New South Wales at the time of Bigge's arrival only Simeon Lord's factory was producing cloth commercially. His house, built in about 1805 on the corner of Macquarie Place and Bridge Street, was a large three storey building.[21] Gradually other buildings were added to it along Macquarie Place, to accommodate all the other activities that took place there. It had a granary, a blacksmith's shop and foundry, dyeworks, glassmaking facilities, pottery and textile factory, a workshop for ropemaking and some warehouses (Fig. 7).[22] The Governor encouraged Lord to expand his business and build a water-powered textile mill at Botany as well as a flour mill and houses for his workers, and for himself. The textile mill began work in 1815 (Fig. 8) and operated until 1857 when the Government resumed the land to build a water pumping station, the remains of which is on the site of Lord's flour mill. Nothing at all is visible today on the site. The land was flooded and the channel of the Cooks River diverted and later the whole area was filled in to create Sydney airport.

Some bigger landholders and farmers invested in hand looms to make cloth for their own use out of the wool they produced. Only three are mentioned here. The earliest was John Blaxland (1769-1845). In 1816 he established a small woollen mill on

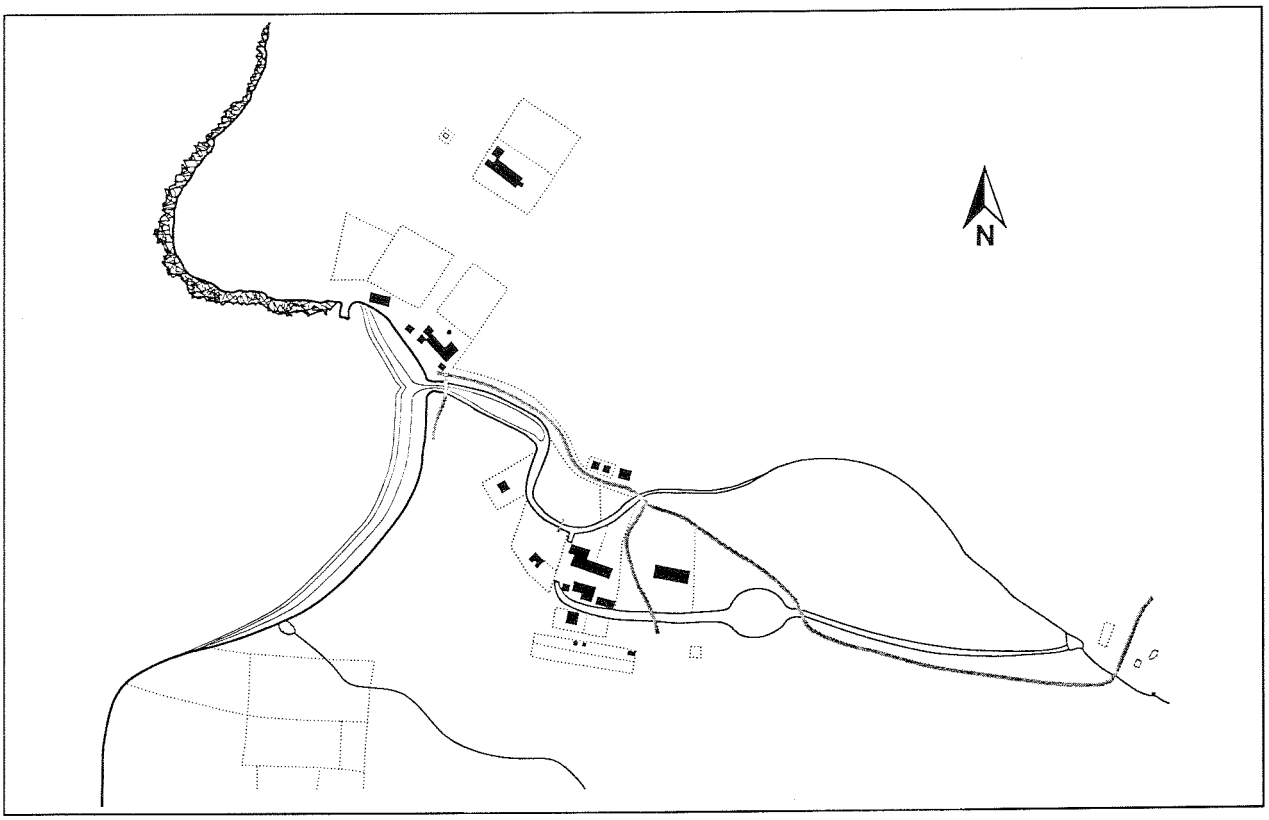

Fig.6: Plan of Darlington c.1830, based on a plan held at the Tasmanian Archive in Hobart (Redrawn by E. Stenning and A Wilson).

