GAZETTEER OF HISTORIC AND INDUSTRIAL SITES

IN THE

ILLAWARRA REGION

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For:

The Heritage Council of N.S.W.
Department of Environment and Planning

AUGUST 1980

PART 2

GAZETTEER OF HISTORIC AND INDUSTRIAL SITES

IN THE

ILLAWARRA REGION

PART 2. HISTORIC AND INDUSTRIAL SITES; BACKGROUND HISTORY AND RESEARCH

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WITH THE AID OF MEMBERS OF THE ILLAWARRA INDUSTRIAL ARCHAEOLOGICAL SOCIETY

AND

THE CITY COUNCIL OF GREATER WOLLONGONG

AUGUST 1980

2. List of Historic Themes for the North Illawarra Region

1. Exploration
2. Settlement
3. Whaling and fishing
4. Dairying and butter factories
5. Cedar cutting and timbering
6. Shale mining
7. Coal mining and coal transport
8. Coke works
9. Stone quarrying
10. Metal smelting and refining
11. Processing industries and manufacture
12. Sea routes and harbours
13. Land communications
14. The coming of the railway
15. Town Services: Gas and electricity
16. Water supply
17. Defensive sites

1. Exploration

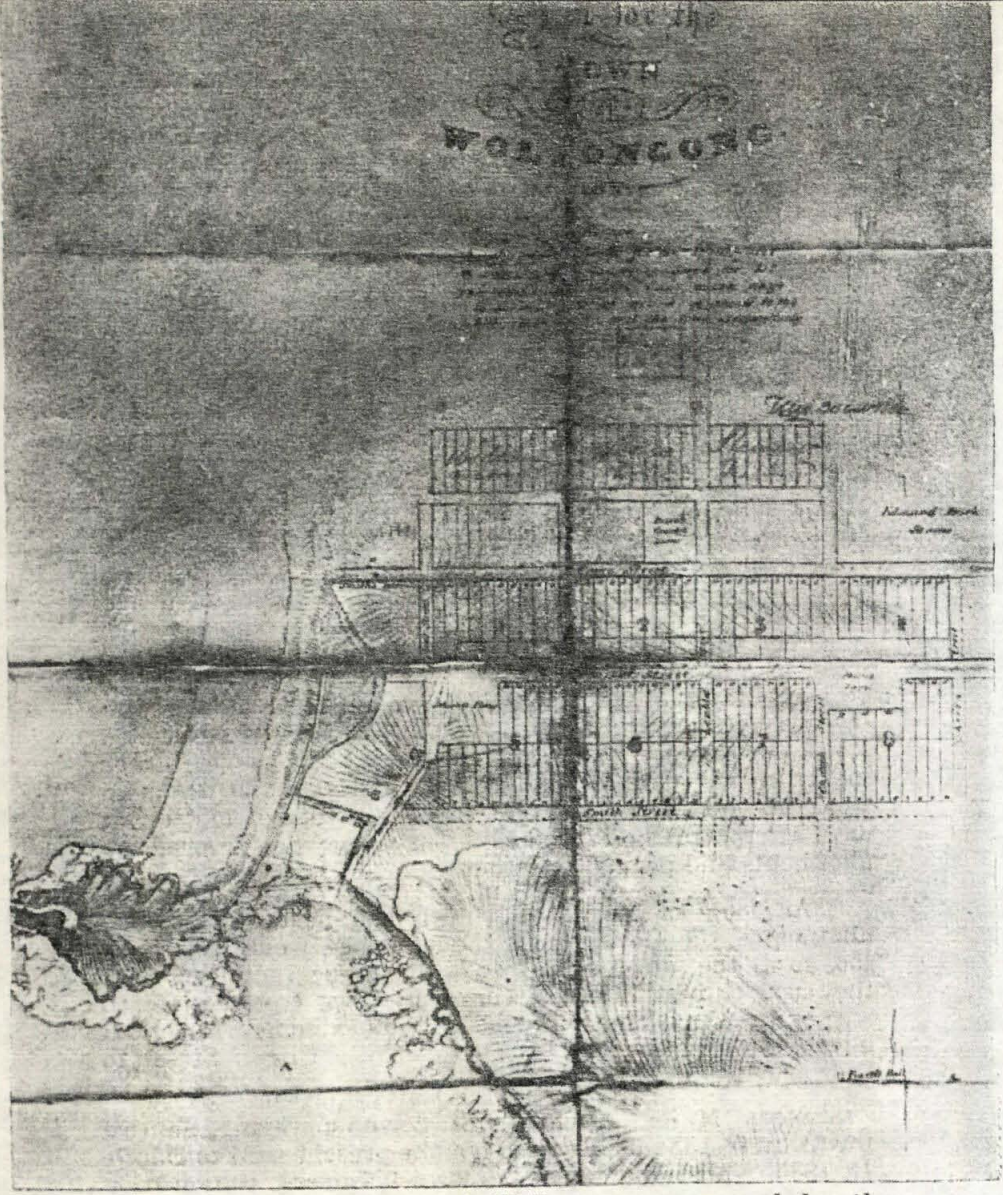
A number of locations in the Illawarra have significance because from the time of the first European visits to the coast they impressed travellers sufficiently for identification in early journals and despatches, whether for their scientific interest, spectacular beauty or, most often, for their usefulness to travellers and surveyors alike as landmarks.

References

Sources, informed discussion and further references are to be found in the following publications:

W.G. McDonald (ed) — Earliest Illawarra by its Explorers & Pioneers (Illawarra Historical Society 1966)

W.G. McDonald — The First-Footers; Bass & Flinders in in Illawarra (Illawarra Historical Society 1975)

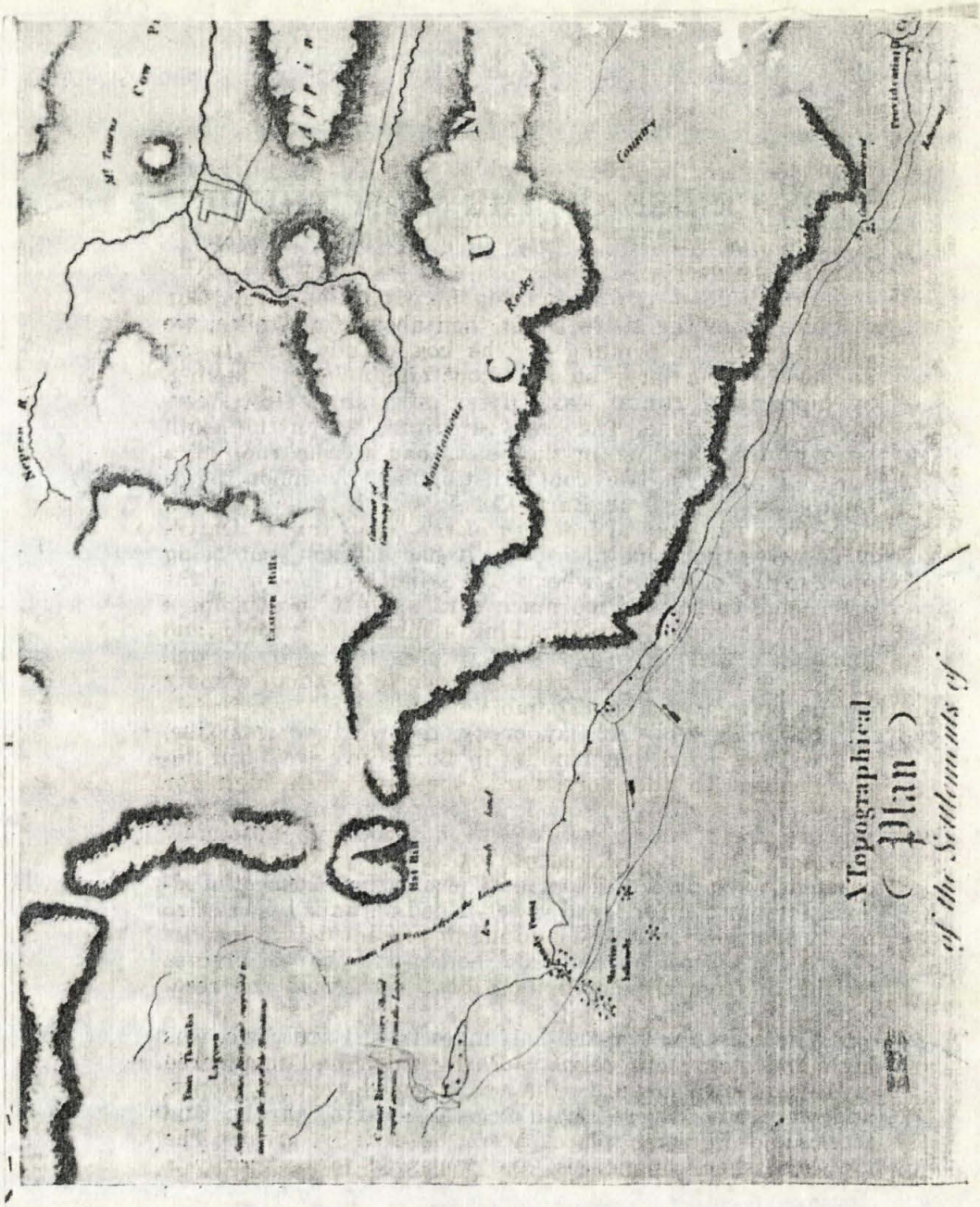


Sketch plan for Town of Wollongong, prepared by the Survey Department of New South Wales

(The points of the compass reverse the modern convention — south is uppermost. Major Mitchell's initials "T.L.M." and the date "30 Oct. 1834" appear below and to the right of the legend. The buildings of the military settlement described by Alexander Stewart can be seen in the enclosure to the left of Harbour Street. "Bustle Hall", C. T. Smith's house, is marked in the lower right-hand part of the map.)

Illawarra, 1834

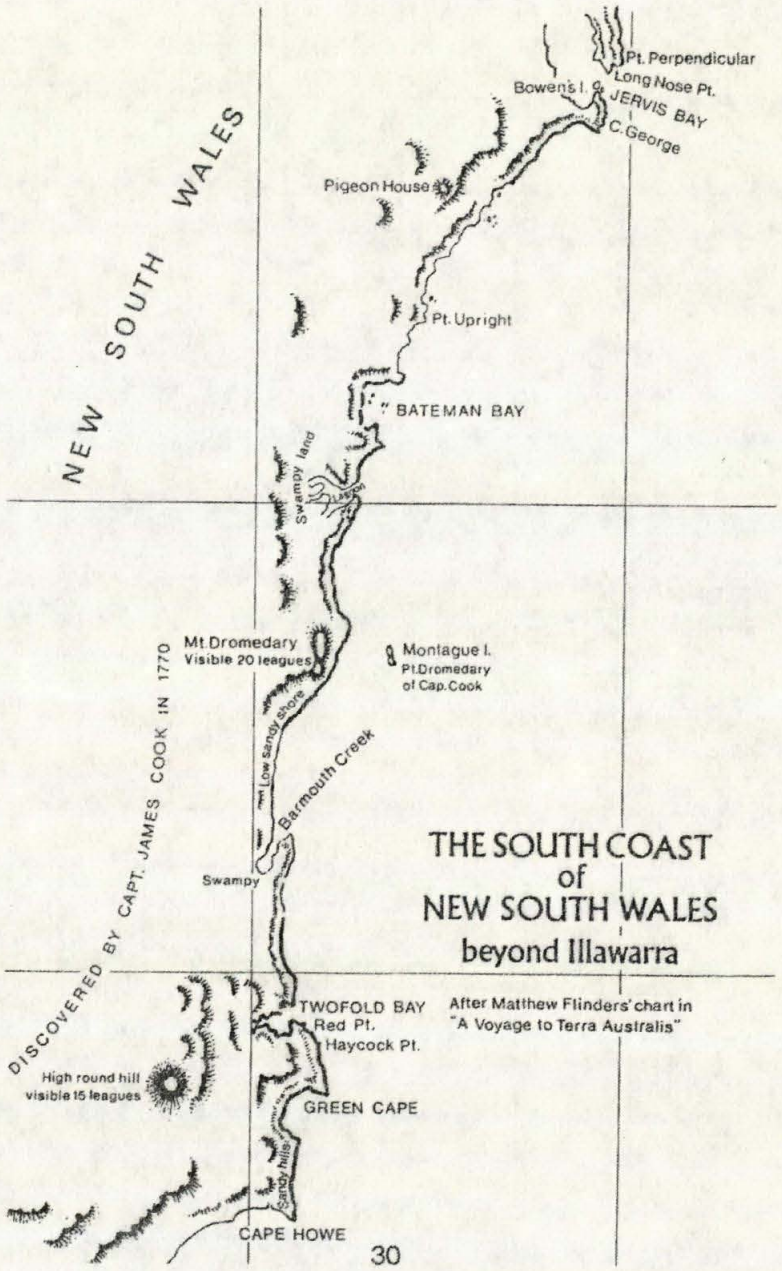
From Major T. L. Mitchell's map in "Report on Roads in New South Wales, 1827-55".



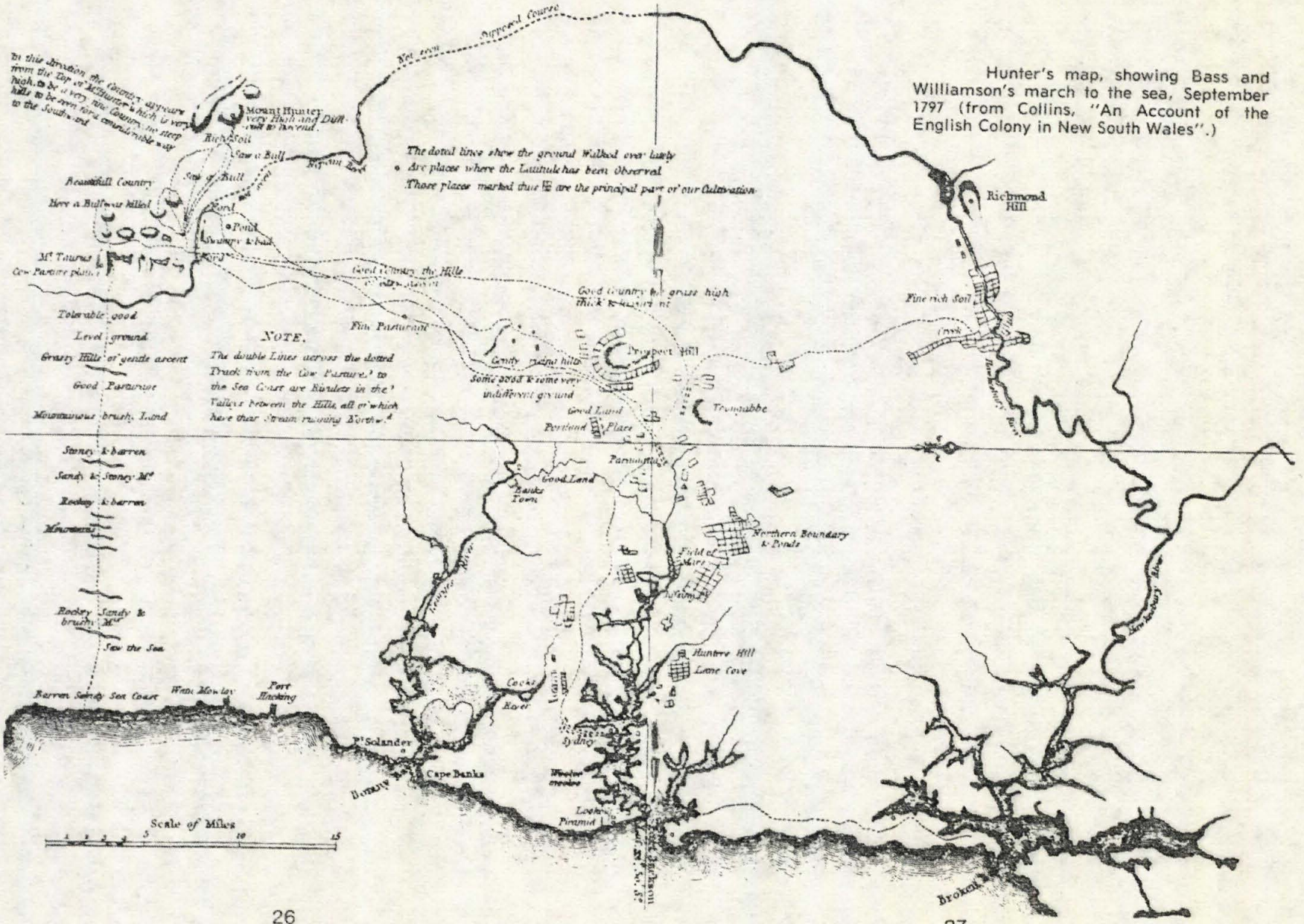
Illawarra, 1797

From "A Topographical Plan of the Settlements of New South Wales . . . surveyed by Messrs. Grimes & Flinders" (The Grimes & Flinders Map).

(For the sake of clarity, this has been reproduced from a copy with additions to 1815; but the Illawarra portion is identical with the original 1797 map.)

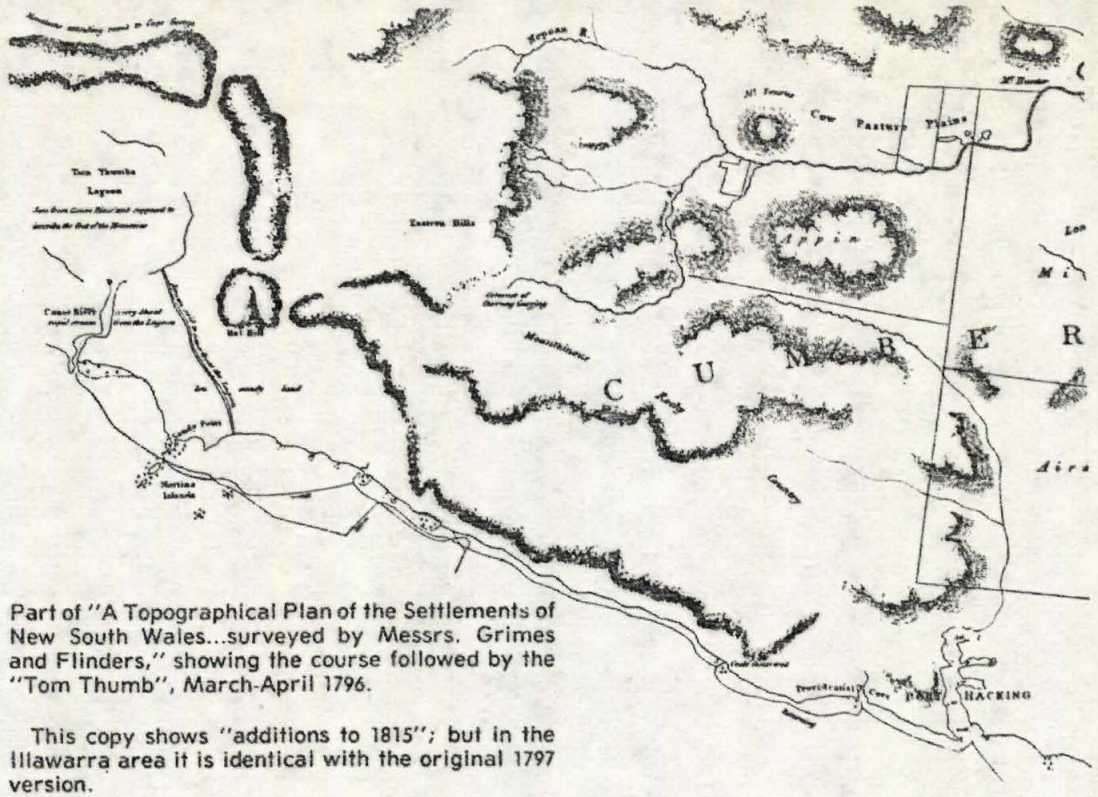


From W. G. McDonald The First-Footers



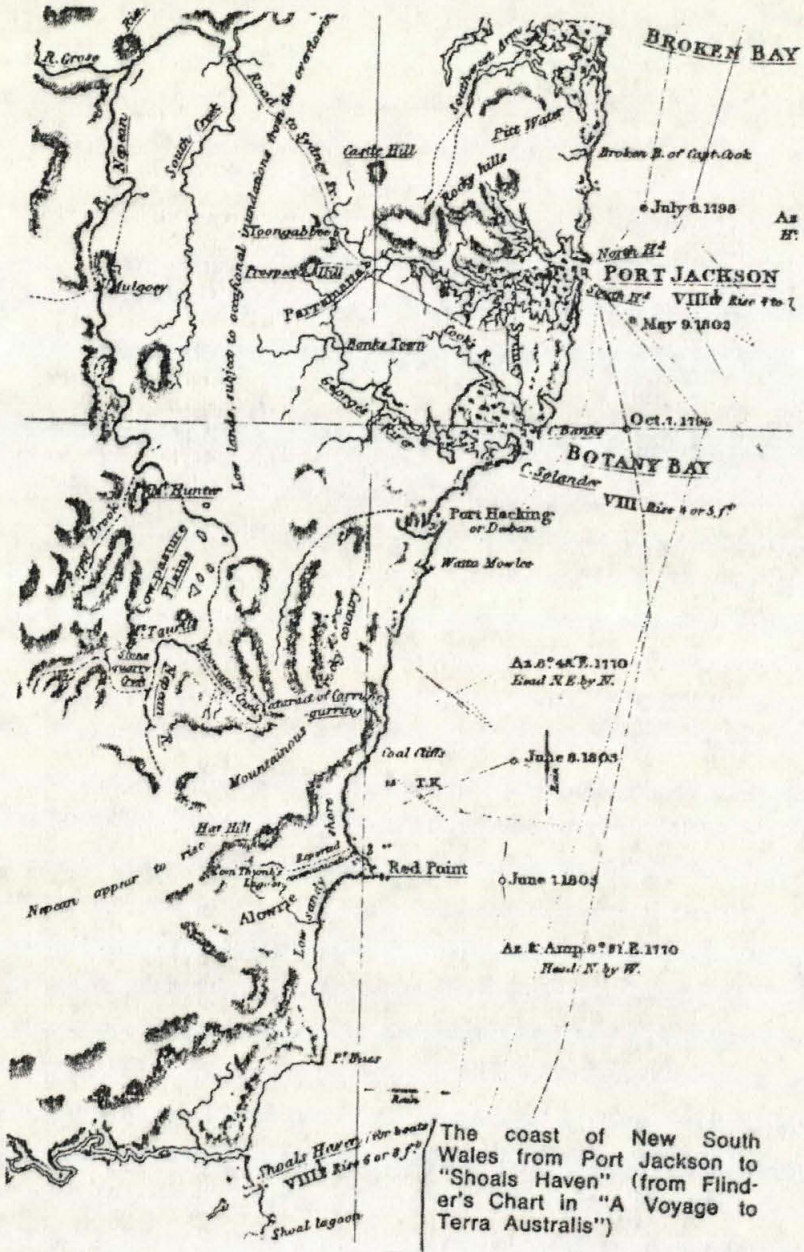
Hunter's map, showing Bass and Williamson's march to the sea, September 1797 (from Collins, "An Account of the English Colony in New South Wales".)

From W. G. McDonald The First Footers



Part of "A Topographical Plan of the Settlements of New South Wales...surveyed by Messrs. Grimes and Flinders," showing the course followed by the "Tom Thumb", March-April 1796.

This copy shows "additions to 1815"; but in the Illawarra area it is identical with the original 1797 version.



The coast of New South Wales from Port Jackson to "Shoals Haven" (from Flinder's Chart in "A Voyage to Terra Australis")

1.01 Hat Hill (Mt. Kembla)

Cook's journal entry for April 25, 1770 appears to describe Mt. Kembla - "a round hill the top of which look'd like the Crown of a hatt"[1]. Subsequently identified (1918) by Alan Cunningham at Mt. Keira but generally accepted as Mt. Kembla following Matthew Flinders[2]. These identifications are discussed by both W. G. McDonald [3] and C. W. Gardiner-Garden[4].

1. Journal of Lieutenent (afterwards Captain) James Cook, ed. and annotated by Dr. J. C. Beaglehole, Cambridge University Press, 1955.
2. Journal of Matthew Flinders (M.S., National Maritime Museum, Greenwich). Entry for Monday March 28, 1796 where Hat Hill is said to bear west-north-west from Saddle Point (Red Point).
3. Earliest Illawarra by its explorers and pioneers, pp.6 note 4, 15, 16, 17, 60, 61 (Illawarra Historical Society, 1966).
4. Observations on some of the Historical Aspects of the Prominent Geographical Features of Illawarra (1959, 2nd ed. 1965).

1.02 Coal Cliff Headland

While probably not the first place at which Mr Clarke on his epic journey (from the wreck of the Sydney Cove February 1797) identified the presence of coal seams in the Illawarra escarpment, it was described by George Bass in 1797 as follows:

> "This vein of coal ... commences about 20 miles to the southward of Botany Bay. The land there is nearly twice the height of the north head of Port Jackson, not a steep cliff like it, but has here and there small slopes and lodgments on which trees and shrubs grow. The sea washes up so close to the foot of it that it is no more than barely passable without some danger in blowing weather. About twenty feet above the surface of the sea, and within reach of your hand as you pass along, is a vein of coal of about six or seven feet in thickness; the rock below it is slaty, but above it is of the common rock stone of the country. The vein does not lay perfectly horizontal, but goes on declining as it advances to the southward, until at the end of about two miles it becomes level with the surface of the sea, and there the lowest rock you can see when the surf retires is all coal. Here the bold high land gradually retreats back, and leaves in its front a lower sloping land, which, keeping the line of the coast, meets the sea with sandy beaches and small bluff heads alternately. In the land at the back of the beaches and in the small bluff heads we traced for about six miles along the coast four strata of coal from fifteen inches to three feet in thickness, with intermediate spaces of slaty rock of a few inches in thickness ..." 1

It had also been mentioned in a footnote by Matthew Flinders in March 1796,

> "The small place of shelter which we now left, is among the cliffy heads in which a stratum of coal was afterwards discovered. We had passed under the cliffs of this head in our search for water, and must have seen lumps of coal which had fallen down; but the weather and surf had so altered its appearance, that it remained unnoticed, and our pursuit was so different." 2

although there is some doubt about the accuracy of his memory at this point.

1. George Bass to Lieutenant-Colonel Paterson, 20.8.1797. N.R.N.S.W. III pp.289-90 and here taken from W.G. McDonald Earliest Illawarra pp.17-18.

2. cf. McDonald, Earliest Illawarra p.16 notes 13 and 14, and pp.60-62.

1.03 Kiama Blowhole

Mentioned by George Bass as follows -

"The shore in this bight, and also for some distance on each side of it, bears evident marks of volcanic fire. Several of the little heads and points are of a basaltic nature; some irregular, others columnar basaltis. Upon landing, I perceived, near the extremity of one of the heads, the rocks laying scattered about in a very irregular manner, and upon examination it appeared that a volcanic eruption had formerly taken place there. The earth for a considerable distance round, in a form of approaching to that of a circle seemed to have given way; it was now a green slope.

Towards the centre was a deep ragged hole of about 25 or 30 feet in diameter, and on one side of it the sea washed in through a subterraneous passage with a most tremendous noise. * The pieces of rock that lay scattered about had all been burnt, but some were in a state of scoria." 1

* The Blowhole at Kiama. (Note 3, p.21

1. H.R.N.S.W. III pp.313-5 here taken from W.G. McDonald op.cit. p.19 and note 3, pp.21.

1.04 Surveyor's Marker, Obelisk, Kiama

Although the first land grants were marked out in the Kiama region in 1825 by Sur. James McBrien and the town site was reserved in 1827, it was not until 1837 that Sur. Elliott was sent to map (yet again) every topographical feature of the town site, and February 1839 that Sur. Burnett's plan (ignoring most of them) was approved. 1 The half-acre blocks were marked out and the first land sales took place in early 1840.

The obelisk on Terralong Street opposite Manning Street was erected in 1861.

1. cf. Sur. Burnett Survey of the Reserve for the Town of Kiama 10th December 1838 (NLD K.Z.990, Archives of New South Wales) published in W.A. Bayley Blue Haven pp.24-5)

1.05 Several examples of surveyor's blazes on strainer posts in the Metropolitan Catchment in the vicinity of Bulli.

Ongoing long-term research into this theme could include field survey work on the lines of those carried out by early surveyors such as Mitchell, Hoddle, Meehan and others (as stated by Messrs. Gardiner-Garden and McDonald) with careful observation for archaeological sites of interest; also a systematic archaeological survey of the Five Islands for traces of any earlier occupation. **

** As these would be extremely fragile, such a non-disturbing survey should be carried out by experienced and responsible field works only.

2. Settlement

The story of how and why successive individuals and families came to live in the Illawarra - the history of its settlement patterning - is still discernible in its landscapes and urban street plans and views. It is a story of unusual complexity for New South Wales, with some five or six major chapters and several smaller ones. Some of it is beyond the scope of this report, but the remainder concerns the homes, schools, churches and gardens of many who came to find work in urban or rural industries - specialised types of settlements - which form in themselves, a series of artefacts superimposed on and into the landscape.

1. Historic Homesteads

The earliest land grants in the Illawarra district were around Lake Illawarra, approximately where Port Kembla, Dapto and Albion Park were later to be, and were formally granted by the Governor in January, 1817. Their names were Exmouth, Macquarie Gift, Waterloo, Berkeley and Illawarra Farm (as shown in fig. 1.)

Settlement followed rapidly in the 1820s and 30s, with grants taken up in the Jamberoo valley, along the headwaters of the Minnamurra River, along Macquarie rivulet, west of Lake Illawarra around Dapto, and around Tom Thumbs Lagoon and the port of Wollongong. Robert Dixson's Map of the Colony of New South Wales of 1837 marks the existing land grants, as does William Baker's Australian Atlas of 1848. Among the most notable of these estates were Samuel Terry's grant (Terry's Meadows) later to become Albion Park, and D'Arcy Wentworth who steadily consolidated all the land between the lower Minnamurra River and Lake Illawarra as his Peterborough estate (later to become Shellharbour municipality), the southern portion of which was subsequently sold to G. L. Fuller in 1865 to become his Dunmore estate. Henry Osborne received 2560 acres west of the Johnston grant which he named Marshall Mount; the surviving property of this name was the second to be built there, and remains among the oldest of these early homesteads surviving today. Others include Avondale (1850s), Horsley (c.1850), Cleveland (c.1840),

Penrose (c.1853-62) around Dapto, The Hill In Dunster's Lane south of Albion Park (c.1865) and Hartwell House in Kiama (1858), all of which, like Marshall Mount, have National Trust listing.

2. Early Rural and transport settlement

Some villages developed informally throughout the first half of the 19th century, mainly as a result of land and sea routes. Bulli on the main early pass over the escarpment to Appin, was a national stop-over point, and the development of regular coaching servi ces to and from Appin brought a further scatter of inns, tall-houses and settlements on and below the scarp. The Bulli Hotel at the bottom of the pass was one, the Brownsville hotel another - two of many. Sherbrooke, a village behind the top of Bulli pass, was right on the coach road. Ben Rixon bought two acres up behind South Bulli mine in what is now the catchment area, to build an inn on the Appin Road and its ruins possibly lie there still. Nearer to Appin, and in Appin itself, there are whole rows of crumbling cottages testifying to the passing of a coaching township nearly a hundred years ago.

Jamberoo developed early on the circuitous track from Wollongong south to Kiama, while both Wollongong and Kiama developed early as the best available national harbours. Regular steamer services in the 30s and 40s accelerated coastal development and inns, such as the shed for goods to be shipped on the steamers, customs house, hotels, lighthouses and lighthouse keepers residence.. Peterborough (Shell Harbour) and later Dunmore grew out of thriving industrial estates developed by energetic landlords.

The need for Government towns was also early evident, and these were laid out at Wollongong in 1834, and at Kiama in 18 The land in each case having been reserved long before.

3. Coal-mining settlements

The beginnings of systematic explotiation of coal mining about 1850 at Mt. Keira was to set in motion considerable changes in the appearance of the northern Illawarra coast from then on. Around each mine, its entrance facing the sea some way up the lower slopes of the scarp, was to grow not only a collection of mine buildings and transport facilities, but houses for the mine managers and their families, and then much less spacious rows of

cottages for the workers. Gradually these came to form mining villages, with company housing, together with churches, chapel, hotels and temperance houses, Institutes of Arts and, in due course, cinemas. These separate and discreet settlements, from Helensburgh in the north to Kembla Heights and Wongawilli in the south, are for the most part, survivals essentially of the turn of the century or just before. Some, like Scarborough, Balbownie or Kembla Heights, remain remarkably intact; others life Clifton Village are now by-passed totally, and exist virtually as archaeological sites.

At first,exploitation of the coal resources was tied to transportation by steamer, so that each village clustered not only around its mine, but along the tramline that took its coal down to its own loading jetty. The coming of the Illawarra railway in 1887, to which in due course all the mines were to be connected, shifted the topographical emphasis from the jetties to the main line stations, and as the older harbour areas began to die, the sites along the railway came to life. Industrial buildings of turn-of-the-century design - dairy factories, chaff and produce manufacturers, as well as timber yards - joined the coal, coke and metal processors as users of the railway, being housed in small dwellings beyond the tracks. Some settlements were physically split by the railway; Albion Park, for example, which set up its satelite Albion Park Rail well east of the old settlement - or, like Shellharbour, its harbour totally separated from road and rail.