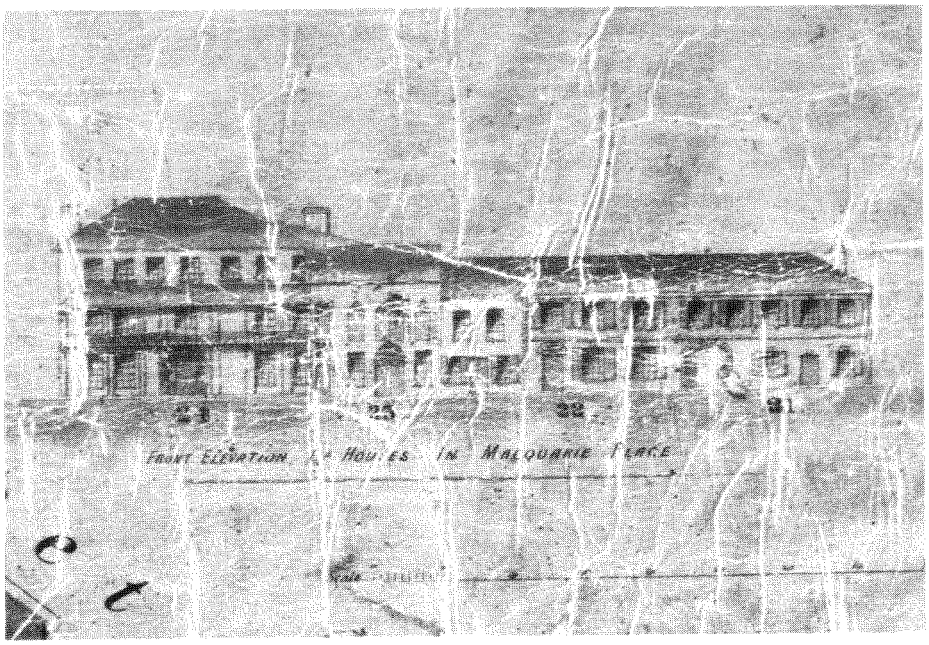

Fig.7: Simeon Lord's house, 21-24 Macquarie Place. The complex included the granary, blacksmith's shop and foundry, dyeworks, glassmaking facilities, pottery and textile factory, but there is no record of where these industries were located within the complex. Mitchell Library, M3 1721/1842/1.

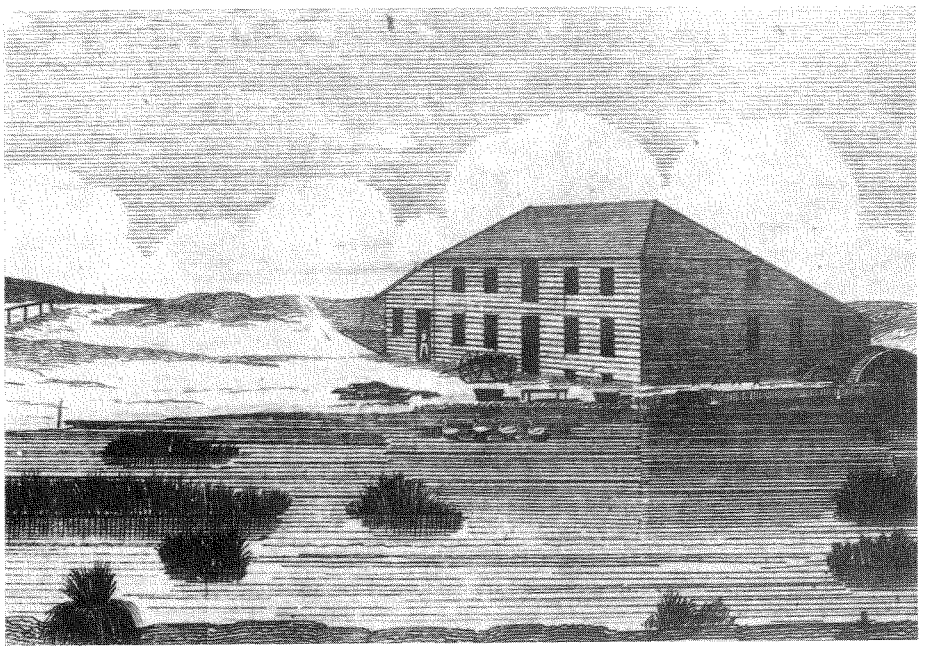

Fig.8: Simeon Lord's cloth mill at Botany. J. Carmichael, nd, National Library, Rex Nan Kivell Collection U1131.