4. Dairying settlement

Two more developments of the 1880s and 90s have contributed considerably to the settlement landscape of the region. The expansion of dairying which followed the abandonment of wheat growing on the coast because of rust, and the increase in demand for dairy products by urban markets was accelerated by the coming of the Illawarra railway in 1887-8. The small dairy farms were sprinkled through the lower slopes and valleys of the scarp, and developed their own tiny communities - Avondale, Calderwood, Marshall Mount, Tongarra, Yellow Rock, Tullimbar - most of which in turn built churches, schools and butter factories. Equally, each in turn declined after the turn of the century as the line of major dairy factories with refrigeration facilities developed along the railway line and just survive, mostly with little subsequent change.

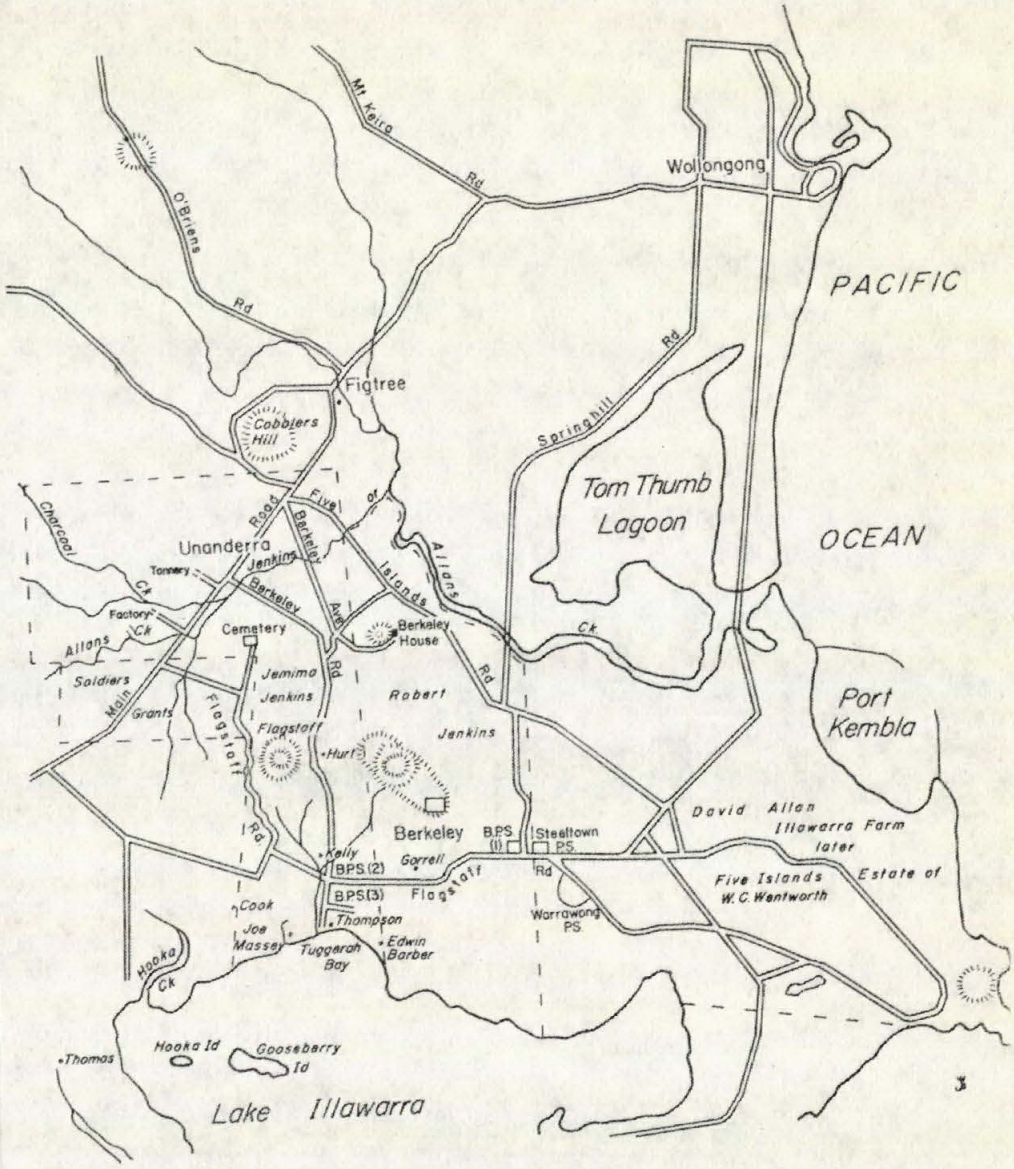
5. Stone quarrying settlement

Another expanding industry of the 80s was the quarrying of basalt for road metal in and around Kiama and Bombo, then increasingly north to Minnamurra and Dunmore. Not only the scars and hollows of the quarries, but the rows of quarry workers' cottages dominate the settlement of Kiama and Bombo and can also be found on Bass Point and just south of Minnamurra bridge (Trevethan Street) a fairly intact cul-de-sac against the railway line.

6. Other settlements

There are many other aspects of settlement distribution to which attention should be given - not least the transferral of emphasis to the Port Kembla region since 1928 and the steady development of lower cost workers' housing suburbs to the south of the port of Wollongong. A contrasting occupance, to use the geographer's term, is that of the early seabathing holiday residences at the beaches from Stanwell Park and Thirroul to Wollongong, Shellharbour and Kiama, with their rock pools and beach hotels, or the little row of fishing weekenders at the mouth of the Minnamurra river of the 1930s and 40s in fibro and timber, markedly more at home in their setting than the massed ranks of brick mansions tightly packed along the ocean beach a kilometre to the south.

Since several of these settlement changed their character or emphasis in the course of time, the following lists of historic structures and complexes are arranged alphabetically by region with a concordance attached arranged by type of building.



OLD BERKELEY

From K. H. Barwick History of Berkeley

Old Berkeley lay quiet and peaceful as the Second World War began in 1939. Fishermen continued their tasks at the Fishing Village and the dairy farmers milked their cows which grazed upon the hills.

But the growth of Port Kembla in the preceding decade and the drive there for greater steel production made a potential target for an enemy. Although Berkeley was considered sufficiently far removed from Port Kembla to provide safety for Steeltown school pupils, it was also encompassed in the organization of Port Kembla defences.

Possibly the greatest work was the construction of the tank trap which took a direct line from Mullet Creek to the mouth of Hooka Creek, making the Thomas farm an island. The canal is still there. It was built as part of an overall plan to prevent an armoured thrust along the coast to Port Kembla.

Another result of the war was the placing of the concrete tetrahedrons around the little harbour of the fishing port making a cosy little anchorage for the launches of the fishing fleet. Army files containing the reasons for the work have been destroyed but the blocks remain a reminder of the war period when boats were held for destruction if the enemy had come.

POST-WAR EXPANSION

The development of Port Kembla had begun the use of the south-eastern part of the old Berkeley Estate as a "dormitory suburb" and so the centre called Lake Heights appeared, home building there gaining impetus at the close of the war.

Berkeley itself was selected as a site suitable for the erection of a hostel to house 2800 persons brought to Australia under the migration programme of the Commonwealth government. The hostel was built in the early fifties using rows of galvanised iron huts. At the same time the New South Wales Housing Commission planned Berkeley as a model township of 600 acres to be developed to house 8500 people in 2075 homes, the most ambitious programme launched.

The hostel was built just west of the former fishing village and south of the temporary home centre the housing commission began building its cottages. Expansion moved westerly as streets were laid out and houses built until Flagstaff Road was reached, when planning and building proceeded southwards.

HOMES AND PEOPLE

Migrants of thirty nationalities were housed in the settlement which is essentially a residential area. Homes are mostly of fibro with a brick building on each corner and here and there a block of brick flats. Water, electricity and sewerage were installed as development proceeded. Streets were kerbed and guttered and paved with bitumen.

An area set aside for commercial development has, unfortunately, only been taken up slowly making people go to Unanderra, Port Kembla and Wollongong to shop by bus services. Only now is the shopping area beng built up actively with shops and facilities.

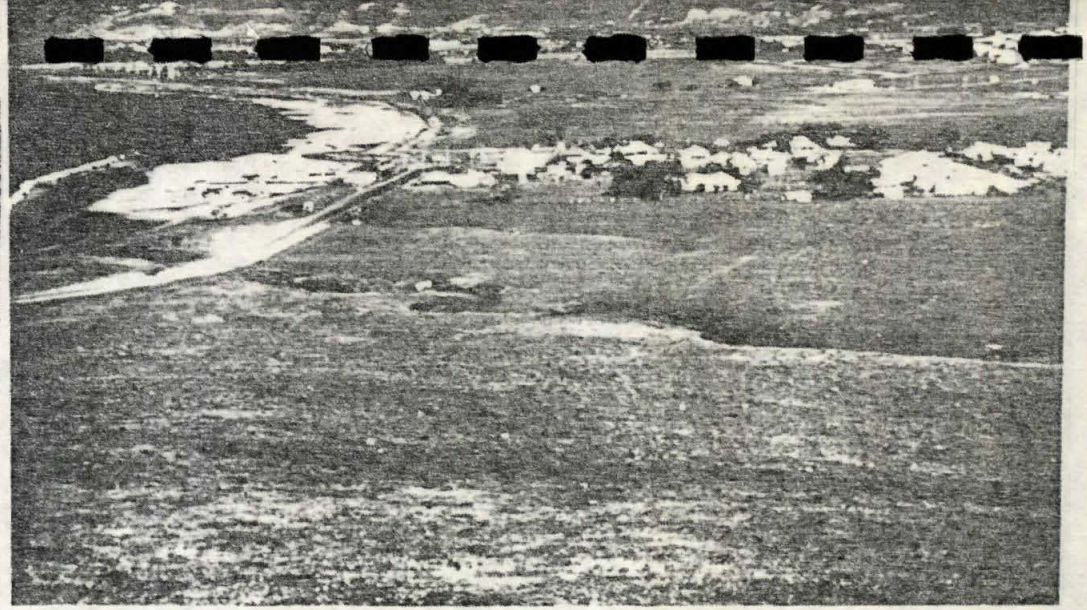
To provide for through traffic Northcliffe Drive was extended from Lake Heights around the foreshores to the former fishing village in 1956 thus eliminating the steep "Gorrell's Hill" on the Flagstaff Road. The expressway is being continued in a westerly direction to by-pass the town and link up with the Princess Highway near Kembla Grange.

SCHOOL EXPANSION

To provide for the greater population two additional primary and one high school have been built at Berkeley.

The first to be built was Berkeley West public school designed in modern style framed with pre-cast concrete using steel and fire resistant materials. Walls have

Fran K. H. Barwick History of Berkeley

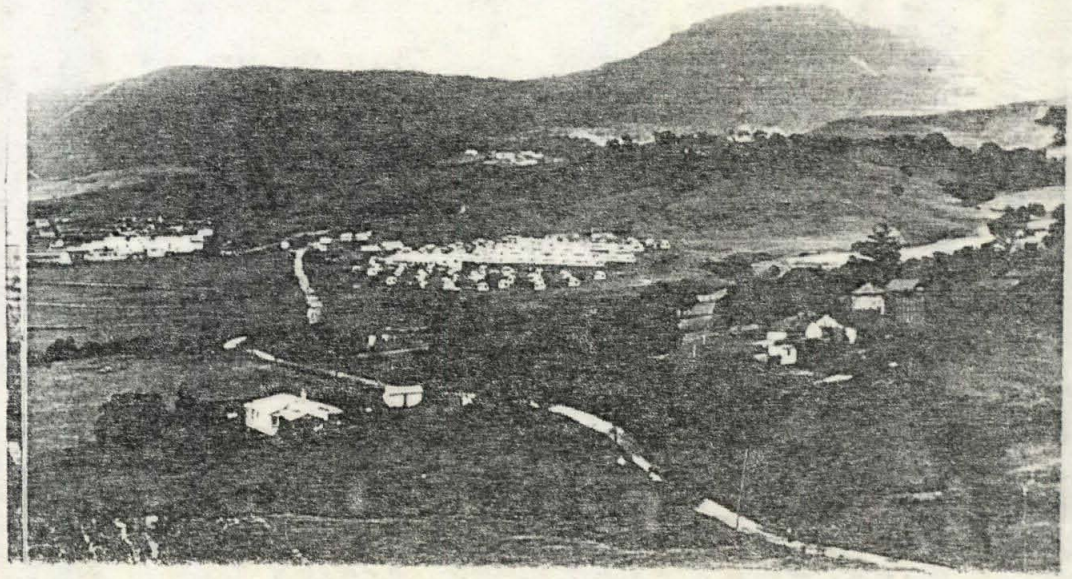


THE BERKELEY FISHING VILLAGE IN 1957
as the housing expansion began. The little harbour in Lake Illawarra for the fishing boats is on the left.

W. A. Bayley

BERKELEY FROM FLAGSTAFF HILL
showing Commonwealth Hostel for Migrants in 1954. Berkeley Public School is on the right of Flagstaff Road. It was later moved to its present position opposite.

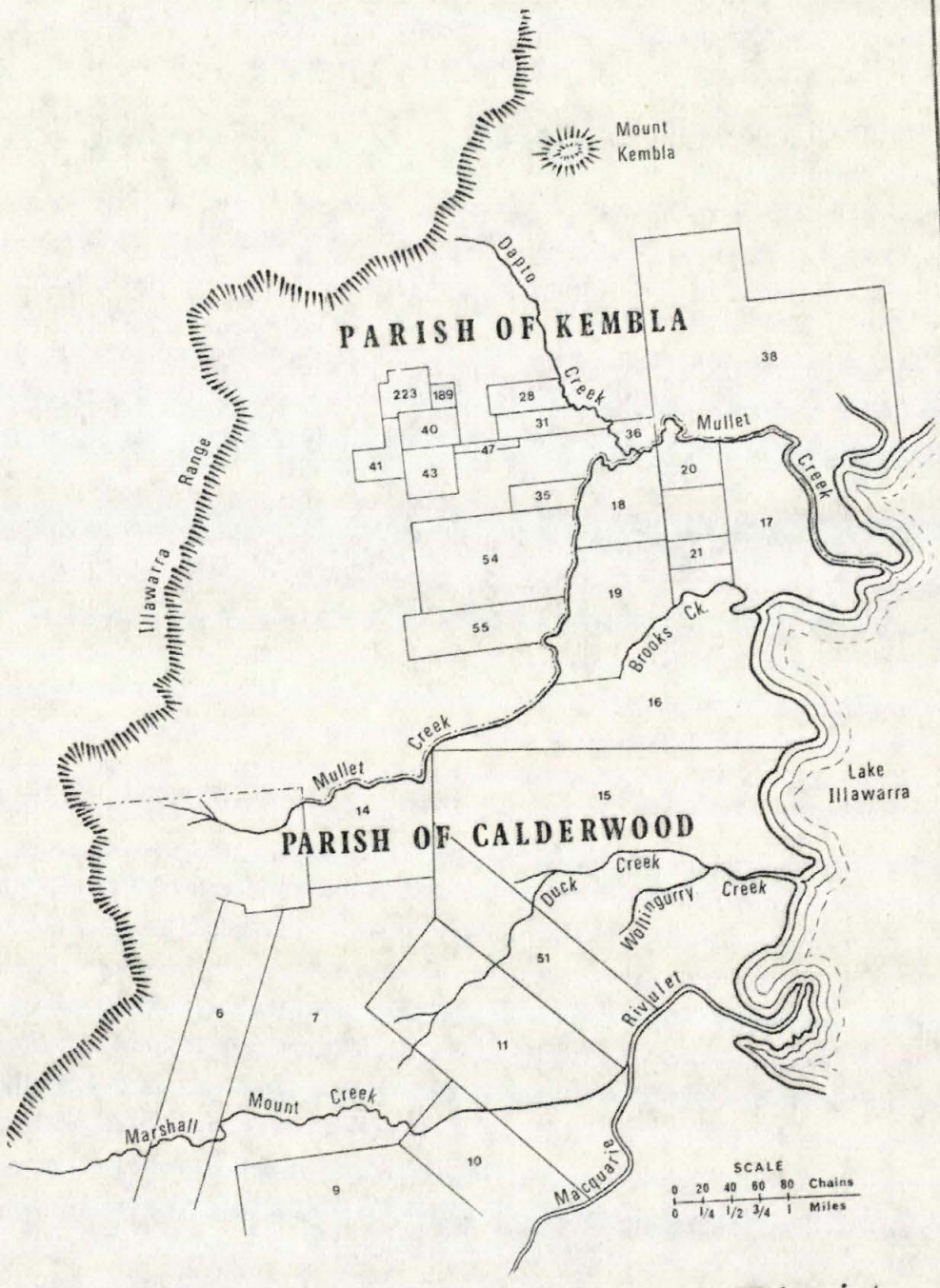
T. S. Nairns



"Sidmouth", the old colonial style house standing back with verandah posts, was built by R. M. Westmacott in 1837. The school was built in 1891. The large house next to it has been purchased by the Dept. of Education. It was built in 1905.

The beach during carnival time at Austinmer.

from N·S·King The Story of Austinmer



Dapto and District

SHOWING LAND GRANTS
MENTIONED IN TEXT

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31
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36
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Portion Number

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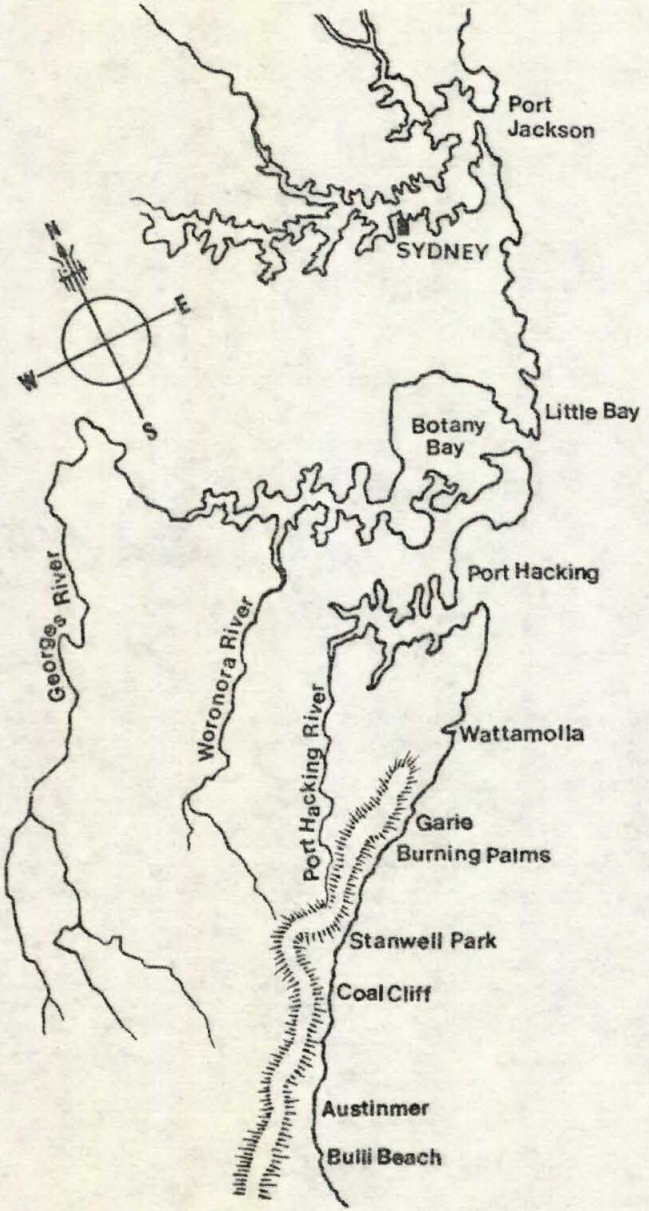
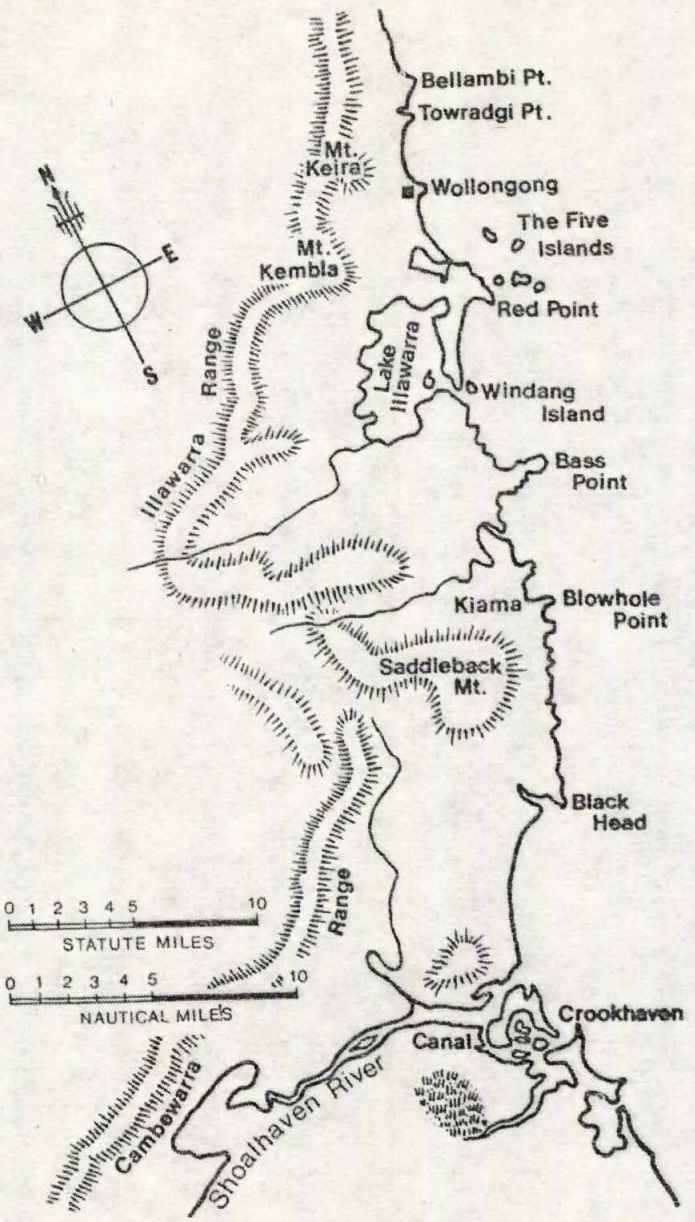
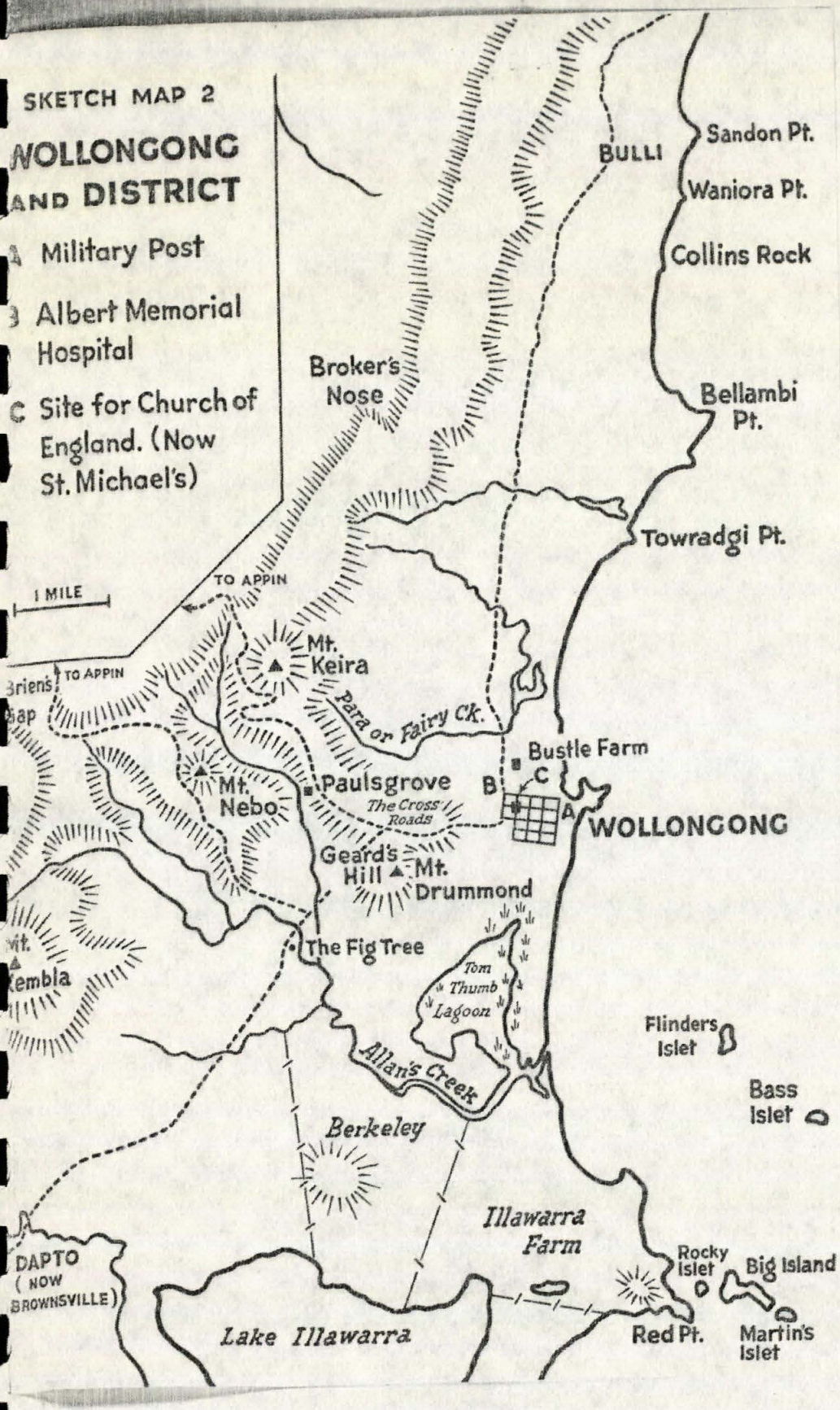
from W. G. McDonald Nineteenth-century Dapto





from W.G. McDonald The First Fleet Years.



From W.G. McDonald Earliest Illawarra.

from W. G. McDonald Earliest Illawarra

from W.G. McDonald, Nineteenth-century Dapto

2.237 Mount Keira Public School

On 9th November, 1861, the first teacher was appointed by local
On 5th May, 1862 an "application for the establishment of a non-vested National School at Mount Keira in Wollongong Parish" was submitted.

In 1875, J. & F. Osborne gave the Council of Education one acre of land from the portion of W. Spence's 100 acre grant, part of Portion 31, Parish of Wollongong in the County of Camden. G. Osborne built the school which was finished in November, 1877.

In 1881, attendance was 186; in 1885 ordinary attendance was 140; sometimes more than 150 (depending on the time of the year in relation to harvests, etc.) Enlargements were therefore necessary which were completed in February, 1886.

In 1888 attendance was 259, with average attendance being 176.3. In 1891 the average attendance fell from 187.9 to 94.1; this decline can be attributed to the opening of the Keiraville School.

Report of the opening of the new public school at Mount Keira.

The foundation stone of the new building was laid on 7th March, 1877.

What is left of the old village of Mount Keira is a row of Miner's cottages below what is now known as The old School of Arts building and some old shops are all that remain which served the community who once lived there.

The Mount Keira school is still in operation, being a "Demonstration School" for the Wollongong Institute of Education.

References: Department of Education records; Illawarra Mercury, 13th November, 1877, op.cit. 9.3.1877.

2.2317 Peterborough School

In Swamp Road, Dunmore. Was originally a wooden building which stood where the Dunmore butter factory was built, of which only the concrete slab remains. A school was established in August, 1860. A National school began in March, 1862.

In 1863, there were 62 on the roll, with the average attendance being 43. In 1872, a new school building was necessary. Two acres on the northern side of Terragong Swamps road was acquired on 29th July, 1881. The new Peterborough school was erected of rubble on the new site in 1881; a teacher's residence was a short distance away. The name was changed to Minnamurra public school on June 6, 1888. The school is now closed, although the stone building remains renovated.

Reference: Department of Education records.

2.310 Sherbrooke (in the Eighties)

From Bayley, W.A. Ninety Years On: Bulli Public School, Bulli 1959, note: "Sherbrooke was a settlement in the tall timber about miles west of the top of Bulli Pass on the mountain. It was removed when the Cataract Dam was built at the beginning of the twentieth century. Only the old stone school remains there now, used as a residence for the ranger, Mr. Bewley" (1959).

14 families lived there in the 1880's; some of these were the Brown, Wales, Williams and Knight families.

The School house was destroyed in bushfires of 1968: the toilet still remains.

An apple growing district.

Sherbrooke Public School originally opened as Bulli Mountain Public School in 1870, closed in 1907 with the transfer of the teacher to Kangaroo Valley.

Reference: Department of Education sources.

2.35 Brownsville

Named after George Brown, Brownsville is situated on the banks of Mullet Creek just north of Dapto, on the left hand side of the Prince's Highway when travelling south. The suburb (as it is today) is off the main road. The original town of Dapto was situated at Brownsville.

George Brown was in the area from 1828, owning 460 cattle and 626 sheep. In 1834 he was Ship Inn licensee at Mullet Creek. In 1839 he built a windmill and, soon after, a steam flour mill. In 1841 he began a twice-weekly coach service between Wollongong and Dapto.

The town began to develop around the Inn and the Mill. The demise of the area as a wheatgrowing area was due to climatic conditions. "A considerable quantity of rusting wheat in the vicinity of Marshall Mount and Terry's Meadows had been destroyed by a hailstorm" and "rust has destroyed a considerable quantity in some localities." With this, there was a general change to dairying. The mill operated intermittently until, in 1878, it became a cheese factory. "In 1878 my uncle, James Wilson, and his brother came over from Victoria and opened a cheese factory at Brownsville. The milk supply from Kembla Park (his father's property) was taken there for cheese making at first by bullocks and dray afterwards by lorry and two horses ... Butter at that time was only 6d. a lb. and they bought milk at 3-1/2d. per gallon ... The farmers failed to supply milk when butter advanced and the factory was closed ... The writer took charge of the cheeses until they were all sold ..."

2.54 According to John Brown in 1873, there were on the allotments adjoining the store "The Illawarra Hotel, the Central Illawarra Council Chambers, a butcher's shop and a smithy, Church of England and Wesleyan Chapel and other buildings and police station".

Osborne Memorial Church is situated at Brownsville, foundation stone laid in July 1880. The church was opened in November, 1882. It serves as a memorial to Henry Osborne and his wife, erected by their children.

Brownsville stagnated with the coming of the railway in 1887; the new town grew up around the railway station, about 2 miles further south at Dapto. The churches, showground and school, as well as the businesses, moved to Dapto. St. Luke's remains today.

No trace of the mill appears to exist today, although the hotel building still remains. Much of Brownsville is now suburbia, as a new development has taken place in the last seven years with the rapid growth of Dapto and surrounding area.

References: 1828 census material; Illawarra Mercury, 16th December, 1856; W.G. McDonald, Nineteenth Century Dapto, Illawarra Historical Society; Wollongong 1976, p.52 and p.59.

2.36 Unanderra

Unanderra was previously called Charool or Charcool Creek. A report on the naming of Charcool Creek appears in the Illawarra Mercury of 5th April, 1881.

George Cribb brought cattle to where the Figtree Bridge stands "called the district Charool Creek in honour of Cribb's stockman known as Charcool Will". (Naming occurred in the period 1815-1817: the name was changed in 1881 at the Post Office (7th April). The Post Office was established on 1st October, 1860. The name of the school was not changed until November, 1888.

Unanderra school was "established in 1877; prior to this, a Presbyterian and Catholic denominational school had opened in 1840; they closed in October, 1977 and 1881 respectively".

The Council of Education granted application for a school in October, 1876. The land was acquired from William Jenkins of the Berkeley Estate. Buildings were completed in October, 1878. The first teacher was appointed on 21st October, 1978 (John Richardson). The school opened in late October or early November, 1878.

4.11 Report on the opening of the school.

A butter factory and dairy company existed at Unanderra; however, not much can be found on this. The butter factory was situated at the end of Factory Lane, was managed by Mr. Billy Fackender at the turn of the century, and burnt down in 1910.

Unanderra had a tanyard which was "Charool's most important industry, the tanyard of Mr. John Richardson. It was established in 1860, and was situated at the back of Richard Brothers' store, opposite the Unanderra station, employed 40 hands at one time (end of Tannery Street). Site of the present infants building of Unanderra Public School.

References: Illawarra Mercury, 3rd October, 1876; Illawarra Mercury, April 1881; Illawarra Mercury Reports, Sept. - October, 1860; Department of Education records; Unanderra School Centenary 1878-1978: Department of Education records; Illawarra Mercury, 15th November, 1878; Unanderra School history; Illawarra Historical Society Bulletins.

2.41 Clifton Colliery Village

Clifton came into being with the opening of the Coal Cliff mine. The village site was described in the Sydney Morning Herald of October 30th, 1877.

Clifton was a planned village, which is still evident today. It was "laid out in the form of a crescent, having the Public School in the centre; behind the crescent other streets radiate in geometrical order.

Most of the housing was company housing, which was an improvement on others in other villages, being two or three roomed weatherboard cottages with galvanized iron roofs. They were "well built and confortable".

The development of Clifton in the 1880's was due to its earlier position as a railway town, rather than due to mining and important is the transportation of goods.

Clifton is the site of the most difficult rail sections put down at the time, with seven tunnels in seven miles, with the Clifton Tunnel being nearly one mile long. Numerous deep rock cuttings and brick arch culverts were needed as well. This section proved the longest to complete, causing concern amongst Illawarra residents, as the section Clifton to Wollongong and Bombo was completed. The section Clifton to Wollongong opened for traffic on 21st June, 1887 and as 9th November, 1887 to Bombo. Coach conveyed passengers from Clifton to Waterfall. A temporary terminus was built at Clifton, of which no trace remains today. It was not until 3rd October, 1888 that trains commenced to run between Sydney and Bombo.

Large numbers of railway workers camped at Clifton until 1889.

Clifton continued to grow in importance through the 1890's; this can be explained by its continued and growing link with Helensburgh. A new public school was opened on 17th January, 1911, between Clifton and Scarborough, replacing an earlier school, showing the importance of the area.

In the Town and Country Journal of the 21st January, 1914 (p.34), Clifton and Scarborough are referred to as important mining centres.

Today much of the early Clifton remains in, basically, its original form. As a mining village in such a good condition, it appears to be worthy of serious study before any destruction of this village and its atmosphere is altered.

References: Sydney Morning Herald, October 30, 1877; Sydney Mail, April 6, 1878, p.429; Sydney Morning Herald, 15th January, 1878; Illawarra Mercury, numerous reports, early 1887; Singleton, C.C. Railway History in Illawarra, Illawarra Historical Society, Wollongong 1972 pp.8-11; Department of Education; Town and Country Journal, 21st January, 1914, p.34.

2.63 Marshall Mount

The headquarters of Sarah and Henry Osborne, pioneers of the Illawarra district. Henry Osborne arrived from Ireland on 9th May, 1829. He received a free grant of 2560 acres in the Dapto district and called it Marshall Mount after his wife's maiden name. He increased his holdings soon to 5000 acres and then began to look elsewhere - the Riverina.

In the 1840's, in the Illawarra, he added to his holdings Charles Throsby-Smith's "Calderwood", Elyard's "Avondale", William Browne's "Athonlin", Brook's "Exmouth". His central Illawarra estate extended from Macquarie Rivulet to Mullet Creek, from Lake Illawarra to the mountains with large holdings on the southern mountain slopes of Jamberoo in Kangaroo Valley and Jerrara.

Marshall Mount grew as a village, as most of the land owned by Osborne was tenanted out. In 1859, a National School was opened just north of Marshall Mount House (May 1899). 73 pupils were on the attendance roll, with the average attendance being fiftyfour. A new school building was built in 1897 on the site of the Methodist Church. This building is still standing. The school closed in 1972. The Wesleyan Church was erected early in 1858, of weatherboard and shingled roof, but was destroyed by fire in 1879.

2.28 The Marshall Mount homestead has been in the process of restoration, with the present owners, the McDonalds. No sight of the old Marshall Mount creamery below the house near the barn on the opposite side of the road.

References: Shipping Lists; N. Griffiths, Some Southern Homes of N.S.W. (History of the Osbornes) Sydney 1929; Parish Maps; Department of Education records; Illawarra Mercury, 15th July, 1879.

2.65 Tullimbar

West of Albion Park, approximately where Yellow Rock Creek and Tongarra road cross each other.

This was a substantial area: an early store conducted by Thomas Davis, a Post Office opened in January, 1873 and closed on April 18th, 1894.

Tullimbar public school built of stone on the hillside above the old denominational school it replaced. School opened on October 31st, 1881. It was built on 2 acres of land purchased from W. Bartlett in 1880. School closed in 1965. Building still remaining, although little signs of any other activity.

Illustrations: Photo of Davis' store, Green Meadows, Halstead Press, Sydney, 1959, p.76 (verified by Post Office); S. Thomas, The Town at the Crossroads, 1975, pp. 128-29.

2.66 Albion Park West

West of Albion Park, along Tongarra Road. Was quite a settlement at one stage, had 3 churches, 2 stores and a blacksmith's shop. In the 1890's interest in this town began to wane.

Except from hearsay, unable to find anything substantial on this town. Conflicting reports on it, regarding actual sites of buildings, etc. From my research it appears that what was left of this township has disappeared from view with the growth westwards of Albion Park, along Tongarra Road.

The reason for the decline was the coming of the railway and the movement of people to what was known as Albion Park Rail. I can find very little in writing on this.

References: S. Thomas, The Town at the Crossroads, 1975, p.24.

2.67 Jamberoo

Jamberoo, a private village on the land of Michael Hyam, who arrived in 1828.

The village of Jamberoo was advertised in the Australian in 1841 as being for sale. A thriving area, Bishop Polding consecrated a Catholic cemetery in 1838; Catholic school opened in 1839; Harp Inn, 1837; Church of England schoolhouse-church 1842; Wesleyan services 1839 (chapel in 1851).

Episcopalian Church description of the laying of the foundation stone, seven churches in close proximity: "on this day they laid the corner stone of the seventh church, without taking into consideration school houses which were used as places of worship." Post Office sought in 1843, opened on July 1st, 1852.

1856: Jamberoo had become a "thriving bustling village" with many stores, blacksmith's shop, new hotel license issued in 1857 for Jamberoo Hotel. Later on it had 3 saw mills, tannery, flour mill, brewery, two blacksmiths, coalmine at Minnamurra Falls.

Growth around Jamberoo is the centre of Woodstock, Curnemore and where little remains today.

Much of the old rural village remains today - if not physically, in atmosphere. The old section of the village is especially good; the Jamberoo Hotel, especially the side of it, the number and age of the churches, cemeteries, the school, the layout of the village, etc. are ever-present reminders of the past.

Old residents of Jamberoo talk of this township, from hearsay rather than facts, are hazy on sites. What they remember cannot be verified to a large extent through my primary sources.

References: Early Parish maps; W.A. Bayley, Blue Haven, Halstead Press, Sydney, 1960, p.21; Catholic Church records, Wollongong; Illawarra Mercury, 21st March, 1865; W.A. Bayley, Blue Haven, op.cit. pp. 22-3; verbal verification from local residents.

2.68 Woodstock

Location: Mountain Pass Road, Jamberoo, on the right hand side of the road when travelling west, just before the first house.

Woodstock was quite a settlement, the focus point being the dairy factory on the western side of Jamberoo, named Woodstock. Begun in 1887, Woodstock in 1888 had 55 suppliers (the other factory on the eastern side of Jamberoo, Wauchope, had 27 suppliers at the same time). In September, 1898, the three companies then operating at Jamberoo, Woodstock Wauchope and amalgamated; the central point was Woodstock, where the refrigerating plant was located.

Woodstock Dairy Company went into liquidation in September, 1901; Woodstock Creamery Company took over building and machinery.

Prior to the dairy industry in this section, Woodstock had other uses. A flour and timber mill was erected on the estate of John Ritchie in 1838, operated by a water wheel in the Minnamurra River.

The mill was built by Captain J.G. Collins, called the Woodstock Mill. The surroundings became known as the village of Woodstock. A brewery was added in 1844, with hops being grown by the . The mill had a co-operage where barrels were made, a piggery, a bacon factory and a 2-storey barn. The premises became the Man of Kent Inn, then a store, subsequently a schoolroom until the building of the nation school.

1900 - no trace.

The mill had a biscuit factory attached, a timber mill and brewery.

The Woodstock mills and Brewery Estate was subdivided in 1861, sold in 1862, with the mill disappearing in the 1870's. Today some concrete slabs are all that are left of this thriving centre of the 19th century.

The dairy factory was taken over by the Jamberoo Co-operative Dairy Society in 1926, due to economic pressure.

References: Illawarra Mercury, September, 1898; Bayley, W.A. Blue Haven, Halstead Press, Sydney 1960 pp. 150-1; Bayley, ibid p.22; Illawarra Historical Society Bulletin, March, 1967; Bayley, op.cit. p.88; Jamberoo Co.-op. Dairy Society Ltd., Booklet on 'Dairying Industry in Brief', p.5.

3. Whaling and Fishing

More research is required on both sites and historical background in this theme.

There appears to be little mention of whaling off the Illawarra coast in the 19th century, although the protected bays on the north side of Red Point and Bass Point as well as the off-shore islands appear prima facie to have been suitable for bay wahling. Further research and field work might find traces of such activities from the early part of the 19th century in one or more of these areas.

2.721 More is known of small fishing villages such as Berkeley
2.722 and Windang on Lake Illawarra. Traces of the former especially survive within the later development of the area.

The major fishing development along the Illawarra is associated with the fisherman's co-operatives of the 1930s-1960s once flourishing in each of the Illawarra and South Coast harbours and now, with one exception, either vanished or surviving only as deteriorating or re-used structures. The one exception is that at
3.1 Wollongong Harbour which is still in daily and spectacular use.

References

W.G. McDonald Old Berkeley Fishing Village
(Illawarra Historical Society)

4. Dairying and Butter Factories

History

The delicately-balanced battle between Australian farmers, the elements and the economic situation are rarely better seen than in the Illawarra in the later 19th century, with the advancing and retreating battle lines, and some of the buildings associated with them are still there, to be discerned on the landscape for those who can pick them out.

The fertile basaltic, latitic and alluvial soils, coupled with a rainfall of over a year, and a mean yearly temperature of gave early promise of considerable productivity to those tough enough to take up the challenge of clearing the almost impenetrable rainforest which ran right down to the coast and for many of the early years forced transport by sea or at best by foot and pack horse through much of the coastal strip. The earliest settlers practised mixed farming, grazing cattle and horses on the land they could not yet cultivate, with wheat as the main staple. Dairying was also carried on largely for household consumption, until the introduction of the steamer service in 18 when at least butter (but not whole milk) could be got to Sydney with some chance of being in fair condition.

Economic facts relevant to dairying are that cream can be transported further than whole milk without deterioration (that is, before refirgeration), butter further than both, and cheese much further again. At the same time there is a corresponding fall-off in prices: milk supplied as whole milk to a demand area commanded one and half times as much, broadly speaking, as milk supplied to a butter factory. The return on milk supplied for cheesemaking, which in fact occurred further south down the New South Wales coast at a greater distance from Sydney's milk markets, was less again. In the 1860's rust invaded the coastal wheat crops, turning farmers there more firmly towards dairying. At the same time, the melting butter kegs awaiting the steamer in high summer already salted or treated with boric acid for preservation, together with the extreme drudgery of a pioneer dairy farmer's existence meant a low profile for this form of farming until further changes took place.

These changes took place in the 1880's. Together with the successful conquest of refrigeration came the development of the Fresh Food and Ice Company of Sydney, anxious to purchase good quality dairy products from districts within reach of Sydney and have them transported in good condition. In 1887 the Illawarra railway reached Bombo, then Kiama, but the Great Southern Railway had long since reached Picton (1867) and beyond. In the later 1870's meanwhile appeared the mechanical cream separator, developed by Gustaf de Laval from Sweden, a machine that could deal with 300 gallons of milk per hour, and extract more cream from it in a far shorter time than old fashioned setting. The first separator in New South Wales was set up at Mittagong by the F.F. and I. Co. whose role in the encouragement of wholesome dairy produce from the Illawarra by assisting local participation was critical.

The growth of dairying from c. 1880 in the Illawarra was sensational, and similarly indeed its decline from the 1890's onwards, largely in relation to specific changes affecting transport, technology and profits.

1881 Separators exhibited at the Sydney Show.

1883 Separators installed at Mittagong by the F.F. and I. Co. to extract cream from surplus summer milk, the whole milk having gone to Sydney as usual by train.

1884 The Kiama farmers set up their own butter factory instead of having the F.F. and I. Co. carry out their own projected development, with full co-operation from the F.F. and I. Co.

1885 D.L. Dymock set up the Albion Park factory No. 1.

1887 He assisted in setting up the two Jamberoo factories (Wauchope and Woodstock).

1887 The F.F. and I. Co. also set up its own butter factory at Omega near Gerringong.

(Home-made butter now dwindles in proportion to factory-made butter, while cheese production, with its lower milk price to farmers, also falls in proportion to butter production).

1888 The rail link from Kiama to Sydney allows access for Kiama district farmers to the whole milk market of Sydney as opposed to the lower price from the butter factory. The F.F. and I. Co. now draws upon Kiama factory as a collecting centre for whole milk, since it is more dependable than the tablelands.

1892 The Unanderra factory has now also become a collecting station for whole milk for Sydney, as was Wauchope. Albion Park was now making butter only from its summer surplus milk, and Gerringong only from its evening delivered milk. Only Woodstock factory continued to make butter all the time.

Conversely therefore, the plateau farmers, who had once had the advantage of the earlier rail link, and so could get away with minor undependability through droughts and low temperatures in milk deliveries to Sydney but who no longer had such a monopoly, now in their turn took up the slightly less lucrative area of butter making. Two factories appeared at Robertson, one each at Wildes Meadows and Kangaloon, and one each at Picton, Bowral and Exeter along the railway line.

In contrast also to the Kiama-Albion Park region was the area to the south of the rail head, where butter factories built in the late 80's survived the next decade because of the impracticability of exporting whole-milk. These included -

1888 Butter factory built at Gerringong.

1889 Butter factories at Jaspers Brush, Cambewarra, Foxground and three at Kangaroo Valley.

Further developments followed the spread of factory refrigeration in the 90's, when the variation in quality between the newly-introduced coldroom-made butter produced by the F.F. and I. Co. from creamery butter and lower-grade unrefrigerated butter became apparent. Refrigerating equipment needed capital, and a new process of distinction began between the smaller butter factories which became creameries only, separating cream which was then supplied along with cream from other creameries to a few centralised factories which had installed refrigeration. Some new creameries were also built to supply the central factories.

1895 The Berry Estate built the first central factory, drawing cream from 15 separating creameries, most of them formerly independent factories.

Key central factories with refrigeration survived at Woodstock, Dapto, Unanderra and Albion Park, while Druewalla, Tongarra, Marshall Mount, Yellow Rock and others operated for a while as creameries. Creamery butter fetched a higher price than factory butter, but the introduction in the late 1880's of a low-priced hand separator which allowed direct delivery of cream to the central factories also increased the risk of contamination of good cream by bad. In the early 20th century, the creameries successively closed, leaving only the central dairy factories on the railway line.

By 1900 the dairying boom in the Illawarra eased as the north coast developed rapidly and the south was affected by a series of droughts. The reduction in dairying acreages, especially in the upper parts of the valleys caused also by the attraction of industrial employment at Port Kembla and in the collieries can be clearly seen in the ruins of abandoned farms and regrowth over once-cleared fields.

Remains

Only one of the smaller factories or creameries is known to survive as other than a site or foundations,viz. the first Albion Park factory (1885). Most of the remainder, weatherboard with iron roofs and a skillion for the machinery, disappeared with little trace. A few survived because they became central dairy factories - strategically placed and with capital to instal refrigeration. Woodstock at Jamberoo and the Illawarra Central at Albion Park were the most significant in the present area. Some of the local creameries supplying them in the early 20th century - Tongarra, Druewalla - have also left tangible evidence because of the necessity to set the separators on concrete blocks.

Usually associated with butter-making are piggeries and bacon factories, using up the skim milk, and several of the Illawarra butter factories and creameries had piggeries attached. Conversely, before the 1880's, and again after the introduction of the hand separators allowing a reversion to cream separation back on the farm, pigs were part of the dairy farms themselves. Hicks bacon factory at Shellharbour was a thriving establishment in the 1890's, which in 1906, followed the movement of the dairying industry north to Lismore.

Another physical trace of the boom period of the dairying 80's is its transport system. Before the coming of the Illawarra railway it was the arrival of the steamer at Wollongong, Shellharbour, Kiama or Gerringong that dictated the delivery of butter kegs to the wharves. To each of these loading points led a 'butter track', a pack-horse route down from the higher farms using short cuts not accessible to drays. The horses carried one keg each with a counterweight to balance it. A signal was posted on some eminence above each harbour when the steamer was sighted to alert the farmers to despatch their consignment, e.g. the Ball Tree on Dunster's Hill behind Shell Harbour where a cane ball was hoisted. At Kiama harbour for many years goods were gathered under the great figtree in the shade before a shed was built.

4.1 Kiama Pioneer Butter Factory

Remains

Site only, with memorial cairn. One mile west of Kiama township on Kiama-Jamberoo roadside on the bank of Spring Creek.

History

The factory was officially opened on June 18, 1884. It was built of weatherboard with oak shingled roof, later replaced by galvanised iron. The skillion section housed the machinery.

It was soon out-dated as new factories were built using inventions and methods continually devised and improved.

The building was taken over by the Fresh Food and Ice Company as a milk depot in 1897 or 1898 and closed early in the twentieth century.

The memorial cairn was erected by Bruce Tidmarsh on instructions from Ray Weir, on whose property, acquired by his father about 1910 and named "Boronia", the factory building stood until it was demolished in 1936.

Details of the erection of the memorial appear in the "Kiama Independent" of 18/8/1962, page 2.[1]

The brief reminiscences of Mr. H.H. Honey, Manager 1884-90, are published by Bayley, ibid tell of the role of the Fresh Food and Ice Company of Sydney in importing two Danish separators for the Pioneer Dairy Company in 1883, following the importing of the first separator by the same company for their Mittagong Milk Depot in 1882-3. In 1885 the first factory-made butter was shipped to Britain. The competitive nature of the dairy industry emerges in this account, in which the F.F. & I. Co. of Sydney outbid the local South Coast and West Camden Company by a bonus payment of 3d. per lb. for ordinary pan-set butter above top dairy prices to acquire the total output.

Honey lists the change in packaging of butter from iron-bound wooden kegs (tending to rancidity in the long term) then earthenware jars in wicker baskets (which could not be steam cleaned), then a tin container in a wooden jacket which proved too flimsy and, finally, the square white pine box, lacquered inside. The last form survived for many years, with grease-proof paper taking the place of the lacquered interior. He also emphasises that the early factories were also separating stations involving heavy cartage of milk. The spread of the home separator in the farm meant fewer factories processing cream only.

[1] (W.A. Bayley, Kiama Pioneer Butter Factory, 1963).

4.13 Dunmore Dairy Company Ltd., Dunmore, Shellharbour

Situated on the Dunmore Estate, Dunmore, along Swamp Road, on the site of the first Peterborough School building (demolished to make room for the factory). The land was owned by G.L. Fuller. The need for a second factory was initiated at a meeting in June, 1888, in the Shellharbour Temperance Hall. Operations began on January 8, 1889. Factory was 60' x 20', equipped with 4 DeLaval separators, 2 Finlayson churns, butter troughs. Fourteen suppliers. Piggery at rear for 200 head. Outlay on factory and plant Two thousand pounds. Factory grew to be the largest in the colony for milk supply. By 1894, over one million gallons were being supplied by 39 suppliers. All debts were met in 5 years of operations - 1895. The company went into liquidation in 1902; G.L. Fuller took over the factory and controlled it as a creamery, the reason being that private separators ousted it when it became purely a separating station for the despatch of cream to Sydney.

The only remains today: a wide driveway and part of the concrete slab are visible and the house on most of the concrete slab. Present owner - Mrs. O'Dwyer.

References: Illawarra Mercury, June, 1888: report of meeting to be held and meeting; W.A. Bayley, Green Meadows, Albion Park, Shellharbour Municipal Council, 1959, p.134-35; also quoted in his Illawarra Pastures.

4.2 Albion Park Factories

Remains

First factory: Part of weatherboard factory survives, traces of machinery and enclosures at rear. No contents. Former manager's house adjacent. Both well-maintained by present owner, Mr. King, Tulkaroo, Calderwood Road, Albion Park.

Second factory: Survives at Albion Park Rail, but much modernised.

History

The first dairy factory at Albion Park was built by the Albion Park Factory and Dairy Company Ltd. in 1884 and began work in 1885, two years after the Kiama Pioneer factory. It was erected on the south bank of the Macquarie Rivulet, on the Calderwood Road, so that it could service Marshall Mount, Calderwood and South Dapto, as well as Albion Park.

The factory was, as usual, a weatherboard building with skillion housing six de Laval separators, churns and other appliances driven by a 16 horsepower steam engine. Associated was the piggery, to which skim milk, water and waste were all piped.

This factory finally closed in 1908, but its role had long been superseded by the second factory, operating under the name of the Illawarra Co-operative Central Dairy Society[1], which opened in 1899. This was sited directly on a rail siding near Albion Park railway station in Creamery Lane. It was also one of the central factories with refrigeration, servicing smaller creameries and farms, but has been updated in recent years to suit its considerable production and little of its early history appears to survive.

[1] (cf. W.A. Bayley, A History of the Illawarra Co-operative Central Dairy Society).

4.3 Avondale Creamery

Sites and Relics

Site probably undisturbed but below ground in paddock of the Avondale property of the Osbornes.

History

Established in 1901 by the Fresh Food and Ice Company. First manager was Mr. Hamilton Charlton. Eight farmers supplied the creamery.

4.4 Tongarra Creamery

Remains

Situated six miles west of Albion Park, on the banks of the Macquarie River, beside the main road (southern side).

The site of the old creamery was fairly recently bulldozed, and the pile of debris can still be detected, including part of the broken floor slab. The old steam engine from the Tongarra creamery is in the Illawarra Light Railway and Steam Museum at Albion Park.

History

A meeting concerning the factory was held in February, 1893, at Thomas Rogan's. A company was formed, which opened on 1st June, 1893. The first manager was David O'Keefe, formerly of the Wauchope factory at Jamberoo. Seventeen suppliers; object to send the cream to Sydney for manufacture into butter.

Closed December, 1908. A few slabs remain today.

References: Parish land maps: Illawarra Mercury, Jan.-Feb.,1893.

4.5 Druewalla Dairy Company Ltd., Jamberoo

Remains

Situated on the Jamberoo Mountain Pass Road, approximately 2 miles up, near the Minnamurra River (right hand side of the road going west). A massive squared concrete block that supported a large separator survives in the middle of a paddock near an old shed now used for hay that may also be part of the former factory.

History

The Druewalla factory was built in 1891 to service the dairymen on the Jamberoo mountain, saving them a journey of six miles into the Woodstock factory at Jamberoo. However, it only operated for seven years as it was then decided to instal refrigerating plant at Woodstock, a central point for the district. (q.v.). The families associated with this are the Boyles, Charles Allen and the Brennans. The factory was managed for many years by Thomas Brennan.

W.A. Bayley, Blue Haven, Halstead Press, Sydney, 1966, p.162.

4.6 WAUCHOPE AND WOODSTOCK FACTORIES, JAMBEROO

and

4.7 In 1887 two factories were set up at Jamberoo at Wauchope on the eastern side, and at Woodstock on the west. A Kiama tinsmith, George Bullen, made the milk-cans. Waughope began operation in November 1887 with W. Robb as assistant manager and C.W. Craig as the largest supplier. Woodstock began early in 1888.

Waughope paid 4 1/2d and Woodstock 4d a gallon for milk. Gradually the majority of dairymen joined the Factories isolated ones in the hills using pack horses and slides along the old 'butter tracks' to send the milk out. Waughope in 1888 had 27 suppliers and Woodstock 55.

As soon as the Kiama - Sydney Mail was opened in 1888 the two factories began to send their butter to Sydney by rail instead of by steamer, rail being faster and cheaper. A branch line to Jamberoo was contemplated on several occasions but never carried out.

The Waughope factory continued at Jamberoo, but the opening of Woodstock in 1899 as a central creamery reduced the work at Waughope lower down the valley. In 1903 Waughope installed refrigeration plant, and cooled milk was sent from Kiama to Sydney to supply Sydney's quality milk trade.

In 1898 the three companies - Waughope, Woodstock and Druewalla - decided to amalgamate and place refrigerating plant (although not pasteurisation) at Woodstock. Druewalla was soon closed.

At Woodstock the former Woodstock Dairy Co. went into liquidation (September 1901) and the newly-formed Woodstock Creamery Co. took over the machinery and buildings. Two new attemperator vats were installed and the old boiler and engine replaced by larger and more up to date ones. There were 80 suppliers and in 1906, 313,919 lb butter was made. The refrigerating capacity of the factory was doubled and cream vans began running instead of milk vans as most suppliers had secured home separators by that time. At the annual meeting in 1907 Craig said there would be one factory for Jamberoo.

The change arrived in 1908 when C.W. Craig resigned as director of Woodstock factory where "to comply with Board of Health's new-fangled requirements extensive alterations have to be made to the manufacturing portion of the factory, the principal part of which is the installation of concrete floor". The shareholders organised a working bee, used bullock teams and cleared out the factory which had been in use since 1887, ready for concreting the floor and making room for the engine and refrigerating plant and the factory was re-opened.

The Jamberoo Dairy Co. was operating in the old Waughope factory. The company was reconstituted, the former factory dismantled and a new one erected on the same site. Instead of lying north and south it was built east and west. P.C. Davies of Kiama was the builder. It was of timber, 45 feet by 27 feet. All foundations and floors were of concrete having a complete floor drainage system. New manufacturing plant was installed, a Tangye suction engine replacing the "old type steam engine". There was an engine room, a cool room and a receiving verandah on the northern side. The factory had a capacity of 10 tons of butter per week. Stuart Graham became manager and W. Johns engineer.

The factory was officially opened on December 2, 1908 by C.W. Craig, chairman of directors.

In 1915 cheese making was added at Wauchope, production being commenced on May 11. It was equipped as the largest cheese factory in the state with two cheese vats each with a capacity of 750 gallons. With the introduction of "block days" during the Great War when farmers in turn could not send milk to Sydney, the Jamberoo cheese making plant produced large quantities of cheese and by the end of 1916, 40 tons of cheese was in stock.

Motor lorry transport of milk and cream began in 1917 and brought quick returns. The factory soon became noted for export cheese quality. An up to date pasteurising plant was installed in November 1921, and the first consignment of milk was sent via Kiama to Peters' American Delicacy Co. which also took the largest portion of the cream.

A record was achieved in 1929 when over one million gallons of milk was handled for the year, half being supplied to Peters' ice cream factory. The new dairy factory was fitted for steam or electr operation. It was a brick and concrete building with walls tiled to a height of six feet and a capacity to treat 15,000 gallons of milk daily. A new departure was made in 1933 when the department used for cheese making before Peters began taking milk was converted for manufacture of powdered milk.

Sites and relics

The existing buildings of the Jamberoo Dairy Co. deserve a thorough study, since a first inspection suggests that the present complex incorporates substantial remains of the 1887 buildings as well as both the 1908 and 1921 changes. Documentation of the building materials used in each stage would be particularly valuable in view of the detail records available.

4.13 Dunmore Dairy Company Ltd., Dunmore

Remains

Footings of the concrete yard and slab only survive, now forming the footings of a later bungalow (present owner Mrs. O'Dwyer).

History

The factory was built on the Dunmore Estate at Dunmore along the Swamp Road on the site occupied by the first Peterborough school building which was demolished to make room for the factory. The Dunmore butter factory began operations on January 8, 1889. It was designed by Waugh and Josephson and built of colonial hardwood with corrugated iron roof, lined with pine and floored with tallow-wood. The building 60 feet by 20 feet had a verandah right around and was adjoined by two semi-detached cottages for manager and engineer. There were fourteen suppliers and the factory was equipped with four De Laval separators and two Finlayson churns and butter troughs. The 60 lb. kegs for the butter were made by Craig and Hughes of Shellharbour. A piggery at the rear of the factory had 200 swine. The construction was supervised by J. Bigg, the manager J. McEncroe, buttermaker J. Condon and engineer G. Mercer. The largest supplier was George Couch who sent 110 gallons of milk daily. The outlay on factory and plant was £2000.

The factory grew to be the largest in the colony for milk supply by 1894 when over one million gallons or 4840 tons were supplied by thirty-nine suppliers. The following year a picnic was held in G. Couch's paddock adjoining the factory to honour J.D. Allen for his services to the factory as secretary, when it was pointed out that all debts had been met in five years of operations. The factory by that time had begun to send all its cream to Sydney "to be with the times" after butter making for five years. From January 1898 the company decided to divide its cream between the South Coast and West Camden Company and Foley Brothers - both proprietary companies in Sydney. The true spirit of co-operation was gone but this was revived when George Couch played a big part in the new co-operative movement begun to establish a central creamery. Its days as a co-operative factory were numbered. Private separators ousted it when it became purely a separating station for despatch of cream to Sydney and the company went into liquidation in 1902 when G.L. Fuller took over the factory and controlled it as a creamery.

4.11 Unanderra Cooperative Butter Factory

The development of butter-making in home dairies began to speed up in the 1850s around the Berkeley Estate, a major change occurring in 1887 with the establishment of a co-operative butter factory in Factory Street, Unanderra between Allan's and Charcoal Creeks. 27 suppliers began the co-operative on December 13. From 1889 the butter factory came under increasing pressure as local dairy farmers preferred to supply whole milk to Sydney via the milk train. It continued to operate throughout the 90s then became a milk receiving depot.

(cf Barwick, Berkeley p.5 also photograph p.8)

For 4.8 Marshall Mount Creamery

4.9 Tullimbar

4.10 Yellow Rock

4.11 Unanderra Butter Factory and Dairy Co.

4.12 Dapto

see under relevant Settlements in Section 2.

5. Cedar-cutting and timbering

Both the early stay of cedar-cutting on the coast and scarp and the later development of timbering up and into the escarpment need further research.

At least two old saw mills remain - the former Dapto sawmill of J. Clarke thoroughly recorded by Ken McCarthy and his students, but now in a critical condition and the Corrimal sawmill of Harry Cram, still just operating.

The latter, which has a number of prime movers as well as a wealth of milling machinery was briefly visited but urgently needs fully recording. Mr. Cram himself is a source of much invaluable information.

A further aspect of the theme which needs exploration is that associated with the collieries. Several of them such as Bulli South had their own logging tramways and mills on top of the scarp to supply pit props and mine timbering and traces of some of these can still be seen.

As a footnote, at least one member of the Illawarra Historicial Society has mentioned the existence of cedar-cutting pits on the scarp, but these are still to be located and investigated.

5.7 Corrimal Sawmill (H. Cram)

History

The sawmill appears to be about 40-50 years old, its present owner Harry Cram. Its peak production period was during World War II when rifle furniture was prepared to be made by Slazengers. Coachwood from the scarp was used for this, woolly butt and black butt from the same source for other purposes.

Site and relics

The sawmill still more or less in working order, is packed with equipment - saws, two moulders, and a great range of steam engines.

(Personal reminiscence, H. Cram)

5.8 Dapto Sawmill

J. Clarke's Sawmill, stripped 1951-2. Present owner George Brunero, 360 Princes Highway, Dapto. The original prime mover was a Garrett, which went to Londonderry Railway Museum, the later one a Marshall.

For detailed record and drawings cf. Part 3 of thie Report.

6. Shale Mining

The American Creek shale mine, the site of which is now on the property of Nebo Colliery was one of the earliest and richest of the numerous shale mines which began to be developed in N.S.W. from 1865 onwards.

The shale oil basin of N.S.W. extends from the Clyde River south of Nowra north as far as Murrurundi in the Upper Hunter valley, and est to the Goulburn and Capertee valleys; the main concentration of sites is to be found in the Blue Mountains (Katoomba, Mt. Victoria, Hartley Vale) and the Capertee and Wolgan valleys, Newnes, Glen Davis, Torbane). In the early years of the industry, the major product was kerosene oil for illumination but by-products were no less valuable - gasoline, spongaline, paraffin and paraffin wax, in wood preservatives such as creosote, lubricating oils, naphtha, sulphate of ammonia. There was a major development of the Capertee to Wolgan Valley sites during the first half of this century.

Kerosene shale had been recognised in N.S.W. as early as 1824 near Hartley but was not developed until competition with the imported American product became less intense in the 1860s.

There appears little doubt that the Pioneer Kerosene Works at Mt. Kembla was in fact, the first place at which shale was mined in N.S.W., and certainly the first at which it was successfully retorted, mining operations having begun there in mid 1865 with the first kerosene being produced on site in November 1865. Mining operations followed rapidly at Hartley in 1866, their shale being transported to Sydney for refining at Waterloo. Other mines followed - Joadja c. 1874, Glen Davis from 1881, Torbane and Glenowlan 1896 and Newnes in 1908.

Unfortunately, the rich promise of the Mt. Kembla seam did not prove long-lived and the mine closed in 1878. Historically however, the site remains of considerable significance to the story of Australian shale oil.