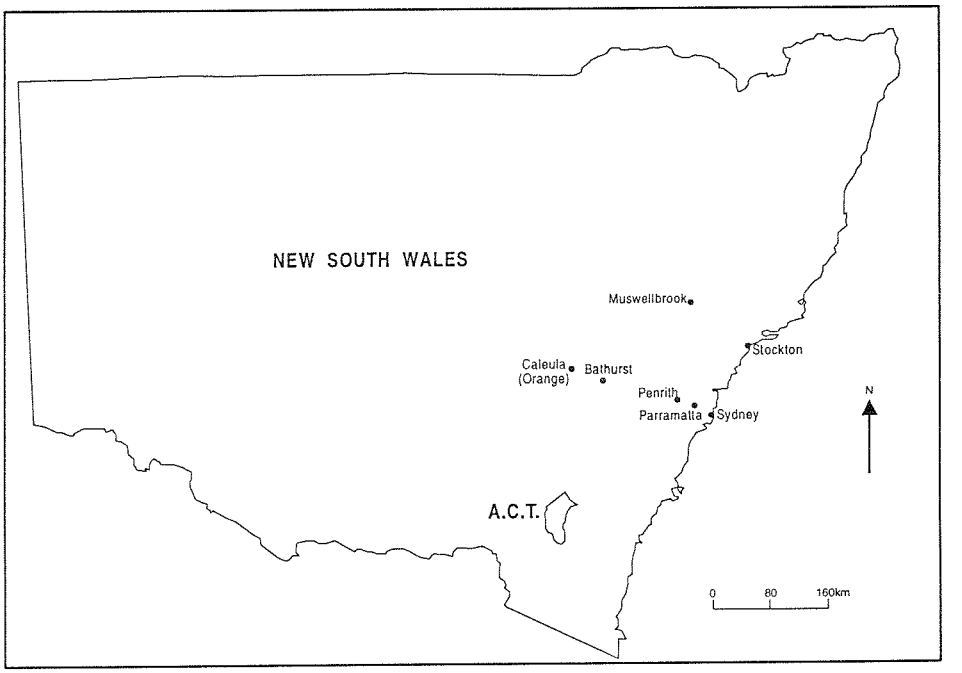

Fig. 9: Map showing principal mill sites in New South Wales before 1850.

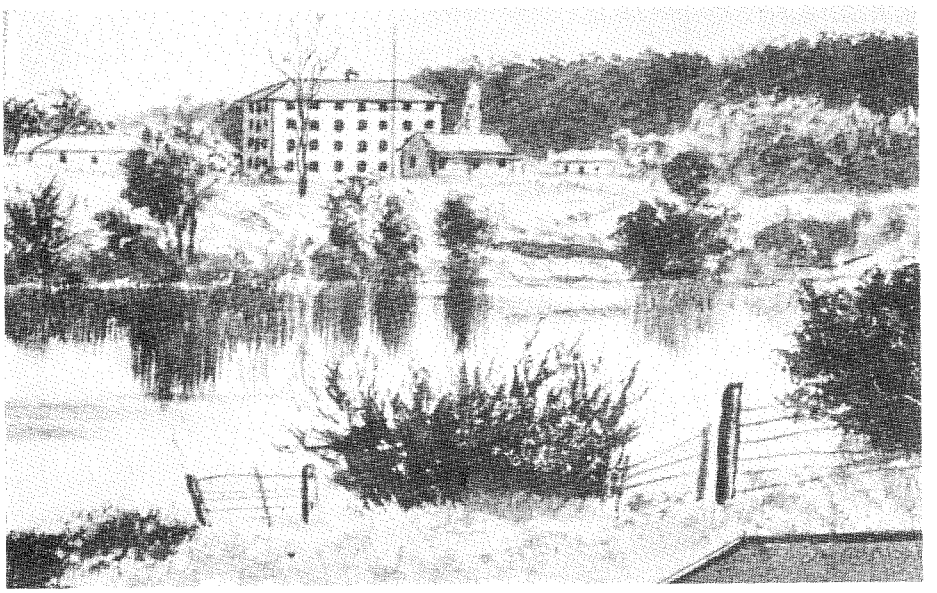

Fig.10: The Jamison factory at Regentville, Sydney Mail *13 July 1904, p. 94. General Reference Library.*

his estate on the Parramatta River for manufacturing cloth for his servants. Three assigned convicts, who had some knowledge of the industry, made thirty yards of woollen cloth a week out of the coarse wool 'not fit for exportation'. William Cox (1764-1837), who was better known as a road-builder, had blankets made for his convicts while he had a farm at Clarendon near Windsor.[23]

James Atkinson (1795-1834), after arriving in Sydney in 1820, received two land grants from Governor Macquarie near the present town of Berrima, one of which he named Oldbury. His experiences resulted in *An Account of the State of Agriculture and Grazing in New South Wales,* a book that contained his observations and suggestions, useful to intending settlers. It was published in London in 1826, one of the first of such publications. He advised in the section dealing with textiles that 'in general...every family should endeavour to live as much as possible within themselves — that is, to supply their wants with their own produce.' To that end he also advises to use the 'dirty and refuse wool .... and the fleeces of such sheep as may die' to make into cloth for servants. 'A small patch of flax should be grown every year' for making 'twine for shoemakers, towels, sacks, and other useful purposes.'[24] As for equipment, very good spinning wheels as well as looms were available in Sydney, he wrote, though it was difficult and expensive to buy cards and hackles.

Small textile mills in the country were set up for making woollen cloth for profit, when they were not milling grain. One was that of John Brown, who arrived in Australia in the early 1820s, and was granted 2000 acres at Kelso near Bathurst in 1823. Brown built a substantial house, on his land Winburndale, with the usual outhouses as well as workers' huts, all made of brick. His woollen manufactory, the Wallace Mill, was also built of brick, 40 feet (12.2 m) by 14 feet (4.3 m). It was powered by the 'muscular strength' of horses, and was producing woollen cloth and blankets by 1830. The mill seems to have been working for only 3 years when due to Brown's illness all of Winburndale was let. The machinery he had was carried away to a nearby property where some manufacturing was recorded in the next few years. All that is now left of John Brown's Wallace mill are bricks marked JB, incorporated into his neighbour Thomas Kite's house, called Yarrows, and three pear trees in a ploughed field.

From the late 1830s a hopeful economic climate coupled with the desire to invest money in profitable entreprise, resulted in the setting up of a number of bigger and more professionally run textile factories (Fig. 9). The mill of Sir John Jamison (1776–1844) was outside Sydney at Regentville near Penrith (Fig. 10). It was first mentioned as a cloth factory in 1838 in the Police Magistrate's Report, even though at the time it was only planned.[25] The steam engine that powered it was originally imported in 1835 for irrigating and flour milling. The cloth mill began working in 1841 with textile machinery, owned and installed by Abraham and John Rayner. They had arrived in Sydney in the late 1830s. Having been brought up in the textile trade, they were experts, and brought with them crates of machinery. However by the beginning of 1844 the manufacturing almost came to a halt because of lack of funds. Had Jamison been in good health, perhaps he could have prevented the situation deteriorating to such an extent that the Rayners asked for a dissolution of the partnership. When Jamison died in 1844 the partnership was dissolved and manufacturing continued with different managers till 1850, when it finally folded, although the previous year it produced over 11 500 yards of tweed. The Rayner brothers later began operating their own mill on the opposite side of the river, where they were able to buy the old Police Station at Emu Plains in 1850.

In 1844–46 the flour mill of James and William Byrnes in Parramatta was extended to include a textile mill with machinery shipped from England. This factory was built according to the latest design and was powered by steam (Fig. 11). It worked on and off for 16 years making tweed, doeskin and pilot cloth. Nothing remains of the mill: the machinery was later sold to Murray brothers who installed it in their mill in North Parramatta. The Byrnes' mill was demolished about 1925 and the site is now a park, but there is still some old stonework on the edge of the river.

Within Sydney, Thomas Barker (1799–1875) started operating an important commercial mill in 1842. He had arrived in Sydney in 1813 with his guardian John Dickson and in 1827 purchased a 16-horsepower steam flour mill at Darling Harbour. In the early 1840s he went into partnership with John Walker to manufacture tweeds (Fig. 12). Of the textile mills that began at about this time theirs was the only one that lasted well into the twentieth century, the last of its walls being demolished in 1986 when Darling Harbour was developed.

Commercial operations outside Sydney included the flour milling and tweed manufacturing carried on simultaneously at Muswellbrook by George Chivers from 1837. He had a one-horsepower carding machine, one spinning jenny and two handlooms.[26] 'Colonial cloth' was in great demand then, specially the good quality cloth Chivers manufactured. After his death in 1845 the mill was managed by his brother till about 1853. Some walls of the early buildings are incorporated in the caravan park building that is on the site now, but no evidence of any milling has survived. Dr James Mitchell's tweed factory at Stockton was well built and well equipped with machinery imported from England and promised to be a substantial producer of woollen cloth in the colony. However, it only lasted for seven years, from 1844-51, when the factory went up in flames (Fig. 13).

The mill at Caleula near Orange was first mentioned in 1846 as a cloth manufactory, in the *Police Magistrate's Report* from the Wellington district. It belonged to Henry Herman Kater (1813-1881) who had arrived in 1840 with 20 000 pounds and a letter of introduction to the newly formed Australian Club. In July of that year he had married Eliza Charlotte Darvall at St James Church in Sydney. The economic depression in 1842 made thousands of people bankrupt including Kater. Nevertheless, after attempting to establish themselves at other places, he and his wife settled in a district that was then sparsely populated but already produced wool and wheat. Their flour mill was operating in 1843 and three years later the Katers were producing good quality cloth in the woollen mill. Eliza Kater was a well-educated and talented woman who took keen interest in the factory. Her painting of the property helped me to locate the remains of the mill (Fig. 14).

The cloth the Katers produced was so popular that the mill could not produce enough to satisfy the demand. However in 1852 Kater stopped manufacturing and relied on flour milling alone. The reason probably was the scarcity of workers, particularly skilled weavers and spinners. Transportation had ceased and free labour was hard to find, even harder with the rumours of gold in the hills not far away. Flour milling continued at Caleula until 1871 when Kater retired from business. By this time the population had increased in the district and labour was more plentiful, but textile manufacturing never resumed.