Shale Mining

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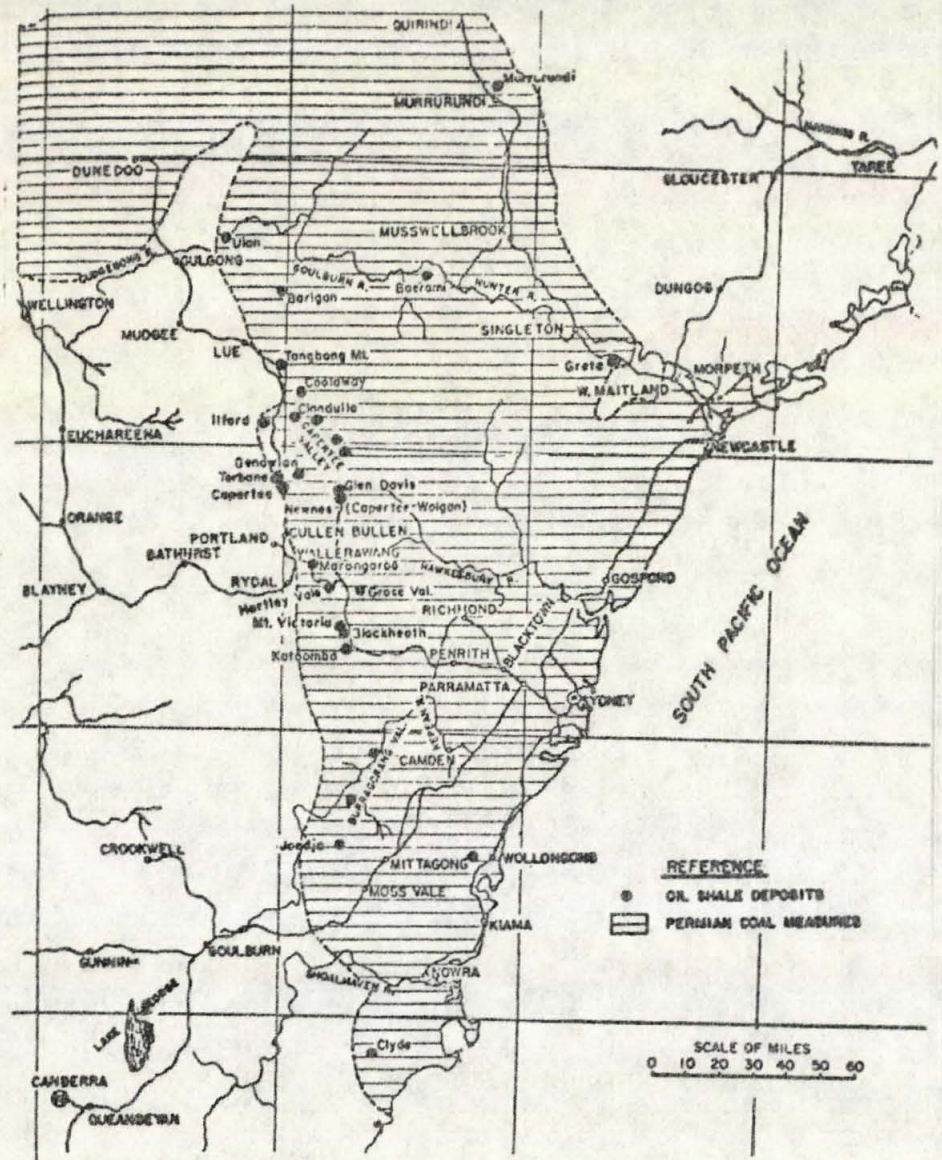

Map No. 1 **Oil-Shale deposits in New South Wales, Australia**

(From Oil-Shale Operations in N.S.W. by A. J. Kraemer and M. H. Thorne, 1951. p. 4)

From A·S. Luchetti + others The Oil Shale Industry.

VIEW OF MOUNT KEMBLA AND THE KEROSENE OIL WORKS

Illustrated Sydney News

28 October 1871 p 180

91

6.1 Pioneer Kerosene Works, American Creek, Mount Kembla (1865-1880: 1943)

1. History

The site of this shale mine and plant lies in Portions 4 and 160, Parish Kembla, County Camden on a small plateau of 2 acres, 520 ft. a.s.l., on the north side of American Creek, within the area today occupied by No.1 Flat, Nebo colliery.

A seam of shale was discovered here in 1865 by R.T. Want, on property belonging to John Graham (Lishmund 1974,51-2). About the middle of the same year two shafts of 8 ft. wide were driven to ascertain the quality of the shale, and when this was proven, work began with the necessary building, the bed of shale lying about 20 ft. above the spot selected for the works (I.S.N. 28/10/1871). A seam of anthracite coal in the vicinity was also worked, for supplying the furnaces, and the first kerosene was produced in December 1865. W. T. Hammil, an American oil refiner had approached Graham for the purpose of exploiting the deposit and supplied plans and estimates for the plant which was erected by Robert Longmore for $8,000. (Fleming 1976). Detailed accounts of the buildings on the site mention engine, still, refining and retort houses and the tramway system to the retorts (Ill.Mer. 13/10/1865: See Appendix). A substantial bridge spanned the creek and the oil was conveyed down the winding track to Wollongong by drays and was from thence shipped to Sydney by steamer. (I.S.N.28/10/1871).

An 1872 prospectus for a new company which never eventuated 'The Sun Kerosene Shale and Oil Company, Wollongong,' gives further details of the plant at that time (Fleming 1976:Appendix). In 1874 Graham sold his interest in the company for $20,000 to the Mt.Kembla Coal and Kerosene Company: in 1875 and for part of 1876 operations were suspended due to a drop in the price of oil, to be resumed bu then finally closed in 1878. In 1878 the Mt. Kembla Coal and Oil Co.(Ltd.) purchased the area for coal mining activities (ibid). There is no record of further activity until 1943 when Madden and Co. reopened the same seam and developed a prospecting adit, but results were poor and the work was abandoned soon afterw ards (Lishmund 1974, 51-2). As well as the area of the works, the company also possessed a store on the northside of the Belmore basin, the building being 100 ft. by 30 ft. (Fleming 1976). It is estimated that up to 1880, some 8,640 ft. of shale had been mined. (Lishmund 1974,51-2).

(Concrete bridge remains said to relate to the opening up of the colliery: mentioned by Fleming (1976)):Local information. Contemporary illus. Illus.Sydney News 28/10/1871 p.180.

References: 1974 Lishmund, S.R., The Mineral Industry of New South Wales No.30. Oil Shale. (Dept. of Mines: Geological Survey of N.S.W.); 1976 Fleming, A.P., The Pioneer Kerosene Works at American Creek (Mt. Kembla, N.S.W.) with a brief reference to the succeeding companies. (Illawarra Historical Society); Illustrated Sydney News October 28, 1871 p.174 Kerosene Oil Works at Mount Kembla (illus. p.180); Illawarra Mercury Friday October 13, 1865 American Creek Kerosene Works.

Appendix

6.1 (cont'd) Pioneer kerosene Works, American Creek, Mt. Kembla

Details of the works from an account published in the Illawarra Mercury, Friday October 13, 1865 [pp. 2-3].

Road: about 12 chains long and 20 ft. wide has been made from the main road to the creek, across which a bridge has been erected 60 ft. long by 20 ft. wide, supported by heavy beams bolted to large rocks in the bed of the river (several very large rocks being removed for the purpose).

On the flat ground first we come to:-

Engine house built of strong, squared uprights and covered with corrugated galvanised iron, in which is an 8-horse high pressure engine. Adjoining is the Still House 'built in like manner' and adjoining these two there is a large stone house 24 ft. x 37 ft. called the refining house, the foundation of which had to be sunk about 9 ft. This too will be covered with galvanised iron.
On the left is the retort house 15 ft. x 30 ft. in which are set 10 retorts (each of which will be charged with about 3 cwt of shale); adjoining thereto is a very substantial stone chimney, elevation 40 ft.
About 200 ft from these stands the clearing house 30 ft. x 30 ft.

2 adits: 40 yds towards the north-west and about 100 yds apart: shale is run out on the tramway and stacked for use.
At mouth of the adit is a shoot about 25 ft. long into which the shale is tipped on to a large platform: from thence a tramway is erected, about 250 ft. running under the retorts and receives the spent shale of five retorts and runs off by a branch-line to a gully, there to be deposited.

Appendix

Pioneer kerosene Works cont.

Behind the retorts are two condensing tanks of 9ft square and 5ft deep: these are supplied with water brought from the river at an elevation of about 10 ft. over the works into a large galvanised iron tank, from which a close iron pipe runs to the chimney and then branches off to the retort and still condensing tanks and for the use of the engine.

Below the retort-condensing tank is placed a large iron tank of 2000 gallons: in still house is a wrought-iron still of 900 gallons filled from the large tank by a pump worked by the engine and after passing through its condenser runs into an iron tank in the refining house in which are two large cylinders of wrought iron. From refining house the oil is drawn off by an iron pipe 200 ft. to the clearing house in which two large framed wooden tanks are placed, lined with lead and capable of holding 6 tons each of refined oil. In the roof of this house are sliding shutters to admit light to help clearing and settling. In this building the oil will be drawn off and packed for market.

Adit for coal is about 70 ft. above the kerosene, about 7 ft. wide and 7 ft. high. Drive is at present 15 yds.

It is reported that the first retorts were horizontal and D-shaped (Lishmund 1974, 51-2) and the castings were made by P.N. Russell & Co. (Fleming 1976).

In 1872-3 it is reported that the works had 23 retorts, 3 stills, an engine and other machinery, buildings etc. in 200 freehold acres belonging to Graham plus an adjacent block known as Jeykell's Kerosene land. (Prospectus for 'Sun Kerosene Shale and Oil Company, Wollongong' Sept.20, 1872) (Fleming 1976).

And in 1878

23 older D-shaped cast iron retorts 9 ft. long x 18 ins. wide and 24 newer retorts, 9 ft. long x 28 ins. wide (Fleming 1976).

6.1 American Creek Kerosene Shale Works

2. Site & Relics

The old site of the shale works lies on AIS land at Nebo colliery. It can easily be seen, a 2-3 acre plateau on the edge of the American Creek gorge.

Earlier access to the site was from directly across the creek, and several bridges have been built, the remains of the last of which (probably c 1940s) can still be seen.

At present the site has no buildings on it; the last two old stone houses were recently knocked down. The line of the 1940s/50s road can clearly be seen along its western side terminating against a higher level platform and sandstone retaining wall which appears to be part of an earlier system.

The site is now used for storage of rows of hydraulic cutters.

N.B. The former Under Manager of Mt. Kembla Colliery, Fred Kirkwood, who lives on Mt. Kembla knows where one of the Kerosene Shale Retorts is: also where the steaming coal mine is that supplied coal for the Shale Works. (In fact there may be another separate old man that knows all this).

Collieries

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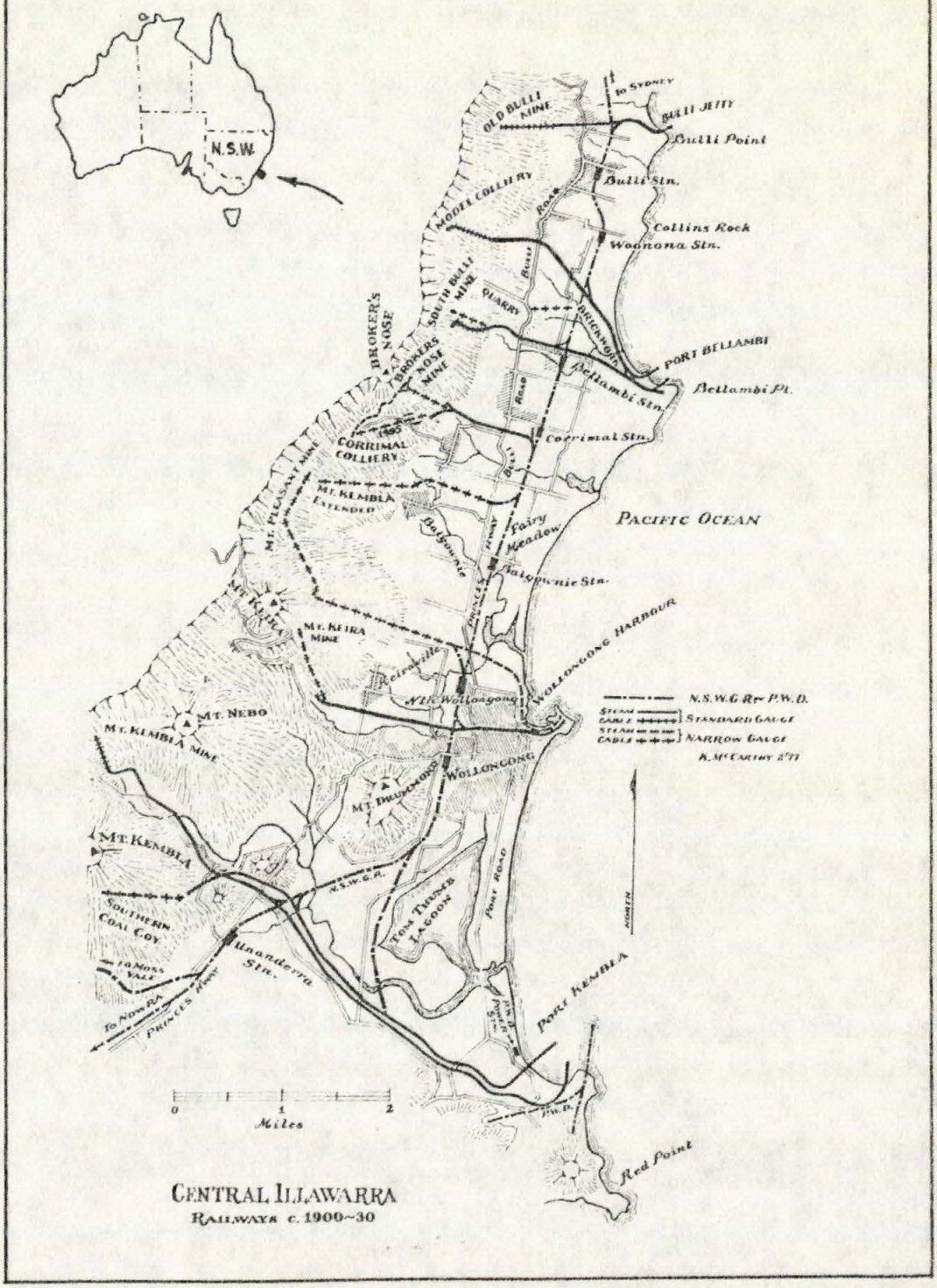


CENTRAL ILLAWARRA
RAILWAYS c. 1900–30

From K. McCarthy The Corrimal Colliery Railway

COLLIERY RAILWAYS

The first coal from the Bulli seam, was shipped on April 16 1857 from the newly opened Osborne Wallsend Colliery. For other than local use, means of transport had to be found for this coal for use in Sydney or overseas and in 1860 the Mount Keira Tramway Act was passed to enable the coal to be delivered by rail to Belmore Basin in the port of Wollongong, then under construction.

Following the opening of the Osborne Wallsend Colliery, the Woonona Colliery was also opened in 1857, then the Russell-vale Colliery at Bellambi in 1858, Bulli and Mount Pleasant Collieries in 1861. These collieries were located like the Osborne Wallsend Colliery, just northwest of a low headland on the coast, enabling a tramway to be run on a steady grade with the load from the mine to a jetty with some protection from sudden wind changes from the south. Both the Woonona and Bellambi colliery tramways converged on Bellambi Point while the Mount Pleasant tramway met the Mount Keira line at Belmore Basin.

These collieries were followed by the Coal Cliff Mining Co. in 1877; Mount Kembla Colliery in 1882; Broker's Nose Colliery in 1884; and the North Illawarra Coal Co at Austinmer and North Bulli (later Coledale), also in 1884. The Mount Kembla Colliery built a 12.5km railway to the Five Islands at Red Point, renamed Port Kembla in 1892, while the North Illawarra Coal Co built railways from both Austinmer and Coledale to a jetty at Long Point later known as Brickyard Point. At Coal Cliff the mine adit was right in the seacliff 12 m above high-water where coal had been first discovered in 1797; and the jetty extended seaward from the adit as an open roadstad. The Broker's Nose Colliery, apparently without plans for a tramway to the coast, only built an incline skipway from the mine to the coastal plain for local distribution of its coal.

All these collieries were opened by adits into the upper or Bulli coal seam, outcropping along the Illawarra Range escarpment from 12 m above sea level at Coal Cliff to the north, to some 245m above sea level at Mount Kembla. With the exception of Coal Cliff and Coledale in the north, each colliery required an incline way to lower the coal to the coastal plain. As at Corrimal, at Austinmer and the Mount Keira mine of the Osborne Wallsend Colliery, the coal descended the incline in narrow gauge mine skips; while at Coledale, Bulli, Woonona, Bellambi and Mount Kembla, standard-gauge wagons conveyed the coal from the pit-head down the incline and to the jetty. At Mount Pleasant a track gauge of 1.118m was in use in a similar transport system. At Austinmer the coal was transferred to standard-gauge wagons at the foot of the skip incline for conveyance to the waterfront, while at Mount Keira the 1.118m gauge was used.

Steam locomotives were introduced on these railways before the Government railway was built: at Bulli in 1867; Mount Keira, with conversion to standard gauge, in 1879; Mount Kembla in 1883; Mount Pleasant and Austinmer in 1884; and Bellambi

in 1887. The Woonona Colliery acquired its first locomotive in 1889, then in the same year the Southern Coal Co constructed a railway with locomotives from Mount Kembla to the Five Islands alongside the Mount Kembla railway.

Thus, by the time the Government railway was completed, many collieries had already built railways for the transport of coal from the mines to open roadstead jetties built along the foreshores of the Illawarra coast for shipment around Australia or overseas. The Government railway was thus involved with no less than eight level-crossings of colliery lines together with one grade separated by an underpass.

Colliery jetties

The history of the coal loading jetties is grim. The first impressions of the Illawarra coastline, as being devoid of satisfactory locations for jetties with sufficient protection to be free from the hazards of wind and storms, were confirmed in damage and destruction of jetties and ships washed on to shores or reefs. Apart from the helpless early sailing vessels, many steamers had their propellers fouled by broken lines. From as early as 1826, Wollongong Bay was recognised as the principal port for loading cedar. The first coal was loaded there in 1849. Bellambi Cove had also been used to load cedar. It was the first location where attempts were made to build jetties in 1858 and 1863, but these were out of use by 1864 and short-lived.

The first major attempt at jetty construction was at Bulli Bight in 1863, but the jetty was carried away by a heavy sea within twelve months, then after rebuilding was destroyed in 1867 with the loss of four lives and 40 wagons. Further damage occurred in 1907 and 1912 - and then again in 1943 after which it was abandoned. There was 8 m of water at the jetty and the chutes were capable of loading 120t of coal an hour.

The Coal Cliff jetty was built in 1878, destroyed five months later, and again in 1881. It was abandoned in 1910. There was only 4.3m of water at low tide at this jetty and 250t cargoes were loaded at 100t an hour.

The Mount Kembla jetty was built at Five Islands Point, now Port Kembla, in 1883 and withstood the weather even prior to building of the Port Kembla breakwaters. It had 6m of water at low tide loading 1000t vessels at 120t an hour.

The next jetty constructed was for the North Illawarra Coal Co at Long Point, Austinmer, in 1884. It had 8m of water at high tide and could load coal at the rate of 120t an hour. The steamer "Waratah" was wrecked there in 1887 and the jetty destroyed in 1898.

A new jetty was built at Bellambi for the South Bulli Colliery in 1887, rebuilt in 1909 and stood, with minor damage, until put out of use in 1954. Also in 1887 the Southern Coal Co jetty was built at Five Islands Point as then known, was in constant use until 1916, then remained derelict until 1925. There was 9m of water at low tide at this jetty which was able to load coal at 300t an hour. A second jetty was built at Bellambi in 1889, twelve months after the opening of the Government railway but was destroyed in a storm with the loss of a collier in 1898 and abandoned.

7.01 Helensburgh Colliery (Metropolitan, Camp Creek colliery)
(also called "Heathcote" at one time)

1. History

In 1884 prospectors (the South Cumberland Coal Mining Co.) put down a bore at Camp Creek (Harper 1915, 183-4), this was followed by a shaft sunk in 1886, but the capital was too small and a new company was formed, being transferred in 1887 to the Metropolitan Coal Co. of Sydney, the name of the colliery becoming Helensburgh in 1887-8 (Cousins 1948, 172). Eardley gives the date of opening of the colliery as 1887 (Eardley 1968, 5) the first five years beingspent in shaft si nking and equipping the mine. In 1888 only 10 miners were employed underground.and a new air shaft was being sunk about 10 chains from No.1 pit, some 16 ft. in diameter (Annual Report Dept. Mines 1888). In 1906 the mine is reported as having two shafts put down, the main one 1100 ft. deep and 16 ft. diameter and the air shaft 1100 ft. deep and 15 ft. in diameter, at the foot of the hill on the opposite side.of the valley to the mine. The mine was at this time "exceptionally well equipped", the winding engine being the largest of its kind in Australia. On the surface, the buildings were of brick, with a private railway connecting the colliery to the Illawarra Railway a little south of Helensburgh railway station (Mines and Minerals of N.S.W. 1906,139-140). (Further details of plant are given in the publication). In 1912, the area controlled by the colliery was 22,000 acres, the largest area held by any coal mining company in N.S.W. (Danvers Power 1912, 148). Working was by the usual bond and pillar method and the coal was sent by rail to Sydney. In 1965 the colliery was taken over by AIS. Unlike all of the other mines in the region, there are no coke works connected with the Helensburgh mine.

Illustrations: Dept. of Mineral Resources and Development; Mines and Minerals of N.S.W. (1906).

References: Harper (1915); Cousins (1948); Eardley (1968); Annual Report of Dept. of Mines (1888); Mines and Minerals of N.S.W. (1906); Danvers Power (1912).

7.01 Helensburgh Colliery (Metropolitan, formerly Camp Creek?)

2. Sites & Relics

The main features which survive here are as follows:-

7.011. - old power house brick, up behind head frame

7.012 - beside it an old-looking pylon, which could have been part of the power supply to the old TB hospital in Waterfall.

7.013 - Shaft No.1 with fine ornamented iron head frame circular braces. N.B. pulley wheels may have gone to Kemira.

7.014 - Shaft No.2, brick, with axial fan for former updraught still in position.

- Two wooden tubs (the smallest kind 25 cwt)
- small iron pull or drag which went behind the tubs as a safety device in case the coupling broke
- Old hand drill and two short drills
- Canary cage
- Old Universal cutter, a Sullivan, still underground in Helensburgh
- Battery-operated loco already sent to Londonderry
- 8-person man cage
- Old-style continuous miner with caterpillar wheels, chains & cutters. (Coal fed from continuous miner into battery-operated shuttle cars then onto belt. (Continuous miners made by Joy Manufacturing Co.

Transport Near mine is the cutting for the first S. Coast railway with the steep gradients including two

7.015 tunnels - one back from the mine along the safety cutting (leeches!), the other forward 150 yds towards where the

7.016 AIS is filling and also making overflow dam at lower level.

7.02 Coal Cliff Colliery

1. History

The coal seam outcropping literally in the cliff face at Clifton was first worked about 1876 by an adit only some 40 ft. a.s.l. (just above high water mark), the owner of the colliery being Mr. Thomas Hall and the manager Mr. Thomas Oswald (SMH 3/10/1910: Jervis 1942, IV, 292-3). The first cargos of coal was shipped from the 500 ft. jetty nearby on January 11, 1878 (Cousins 1948, 170). Working was on the usual bord and pillar principle. By 1888, 90 men and horses were employed underground (Ann. Report Dept. Mines 1888). From 1908-1910 the mine was further developed when a second shaft was sunk further to the north west and by 1915 the coal was handled from this shaft adjacent to the Illawarra Railway line (Harper 1915, 170-172) with the cliff tunnel being used only as a return airway (Humble 1922(a), 21-23), the mine having been formerly ventilated by a furnace (Danvers Power 1912, 158). At the new shaft sunk in 1909-1910 up-to-date screens, weighing machine, a weigh bridge and solid steel poppet heads, 90 ft. above the shaft were also installed (SMH 3/10/1910). By 1920 the mine employed 436 persons (Humble 1922(a), 21-23, further details of plant being available in this publication). The colliery which still functions today is owned by Coal Cliff Collieries Ltd.

Previous owners etc.

1867 Thomas Hall
1893 Part of Southern Coal Owners Agency
c1896 Property secured by Messrs. E. Vickery & Sons
c1908(?) Taken over by Coal Cliff Collieries Ltd.
[? Articles of Association of Coal Cliff Land & Coal Mining Co. Ltd., to become a registered company, are dated 1889: Mitchell Library].

7.02 Coal Cliff Colliery cont.

Illustrations: Dept. of Mineral Resources & Development: photographic library; Mitchell Library c1895 Colliery & Jetty; [n.d.] good views of buildings etc.

* Allen family photographs: 11 photographs of mine and jetty including 'Calico Town' where labourers lived: new buildings being erected (relates to development of mine at this time).

7.02 Coal Cliff Colliery

2. Sites & Relics

The portal, or man-made entrance, survives in the cliff, with a brick structure below it.

7.03 South Clifton colliery

1. History

Mining work began in the South Clifton area about 1883 (Eardley 1968, 5). In 1902 the mine passed from Mr. Thomas Saywell to Saywell's Collieries Ltd. and in 1903 the South Clifton Coal Mining Co. Ltd. was formed, the shaft adjoining the Illawarra Railway line at Scarborough railway station (Harper 1915, 167-9). In 1906 the shaft sunk was 200 ft. deep, with pick and shovel working, and electric light throughout the mine (Mines and Minerals of N.S.W. 1906, 142-3). Until 1919 two contiguous mines were worked about 3/4 mile apart. The northerly one, which was abandoned, had a pair of shallow shafts at about railway level and an adit at a lower level, the latter used as a travelling road by the workmen (Danvers Power 1912, 163 fig.45). One of the goaf areas however let in rain and surface soakage to such an extent that in May 1919 it was decided to abandon operations and take out the plant (Humble 1922(a)21-23). The tunnel used in 1922 worked the same seam also by the bond and pillar method (ibid): (also further details of plant in this publication).

Another area of apparent abandonment is mentioned by Harper in 1915. He notes that 'many years ago' an area in the eastern portion of the South Clifton leases was opened up. The remains of two tunnels were noted, with refuse at the mouths of cinder coal and volcanic rock, although no old plant was visible, the tunnels possibly being abandoned almost at the outset (Harper 1915, 167-9).

Coal was despatched on the Government railways for shipment at Darling Harbor and Port Kembla (Mines and Minerals of N.S.W. 1906,142-3). (In 1965 the colliery was in the ownership of the South Clifton Colliery Pty.Ltd.)

Illustrations: Dept. of Mineral Resources and Development.

References: Eardley (1968); Mines and Minerals of N.S.W. (1906); Harper (1915); Danvers Power (1912);

7.04 North Bulli Colliery (Coaldale colliery)

1. History

Eardley suggests that mining began in this area as early as 1884 (Eardley 1968, 5) and some preliminary operations area noted prior to 1902 by Mr. G. O. Hyde of Sydney (Harper 1915, 154-6). However it was in 1902 that mining fully started with a policy of improvement initiated by the North Bulli Colliery Ltd. The colliery which adjoins the Illawarra Railway line at Coledale was of the usual tunnel type at about 200 ft. a.s.l. with part longwall and part bond and pillar workings (Humble 1922(a), 21-23). About 1904 electric coal cutting machinery was installed, surplus power from the pow er house being used for lighting the mine and pumping. Underground haulage was by the 'endless rope' system. The collieries own waggons and locomotives transported the coal from the mine along the government railway to Kembla junction and from thence to the company jetty by private line.

In 1906 about 250 men were employed in the mine and connected works and at that period 'the number is being added to daily' (Mines and Minerals of N.S.W. 1906, 140-142). Large coal was used for interstate steamers in Sydney Harbour with smaller coal going to the N.S.W. Government Tramways power-houses. (Harper 1915,154-6). (Further details of the colliery plant at a later date are given in Humble 1922(a) 21-23).

Illustrations: Dept. of Mineral Resources and Develoment: photographic library.

References: Eardley (1968); Harper (1915); Humble (1922(a); Mines and Minerals of N.S.W. (1906).

7.05 North Illawarra Coal Mining Co.

[is this the same as Austinmer (Westmacott's mine? see other notes].

* Mining begun in 1884 above Austinmer (Eardley 1968,5)

Area held by the company being shown on Robjohn's map of coal mining area (c1889).

** In the 1888 Annual Report of the Department of Mines there are two reports viz:

North Illawarra No. 2 tunnel
240 men and horses underground

North Illawarra No. 1 tunnel,
6 men underground

(by 1928 there is no mention of this concern)

Jetty at Long Point

7.06 Austinmer/(Westmacott's mine?)

** Eardley reports that prior to taking over South Bulli in 1890, Mr. E. Vickery had abandoned the North Illawarra Coal Mine at Austinmer, the rolling stock being transferred to the Mount Keira coal railway at Wollongong (Eardley 1968, 47).

Austinmer (Westmacott's mine - reported in 1915 as "idle now for some years", but a considerable area was opened up in the past. The mine was closed down as the thickness of the Bulli No.1 seam diminished in the west and northwest from c5 ft. to under 3 ft., whilst the proportion of 'cinder' coal was high in other parts of the mine (Harper 1915, 157).

7.07 Excelsior Colliery

1. History

In 1905 mining was begun by Messrs. Carroll & Ryan in an area about 1¼ miles WNW of Thirroul station at 361' a.s.l. Carroll & Ryan sold out after eight months to Messrs. Kirton & Earnshaw and in 1908 the Excelsior Colliery Ltd. comapny was formed. Coal produced early in these operations was sold locally and then carted to Thirroul station to be railed to Sydney. Later a skip tramline was constructed and a private siding built on the railway lien north of Thirroul station to hold government railway trucks. The coal was screened by the railway which was connected to both the old and new tunnels by the inclined tramway. In 1915 it was reported that the company had recently secured a larger area and operations were to be opened on a bigger scale (Harper 1915, 157-160). The mine operated on the usual bord and pillar workings. Details of plant in 1922 are given by Humble who reports that coal was also shipped from Bellambi jetty or Port Kembla (Humble 1922(a)). [The tunnels, known as Excelsior No.1 and No.2 were working in 1928. Excelsior No.2 and Excelsior B Pit were not working in 1965, both being then owned by Excelsior Collieries and Coke Works Pty. Ltd.].

Illustrations: Dept. of Mineral Resources and Development: photographic library.

7.08 Bulli Colliery (Old Bulli Colliery)

1. History

Said by one authority to have been opened about 1858 (Harper 1915,160-165) and by another in 1863 (Danvers Power 1912,180) coal produced from the Bulli mine was in early days taken by horse traction from the foot of the incline (presumably of the self-acting inclined way type) to the jetties, the latter part of the journey in later years being made by a short private railway line. In 1880, 90 men and boys were employed underground (Ann.Report Dept.Mines 1880). With the great Bulli mine disaster of March 25, 1887, work came to a stop. The mine was acquired after the disaster by Mr. George Adams who started producing coal from the reconstructed mine in 1895. In the early 1900's large sums of money were spent in exploiting the area to the west of the old Bulli holdings, and electrical plant was installed to expedite this (Mines & Minerals of N.S.W. 1906,146). Not all such ventures were successful in the long term, one small colliery known as the 'Blackball' (Portions 82-83, Parish Woonona) for example was opened in the No.6 seam in 1904, but abandoned in May 1911 (Harper 1915,160-5). Further details of the plant in 1922 are also known (Humble 1922-6, 63-66). In 1936 the mine was taken over by AIS, the present owners. The bord and pillar method of extraction was in use. By 1922 the coal was shipped from both Bulli jetty and Port Kembla.

Illustrations: Mitchell Library - photographs (early & 1950's) and lithograph (c.1880's) N.S.W. Dept. of Mineral Resources and Development.

7

7. Bulli jetty

1. History

Used by Bulli mine and by other coal producers, the Bulli jetty would seem to have been built sometime in the late 1850's to early 1860's. The first jetty was destroyed soon after its construction, by a heavy sea, the 2nd jetty on the site being carried away with four men and 40 tons of coal on June 21st, 1867. A third jetty was built by Mr. Shoobert, reported to be 650 ft. long. How long this survived is unknown, but on May 1st, 1907 205 ft. of the then existing structure was again carried away (Cousins 1948,170). A blue print exists of a plan of Bulli jetty, dated 1913, this structure being about 906 ft. long. (Pictorial evidence goes up to c 1925, but it is not known how long after this a jetty was here.)

Illustrations: Mitchell Library - small picture file
c 1871- 1873, 1880, 1907, 1910, 1920, 1925
Plan of Bulli jetty (blue print) M3 811.319
(ground plan only with depths) BULL I
1913
1

7.08 Bulli Colliery (Old Bulli Colliery)

2. Sites & Relics

The most significant surviving relics of the Bulli colliery are its ventilator shafts Nos. 1 & 2 situated up on the scarp above the mine.

At Shaft No. 1 especially there survives the original shaft sinking head frame together with the stage used during the sinking, as well as the winding engine still in position. All are in sound condition, and the whole complex is one of striking interest, appearance and interpretive potential.

At Shaft No.2 the circular brick ventilator stack is standing, together with a spectacular fan brought there from Nebo in 1948. (where it was already old). The bent profile of the fan results from its original site at Nebo, its capacity is about 350-375,000 cu.ft. min. (cumins). At this site also there is an old man cage worthy of preservation.

The Old Bulli pit-top or portal(s) still survives 150 ft. above the present opening, and so does a former furnace shaft.

7.09 Bellambi colliery (Hale's mine, 'Model' or 'Woonona' colliery)

1. History

In 1858 Mr. Thomas Hale opened a mine near Bellambi. Coal was transported by horses to the beach from where it was shipped in small boats to be transhipped into schooners for Sydney (Harper 1915,7). Later a wooden tramway ran from the mine to the jetty (Cousins 1948, 166-7). In 1864 the mine had about 26 miners (N.S.W. Leg.Ass.,Proc. of Insp. 1864) but was not fully developed until taken up by the Bellambi Coal Co. in 1889. In 1888 it was reported that six men were employed underground driving a main heading to connect with the old Woonona Workings (another name for this mine) with construction also continuing on the tramways. It was estimated that it would be about 3 months before the surface arrangements were completed (Ann. Report Dept. Mines, 1888). In 1901 the Bellambi Co. purchased the South Bulli mine and the workings were eventually connected, and in 1905 a direct connection was made from the Bellambi collieries to sidings leading to the South Bulli jetty. By 1922 the ventilating plant at South Bulli was used for both mines with the coal output screened near the tunnel and lowered 350 ft. on a gravity incline (Humble 1922(b)). (Further details of plant at this date in this public tion). The mine workings were of the usual bord and pillar type.

Illustrations: Bellambi Coal Co. publication 1909 (excellent coverage).

References: Harper (1915); Cousins (1948); N.S.W. Leg.Assembly, Proc. of Inspectors of Coalfields (1804); Ann. Report Dept. Mines (1888); Humble (1922(b)).

Hale's and Taylor and Walker's jetty

1. History

South of the later South Bulli jetty.

Built in 1862, connected to Hale's mine tramway (later Bellambi mine) and to Taylor and Walker's mine (later South Bulli).

Attempts by Hale to destroy the jetty by sawing it apart in 1862, the whole affair ending in charges of assault and counter charges of trespass. (Eardley 1968,38-39).

The jetty is described by Eardley as a low-level pier (Eardley 1968,40).

7.10 South Bulli colliery (Taylor, Walker and Longmore mine)

1. History

In August 1861 Messrs. Taylor, Walker and Longmore opened a colliery at Russellvale on land leased from Mr. H. Osborne, some 1 1/2 miles south of Mr. Hale's Bellambi colliery. To pursue their interests Messrs. Taylor, Walker and Longmore purchased from Mr. Hale one acre of land at Bellambi Point to erect a jetty. Too late Mr. Hale realised that he had sold the right to access for his own tramway to get to the jetty and a bitter feud ensued. Jetty construction for the Taylor concern continued, to be partly demolished by the Hale faction, only to be re-erected by the opposition. In 1862 Mr. Hale and friends sawed through much of the jetty only to be caught in the act when Mr. Walker arrived, after which open battle ensued.

Messrs. Taylor and Walker's tramway ran to their jetty (to the south of the site of the later South Bulli jetty). It seems that it was intended to use steam haulage from the base of the incline to the jetty, but this was apparently little (if ever) used (Eardley 1868,38-39). (In 1864 the Taylor, Walker concern went insolvent and the colliery lay derelict for some years, although it seems that previously production had not been large, only 1 or 2 men being employed in the mine since 1862 (N.S.W. Leg.Ass. Proc. of Inspectors,1864).

After some years the concern was bought by Thomas Saywell (as part of a syndicate) plus a strip of land to go to the jetty at Port Bellambi.

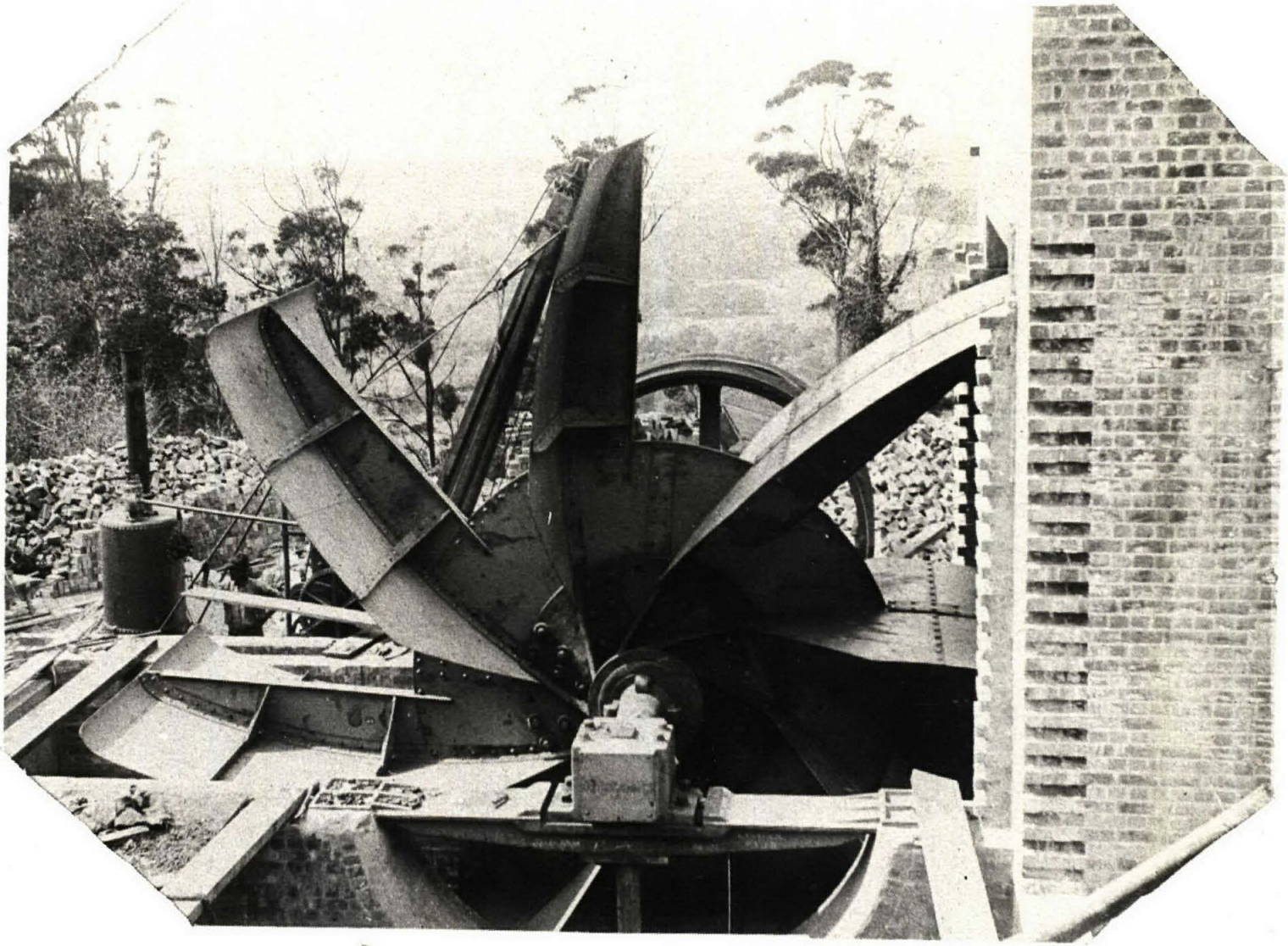
In 1885 a public company was floated and work began under Messrs. Saywell and Wilson to construct screens at the mine entrance, a winding-engine house, a boiler unit, sawmill and workshops. The coal being transported by inclined way to the railway and from thence to the jetty (Eardley 1968,38-40), some 57 miners being employed in 1888 (Ann. Report Dept. Mines).

In 1890 Mr. Ebenezer Vickery bought the colliery from the Saywell interests (Harper 1915,151-3) and in 1901 it was purchas- by the Bellambi Co., the Bellambi and South Bulli workings being interconnected about 1908 (ibid,56). In 1926 the two collieries were grouped together as South Bulli (ibid,57).

Illustrations: Mitchell Library - small picture file
South Bulli tunnel (1887) and
pit top;

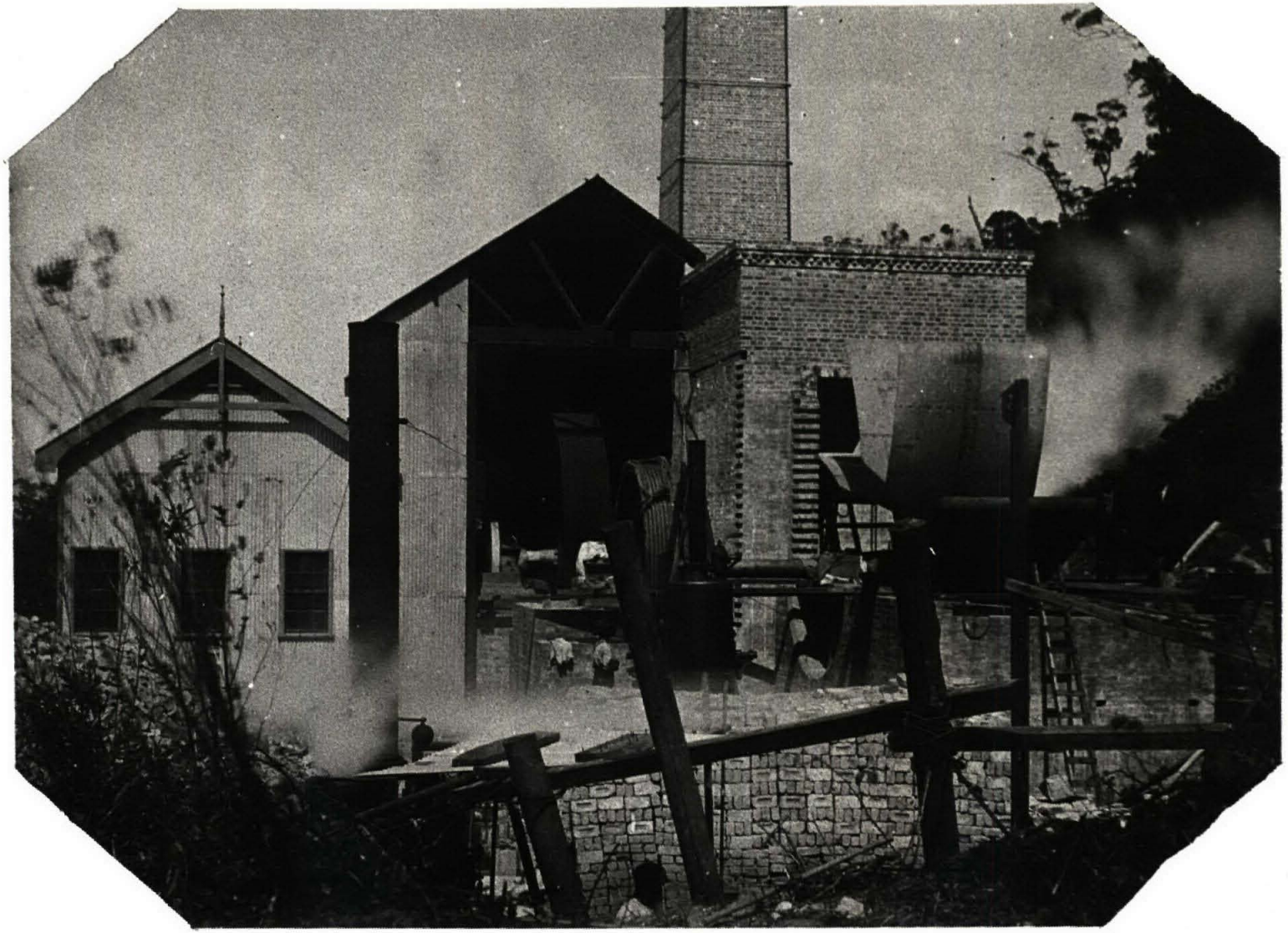
Bellambi Coal Co. publication 1909 (excellent coverage.

References: Eardley (1968);N.S.W. Legislative Assembly: Proc. of Inspectors of Mines (1964); Harper (1915); Ann. Report Dept. Mines (1888).



Fan. Back View, overlooking the sea, showing construction of blades &c: one half of fan only is exposed, the fan well underneath contains the other portion.

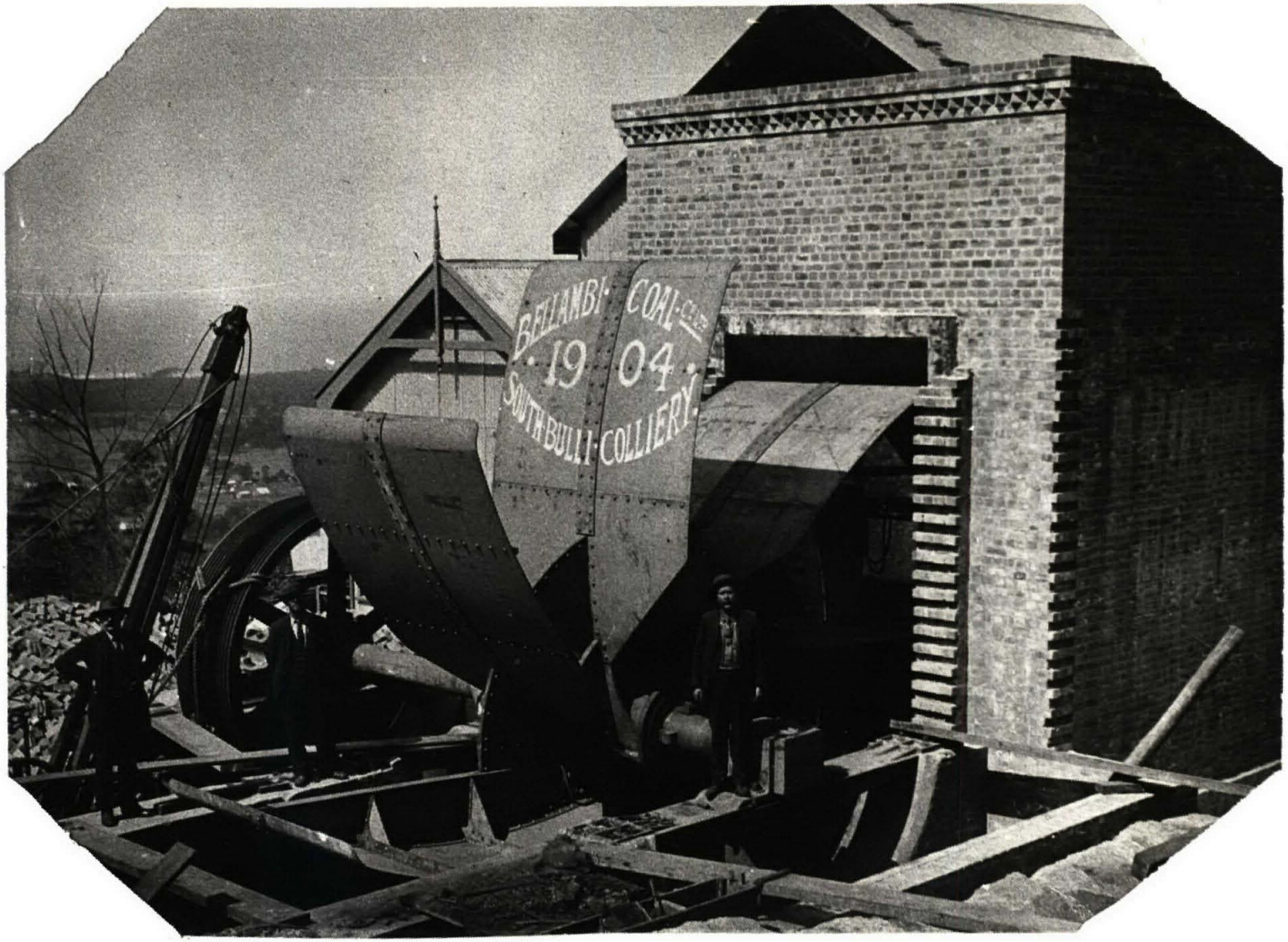
4



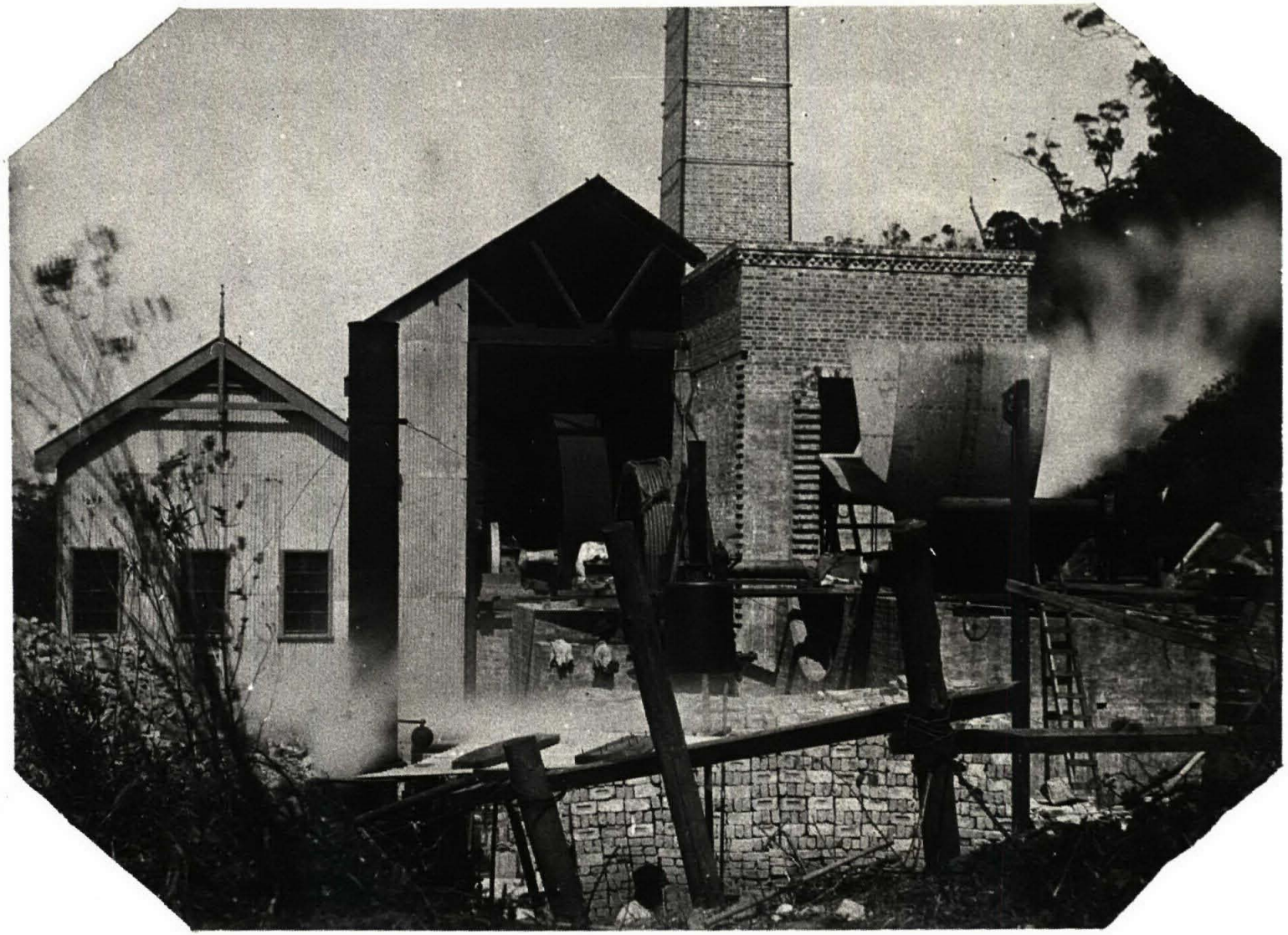
Fan. End view - Showing driving pulleys in Engine House - & fan (on the Right) & chimney & Stack

Terminus of new Railway to Fan site - Chimney, boilers
Fan Engine House, and Electrical Engine Power House
Power cable can be seen overhead - to left of view

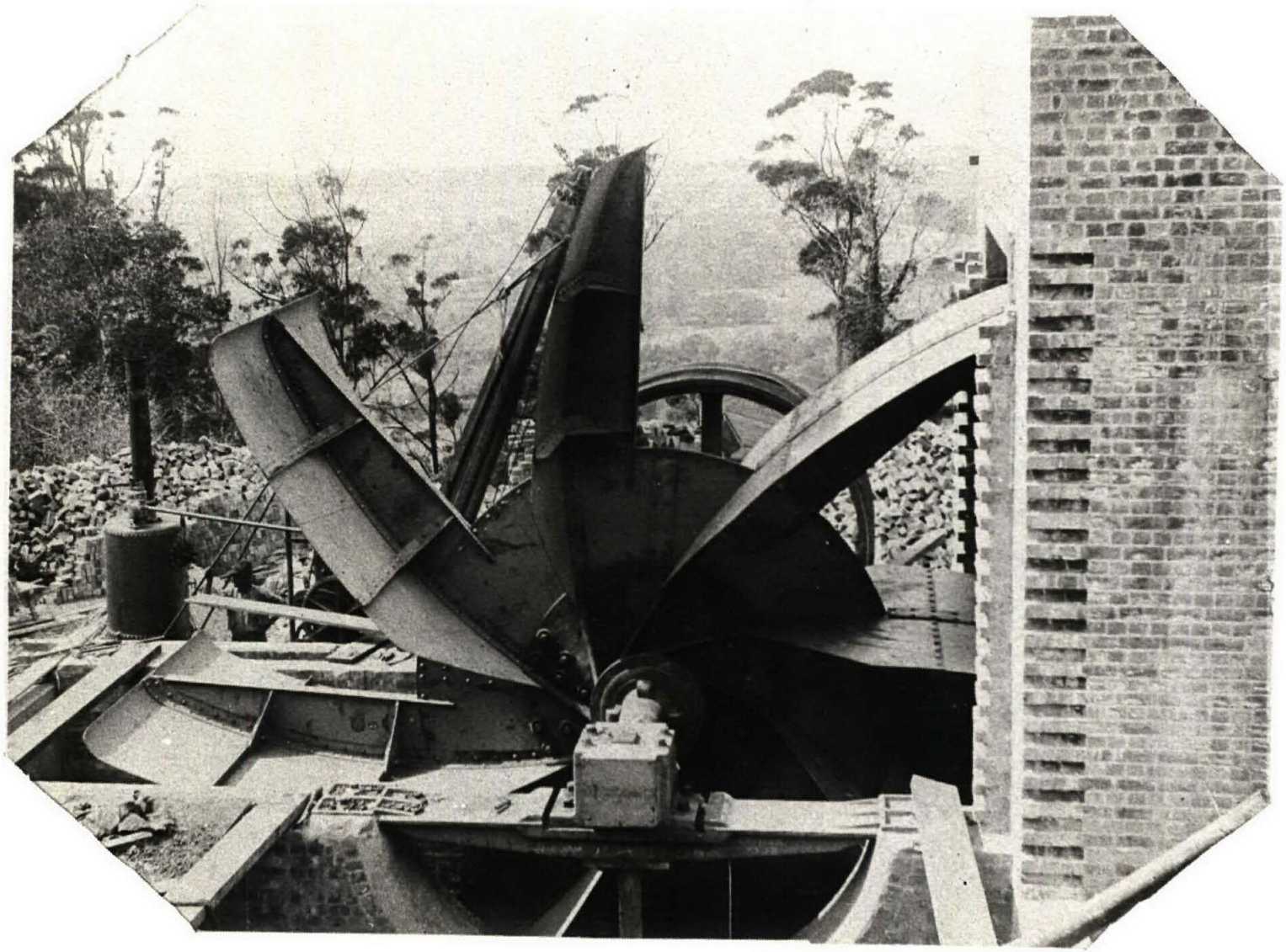
Terminus of new Railway to Fan site - Chimney, boilers
Fan Engine House, and Electrical Engine Power House and
Power cable can be seen overhead - to left of view.



Fan & Fan Chimney - Compare 1/2 diameter with figure of Engineer alongside.

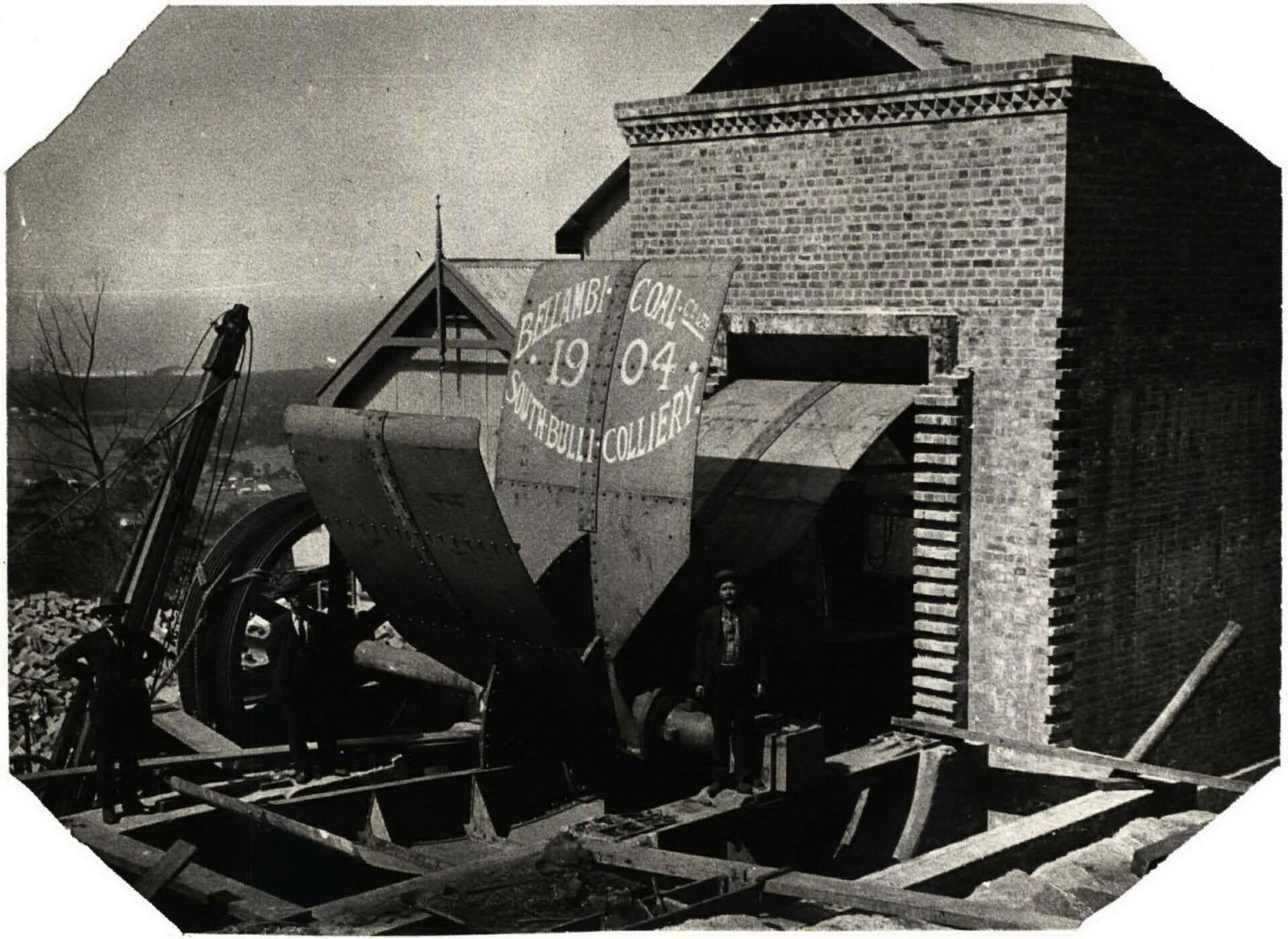


Fan. End view - Showing driving pulleys in Engine House - & fan (on the Right) & chimney stack



Fan. Back View, overlooking the sea, showing construction of blades &c: one half of fan only is exposed, the fan well underneath contains the other portion.

4



Fan & Fan Chimney - Compare 1/2 diameter with figure of Engineer alongside.

South Bulli jetty
Bellambi jetty

1. History

Due to a confusion of nomenclature, both the South Bulli and Bellambi mines being owned by the Bellambi Co. after 1901 and both jetties being located north of Bellambi point, it is often difficult to know which jetty is being referred to.

On the basis of Eardley's note that the northern jetty, the Bellambi jetty was destroyed in 1898 (Eardley 1968,52) it is therefore assumed that all later references are to the South Bulli (Bellambi Co.) jetty. A violent storm destroyed the shipping appurtenances on Bellambi jetty (Eardley 1968,47).
Assorted references therefore apparently to South Bulli are:-
c 1886 - 1889 new jetty completed, 1000 ft. long with a new tramline 3 miles long also built (Cousins 1948, 173).
early 1900's (?) work on the jetty over a period of 3 years to do repairs with a large storage bunker of 700 tons incorporated in the new jetty at the shore end (Eardley 1968,55).
1906 jetty extends 1630 ft. into water with draft of 24 ft. at low water at the chutes: 2 separate chutes, with steam driven winches and electric light also on the jetty (Mines & Minerals of N.S.W. 1906,138).
1922 jetty on N. side of Bellambi reef is 900 ft. long (Humble 1922(b) 63-66).
South Bulli jetty was abandoned in 1952 and handed over to the military authorities for demolition exercises (Eardley 1968,60)

Illustrations: Mitchell Library: coloured print (n.d.) Ground plan and elevations: enlarged and improved jetty 1888 (?)

M2 811.319
BUL I
1888 ?
1

(jetty c 800 ft. long)

c 1909(?) jetty with loco and waggons.
3 photos after seaward end collapsed after abandonment 1959.

References: Eardley (1968); Cousins (1948); Humble (1922 (b)); Mines and Minerals of N.S.W. (1906).

7.11 Corrimal Colliery (Corrimal - Balgownie, Broker's Nose)

1. History

In 1884 Mr. Bertram, in the interests of the Broker's Nose-Corrimal Coal Co. commenced to drive an adit into the 8 ft. seam at 375' a.s.l. in the vicinity of Broker's Nose. Initially the coal was taken in bullock waggons to a nearby siding on the South Clifton-Wollongong railway line but the output from the mine was restricted due to a lack of harbour facilities (which were held by two other companies), there being at that time no direct railway line to Sydney (Eardley 1968, 60).

In 1888 the mine started up again, with three men underground and surface arrangements reported as soon being completed for the output of coal (Ann. Report Dept. Mines 1888). A connection was also built between the company's skipway and the government railway at Corrimal, a lucrative trade with Sydney thus being developed, both by rail and by colliers at Wollongong Harbour (with the completion of the new Wollongong line). For financial reasons the company was reformed in 1889 as the Corrimal Coal Co. the leases being taken over in the same year by Mr. Pringle for the Southern Coal Co. In 1890 a new extension was built from the screens at the base of the inclined way to sidings at Corrimal. In 1902 the controlling authority of the Southern Coal Co. was vested in a new concern known as Corrimal-Balgounie Collieries Ltd.

Concerning the transport of the coal to Port Kembla (where the Southern Coal Co. had a jetty), the leases concerning the railways between Unanderra and Port Kembla and the jetty and shipping facilities were taken over in 1903 by the Harbour and Rivers Branch of the N.S.W. Public Works Dept. Although they were allowed to use these facilities until 1905, when public tenders were called the North Bulli Coal Co. took possession thus cutting off Corrimal's shipping arrangements. The company approached the Mt. Kembla Coal Co. to haul their coal to their jetty, coal also being shipped at Port Bellambi travelling to Bellambi by government railway and from thence by the South Bulli loco-

motives to the port. At this time within the mine coal was drawn to the surface by endless rope haulage operated by 5-multi-tubular and Cornish boilers (Cyclopedia of N.S.W., 1907). A new ventilating shaft, 850 ft. deep was also being dug at about this time (Mines and Minerals of N.S.W., 1906, 145) and see same publication for further details of plant.

In 1908 serious flooding affected the inner workings of the Corrimal mine tunnel and it was decided to drive another adit to the seam about one mile further out, which became known as the "Daylight".* A surface tramway connected the Daylight tunnel to the head of the inclined way and over the years several of the gullies were filled with chitter and other waste from the mine. (Eardley 1968, 60-72).

By c1915 nearly all of the steam plant had been superseded by electricity (Harper 1915, 149-50), further details of plant c1922 being given in Humble 1922(b) 63-66.

In the 1950s extensive re-organisation of the company's surface transport system took place and in 1964 the company was taken over by AIS (after large losses during the previous year). (Eardley 1968,72-77).

Illustrations: Dept. of Mineral Resources and Development: photographic library; Eardley (1968).

References: Eardley (1968); Annual Report Dept. Mines 1888; Cyclopedia of N.S.W. (1907); Mines and Minerals of N.S.W. (1906); Harper (1915); Humble 1922(b).

* Harper notes that the Corrimal tunnel was 65 chains north of the Balgownie tunnel (Harper 1915, 149-50).

7.11 Corrimal Colliery (Corrimal Balgownie)

2. Sites & Relics

Corrimal No. 1 Shaft: Cleaned up two years ago c.1977 by AIS i.e. destruction of homestead, but winding engine and wooden head frame and old skip all survived. Also fan and stack maintained.

Corrimal No. 2 shaft has winding wheel and evasé brick stack.

Incline still there, as well as a number of skips and track. The haulage breaking system is still in position at the top to north: the road can be followed to the old incline directly under Brokers Nose (the later incline went directly down to Washery.)