Over a span of about 150 years the Caleula site has undergone a variety of social and environmental changes. At present the remains of the house and the mill show clearly through the grass in the paddock. The site where the buildings stood is an approximately rectangular piece of land c.100 metres by 50 metres, longitudinally aligned north–south between the present Orange–Wellington road and Caleula Creek. Four large standing posts dominate the southern half of the rectangle (Fig. 15). The foundations of the mill were recorded in 1984 (Fig. 16). [27]

Sheep graze at present in the abundant grass (mainly *Phylaris).* The scattered trees are mostly varieties of gumtrees, with some introduced species such as two prominent acacias and a very large white mulberry. Some briar rosebushes, two varieties of thistles, and a fairly dense growth of horehound

with most unpleasant burrs also grow there. The soil surface is dry and friable. Samples from four locations did not show much difference in any of the tests except that the PH was highest (between 8 and 8½) near the four posts, otherwise it varied between 6 and 7. Some areas had high organic content that could be attributed to the grazing sheep.

The mill buildings appear on the left of Eliza Kater's painting and their site is now principally marked by the four posts, made of an unidentified very hard timber which has hardly deteriorated over 150 years unprotected from the weather. The posts were cut square (27–29 cms on each side) and were sunk securely into the ground. The eastern and western pair of posts are held steady at ground level by horizontal timber beams of similar dimensions with tongue-and-groove joins. The tops of the northern and southern pair of posts were joined by timber beams in a similar way. These beams have fallen off and are lying on the ground. The strength of the construction indicates that it probably housed the millstones.

The steam engine was probably housed to the south on elevated ground where there are now pieces of timber, a cast iron pipe and a well. The large pieces of timber certainly looks like part of a deteriorated machine bed. A housing approximately 38 cm wide would accommodate cross logs at either end of the north-south timbers. The upper surface of the logs had been sawn or adzed, while the rest stayed in the round. The northern ends of the logs have almost disappeared. In both the main and the cross logs are holes, which appear to be where large spikes had been inserted to hold them together. Two such spikes were found. The southern ends of the main logs have notches that were cut to house part of the equipment. There are no corresponding notches on the northern end.

The two wells were brick-lined without mortar. The southernmost well had an internal diameter of 1.27m and 24 courses of bricks line it to a depth of 1.4m; its total depth is 11.1m. The well on the west of the four posts has an internal diameter of 1.35m and 19 courses of bricks line it to a depth of 1.24m. The distance from the mouth of the well to the muddy water level was 5.3m.

One of the wells supplied water to the steam engine. No documentary source mentions what sort of engine it was or where it was made and no surface remains were found. The engine would have had to drive the millstones to grind flour, and in the cloth-milling section the mule for spinning, and perhaps the fulling stocks. It also had to pump water up from the well to the boiler as well as for washing and dying cloth. It is likely that the engine was a cast iron one with its own mounting, dismantled and sold when no longer in use. It was probably a beam engine, as this type of engine was the most popular up to the 1850s to transmit power from piston to the main drive.[28]

Near the four posts were a shallow hole with a wooden peg close to it and a deteriorated log still partly bolted to the ground. Next to the hole was a large beam used to hold in place some type of heavy machinery. One side of the beam has two indentations with two bolt-holes, each going right through. One of the bolts, which was bent and could not be pulled out, is still in place; one end is flattened and has a hole through it while the other end has a screw thread. A large pile of bricks north of the four posts could represent the collapsed chimney-stack.

Millstone fragments were distributed over a fairly large area at the southern end of the site. These were of stone similar to the 'French burr' imported from the La Ferté quarries near Paris, and known for its hard-wearing quality.[29] There are not many other artefacts on the surface because these have been picked up over the years, when the paddock was ploughed. The present owners have discarded sherds but have kept some pieces such as ceramic ink bottles. At the time of my survey, when the weeds were cleared, some bottle fragments were found, as well as a large fragment of a ceramic meatpaste jar, seven fragments of millstone, some large iron bolts and spikes, and an almost two metre long cast iron pipe, used for pumping water from the well. North-east of the present gate were found pieces of iron, as well as some building stones and bricks, some of which had an oblong frog. All of the surface finds on the site can be dated to the period of occupation by the Katers.

The house remains are on a slightly elevated level platform on the northern half of the site. There are many depressions in between raised brick and rubble filled areas, that indicate collapsed external and internal walls. On the west side of the house a larger depression could mean a collapsed cellar. Between the house site and the road there were no surface features except three piles of stones that were perhaps ploughed up and put into neat piles after the buildings to which they belonged disappeared. These collapsed buildings could have been the remains of workers' huts.

CONCLUSION

Historical research pinpointed most of the cloth-milling sites discussed in this paper, which were then examined archaeologically by surveying these places, that have all but disappeared. I attempted to find remains of mills and equipment and studied the changing textile technology of the nineteenth century in order to know what to look for. All the sites except Cascade Bay were visited and surveyed in the early 1980s. In this paper, only Caleula is discussed in some detail, because this was the site with the most substantial remains.