7.12 Mount Pleasant coalmine

1. History

In 1861 Messrs. Lahiff and Fawcett opened a mine adit at c 600 ft. a.s.l. on the north side of Mount Keira, the coal from which was taken down the mountain side on oxen drawn sleds and on the flat was transferred to carts, being sold locally and also shipped from Wollongong. At the time the mine was not fully developed commercially and help was sought from Messrs. James and William Byrnes, who formed the Illawarra Coal Co. to take over the Mt. Pleasant property, keeping Mr. Lahiff as manager. With the passing of the Mount Pleasant Tramway Act in 1862 the mine was connected from the base of the self-acting inclined way by tramway to Wollongong harbour, having a junction there with the Osborne Wallsend tramway. The first coal trains on the line were horse drawn in 1862, using the new staiths at the Belmore Basin by 1868. (Eardley 1968,22-30). In its early stages in 1864 only 12 miners are reported underground (N.S.W. Leg.Pos.,Proc.of Ins.of Mines 1864) but by 1888 the number had increased to some 112 men and horses in the mine (Ann. Report Dept. of Mines 1888). By 1884 the first locomotive haulage had begun and with the development of the northern section of the coal lands by the Illawarra Coal Co. in 1886, a new adit was started, mid-way between the peak of Mount Korimal (Broker's Nose) and the old tunnel on the eastern slopes of Mt. Keira. A surface tramway connected the two tunnels to the incline, running around the mountain side at about 600 ft. a.s.l. for a distance of some 11/4 miles. After the unsuccessful use of locomotives the line was changed to rope haulage in 1890 (Eardley 1968, 28-31). (Eardley reports that it is difficult today to see the layout workings at the head of the incline and much of the surface tramway route).

In 1888 a limited liability company, the Mount Pleasant Coal and Iron Mining Co. took over the Illawarra Coal Co., and in 1893 the Southern Coal Owners' Agency was established to act as a selling agent for various companies including the Mt.Pleasant Co. (M & M of N.S.W. 1906- 150). By 1907 plant at the mine included two winding engines, an electric pump for draining the mine and ventilating plant (Cyclopedia of N.S.W. 1907) with further equipment detailed by Humble in 1922 (Humble 1922(c) 104-7). The mine worked

until 1933 under the assigneeship of E. Vickery & Sons, until severely hit by the depression, being acquired by AIS in 1937. All surface workings of the Mount Pleasant colliery were then abandoned and the underground workings cross-connected with those of the Mount Keira mine (Eardley 1968,20).

Illustrations: in Eardley (1968) and Cyclopedia of N.S.W. (1907).

References: Eardley G. (1968); Annual Report Dept. of Mines (1888); Mines and Minerals of New South Wales (1906); Cyclopedia of N.S.W. (1907); Humble (1922(c)) Chem.Engineering and Mining Review XV 1922-1923.

7.13 Balgownie Colliery (Owen's mine, Mt. Kembla extended)

1. History

In 1909 at the instigation of Colonel Owen a drive was made into the 'Four-Foot' coal seam, west of Balgownie railway station (now known as Fairy Meadow), the mine tunnel being about midway between Mount Keira and Broker's Nose. Operating on a very small scale the coal was mainly for local comsumption being won by two men underground with a man and wife team as surface workers. A self-acting aerial cable way transported the coal a distance of about half a mile down the steep hillside to a depot established at the foot of the hill, the head frame of the cable way being mounted near the mouth of the coal tunnel, the coal being transported from the base of the incline by horse-drawn ve vehicles. On April 1st 1910, the assets, leaseholds etc. of Owen's mine were taken over by the newly formed Balgownie Coal Co. which improved the output of the mine and constructed a tramway; however, the company was forced to close on January 7th, 1913. After a period of redundancy the mine was taken over under lease by Mr. E. W. Owens and in 1922 a company was registered called Mount Kembla Extended. In December 1922 the company completed a double-tracked, self-acting inclined way from their adit to the foot of the hill slope, where the skips were detached and hauled to the screens by horses, this method being superseded in May 1923 by an electrically-driven haulage rope. Within the mine skips were drawn from the working face to the surface by a steam-operated winch.

In 1924 the company had a contract for the supply of boiler coal to Sydney City Council. Industrial disturbance led to a 4 months stoppage in 1926, and with the depression the mine closed on October 26th 1936.

Humble reports that the Owen's Balgownie colliery worked the Bulli No. 2 seam and that the Mt. Kembla Extended mine worked the No. 3 seam in a mine of shallow depth (Humble 1923, 150-153).

Illustrations: Eardley (1968) 37.

References: Eardley (1968) 35-37; Humble (1923).

7.14 Mt. Keira Colliery (Osborne-Wallsend mine)

1. History

Beginning operations in 1848-49 this is the oldest coal mine in the Illawarra area. First owned by Mr. Shoobert, two tunnels were opened up in this area of Mr. Keira, one being abandoned and the other, the 'Albert' seam producing good coal (Cousins 1948,162-4). The first load of coal was taken to Wollongong harbour in August 1849 by ox cart down a rough track cut from the mine tunnel to the Mount Keira Road where a depot was established and from thence by horse-drawn vehicles to the harbour and to local customers (Eardley 1968,6). In 1856 Mr. Shoobert sold the property to Mr. Henry Osborne; in the following year a road was constructed from the mouth of the tunnel to the Mt. Keira Road and an upcast shaft and furnace for ventilation was made on Geordie Flat. At this time there was no use for small slack coal which was dumped in adjacent gullies. In 1858 the Osborne Wallsend Co. was formed and in 1859 the system of transporting the coal from the mine entrance was greatly facilitated by the construction of the Mr. Keira tramroad, a self-acting inclined way from the tunnel entrance to a temporary depot some 12 chains west of the Wollongong-Fairy Meadow raod, the tramway including cuttings, embankments and three iron bridges. Earley reports that no signs of this can now be found and suggest that the alignment perhaps followed the alignment of the track as it existed at the time of its closure in 1954 (Eardley 1968,6-7)

In 1859 the tramway could proceed no further to the harbour as the route lay over private land, but with the passing of the Mount Keira Tram Road Act in 1960 the way was cleared for the completion of the route in 1861, haulage to and from the foot of the incline being by horses. Shipment from Wollongong took place from a temporary jetty between the years 1864-68 when the Belmore Basin was being constructed, replaced by three high-level straiths in the new harbour arrangements (Eardley 1968, 6-12)

In 1864 the mine had an average of only some 14 miners,although it is also recommended that it was equipped with a steam engine (the only one in the district) of 10h.p. used to draw the coal tubs out of the mine (Proceedings of Inspecters of Coalfields, N.S.W. Leg.Ass. 1864). However by 1888 the work force had

grown to about 140 men underground (Ann.Report Dept.Mines 1888). In 1879 the first locomotive was used on trackway to the harbour where extensive alterations to diding arrangements had been made. Part of this railway was later purchased by the state in 1889.

A few details of machinery etc. employed at the mine include a record of a saw mill near the top of the hill and a fitting shop at the foot of the incline near the screens and Pooley's weighing machine c1912 (Danvers Power 1912,220). In 1923 the mine (then owned by E. Vickery and Sons) possessed no electric plant: by this date small coal was being coked at the Federal Coke Works. (Other details of plant of this date are in Humble 1923 pp 150-153).

The depression of the 1930's almost brought work to a stop (Eardley 1968, 20). In 1937 the mine was taken over by AIS, as was also Mt. Pleasant. The workings of the two mines were cross connected underground and shipments of coal at Wollongong wharf were discontinued. The wharf tracks became redundant and the right of way went to Wollongong Council (ibid). In 1954 the Kemira tunnel was completed which linked the new Kemira colliery to Mt.Keira and with this came an end of the surface activities of the Mt.Keira railway (ibid,21).

The Mt.Keira mine was of the usual tunnel type with bord and pillar working.

Previous owners and names of the colliery

1849 Mr. Shoobert
1853 Believed that Mr. W. Robson took over the property and opened another seam
1856 Mr. Shoobert sold the property to Mr. Henry Osborne
1858 Osborne Wallsend Co. formed
1859 (after th e death of Henry Osborne) Property leased to Messrs. William Robson, who adopted the name of Robson and Company.
1889 Capt. Osborne put the property up for sale
1899 Hon. E. Vickery purchased the undertaking (still owned by Vickery in 1923)
1937 taken over by AIS

(Eardley 1968,6-21)

Illustrations: Mitchell Library - small picture file (includes pictures of nearby settlement); N.S.W. Department of Mineral Resources and Development Photographic Library.

References: Eardley G., Transporting the black diamond....(1968); Cousins A., The garden of N.S.W. (1948); N.S.W. Legislative Assembly: Proceedings of Inspectors of Coalfields 1864; Annual Report of Department of Mines 1888; Danvers Power F., Coalfields and Collieries of Australia (1912); Humble W., Coal mining in N.S.W.: the Southern District part XX Jan.5,1923. Chemical Engineering and Mining Review XV 1922-23.

7.15 Mt. Kembla Colliery

1. History

After the formation of a mining company in 1878, the Mt. Kembla mine was opened c 1880-1883, an eight foot seam being opened in 1882, when a railway and jetty were also built at Port Kembla (Cousins 1948, 172: Eardley 1968, 5). The mine is of the usual tunnel type with bord and pillar workings. By 1888 200 men and horses were employed underground (Ann. Report Dept. Mines 1888) by which time a second jetty had been constructed at Port Kembla. The mine also had the usual incline arrangements from the tunnel mouth down to the railway - jetty connection. In 1893 the mine became part of the Southern Coal Owners Agency (M & M of N.S.W. 1906, 150). On July 31, 1902 occurred the Mt. Kembla disaster when 95 lives were lost. In 1913 the name of the colliery was changed from Mt. Kembla Coal & Oil Co. Ltd. to Mount Kembla Collieries Ltd. (Harper 1915, 139-40). In 1923 Humble reports that modern screens were located by the tunnel mouth, where the coal was loaded into waggons before going down the surface incline. At this time the mine was ventilated by a furnace located at some considerable distance from the tunnel mouth, the furnace shaft being 404 ft. deep and 12 ft. in diameter (Humble 1923, 150-153). A large dam was also built for use by the company. The colliery was taken over by AIS in 1946 and worked until 1970.

Illustrations: Dept. of Mineral Resources & Development: photographic library mine and dam.
Mitchell Library: Mt. Kembla mine c1906 (buildings etc.: good)
Mitchell Library: Mt. Kembla mine c1901 (forge)
Allen photos: 1910: Mt. Kembla station with trucks
Scenes showing timber props being sent down the mountain side.

References: Cousins (1948) Garden of N.S.W.; Eardley (1968); Ann. Report Dept. Mines (1888); Mines & Minerals of N.S.W. (1906); Harper (1915); Humble (1923).

Mt. Kembla jetties

1. History

Two jetties at Port Kembla (previously known as Red Point) a smaller and a larger one, belonging to the Southern Coal Co. and the Mt. Kembla Coal Co. The first jetty was built in 1882-83 for the Mt. Kembla works, the second in 1887. When the railway arrived in this area, the jetties were connected to it (BHP Tour. 2.78 p.5).

Illustrations: Mitchell Library: Allen family photographs; 3 views of Mt. Kembla jetty.

Mt. Kembla Dam

1. History

Belonging to Mt. Kembla company
(no details of construction discovered)

Allen photos. 1910 - 2 prints.

[See also jetties and Mwunt Lyell coke works].

7.15 Mt. Kembla Colliery

2. Sites & Relics

The old cemetries for the Mt. Kembla mine disaster can still be seen. The Mt. Kembla incline can also still be seen, and some of the wagons are still in the bush. (Fred Kirkwood knows where).

Tony May has a deflection wheel from this incline.

The most notable survivor from the old mine is the red-brick furnace stack on the Mt. Kembla road.

Other assorted mines (little known)

7.16 Wiley's (near Kembla)

Annual Report of Department of Mines: recorded as "little or no work done during last 6 months."

7.17 Southern Coal Co.

Company started in 1888 (Eardley 1968, 5).

Jetty at Port Kembla (Allen photos. Mitchell Library PX *D571 p.28).

Many other coal leases are mapped by Robjohns (c1889) but it is not known how many/or which of these lesser known ones had active mines (mainly all in the individual names of the lessees).

7.18 Ocean View Coal Company (South Kembla)

Ocean View Coal Company Works became the South Kembla Colliery (Harper 1915, 100).

* Eardley reports that the South Kembla colliery opened in 1888 (Eardley 1968, 5).

1933 South Kembla was acquired by AIS (they already owned the adjoining Wongawilli colliery) (BHP Jour. 2.78, p.59).

* The South Kembla workings are probably those referred to in the Annual Report of the Department of Mines 1888 as Southern Colliery (near Kembla)

10 miners reported as working there, with surface arrangements and a jetty being pushed on vigorously to have coal on the market in 3 months.

7.18 Ocean View Colliery (on east flank of Mt. Kembla)

* 2. Sites & Relics

Extremely fine bricked portal survives, now closed by grille. Thre are also a number of small tunnels and workings along the scarp to the north (north of Mt. Kembla, net S.) Probably the line of the incline can still be seen in front of it.

7.18 S. Kembla Colliery (Smelting Works Mine)

2. Sites & Relics

Mine survives near W. Dapto, beyond Coral Vale farm. Incline can be seen, and parts of tramway leading to both Smelting Works (Dapto) and Kanahooka Pt. and Jetty, the only one surviving on Lake Illawarra.

Part of the tramway cutting can be clearly seen on Scheaff's road. The route of the tramway shows clearly on aerial photographs.

For many years St. Kembla was used as a ventilator shaft for Port Kembla (someone has a miners' lamp from it).

J. Biggar's property

7.19 Wongawilli Colliery (Dapto)

1. History

1888 Annual Report of Dept. of Mines Biggar's Prospecting Mines (near Dapto) "little or no work during the last 6 months".

However, a considerable amount of prospecting was carried out on Mr. J. Biggar's property (Harper 1915, 102).

Area later became Wongawilli colliery, opened in 1916 (Eardley 1968, 5) opened by Haslains of Lithgow mainly to get small coal for coke in the No.3 seam (Cousins 1948, 180). Now owned by AIS.

7.19 Wongawilli Colliery

2. Sites & relics

* The original Waddell fan survives here complete together with very fine original brickwork near it, in the old engine room. Underground at Wongawilli is also the old winding engine that operated the incline and the endless rope. Nearby also are old workings with early pick-marks and some excellent early brick work.

Coal Cliff Jetty

1. History

Jetty built in 1878: number of replacements, rebuildings etc. unknown.

Illustrations: Mitchell Library: Dated 1895
1910
1927
1955

North Bulli jetty

1. History

The deepest loading berth in the state: also loads coal for other companies. (Mines and Minerals of N.S.W. 1906,140-2). (No further details).

Illustrations: Mines and Minerals of N.S.W. (1906) 141; Allen photographs, Mitchell Library; North Bulli jetty (Austinmeer) 28th Sept.1901 - 3 photos of jetty 'greatly damaged by rough weather.'

8. Cokeworks

History

The suitability of the Illawarra coal for metallurgical coke was proved in 1876 when Patrick Lahiff set up two experimental beehive coking areas near Pulpit Rock, Wollongong Harbour. Previously fires and small slack coal were considered useless for steaming and household purposes and were dumped in gullies. There they caused problems by choking water courses, or igniting - occasionally accidentally - forming high grade coke as Lahiff noticed.

More ovens were added in 1879 to a probable total of six, demolished in 1892. These were replaced by Robshaw and Figtree's four ovens at the Mt. Pleasant Crossing (erected 1889) which by 1901 had grown to a battery of fourteen supplying both small Sydney foundried and the Old Dapto Smelting Works. Another set (the Tarrawarra Cokeworks) was also established beside the Corrimal Colliery tramway in 1886, a third at Bulli in 1889 and a large battery at Unanderra, the Australian Coke Ovens, in 1888.

Thereafter more cokeworks were established while existing ones grew or were re-sited. In chronological order the main developments were as follows:-

Scarborough Cokeworks	1899 - 1919
Mt. Lyell Coke Works by Pt. Kembla Jetty	1899 - 1925
The Federal Coke Works using Mt. Keira coal	1906 - 1971
The B.H.P. Coke Works at Bellambi	1903 - 1935
The North Bulli Coke Works at Coledale	1906 - 1926

In 1910 the old Mt. Pleasant ovens were replaced on the other side of the track, remaining in use until 1978; and the Unanderra battery was replaced in 1912 by the Corrimal-Balgowie colliery cokeworks at Corrimal. In 1914 were erected the battery of beehive ovens at Coalcliff, the Illawarra cokeworks, some of which like Corrimal are still in use. The last battery of beehive ovens to be installed in the Illawarra was the Hoskings construction at Wongawilli, operating from 1917-1947.

Subsequent batteries, like the massive ones in the Pt. Kembla steelworks, were of the by-product kind.

Remains

Of the beehive ovens mentioned above, only two are still working - the Corrimal-Balgownie Cokeworks and the Illawarra Cokeworks at Coalcliff. Both batteries contain substantial early sections in spite of the modifications carried out in accordance with pollution control requirements in the earlier 1970's.

The Federal Cokeworks demolished in 1971 were bulldozed to form Beeton Park and the historic Mt. Pleasant ovens were bulldozed in 1978.

Remaining sites have not yet been investigated.

References

Harper L.F. and Mingaye T.C.H.: The Coke Industry of N.S.W. (Department of Mines and Geological Survey Mineral Resources No. 23, 1916).

8.1 Illawarra Coke Co. Ltd.

1. History

As with many other mines in the Illawarra area, slack/small coal from the Coal Cliff colliery had initially been tipped into the sea as useless. However, in 1913 operations were begun at the newsly constructed coke works adjacent to the Illawarra Railway line and Coal Cliff colliery, using small coal almost entirely from Coal Cliff, and the first coke was drawn in December 1914. 50 ovens of improved beehive type were in operation, 32 ft. long by 9 ft. 3 ins. wide tapering to 9 ft. by 7 ft. 6 ins. high, with one chimney stack for every two ovens. Bricks used in the ovens came from the Hurstville and Illawarra Brick Cos. (Harper & Mingaye 1916, 48) [Further details of plant at this date are to be found in the same publication]. Humble also reports 50 ovens being used in 1922. (Humble 1922(a), 21-23). Coke from the works was shipped from Sydney and Port Kembla, but mainly the former.

Illustrations:

Department of Mineral Resources and Development: photographic library.

2. Sites and relics

The existing battery of 58 ovens substantially dates from the first construction of the coke works in 1914 although their linings are constantly renewed. Some of the bricks are marked Pendlebury, others Vulcan. In 1968-9 the small stacks (one to each pair of ovens) were demolished and a common flue installed, and in 1975 a new pushing and quenching system completed the anti-pollution modifications. Before that the belching of dirty smoke as each oven was pushed (i.e. its red-hot coke discharged ready for quenching) was used as a landmark by fishermen off-shore.

Other structures of the pre-1968 changes survive, including some of the radial lay-out associated with the use of a large central derrick crane to swing the coke in a 5-ton tub to the screen-house. Both crane and screen-house survive.

Although the Illawarra single motor ram car (predecessor of the later pushing equipment) was scrapped, one very similar from the recently-demolished Mt. Pleasant coke works has been sold to Bowen, Queensland.

Recommendation

That the I.C.W. be encourated in their interest in their own history, especially with reference to the derrick crame and aspects of the existing layout.

8.2 South Clifton coke ovens

1. History

Coke works were established on the property of the South Clifton colliery in 1900 next to the Illawarra Railway line at South Clifton, using slack from the colliery. In 1906, 32 ovens were in use (Mines and Minerals of N.S.W. 1906, 143) the number being increased in 1912 when 16 new beehive ovens were in the course of construction (Danvers Power 1912,162). Of the 32 ovens then in operation 24 were beehive ovens with a flue in common leading to a brick stack and 6 ovens had short chimneys, one between each 2 ovens placed back to back (ibid). By 1916 66 ovens are recorded of beehive type of brick and rubble stone construction 12 ft. in diameter and 7 ft. 6 ins. high, in benches of 24 and 42 ovens situated on either side of the colliery, the ovens being back to back in each bench. The bricks used in the ovens came from Hurstville and the Illawarra Brick Cos. Works. The coke produced was shipped almost equally at Sydney and Port Kembla (Harper and Mingaye 1916, 47).

Illustrations: Dept. of Mineral Resources and Development.

References: Mines and Minerals of N.S.W. (1906); Danvers Power (1912); Harper and Mingaye (1916).

8.3 North Bulli coke ovens

1. History

Part of the North Bulli colliery complex, the first coke ovens at Coledale were erected in 1906, using coal mainly from the Bulli seam at North Bulli colliery. 52 ovens were first built fitted with coal-hoppers, crushing plant, elevators, engines, water tubular boiler, steam ram, coke bunker and with a dam capable of holding 5 million gallons of water, the elevation of the slope between the colliery and the government railway being used to the best advantage for the positioning of these works (M & M of NSW 1906, 140-142). By 1912 further ovens were being constructed (Danvers Power 1912, 169) to give a total complement of 106 ovens by 1916. By that date there were two sets of ovens with a continuous overhead connection for charging, 52 ovens being 20 ft. long by 6 ft. 2 in. high by 7 ft. wide tapering to 6 ft. 8 ins. and 54 ovens each 19 ft. long but the same in other dimensions. Bricks from the Illawarra Brick Co. and Pendlebury & Sons were used, both of the ordinary dry-pressed type and firebricks. (Harper & Mingaye 1916, 44-46). [with other details of plant at this date also included].

Illustrations: Mines & Minerals of NSW (1906) 142: Harper & Mingaye (1916) - probably.

References: Mines & Minerals of NSW (1906); Danvers Power (1912); Harper & Mingaye (1916).

8.3 Bulli coke ovens

1. History

Established in 1889 by the Bulli Coke Coy.Ltd., the works were subsequently acquired by the Bulli Colliery Coke Works Ltd. (G. Adams), being connected to the Bulli colliery by a railway line and only about 1 mile distant from the main, adjacent to the Illawarra Railway line (Harper & Mingaye 1916,41). In 1912 39 ovens were in use (Danvers Power 1912,180), the number having increased to 54 by 1916. The slack used came from the Bulli colliery and the ovens were of Welsh type, 21 ft. long by 4 ft. wide by 4 ft. high (being raised to 5 ft. 6 in. 'as the opportunity offers' in 1916). Bricks used in the construction of the ovens were made by Pendlebury & Sons of the dry pressed ordinary type with fire brick linings. The coke produced was shipped equally from Sydney and Port Kembla. (Harper & Mingaye 1916,41).

Illustrations: Mitchell Library - small picture file.

8.41 Bulli Pass Coal & Coke Co.

Records of: Bulli Pass coke ovens in 1889
(Cousins 1948, 180)

Bulli Pass Coke & Coal Co. reported as a small property confined principally to winning natural coke from the No. 1 Bulli seam (for sale to the Sydney steam trams): now some years since active mining operations were carried out.

A large part of the back country of the property was held by other companies (Harper 1915, 160).

8.5 Bellambi Coke Works

1. History

The Bellambi coke works were started by the Broken Hill Prop. Co. in 1901 using coal from South Bulli and Bellambi mines, being taken over in 1915 by Broken Hill Associated Smelters Prop. Co.Ltd. The ovens, situated about 1/2 mile north of Bellambi station were of rectangular beehive type, each with six horizontal flues in two benches of 50 ovens each, 15 more ovens being under construction in 1915. Made of the Illawarra Brick Co.'s and Pendlebury and Sons dry pressed ordinary and fire bricks, the ovens were 30 ft. long by 2 ft. 11 ins. wide and 6 ft. high. (Harper and Mingaye 1916,39-40). The coke works were discontinued when BHP merged with AIS in 1935, the plant and sidings being abandoned (Eardley 1968,57).

Illustrations : Dept. of Mineral Resources and Development: (coke ovens with some in course of building).

References: Harper and Mingaye (1916); Eardley (1968).

8.6 Corrimal Coke Co. (Australian Coke Co. Ltd.)

1. History

Early in the 1880s Mr. Thomas Bertram, one of the proprietors of the Corrimal Coal Co. built seven coke ovens near the Corrimal colliery, these being worked for several years with indifferent results and then being closed down. (Harper and Mingaye 1916, 12-12). A skip tramway connected the mine's inclined tramway and the coke works, passing beneath Bulli Road (now Princes Highway) in the natural hollow of the creek bed with a bridge for the roadway over the tracks (Eardley 1968, 60).

In 1888 Mr. E. Figtree of the Australian Coke Co. Ltd. then constructed 20 ovens of Welsh type at Unanderra adjacent to the Illawarra railway line, later adding 72 beehive ovens which were worked until c1912 when the new Corrimal works had come into being (Harper and Mingaye 1916,12-13). The old works were then abandoned.

8.7 Foundations had been laid for the new Corrimal works in 1910 with suitable sidings etc. near Corrimal railway station, the whole being officially opened on September 5th, 1912 (Eardley 1968, 75). The new plant consisted of 40 ovens of 'Thomas' type, 30 ft. long by 6 ft. 7½ ins. wide by 6 ft. 6 ins. high, the coal being supplied from the Corrimal colliery (Harper and Mingaye 1916, 37-9).

In 1937 coke manufacturing came under the control of the South Coast Coke Pty. Ltd., with all of the Corrimal Works being taken over by AIS in 1964.

Illustrations: Department of Mineral Resources and Development.

References: Harper and Mingaye (1916); Eardley (1968).

8.8/9 Mount Pleasant Coke Works

1. History

8.8 In 1889 Messrs. Robshaw and Figtree built four 'beehive' ovens on the south-west side of the Mt. Pleasant crossing. By 1901 these had increased to 14 with a weekly output of some 100 tons of coke, large quantities of which went to the Dapto smelting Works and to small foundries in the Sydney area. A siding leading to the coke works came off the colliery line (Eardley 1908, 32-33). These original works were however dismantled when larger

8.9 cokeworks were begun in 1909, this line on the opposite side of the government railway to that of the old works. The new ovens were owned by Messrs. Figtree and Sons of Wollongong. Using slack from the Mt.Pleasant Colliery 40 ovens of the Nchanahan type were used, being 30 ft. long by 5 ft. 10 ins. high, of both dry pressed and fire bricks made by Pendlebury and Sons at Woonona (Harper and Mingaye 1916,34-36). (Other details of plant in the same publication).

In 1920 the works were sold to the Federal Coke Company and still function with coal from South Bulli.

Illustrations: Dept. of Mines and Mineral Resources : photographic library.

References: Eardley (1968); Harper and Mingaye (1916).

8.10 Wollongong Harbour

Coke ovens

The first coke ovens in the Illawarra were built by Patrick Lahiff at Wollongong harbour, near the sloping and broken land midway between the north-east end of the Basin and Pulpit Rock. Two beehive ovens were built about 1875-1876, the first coke being exported from Wollongong in February 1876 aboard the 'Lady Emma' (Gardiner Garden 1975,39). Slack from Mt. Keira colliery (Harper and Mingaye 1916,12-13) was taken to the ovens by horses over a short dead-end siding laid from the upper tracks serving the Mt.Pleasant Cos. staiths at Wollongong (Eardley 1968, 26). In September 1878 the ovens were bought by Messrs. Osborne and Ahearn and worked by them until June 1879 when they were carried on more successfully by Mr. W. M. Ashley. Mr. Ashley also built four more ovens (also of beehive type), six ovens being in use when the lease on the property expired on December 31st, 1890, the ovens being demolished in 1892 (Gardiner Garden 1975, 39: Harper and Mingaye 1916, 12-13).

Position ofovens marked on Dept. of Public Works map 1885
Mitchell Library M4 811.312 gmfs
1885
1

References

Gardiner Garden (1975)

Eardley (1968)

Harper and Mingaye (1916)

8.11 Federal Coke Co. Works

1. History

Using slack from Mt. Keira colliery, the cike works were established in 1900, being connected to the private colliery railway by a loop siding line on the north side of the track. In 1912 it is reported that 40 ovens were in use of the McLanahan type (Danvers Power 1912,227) this number having grown to 45 by 1916. The ovens were rectangular in shape 30 ft. long by 8 ft. wide by 5 ft 11 in. high with vertical flues. The bricks used in the ovens were made by Pendlebury and Sons (Woonoona) of the dry-pressed variety (Harper and Mingaye 1916,31-32).
(other technical details of the workings are given in the same reference). The coke made in these ovens was shipped from Sydney.

Illustrations: N.S.W. Department of Mineral Resources and Development.

References: Danvers Power F., 1912: Coalfields and Collieries of Australia; Harper, L.F. and Mingaye, T.C.H., 1916; The coke industry of N.S.W. (Department of Mines and Geological Survey, Mineral Resources No.23)

8.13 Mount Lyell Coke Works, Port Kembla

1. History

Established in 1899 the Mount Lyell coke works took most of the small coal produced from the Mt. Kembla colliery, although the two concerns had no financial connections. The works were established to provide coke fro the Mt. Lyell Mining & Railway Co.'s smelters in Tasmania and were situated opposite No.2 jetty at Port Kembla. Small coal was brought to the works by tramway being washed next to the coke plant. In 1906 100 ovens were in use. 24ft. long by 3ft. 4½ ins. wide, with a hydraulic ram for discharging the coke. [Further details of plant and process in following reference]. By 1906 however, smelting improvements had reduced the Mt. Lyell Mining & Railway Co.'s requirements and surplus coke was being sold to outside consumers (M & M of N.S.W. 1906, 147-8). 62 rectangular ovens were in use in 1912 (Danvers Power 1912, 240) and by 1916 it is reported that only 36 ovens were in use, of size 30 ft. long by 2ft. 7½ ins. wide by 7 ft. high with 16 in. walls between the ovens, the walls of the ovens being of South coast fire bricks and the floors of Hurstville dry pressed bricks, with a horizontal flue system. (Harper & Mingaye 1916, 28-29). [Also further details of processes and equipment in this publication]. The majority of the coke produced at this date was used in the company's blast furnaces at Queenstown, Tasmania (ibid).

Illustrations: Dept. of Mineral Resources & Development (as in Harper & Mingaye)

References: Mines & Minerals of N.S.W. (1906); Danvers Power (1912); Harper & Mingaye (1916).

8.15 Wongawilli Colliery, Dapto

Coke works

The colliery included a coking plant 40 ovens being in use in 1922 and 40 under construction, with a gravity incline from the tunnel mouth to the coking plant (Humble 1923, 150-153). [Further details of plant in this publication].

Illustrations: Department of Mineral Resources and Development: photographic library.

9. Stone Quarrying (Kiama - Shellharbour)

The volcanic basalt flows of the Bombo-Kiama region have formed the basis of an active quarrying industry since 1870, when a trial shipment was sent to Sydney. The first quarry known (Wakeford's) began operating in 1871 at Pike's Hill, Kiama, just north of Terralong Street, but the main expansion of the industry throughout the region followed the opening of Sydney's first tramway in 1879 with its consequent demand for stone packing for the rails. The early packing was in the form of basalt cubes struck by hand exported from Kiama, Bombo and Bass Point. Steam driven crushers were also operating in Kiama from the early 1880's to make crushed road metal which was eventually to dominate the market.

A number of factors stimulated the industry at different times, just as varying circumstances at times caused its slowing down, interruption and occasional displacement. Quarrying still continued in the region at places such as Dunmore Quarry and Wentworth Hills near Albion Park. Factors stimulating production were the coming of the railway first to Bombo (1887) then Kiama (1888), the erection of hoppers on the wharf (1893 - and some time before) with direct tipping into holds, the erection of chutes in 1907 at Kiama station for tipping metal, 1914-41 the operation of the Kiama Tramway along Terralong Street from quarries to wharf, and 1930 the introduction of electricity to aid in powering crushing machinery. Adverse affects were suffered from the series of disasters which always beset the steamers and sailing ships involved in transporting the metal, in the long period before a tramway from the quarries to the wharf was successfully achieved, during which metal was carted and resultant dust partially laid by sea water (due to Kiama's chronic water shortage), in the severe effects of the economic depression of the early 1930's, and ultimately in the removal of the remaining coastal steamers for duty in World War II, during which period they were found to be replaceable by rail.

In spite of occasional setbacks, however, the industry proved a remarkable one for the Kiama region, especially in the period between the Wars when the two main quarries, Bombo and Pikes Hill were run by state departments, Bombo by the Railway Commissioners from 1895 and Pikes Hill as the N.S.W. State Metal Quarry from 1911. In 1912 the State Metal Quarry at Pikes Hill took over the adjoining McSweeney's Quarry (on south side of Terralong Street) and resumed 21 acres of land, closing off the north end of Hotherstall Street and finally selling out to Quarries Ltd. in 1935.

Little quarrying was done in Kiama after World War II, activity centring upon Bombo. Pikes Hill Quarry was abandoned in the 40's. The loading hoppers on Kiama wharf were demolished in 1965, those at the quarry in 1965.

The next headland north of Kiama at Bombo was virtually removed by quarrying at Bombo Pt. Quarry since 1880 when it was supplying cubes to Sydney and also to the west of the railway line where the Railway Commissioners took over in the 1940's for extensive supplies of railway line ballast, which it still supplies.