The Government's role in cloth manufacturing of the first half of the period was well documented. It is obvious that great emphasis was put on the possibility of making textiles a viable commodity. Private endeavours from 1815 to the 1840s took a great deal of effort and indicated hopes for this much needed industry. The 'bust' period in the early 40s did not stop cloth manufacturing as much as did the 'boom' period later in the goldrush, when no skilled workers were available.

Lack of raw material, expertise and direction was the cause of the failures. What developed was more handicraft than manufacturing; most work was done by hand. Cloth milling with the aid of the power of wind, water or steam was limited and meant spinning with mules such as the ones that originated in the Industrial Revolution, or fulling. This was very often combined with flour milling, because the same power source could be shared and neither wool nor grain supply could be relied upon all year round.

The hopes that were put into the future greatness of the textile industry in early nineteenth-century New South Wales, were not fulfilled. The scarcity of material remains makes research into the industry a difficult task. The study of it poses many questions, on the extent of changes in the environment as a result of manufacturing, on the spread of technology and material culture, on the ingenuity of people adapting to new conditions and raw materials, and their dependency on imported equipment.

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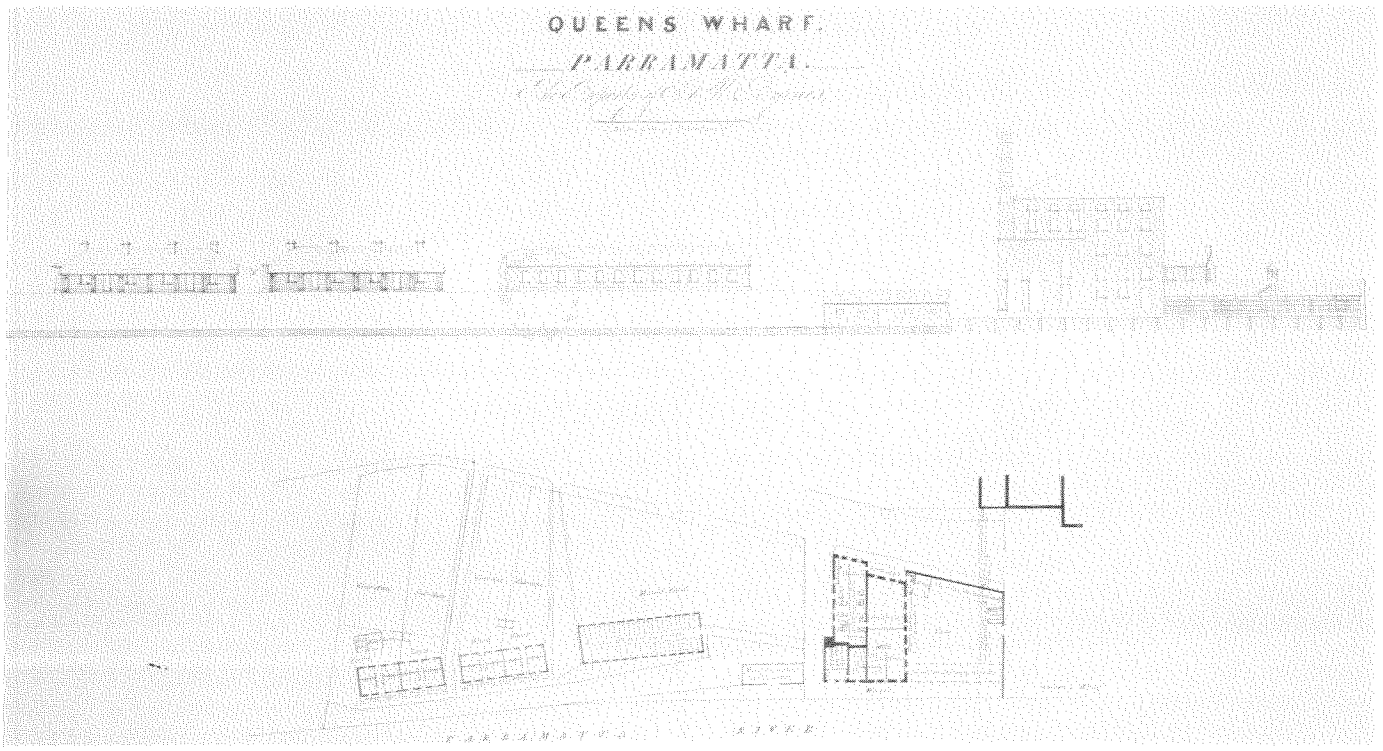
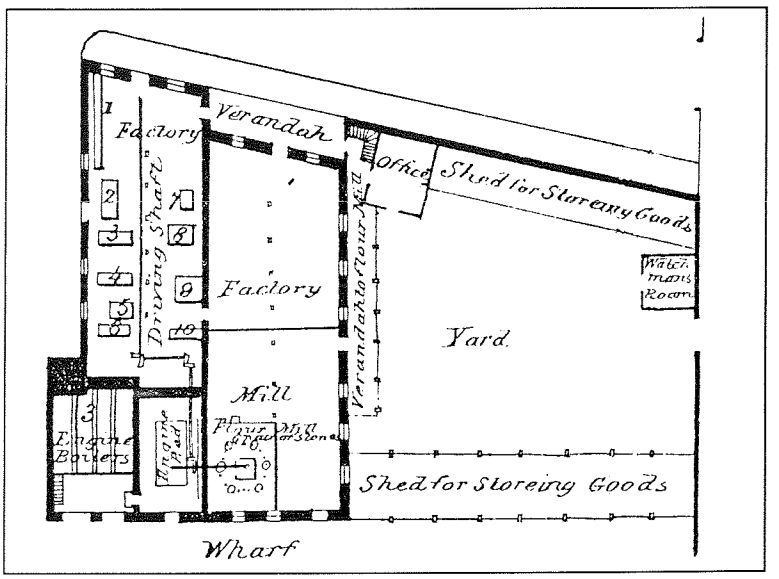


Fig.11: Plan of the Byrnes brothers', mill. 'Plan of the Mills, Cloth Factory and Cottages adjoining the Queens Wharf, Parramatta', W.M. Brownrigg, surveyor, n.d. National Library, F 248. (Redrawn by E. Stenning and A. Wilson)

Reference to plan: 1. Turning to lathe; 2. Patent cutter; 3. Fulling machine; 4. Fulling machine; 5. Washing machine; 6. Fulling machine; 7. Pumps; 8. Hydraulic press; 9. Brushingmachine; 10. Stocks.



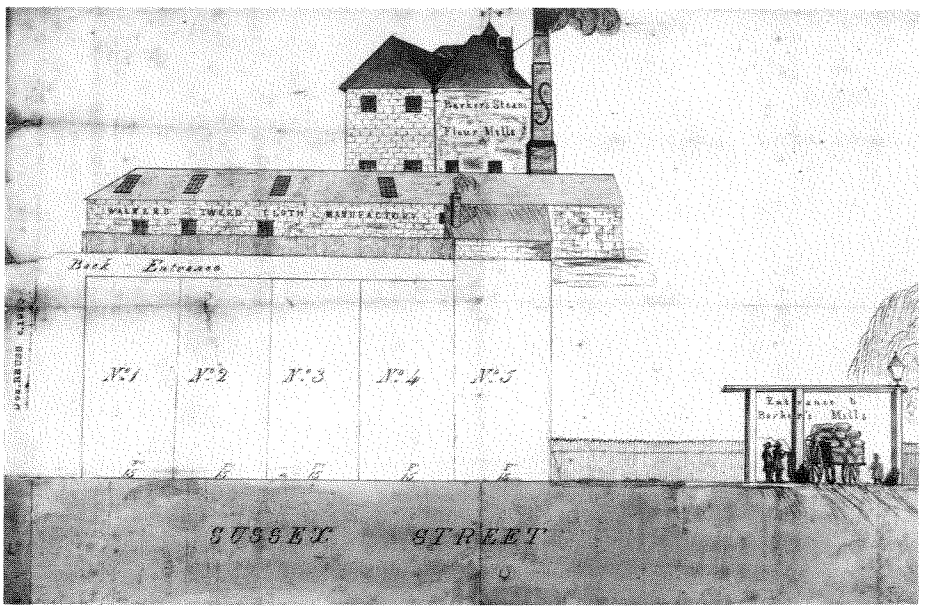


Fig.12: Drawing of the Barker factory, c.1847. Mitchell Library, M2 811.1733/1847/1.

Fig.13: This photograph is a detail of one showing the Stockton factory's chimney, which was demolished in the 1880s. National Library, Humphrey Collection B3293.

Fig.14: Caleula, c. 1856. Painting by Mrs Eliza Kater. (R.I. Jack 1995)

Fig.15: Caleula. The four large timber posts, with fallen crossbeams —the principal reminder of the Kater's mill — photographed from the east, facing the present road to Wellington. (R.I. Jack, 1984)