Each of the headlands further north were quarried, more or less extensively. At Minnamurra Robert Trevethan purchased a quarry from Captain Charles' estate just south of the Minnamurra River mouth, which got its own rail link to the main line. In 1926 this was taken over by N.S.W. Associated Blue Metal, largest supplier of blue metal in its day from quarries at Prospect, Minnamurra and Bombo. Trevethan's quarry closed in 1943, the smaller of the two main quarries on the hill is the Federal Quarry, opened between Trevethans and the river mouth in 1923 and falling victim to the 1930's depression. Its rails were removed in 1936.

North again on Bass Point, south of Shellharbour, quarrying began early on the extensive estate of George Fuller of Dunmore. A jetty was built and quarry started in 1880 and by 1885 when Fuller was in control it was already flourishing. In 1890 he needed improvements to the jetty, more men and

another steamer, and the quarry continued until 1922. In 1923 it reopened briefly under management of the South Coast Road Metal Company but after a wrecked steamer the works were partly demolished. The remains were blown up in 1958.

Further inland on the Dunmore estate was the Locking Hill quarry, still very much in use.

Very much associated with the history of quarrying in each of these areas is that of transporting the product, both from the quarry to the main communication route, and thence along it to the market. Before 1887 the main communication was necessarily by sea, so that the product had to be carted or hauled to the nearest wharf or jetty. After 1887, and even more by 1888, there was an alternative by mainline rail; however, the product still had to be brought to the railhead. This was done from the beginning by horse and cart, but equally from the beginning there was a need for short haul tramways for reasons of safety and excessive dust pollution as well as the effort required for the work by both men and horses.

The story of the first Kiama gravel railway between 1885 and 1887 when the main line arrived and diminished the importance of wharf loading exemplifies the problems involved.

Sites and Relics

The great scars left by the quarrying activity of the last hundred years from Shellharbour to Kiama are not difficult to see, their outlines mostly softened by regrowth and the removal of the plant. None of them have any major equipment remaining - crushers, steam engines and boilers or the later electrically-powered crushing plant. Some traces of the transport networks can sometimes be detected; parts of the old permanent way of the 1914-41 tramway system along Terralong Street survives under the bitumen, and the cutting of Trevethans rail link can be seen at Minnamurra. Some of the movable items have reached museums. Of the old locomotives at Kiama the Davenport went to Parramatta Park, the Fowler locomotive to Goulburn steam museum, as well as the lorry 'Tilling Stevens from the Pikes Hill quarry shed, while some of the rails went to the ILRMS at Albion Park. The fate of the gravel ships that survived - the SS Dunmore, long associated with Fullers works at Bass Point, the SS Bombo, the Kiama and many more.

The final category of evidence surviving (apart from the roads, railways and tramtrack beddings still surviving made of metal from this source) are the rows of quarrymen's cottages that survive close to the quarries - at Bass Point in Trevethan Street just across the Minnamurra river, in Daruen Avenue on Bombo Point and in Kiama in several streets, including the pleasant terrace on the main entry into Kiama from the north now restored to various new uses.

The jetties were demolished in the 1950's (Bass Point), the timber hoppers on Kiama wharf in 1965.

For Historic Background Research on this theme see Part 3

Brickworks

There were a number of brickworks along the Illawarra coastal strip, one of the oldest and best known being the former Vulcan Works (firebricks), purchased by Newbold General Refractories Ltd. in 1940 and by B.H.P. as Australian Industrial Refractories Ltd. in 1974.(It was founded in 1851).

Another long-established surviving brickworks is that now called Clark Brick below the South Bulli colliery, formerly the Illawarra Brick Company and before that Pendlebury's brickworks. Bricks stamped 'Pendlebury' can be found in a number of old structures in the district, for example, in the Illawarra coke works at Coalcliff built in 1914, while bricks stamped 'Illawarra' can be seen on the top of the Bellambi creek dam on the Princes Highway near the Appin Road turn-off.

The existing Bulli Brick and Tile brickworks is of recent date - the site of another on Headlands Road, Coledale has been totally demolished. Two others require investigation - Woonona brickworks up the creek behind Bulli Hospital, and an abandoned one at Unanderra on the corner of Princes Highway and Northcliffe Drive.

The main brickworks were as follows:-

Coalcliff Brickyard	11.101
Brickyard Point, Austinmer	11.102
Vulcan Brickworks, Thirroul	11.103
Bulli Brickworks	11.104
Woonona Brickworks	11.105
Illawarra Brick Co. Bellambi	11.106
Pendlebury's, Clark Brick	

Cordial factories and breweries

There were a number of cordial and soft drink factories in the Illawarra, none of which now survive. Even the sites of most have disappeared and their main memorial is to be found in the whole and broken bottles on nearby rubbish dumps.

One of the best known was Lockett Bros. of Kiama, both brewery and soft-drink manufactory, as well as makers of Amaki sauce. The factory, near the quarry in Terralong Street, was only recently demolished and the site still remains accessible.

J. Pallier of Woonona (also of Kurri) established his factory in 1902 on the corner of Moonie and Chenall Streets, while James Parkinson, of various sites in Wollongong and Woonona between 1883 and 1966, established his first factory in Fairy Meadownin 1881.

Harrold & Harrold, also of Wollongong (Crown Street, Keira Street and Bourke Street) flourished between 1897 and 1906, while Thomas Ball, owner of several hotels for a time also manufactured cordials in Woonna from about 1900 to 1915, followed by S.M. Ball until 1920 and then E.L. Holmes at the same address.

Other cordial factories known are those of Hedley & Co. Liddle Street, Woonona (1919-1935) and Robert Osborne's Illawarra Cordial Company in Crown Street, Wollongong from 1882-1889. Weeldon and Marks had a factory at some stage in Keira Street, Wollongong and H. Bribolet (subsequently bought by J. Parkinson in 1951) on the corner of Princes Highway and Archilles Street, Wollongong.

Cordial Manufacturers	Years known
1. J. Pallier of Woonona and Bulli	c1902
2. J. Parkinson of Fairy Meadow, Wollongong and Woonona (Woonona factory 1935-1966)	1881-1966
3. Harold and Harrold (Crown Street, Keira Street, Bourke Street, Wollongong)	1897-1906
4. T. Ball, Princes Highway, Woonona (Permewans) S. M. Ball, Bulli	-1915
5. E.L.Holmes, Woonona (Permewans)	1920
6. Hedley & Co., Liddle Street, Woonona	1919-1935
7. Robert Osborne, Crown Street, Wollongong	1882-1889
8. Weeldon & Marks, Keira Street, Wollongong	
9. A. Tribolet, Princes Highway, Wollongong (Bought by J. Parkinson 1951)	
10. Lockett's, Kiama	

Remains

Almost none of these sites are identifiable now with the exception of Hedley's cordial factory at Woonona. The Ball's factory at Woonona was where Permewans chain store is today. Locketts at Kiama is still just accessible.

J. PALLIER.

J. ROSS
BOTTLE
MANUFACTURER
SYDNEY

PALLIER & CO.
1777n8
J. ROSS

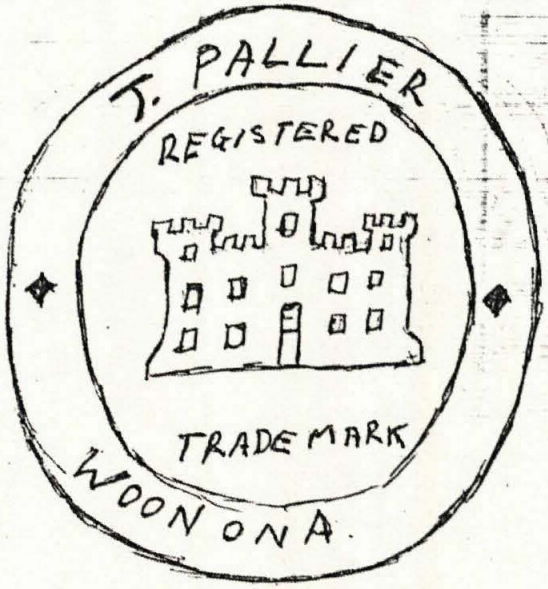
NOT A COMPLETE BOTTLE YET
TO TELL WHETHER IT IS A
COD-LAMONT OR OTHER TYPE

Only Information as yet
JOE & JACK PALLIER START
CORDIAL FACTORY CRN. MOONIE
& CHENHALL ST. WOONONA 1902.
ALSO LOOKS AS THOUGH THERE
WAS A FACTORY AT BULLI

KURRI
J. PALLIER'S
AERATED WATERS
J. KURRI

KURRI
J. PALLIER'S
REGISTERED
WOONONA
AERATED WATERS
J. KURRI

NIAGRA TYPE CODS
BOTH DARK GREEN CODS
LARGE TYPE.



CLEAR GLASS.
COD. TYPE

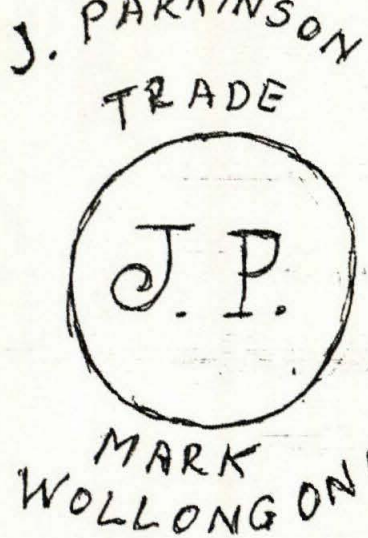
J. PALLIER
WOONONA.

BLOB TOP CORK SEAL.
CERAMIC WARE
GINGER BEER TYPE SHAPE
ALL WHITE
BLUE LETTERING.
OR BLACK.

84-9216.
R. BROWN

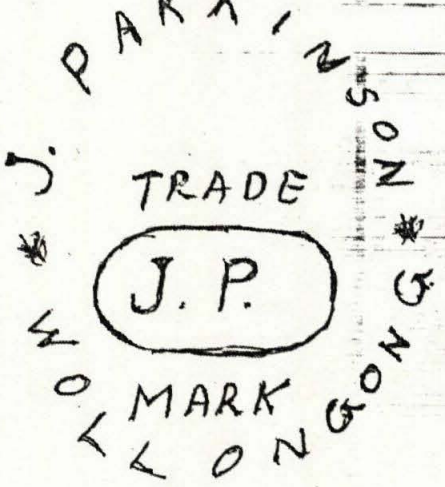
J. PARKINSON. JAMES.

CORDIAL FACTORY FAIRY MEADOW 1881-1882
" " PRINCES HY. NRTH. WOLL. 1883-1899
" " CROWN ST WOLL. 1899-1923
" " KENNY ST WOLL 1923-1966
" " PRINCES HY. WOONONA 1935-1966
BOUGHT OUT TRIBOLETS 1951

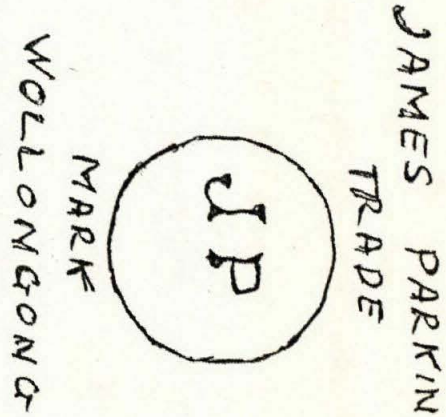


THIS EMBOSING USED ON
LARGE COD PAT.
" NIAGRA PAT.
" LAMONT PAT. FIRST MADE
SMALL " " "
" NIAGRA PAT.

ALL GREEN GLASS.



COD. PATENT.
GREEN GLASS
ALSO COMES IN
LIME GREEN



EARLY LAMONT. PAT.
MADE BY J. LAMONT
GLASGOW.

R. BROWN

J. PARKINSON

J. PARKINSON LTD
TRADE MARK
JP
LTD
WOONONA & WOLLONGONG.

ACID ETCHED
SODA
SYPHON
SIMILAR EMBOSING
USED ON
LATER CROWN
SEAL GLASS BOTTLES.

J. PARKINSON
WOLLONGONG.

GINGER BEER TYPE
BLACK ~~LETTERING~~ LETTERING.
REST ALL WHITE
BLOB TOT.

J. PARKINSON
WOLLONGONG.

REVERSE FONT

SUN COLOURED
FLAT FOOT
HAMILTON PAT
GLASS.

J. PARKINSON
(JP)
WOLLONGONG

SAND BLASTED
BROWN COLOUR REST.
BLOB TOP
GINGER BEER.

J. PARKINSON
WOLLONGONG

GINGER BEER TYPE
BLUE LETTERING.
REST ALL WHITE
BLOB TOP

J. PARKINSON
TRADE
J. P.
MARK
WOLLONGONG.

GINGER BEER TYPE
BLACK LETTERING
REST ALL BROWN
THIS TRANSFER ALSO
USED ON LONG NECKED
CROWN SEAL GINGER BEER.
WHICH COMES WITH WHITE OR BROWN BACKGROUND

R. BROWN.

NEW PLANT FOR CORDIAL FACTORY

J. Parkinson Pty. Ltd., aerated water and cordial manufacturers, of Wollongong, and Woonona, will soon install additional plant and machinery at its Woonona factory in order that the cmpany may continue to render service to its many customers.

In doing so, the company will consolidate the goodwill that has been built up ever since the Parkinson family commenced manufacturing in this district in 1883.

While major operations are being carried out at the Wollongong factory, the requirements of the people north of Wollongong will be continually kept in mind.

The story of the Parkinson family and their interest in cordial manufacturing goes back to 1872.

The late James Parkinson was first interested in the manufacture of aerated waters in Cooma, and in 1873 he started a small cordial factory in that district.

He later moved to Bombala, and it is interesting to note that he exhibited cordial manufacturing machinery at the Bombala Agricultural Show in 1876.

He left the Bombala district in 1882 and went to Sydney, with the object of starting a similar business in the city.

When the South Coast Railway was being surveyed, his attention was drawn to the possibilities of the South Coast, and he came to Wollongong in 1883 to become the manager of a cordial factory owned by Mr. William Osborne. After six months in that position he left to branch out on his own.

He started at a site where Mr. Tribolet's Cordial Factory stood at North Wollongong, and was there for a period of 15 years. At the time there was a water shortage and supply for the manufacture of cordials was drawn from a spring situated in a paddock adjacent to the factory. Mr. Parkinson moved into the City proper in 1889 and transferred his factory to the site where the Commonwealth Bank now stands in Crown Street. In 1923 the premises were transferred to the present site in Kenny Street.

Most of the Parkinson family have been interested in the manufacture of aerated waters, and when the late James Parkinson died, the eldest son, William Parkinson, became manager of the business. He was later succeeded by his brother, Mr. Vincent Parkinson. Miss Gertrude Parkinson acted for many years as secretary of the company.

In 1935 the cordial business carried on by Lockett Bros. at Woonona was purchased. The business was originally founded by the Bell family, whose name is very well known to many old residents of Woonona.

The factory was established on the site chosen because of the proximity to a valuable natural spring which was used in the manufacture of aerated waters until comparatively recent years. This branch has continued to grow and although the original purpose was to render service to the customers north of Corrimal, it now has customers as far north as Cronulla. The same recipes are used at Woonona as are used at Wollongong.

In 1937 they received Gold Medals for a first and second award at the Royal National Exhibition, Brisbane. The previous year at the Sydney Royal Show, they obtained a certificate of Merit (there was no 1st Awards given in that year). In 1938, other local shareholders became interested in the company, and they continued to pursue the policy that the Parkinson family had instigated and carried out for many years. This policy was to maintain a very high standard of product and to give the best possible service to customers.

In 1951 the business conducted by Mr. H. Tribolet at North Wollongong and which was originally established by Wheeldon and Marks, was purchased by the Company.

The Company has always kept abreast of changing conditions in the aerated waters trade, and it is felt that it has rendered faithful service to the people in this district despite the rapidly increasing population and the heavy demands placed on the Company, particularly in recent years.

The management is fully aware of the development in the district, and in order to cope with the increasing demands it was decided to purchase the most modern machinery available.

This machinery is now in the process of being installed, and it is hoped a completely automatic plant will be sucessfully operating before the end of this month.

J PARKINSON

OBITUARY.

27.7.28

LATE MRS. J. PARKINSON.

On Monday death claimed a well-known old and highly respected resident of Wollongong, in the person of Mrs. Parkinson, relict of the late Mr. J. Parkinson, who for many years conducted a cordial factory. She was a woman of very high ideals and neighbourly instincts, and in her own quiet way was always a supporter of charitable movements. She was a devoted adherent of her Church, and her deep religious convictions were reflected in her life. Twenty five years ago the death occurred of her husband. Four members of her family of twelve also predeceased her, viz., Messrs. Alfred and Frank, both of whom were killed at the Port Kembla Power House, with a lapse of eight years between each fatality. Joseph and Theresa, who died before reaching maturity. The surviving members of the family are Messrs. William (President Wollongong Hospital), Edward, Vincent, James, Misses Mary, Gertrude and Cecelia and Mrs. T. Ryan.

The late Mrs. Parkinson was born 78 years ago at Cappawhite, Co. Tipperary, Ireland, her maiden name being Ryan. When 12 years of age she came to this State with her brother and brother. They went to reside at Cooma, where the deceased remained until her marriage in 1871. With her husband she went to reside at Bombala, where her husband carried on a bakery and cordial factory. In 1882 the family moved to Wollongong, where Mr. Parkinson managed a cordial factory for the late Mr. W. Osborne. After a few months Mr. Parkinson opened a factory of his own in premises adjacent to Bode's Hotel. It was carried on there until 1888, when it was moved to premises in Crown Street, where it was carried on for 26 years. About four years ago a move was made into the present up-to-date factory.

On Wednesday the remains were taken to St. Francis Xavier's Church, where an impressive service was conducted by Very Rev. Father Doherty, P.P., V.F. As the coffin was borne from the Church, Miss Dwyer, who presided at the organ, played the Dead March. A large cortege followed the remains to their last resting place in the Wollongong cemetery, where the last sad rites were performed by Father Doherty.

We extend our sympathy to the bereaved family.

Both ARTICLES TAKEN FROM Woll. City Ref. Sect.

(1)

And the recipes used are basically the same as a century ago.

Historians date the start back to about 1850, when the coal industry was beginning in Wollongong.

A company run by Mr. H. Tribolet is believed to have been the first.

The biggest and oldest firm in Wollongong now, Parkinsons, started in 1883.

It started off as the toast of the coast, but now is a million dollar industry.

Parkinson, is taking advantage of a growing market and cooling up for growth.

(2)

Today it has 80 employees.

The firm is outgrowing its factory site in Central Wollongong and making ready to move to a 10 acre site in Berkeley.

The founder of the company, James Parkinson, first became interested in the manufacture of aerated waters at Cooma in 1872 and started a small cordial factory in the district.

He moved to Bombala, on the far South Coast, soon after and left there in 1882 and went to Sydney with the object of breaking into the cordial trade in the city.

Parkinson was drawn to the South Coast in 1883, when he saw the possibilities of Wollongong.

He became manager of the factory owned by Mr. William Osborne, but after six months branched out on his own.

At the time there was a water shortage and supply for manufacture was drawn from a spring in a paddock adjacent to the factory.

Parkinson moved into Central Wollongong in 1889 and transferred his factory to the site where the Commonwealth Bank now stands in Crown St.

In 1923 the firm transferred to the present site in Kenny St.

The Parkinson family continue association with Wollongong the death of James Parkinson in 1908.

The eldest son, William, became manager.

He was succeeded by his brother, Vincent.

Gertrude Parkinson acted for many years as secretary of the company.

In 1935 the firm bought a business conducted by Lockett Bros at Woonona.

Mr Tribolet's company at North Wollongong was bought in 1951.

In late 1966, Parkinson's was bought by Shelley's, a company owned by British Tobacco.

British Tobacco controls more than 150 companies in Australia.

The soft drink industry uses one of the cheapest basic raw materials — water.

The water is filtered and sterilized by a chlorination process and then channelled to a mixing room, where water and sugar are mixed to make a syrup.

The average size mixing tank is 600 gallons and two tons of sugar are added to the water to make the syrup.

Flavoring is added, with citric acid, preservant and artificial colouring.

(3)

The syrup is then piped to the bottling plant.

The bottles pass along a conveyor belt and are filled with soda water.

Further along the belt they are sealed either by crown seal, the flip-off variety, or a screw cap.

The soda water is a super saturated solution of carbon dioxide and water.

Carbon dioxide is passed through the water under pressure to create the fizzy effect.

The only manual labor now in the industry is loading bottles onto the bottle washer and packing the full ones into crates at the end of the production line.

Parkinsons now produce an average 48,000 bottles a day in varying sizes.

R. BROWN.

J. PARKINSON

J. Parkinson

Pty. Ltd.

AERATED WATER AND CORDIAL MANUFACTURERS

Wollongong and Woonona

Parkinson's products have been appreciated by a discerning public since 1883

★ PURITY

★ QUALITY

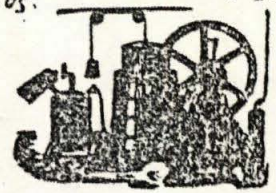
★ CONSISTENCY

You are sure of the best when you buy

PARKINSON'S GOLD MEDAL DRINKS

CRYSTAL FOUNTAIN.

14.1.05. S.C.T.



J. Parkinson,

CORDIAL FACTORY.

UPPER CROWN STREET.

WOLLONGONG.

LATEST AND MOST IMPROVED MACHINERY.

The Best Cordials Manufactured.

Double-Ærated Soda Waters a Speciality

14.1.10 S.C.T.

CRYSTAL FOUNTAIN

J. PARKINSON

Cordial Factory

UPPER CROWN STREET

WOLLONGONG.

Telephone No. 54

fur LATEST and MOST IMPROVED MACHINERY.

The BEST Cordials Manufactured.

Double-Ærated Soda Water a Specialty

7.4.10 S.C.T.

Crystal Fountain.

J. PARKINSON,

Cordial Factory,

UPPER CROWN STREET

Wollongong.

Telephone No. 54.

All goods manufactured by the firm are guaranteed under the Pure Foods Act.

J.R. BROWN

HARROLD & HARROLD WOLLONGONG

HARROLD BROS. ; PATRICK.

Cordial Factory 1897-1902 Crown St. Woll.
Cottage 1899-1900 Keira St. Woll.
Shop & Dwelling 1900-1902 Crown St. Woll.
Cottage & Factory 1902-1906 Bourke St. Woll.

Clippings from.
South Coast Times.
During 1903.

ALL BOTTLES MADE IN SYDNEY

GINGER BEER TYPE SHAPE
BLACK LETTERING.
CERAMIC WARE
GINGER BEER CONTENTS
BLOB TOP. CORK SEAL
WHITE BOTTOM BROWN TOP
ALSO COMES IN ALL WHITE.

HARROLD & HARROLD
WOLLONGONG

HARROLD & HARROLD, Bourke St., can supply the Best and Cheapest Ærated Ginger Beer—Summer weather now on. Try it?

THE Quality of Harrold and Harrold's Cool Summer Drinks and Cordials cannot be excelled. Office and Factory: Bourke St, Wollongong.

EVERYBODY who drinks Harrold's High-class Ærated Waters will admit that they are the best.

ARE you Using Harrold and Harrold's Ærated Waters? If not, try them. They stand unrivalled as the very best. Delivered daily to all parts of the district.

HARROLD & HARROLD'S New Cordial Factory, in Bourke St., is now completed and equipped with the most modern machinery, ensuring an unlimited daily output.

HARROLD & HARROLD
TRADE
MARK
WOLLONGONG

LAMONT
PATENT
AERATED
WATERS. CONT.

GREEN GLASS

HARROLD & HARROLD
TRADE
MARK
WOLLONGONG

COD PATENT
MARBLE
BOTTLE
G. AERATED
WATERS. CONT.

SUN COLOURED GLASS

R. BROWN

T. BALL.

Cordial Factory Princess Highway

WOONONA — 1915

Situated where Permewans is. Today

WITH A DIFFERENT HEAD
SAME DESIGN USED
ON HAYNES PATENT NO 27087
MARBLE BOTTLE, MADE BY
BARNETT FOSTER LONDON

T. BALL
REGISTERED

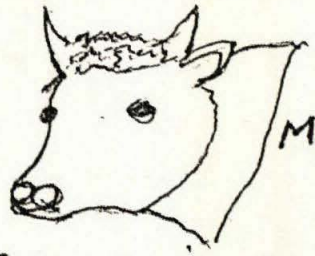
BULLI

T. BALL
REGISTERED

TRADE MARK

BULLI.

T. BALL
REGISTERED



TRADE MARK

BULLI
NEW SOUTH WALES

TB
ON BASE

COD PATENT
NIAGRA TYPE
GREEN GLASS

LARGE & SMALL
BOTTLES

ALSO THERE IS
ANOTHER LARGE
COD WITH A
SLIGHTLY
DIFFERENT HEAD

EARLY LAMONT PAT.

T. ROSS. BOTTLE MAKER Sydney.
GLASS BOTTLE

LATER LAMONT PAT.

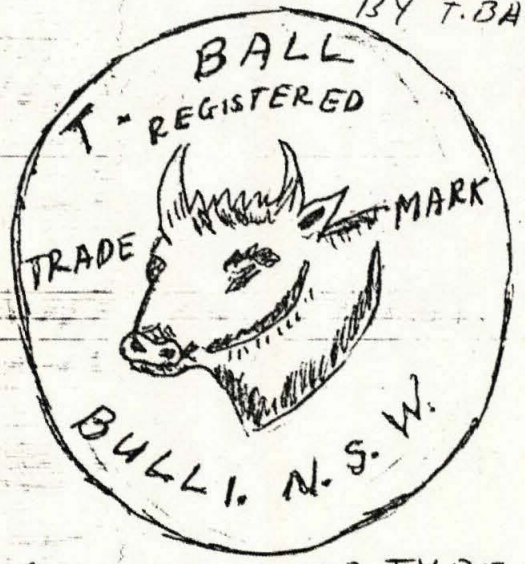
MADE IN GLASCOW. BY. T. LAMONT.
GLASS BOTTLE
THERE IS ALSO ANOTHER
AUST. MADE LAMONT with a
Slightly Different HEAD.

R. BROWN

T BALL

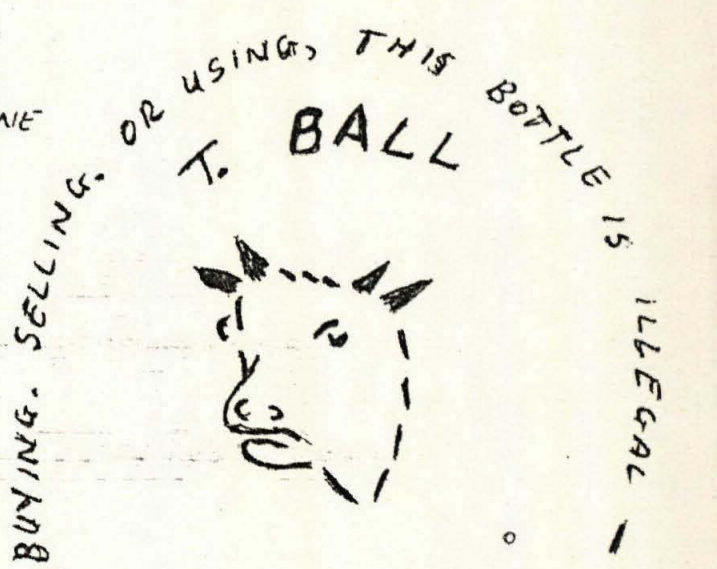
GINER BEER TYPE SHAPE
CERAMIC WARE
BLOB TOP
ALL WHITE
BLACK LETTERING.

T.BALL WAS THE ONLY CORDIAL MANUFACTURER IN N.S.W. TO SAND BLAST BOTTLES.
ONE GINGER BEER HAS BEEN FOUND SAND BLASTED J.P. PARKINSON. PROBABLY DONE BY T.BALL



GINGER BEER TYPE
CERAMIC WARE
BLOB TOP
ALL BROWN
BLACK LETTERING.

EXAMPLE OF SAND BLASTED BOTTLE COULD BE ON GLASS OR CERAMIC.



SOME BOTTLES HAVE JUST T.BALL. BULLI WITH THE HEAD OTHERS INCLUDE N.S.W. N.S.W.

NO GINGER BEERS OR CODS. HAVE THE LETTERING ROUND THE OUTSIDE.

R. BROWN

BALL

10.1.13 S.C.T.

Birth

BALL.—At her residence, Victoria Cottage, Unanderra, December 20th, the wife of Thomas Ball, of a son. Thomas William 49

T M 12.5.23

DEATH OF WOONONA IDENTITY.

THOMAS JAMES BALL.

"Gradually, but surely, each human link In life's long chain is severed."

We have to record the passing from this earth of one of the oldest and best known identities of the Bulli-Woonona districth. We refer to Thomas James Ball, whose death occurred at 1 a.m. last Sunday. He retired from active business life about the time his wife died some 13 years ago, and ever since had resided with and been well attended by his youngest daughter, Mrs. C. Lansdowne, opposite the Court House, Main Road, Bulli. For the past couple of years he had spent many hours each day in an invalid's chair on the verandah, and friends waved a cheerful salutation as they passed along the roadway. Last week, however, with his end approaching, his illness was severe, and the services of a trained nurse were secured, to do everything possible to provide relief for him during his last days on earth.

The funeral moved off at 4 p.m. on Monday, the cortege being of much length and included among those present representatives of various walks of life. The body was first taken to the Church of England at Bulli, where a service was conducted, and afterwards placed to rest in the Church cemetery adjoining and alongside the remains of his wife, Rev. C. H. Tomlinson officiating both in the Church and at the graveside. All members of the family, with the exception of two sons unable to be present, were in attendance at the graveside.

The late Thomas James Ball was born at Lawley, Shrewsbury (England) 75 years ago. He came to Australia, and to New South Wales, just half a century ago, settling first at Wollongong. Working as a miner for several years, he afterwards took on road contracting, and a general carrier in Woonona district. Eventually he became a manufacturer of cordials, and was also proprietor of the Queen's Hotel, at Wollongong, and the Royal Hotel at Woonona, the latter premises being still his property at the time of his demise. He took an active part in sport in his younger days, being also a foundation member of Woonona Bowling Club. He was one of the rescue party on the occasion of that memorable disaster at Bulli colliery in 1887. With the late H. F. Cotterell, late J. S. Kirton and others, he formed the deputation to induce the Commissioners to run Sunday train down the South Coast. About 32 years ago he made a tour of America and Great Britain, visiting relatives and friends. As an adherent of the Church of England, in his younger days he was Senior Warden of the Church in his native town in England.

Of a family of 16, two sons and two daughters predeceased him. Those remaining are: William (Rosebank), Mrs. C. Woods (Beatrice, Bulli), Mrs. A. Woods (Sarah, Bulli), Mrs. H. Edmondson (Agnes, Gosford), Albert (Woonona), Ernest (Mullumbimy), Arthur (Bulli), Sidney (Mascot), Mrs. R. Rowan (Rose, Bulli), Frederick (Wollongong), Mrs. R. S. Moore (Daisy, Bellambi), Mrs. C. Lansdowne (Lilian, Bulli). There are also 35 grandchildren and six great grandchildren.

18.12.14 Funeral Notice S.C.T.

BALL.—The friends and relations of Mr Thomas Ball and family, are respectfully invited to attend the funeral of his late loved wife and affectionate mother to leave the residence, 'Dawleef,' Main Road, Woonona, to-morrow, Saturday afternoon, at 3 p.m. for the old C. of E. Cemetery Bulli

OSBORNE & SON.

18.12.14 DEATHS S.C.T.

BALL.—Dec. 17, 1914, (suddenly) at her late residence, "Dawleef," Main Road Woonona, Bulli, Hannah, the beloved wife of Mr Thos. Ball, Cordial Factory, Woonona. Aged 60 years

16.1.01 Public Caution. S.C.T.

Persons are cautioned against Buying, Selling, or otherwise Appropriating for their own use for any purpose (as bottles are only loaned till empty) all Bottles, whether of stone, glass, or sand-blast, branded with my trade mark—a Bull's Head—and the name thereon of "T. Ball, Bulli."

T. BALL.
Cordial Manufacturer,
Woonona.

R. BROWN

11.6.15

NOTICE TO THE PUBLIC.

OWING to the heavy loss annually sustained through the destruction of my Registered Sealed Water and other Bottles bearing my Registered Brand, I, the undersigned, hereby give notice that any person or persons found breaking or damaging any bottles in any manner will be Prosecuted.

The undersigned also offers a Reward of £2, which will be paid on receipt of information leading to a conviction of any person using any of my Registered Bottles for kerosene, Turps, Acids, Spirits, or other deleterious liquids, and which renders the bottles unfit for further use.

Patent Aerated Hop Beer, and other types of Bottles bearing my name and trademark are only issued to Customers until empties which they must be returned, such bottles to remain the property of Thomas Ball. In the case of bottles accidently broken, stoppers should be returned. Customers will therefore be held responsible for all bottles until returned, and any shortage will be charged to their respective account at current rates.

(Signed) THOMAS BALL,
Steam Cordial Works,
Woonona.

BALL, Thomas

According to the WOLLONGONG MUNICIPAL ROLLS, T. Ball occupied a cottage and a small store in Railway ST, Wollongong between 1896 - 1903. In 1896-1897 he occupied the Queen's ~~Hotel~~ in Market Street.