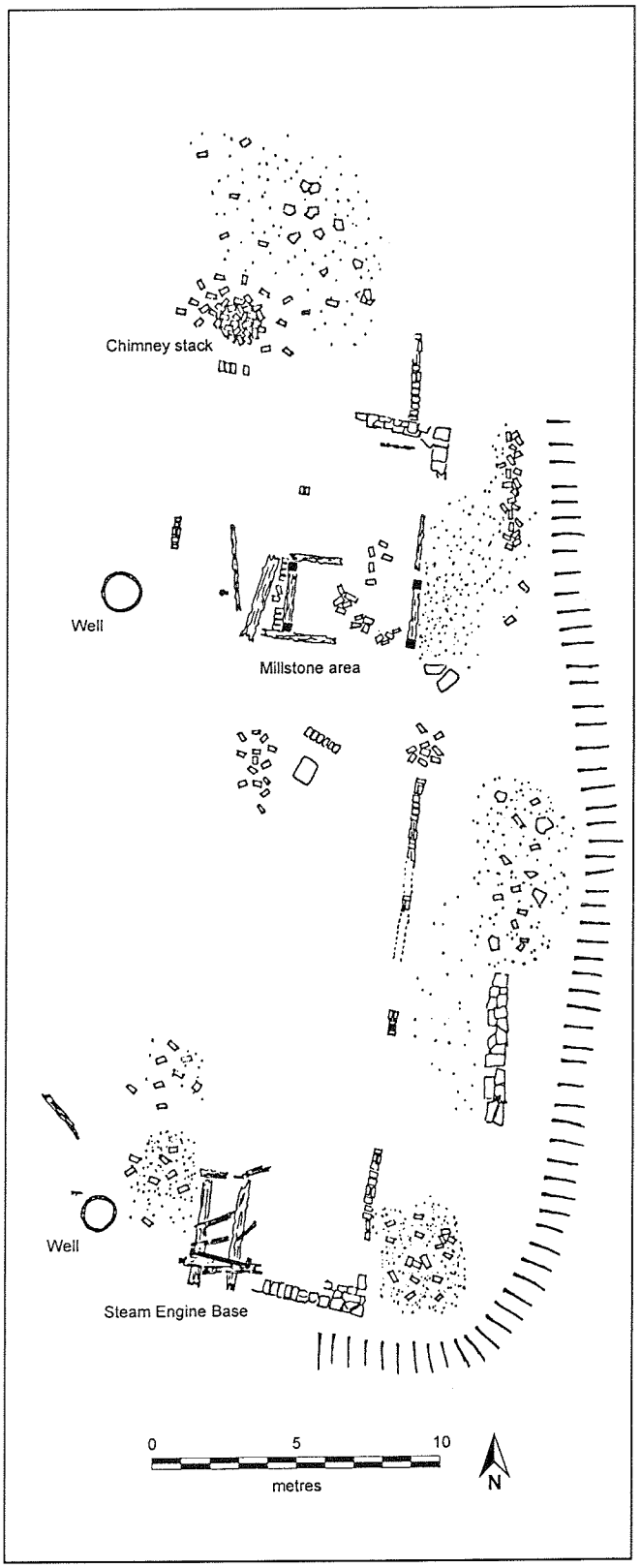


Fig. 16: Plan of the site at Caleula, 1985. (E. Stenning)

ABBREVIATIONS

ADB	Australian Dictionary of Biography
AO	New South Wales Archives Office.
HRA	Historical Records of Australia
HRNSW	Historical Records of New South Wales
ML	Mitchell Library,
PRO	Public Records Office, Kew, England.
PTHRA	Proceedings of the Tasmanian Historical Research Association

NOTES

1. Instructions 25 April 1787, *HRA* I.i.13; *HRNSW* I pt. 2, 89; Frost 1975.
2. Roger Morley, seaman, adventurer and storekeeper.
3. Phillip to Sydney (Instructions for Philip Gidley King) 15 May 1788, *HRA* I. i. 33.
4. Fidlon and Ryan 1980:44.
5. AO Lieutenant Riou to Nepean, 5 October 1790, CO 201/1, 11.
6. Grose to Dundas 21 April 1793, *HRA* I. i.428; A letter from Norfolk Island 19 Nov. 1793, *HRNSW,* 2: 811-813, written by assistant surgeon Thomas Jamison.
7. Aborigines were using plant material for fishing lines, carrying bags etc.
8. Tench 1979:250-253. Among the emancipated convicts who were given land to cultivate, two were weavers in December 1791.
9. Return of Labour 1798, *HRNSW,* 3:521.
10. Hunter to Portland 1st May 1799, *HRNSW,* 3:665.
11. King to Portland 1 March 1802, *HRA* I iii:433,438,439. This was a different plant from the one indigenous to New Zealand.
12. *ADB,* 2:290.
13. Higginbotham 1987.
14. Macqurie to Bathurst 24 March 1819, *HRA* IX 96.
15. PRO, MPH 91(m) Bc/2789.
16. Stenning 1986:43, 57, 66, 71-72.
17. Bigge 1823:53.
18. Kerr 1984:66-68.
19. Darling to Huskisson 15 May 1828, *HRA* I. xiv:184; Darling to Murray 18 February 1829, *HRA* I. xiv:651.
20. The sources of information regarding Maria Island are Brand 1974:75; Morris 1964; Weidenhofer 1977.
21. It was on the site now occupied by the Westpac Bank.
22. Stenning 1986:111-114; 1993:10-20.
23. Stenning 1986:175-180.
24. Atkinson 1826:131.
25. Police Magistrate's Report 4/7267, 4/7268.
26. *Ibid.*
27. Stenning 1986:147-156.
28. Watkins & Wightman 1967; Buchanan 1980.
29. The millstones were recognised and their significance explained by Ian Jack.

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