P.T.O

R. BROWN.

In the 1899 South Coast Tourist Guide "Beautiful Illawarra"
T Ball is mentioned as being in charge of certain livery stables
in Woonona. He was also on the Bulli representation of the
Management Committee of the South Coast Tourist Union.

T. BALL

YOU KNOW HIM. T. BALL.

Bulli Steam Cordial Works,

WOONONA.

Ge for the Bull Brand of Cordials—

For Hop Ale, Hop Beer, Limejuice, Soda.

Clean, Wholesome, Refreshing.

Publicans' Glasses Branded at low charge—Sand Blast Process.

Delivery daily by Carts and Waggons to all parts of the district.

One Name only—BALL. One Address only BULLI.

One Trade Mark—BULL.

← An advertisement for Bull Steam Cordial Works, Woonona which appeared in the 1903 TOURISTS GUIDE TO BEAUTIFUL ILLAWARRA. R919.446 SOU

Page 7 of the above states that T. Ball was one of the Bulli/Woonona representatives on the Management Committee of the South Coast Tourist Union.

R. BROWN

S M BALL, SIDNEY

20·11·15 S·C·T

Notice.

Entirely under New Management

S. M. BALL

Having purchased the Cordial Business lately carried on by Messrs Ball Bros., Woonona, wishes to notify the general public that he has just finished installing all the latest machinery for the running of an up-to-date Cordial Factory, and having purchased a Motor Lorry, is prepared to supply cordials at a minute's notice to any part of the district.

A Trial Solicited

S. M. BALL

10·11·16 S C T

S. M. BALL,

WOONONA,

HAS recently added to his modern plant Up-to-Date Machinery for the making of

ICE, ICE CREAM, and ICES,

And will deliver same promptly to all parts of the district. Send in a trial order.

Mineral Waters and Cordials are made from Iced Water.

Trade supplied promptly per motor lorry. 'PHONE 10, BULLI.

You can have the best if you demand **Ball's Mineral Waters & Cordials**

21·4·16· THE BEST S.C.T.

MINERAL WATERS & CORDIALS

are Made and Supplied by

S. M. BALL,

WOONONA.

Ask for them, and insist on being served with them. Don't be put off.

W have the latest and up-to-date Mineral Waters and Cordial Works.

Trade supplied promptly per motor lorry. 'Phone 10 Bulli.

You can get the Best by asking for **Ball's Mineral Waters & Cordials**

S. M. BALL
REGISTERED
TRADE MARK
BULLI

NEW SOUTH WALES

Cordial Factory Princess Highway

WOONONA. 1915-1920

Situated where Penmewans Is. Today

GINGER BEER TYPE SHAPE
ALL BROWN
BLACK LETTERING
CROWN SEAL
CERAMIC WARE
GINGER BEER CONTE

COD. PATENT. LARGE TYPE — NIAGRA. PAT.
AERATED WATER CONTENTS.

TWO DIFFERENT SHADES OF GREEN
THE DARKER GREEN HAVING T.B. ON BASE OF BOTTLE.

THE SAME EMBOSING OCCURS ON CROWN SEAL BOTTLES BUT ONLY B. ON BASE

DON'T KNOW WETHER MINEAL WATERS Supplied, in COD BOTTLES OR NOT. R. BROWN

E.L. HOLMES.

Cordial Factory Princess Highway
Woonona 1920—
Situated Where Permewans is Today

Still carrying the Bulls Head
on his own Bottles, from
Previous owners S.M.-T.-Ball
He therefore continued
to use SM.T.Ball Cods &
Ginger Beer Bottles
But only Had Crown Seal
Bottles Made for Himself.

E.L. HOLMES

TRADE MARK

WOONONA

REVERSE SIDE

THIS BOTTLE IS THE
PROPERTY OF
E.L. HOLMES LTD
WOONONA

GREEN GLASS
LARGE & SMALL
CROWN SEAL BOTTLES

R. BROWN

HEDLEY.

Cordial Factory 19-19 - 1935

Liddle St. WOONONA

Manufactures or/an Distributors of.

Ginger Beer, Hop Beer, Cordials

"Hot Tom. syrup", Essenses, Vinegar.

HEDLEY & Co

HOP BEER.

WOONONA

26 oz. GREEN GLASS

INTERNAL SCREW

BOTTLE.

GINGER BEER TYPE SHA

CERAMIC WARE

BROWN ALL OVER.

BLACK LETTERING

INTERNAL SCREW

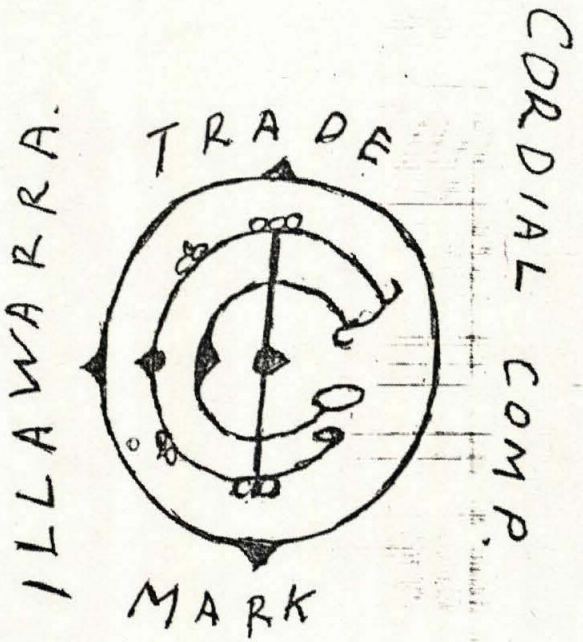
TOP.

R. BROWN

OSBORNE ROBERT

ILLAWARRA CORDIAL COMPANY

Cordial Factory 1882-1889
CROWN ST WOLLONGONG.



LAMONTS PATENT.
GREEN GLASS

MADE BY JOHN LAMONT GLASCOW.

AERATED WATERS CONTENTS.

BOTTLES COME IN LARGE & SMALL SIZE.

ROBERT OSBORNE, of the Illawarra Cordial Factory, Crown-street, is a member of one of the oldest families of the Illawarra district, and was born in 1860 and educated in this town. Having leased land and built extensive premises he started the present business in 1883. He uses an eight-horse power engine and all the latest and most improved machinery in connection with his trade. He employs constantly five hands, does the principal business in the town, and has taken four consecutive prizes at the local show for the excellence of his cordials. Mr. Osborne is married, and has one son and one daughter. He is a member of the M.U.I.O.O.F.

R. BROWN

The Aldine Centennial History of [illegible] 1888 Reg by J Morrison Vol 2)

LOCKETT BROS.

FACTORY KIAMA —

" WOONONA — 1935

LOCKETT'S
KIAMA

GINGER BEER TYPE
CERAMIC WARE
BLACK LETTERING
REST BROWN

GINGER BEER SOLD
AS GINEX

29-1-12 S.C.T

A Judge's Verdict.

Speaking of the Excellence of

LOCKETT'S

DELICIOUS

Ama Ki Sauce.

A leading Judge says one thing in its favour is its Excellent Quality, and it has the effect of making an appetite where one has been lost, in fact it creates too good an appetite.

LOCKETT BROS.
L.B
KIAMA

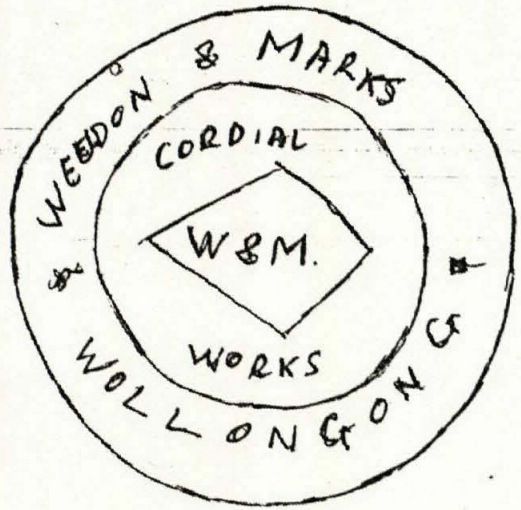
ACID ETCHED
SODA SYPHON
GLASS.

R. BROWN

WEELDON & MARKS

~~WEELDON & MARKS~~

FACTORY KIERA ST. WOLLONGONG.



THIS EMBOSING OCCURS ON
LARGE & SMALL CROWN SEAL
GLASS BOTTLES
ALSO ACID ETCHED ONTO
SODA SYPHONS.

R. BROWN

H. TRIBOLET

FACTORY PRINCES Hy-o ACHILLES
WOLLONGONG.

WOLLONGONG
H.T.
W.
CORDIALS

ACID ETCHED
SODA
SYPHON

TRIBS

EMBOSSED ON
LARGE & SMALL
CROWN SEAL
GLASS BOTTLES

R. BROWN

10. Metal Smelting and Refining

History

The smelting, refining and manufacturing of both ferrous and non-ferrous metals have a history in the Illawarra extending back into the 19th century.

In all the early enterprises the same requirements - port facilities, rail access and the provision of coal and coke - were combined but in various ways.

The first of them exploited iron ore quarries behind Port Kembla in 1881. An experimental blast furnace stack was built at the foot of the Mount Pleasant colliery wagon incline in 1882.

Little more is heard of this enterprise, emphasis shifting to the project of the Illawarra Harbour and Land Corporation in 1890, whereby a dredged channel between breakwaters from the ocean into Lake Illawarra would give ocean-going vessels access to the western shore of Lake Illawarra. The dredged channel through the lake was to be four and a half miles long and 23'8" deep all along. This was originally to allow coal from the southerly Fleming's Mine to be exported, but in 1895, when little had been done, the company announced the formation of the Smelting Company of Australia Ltd. to smelt sulphide ores from New England, Orange and Broken Hill at a smelter to be erected there.

The smelders were erected on the bank of Mullet Creek half a mile from its mouth, and operated for ten years before the works were transferred to Port Kembla, now the Australian Smelting Corporation. Then again in 1907 work stopped, and the company went into liquidation.

One contributing factor to the closure of the works was the final failure of the Lake Illawarra Harbour Scheme. It was but one of several plans to improve harbour facilities in the vicinity of Wollongong- one was a plan to have a deep-water dock in Tom Thumb lagoon, already proposed in the 1880's, another, that of Sir John Goode to excavate a harbour north west of Belmore Basin with breakwaters from Pulpit Rock and Fairy Creek. In 1898 the decision was finally made in favour of the Port Kembla harbour project, with the shift in smelting sites the natural consequence.

The demise of the Australian Smelting Corporation's smelters, which in their heyday treated ores from Cobar and Captain's Flat (N.S.W.), Chillago and Mount Morgan in Queensland and Zeehan in Tasmania, as well as those listed above, was rapidly followed by the construction of the Electrolytic Refining and Smelting Company of Australia Ltd.'s copper refinery in 1908 and the non-ferrous wire manufacturing of Metal Manufacturers Ltd. in 1917, both surviving today.

The iron and steel production plant of Hoskings-Australian Iron and Steel did not come to Port Kembla until 1928. It too

had origins away from good port facilities - in Lithgow - and like the A.S.C., came to Port Kembla because it could no longer afford not to. The works prospered and grew to cover its present 800 ha. Much of its plant and buildings reflect more recent changes, but several items from the 1930's steel-making production still survives, particularly the No. 1 blast furnace and works including the No. 1 Merchant Mill and its superb steam engine.

Remains

In addition then to the ruins of the Dapto smelters and the associated manager's house, and the No. 1 works embedded deep within the A.I.S. complex, there are other items forming part of this theme.

One clearly visible feature is the cutting made for the tramway to the South Kembla mine (South Kembla No. 2) which was to have supplied coking coal to the Dapto smelting works.

Another is the breakwater on the landward side of Windang Island, together with a few rails and wheels surviving on the island from when a quarry on its south west side was used to provide rock for the initial breakwaters of the Lake Illawarra Harbour Scheme.

The Port Kembla Harbour Works, critical to the whole enterprise, although subsequently extended, embodying the original walls.

10.1 Mount Pleasant Coal and Iron Co.

1. History

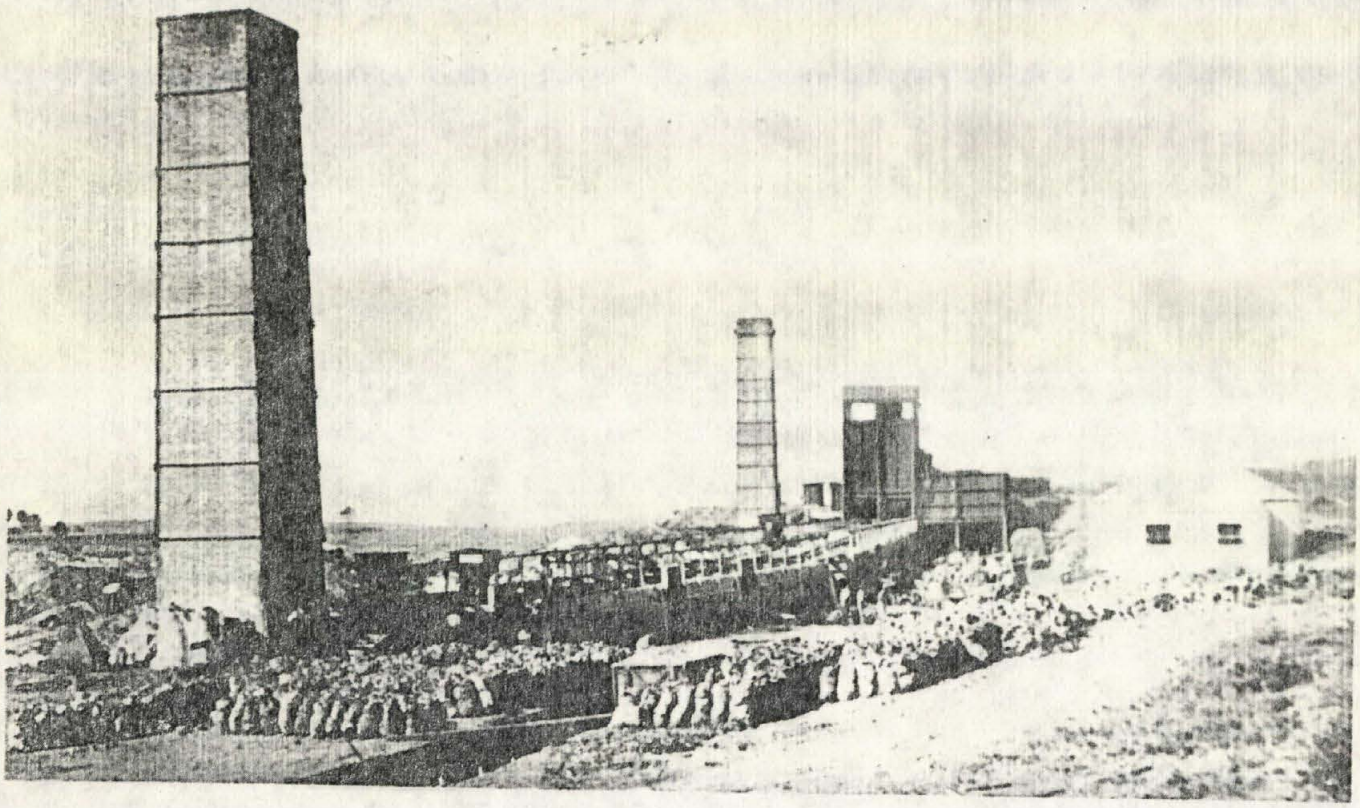
In 1872-73 attempts were made to treat iron and in 1873 a small blast furnace was in operation on a site adjacent to the foot of the Mt. Pleasant inclined way (using iron ore and limestone available on the property). However the industry lapsed and the plant was dismantled (Eardley 1968,32). The ruin of the furnace was to be seen in the early part of this century (Danvers Power 1912,216).

References: Eardley (1968); Danvers Power (1912).

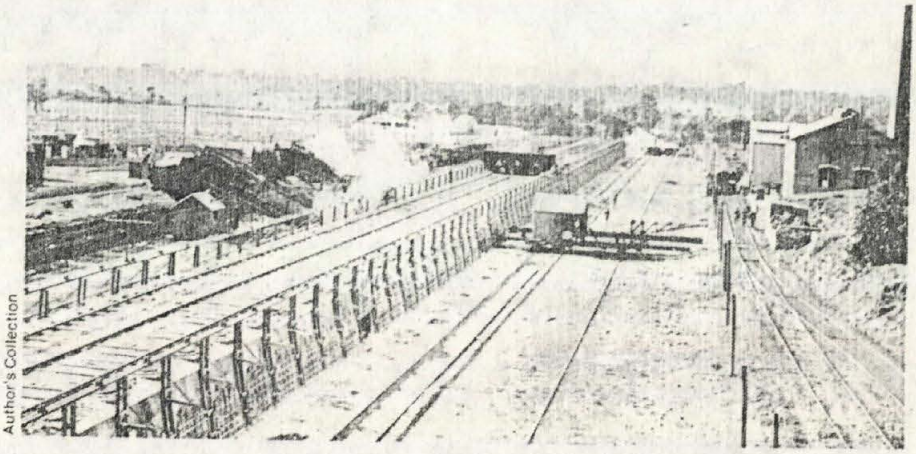
10.1 Mt. Pleasant Blast Furnace

Experimental furnace stack built at foot of Mt. Pleasant colliery wagon incline in 1882; in derelict condition 16.11.1943

(Photo: J.L. Southern Ill. Rail p.12c)

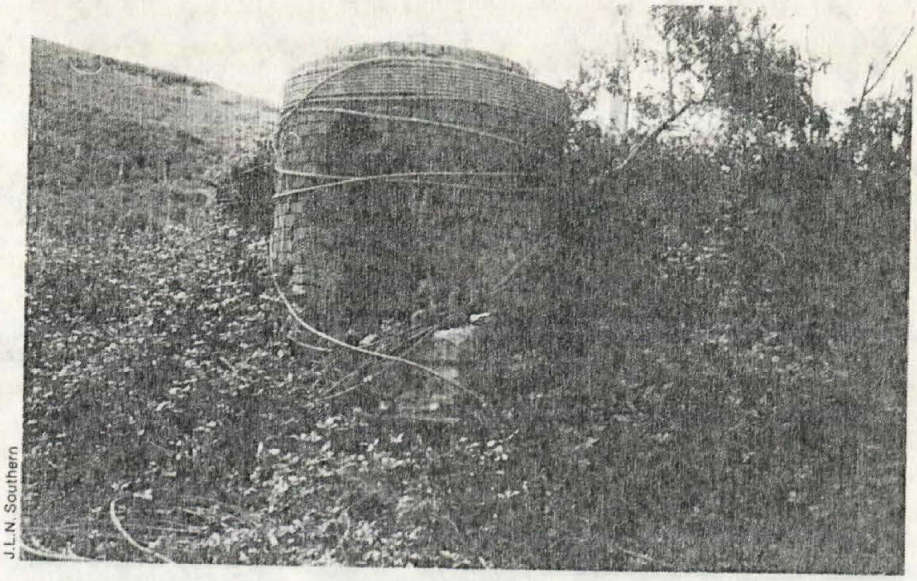


ILLAWARRA COKE OVENS
Bulli coke ovens, 1914.



Author's Collection

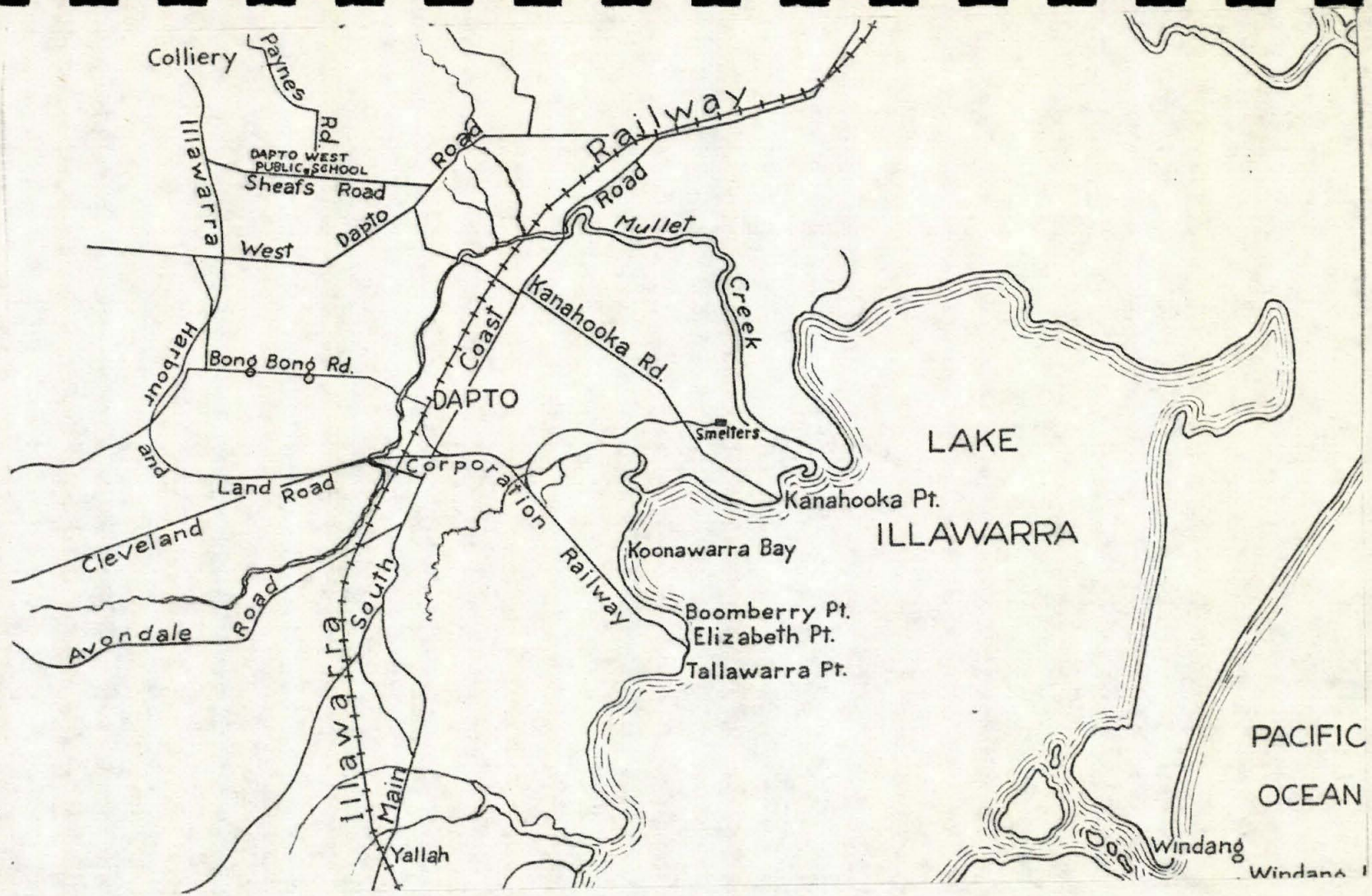
Wongawilli coke ovens, 1925, showing 80 ovens in use together with another 20 under construction.



J.L.N. Southern

The experimental blast furnace built at the foot of the Mount Pleasant colliery wagon incline in 1882, shown in derelict condition, 16 November 1943.

J.L.N Southern, A Railway History of the Illawarra (B.H.P)



J. P. O'Malley The Old Dapto Smelting Works.

10.6 The Old Dapto Smelting Works

Remains

The original landholding comprised 300 acres, the works over one acre, near the mouth of Mullet Creek. The early terracing of the site remains with considerable slag in evidence, although most of the structures have been moved or demolished. Three arches of the old retort house survive, also the large water storage tank into which water was pumped from the dam, and the former general office building "Lakeview". The new stack built in 1906-7 at Port Kembla has yet to be traced.

The cuttings and embankments for the old railway track which was constructed to bring coal from the South Kembla or Fleming's mine are also clearly visible at a number of places and the remains of the jetty at Kanahooka Point survive.

History

The history of the smelters is closely connected with that of the projected Lake Illawarra Harbour Scheme. The first project of the Illawarra Harbour and Land Corporation found in 1890 was the export of coal from what is now known as South Kembla colliery from a wharf on Lake Illawarra between Elizabeth Point and Tallawarra Point. For this a railway 5! miles long was constructed, although never used for its original purpose.

In 1895 the Illawarra Harbour and Land Corporation changed its objectives and its name. Now the Australian Smelting Company, it went ahead with a plant to treat sulphide ores (by the Marsh and Stocker patent) from Broken Hill, from the Company's own mines in New England and Orange, N.S.W. Soon ores from Chittagoe and Mount Morgan (Queensland), Cobar and Captain's Flat (N.S.W.), Zeehan (Tasmania) and Western Australia were being treated.

Flux came from the Carrington Mine at Goulburn, iron stone from Marulan, Breadalbane, Mittagong and Carcoar. Coke was obtained from the Mount Pleasant cokeworks (q.v.) on its earlier (1889) site. The South Kembla colliery surprisingly appears to have contributed no fuel.

The first plant was erected in 1895 under the supervision of G.H. Blakemore, metallurgist in charge of blast furnaces at Broken Hill.

In the annual report of the Engineering Association of New South Wales in 1897, reference is made to the Dapto Smelting Works. It refers to three large floors each capable of holding 4000 tons of ore. Two copper blast furnaces were being erected. The blast furnace flue was 960 feet long, 10 feet high, 8 feet wide with walls 1¼ feet thick. This led to the 160 feet stack built with 221,000 Hurstville bricks. The stack for the roasting furnaces was 180 feet high.

Telephonic communication had been installed, as was also electric light - the works being the first in Australia to enjoy the latter amenity.

The bricks for the flue were "sandstock" of inferior quality and made on the bank of Mullet Creek. Small openings at intervals along the base of the flue-wall gave access to the interior from the floor of which a thick deposit containing valuable minerals would be raked periodicajly. This process was regarded by the men as being extremely dangerous owing to the overpowering heat and fumes.

A description of the works in about 1900 by an employee is quoted by the Rev. Bro. J.P. O'Malley:

"The main plant of the Smelting Works consisted of three blast furnaces, roasting plant, refinery, sulphuric acid plant, steam engines, blowing engines, pumps and a foundry. The lead concentrates were purchased from Broken Hill. Silver ores and gold were sent by sea to Sydney from Zeehan and Mt. Morgan respectively. I well remember that a large quantity of telluride ore from Western Australia was treated during my time at the works. Later the W.A. Associated and Horseshoe Companies had their own Assay Office at Brownsville.

The products from the works were Dore bullion (gold and silver conglomerate), soft lead and a high-grade copper matte containing gold, silver and lead.

The sulphuric acid plant which sent its output to Elliot and Co., was not long in operation."

A change of management took place in 1902 and the difficulties in ensuring ore supplies which were to bring about the collapse of the Company appear to have followed shortly after. The valuable telluride ores from Western Australia ceased to be sent to Dapto, since the Associated and Horseshoe Companies of W.A. built their own smelters, Broken Hill lead ores were being lost to German competitors, and Cockle Creek smelters at Newcastle were beating Dapto in the competition for ores. A final attempt to ensure ores was made when a nickel-processing plant with a 190' stack was erected to treat nickel ores from New Caledonia. The Consolidated Nickel Company erected its own smelters and the Dapto nickel plant never began operation.

In 1905 the Dapto works was closed, its plant and buildings to be transferred to Port Kembla. A railway embankment and works including a new brick stack were erected at the Port Kembla Smelting Company's works. Then in October, 1907, all work ceased and the Company finally went into liquidation in 1909 after ten years of effective operation.

10.7 The Port Kembla Steelworks

History

The Steelworks at Port Kembla, later known as Hoskins Kembla Works, was established in 1928 by Hoskins Iron and Steel Ltd. of Lithgow. In that year, to finance the construction of the new plant, a new company, Australian Iron and Steel Ltd. was formed.

At Lithgow, G and C Hoskins Ltd. had in 1907 taken over an iron and steel making enterprise consisting of a new blast furnace plant and an ironworks producing wrought iron and some steel. The plant was expanded by the construction of beehive-type coke ovens in 1912, a second blast furnace in 1913 and three open hearth furnaces by 1916.

Lithgow coal did not make a strong metallurgical coke and considerably restricted ironmaking operations. The coking qualities of Southern coalfield coal - particularly the Bulli seam - were known and South Coast beehive coke was railed to Lithgow from Federal, Mount Pleasant, Bulli and Illawarra coke ovens at Coal Cliff.

In order to obtain an independent supply of South Coast coke, the Hoskins company took an option over coal leases at Wongawilli, 4.8 km west of Dapto and south of Mount Kembla. These exploited the No. 3 or 'Dirty' seam which, although containing many stone bands, was found to be hard coal and from samples taken in 1911, to be strongly coking.

G and C Hoskins purchased the Wongawilli Colliery holdings in 1916 and commenced development of the mine. A private railway 4.7 km long was constructed from the mine to the Government railway at Brownsville, 1.2 km. north of Dapto railway station where sidings were opened on October 25, 1916 and the Company acquired a locomotive to work the branch.

The construction of coke ovens was begun, the first six being in operation in 1917 and the number increased to 66 by 1924 and to 120 by 1927.

The South Kembla Colliery adjoining Wongawilli to the north was acquired in 1933 substantially increasing the capacity of the Wongawilli mine.

By 1920, 50 per cent of the coke consumed by the blast furnaces at Lithgow was from the South Coast. This traffic emphasised the restricted capacity of the main Illawarra railway as well as adding to the overwhelming freight burden of steel-making at Lithgow.

It was with increasing freight rates in 1921 that the by now Hoskins Iron and Steel Co. Ltd. decided to investigate Port Kembla as a possible site more suitable than Lithgow, being near the southern coalfields and shipping facilities as well as closer to Sydney.

In 1921, 153.8 ha. of land were purchased immediately southwest of the land resumed by the PWD and the new Government railway through Cringila to Port Kembla and 4 km. from Port Kembla harbour. A strip of land was leased from the PWD at the harbour to enable an ore unloading jetty to be built, subsequently known as No. 2 jetty, alongside the site of the old SCC coal loading jetty, the remains of which were demolished in 1925 to make way for the new jetty completed in 1928.

Once the decision was made to establish an iron and steel plant at Port Kembla, the source of supply of ore and limestone had to be considered. Leases for these materials were held inland to the southwest of Port Kembla; and as the shift of location from Lithgow to Port Kembla was largely to reduce the cost of freight, it was realised that a cross-country railway connecting Port Kembla with the Main Southern line would reduce the rail distance to Goulburn - in the vicinity of which there was both ore and limestone - by 160 km. Such a line would also serve to reduce freights for rail transport south as far as Victoria.

The main material concerning the Hoskins company was limestone from Marulan, where leases had been obtained in 1916. By 1922 the deposit was being developed and a 7.2 km. branch railway from the Main Southern railway was under construction. The hoskins enterprise had some doubts regarding iron ore from inland as to quality, quantity and cost of extraction and began to think about buying iron ore from BHP at Whyalla. The lease was taken out at Port Kembla harbour for the raw materials unloading jetty in 1922, at the same time as the land for the works site was procured. A trial quantity of Whyalla ore was taken to Lithgow in 1925.

The Depression of 1930 to 1932 caused considerable curtailment of construction and reduction in operations, nevertheless, the first open hearth steel furnace was made operational in 1931, together with six soaking pits, bloom mill and the rail and structural mill. The General Office building was completed at the same time.

In contrast to the 4 km. haul for incoming iron ore from the jetty, the steel plant layout was on the European pattern of the time: very compact, with the centre line of the mill run out at 45° to the line of steel furnaces, allowing the steel from ingot to finished product to be handled by live rolls or crane and thus eliminating the need for interdepartmental rail transfer.

Finished products were despatched by rail from Unanderra and for shipment, exchange sidings were laid in at Port Kembla with the PWD 4 km. from the mill run out loading bays. From here the PWD shipping facilities were at No. 4 jetty which was extended in 1929 to provide four berths with 7.6 m. to 10.7 m. of water and thus accommodating ships up to 10,000 t. capacity which was fully utilised by the local Port Kembla industries together with shipments from AIS. No. 2 jetty was utilised for steel shipment when not occupied with raw materials. However, the PWD commissioned a second all-purpose jetty in 1940 and a third, No. 6, in 1957.

Recovery from the Depression coincided with the closing down and demolition of the Lithgow works and re-erection of re-usable plant and buildings at Port Kembla. Also at the same time came completion and opening of the Unanderra to Moss Vale line in August, 1932.

The 18-inch Mill and Sheet Mill were re-erected at Port Kembla in 1933 and the remaining four locomotives from Lithgow added to the fleet, but at the same time one of the earlier locomotives was withdrawn from service, leaving a total of 12 - 11 ex Lithgow.

The second steel furnace commenced operation in October, 1933, together with another three soaking pits, while the electrically driven 10/13 inch Merchant Mill was completed in January 1934.

10.7 SITES AND RELICS

The site of Australian Iron and Steel's Port Kembla works has grown considerably since 1928 and especially since steel production began in 1931. However, the whole group of buildings forming part of the original works survives and is still in operation including blast furnace No. 1 and its associated shops, Merchant Mill No. 1 with its bloom mill, and a billet mill still powered by a superb Galloway steam engine. The first continuous hot press in Australia is still in use; the early spun pipe equipment was sent to Bowen, Queensland.

Some of the old locomotives from the works were recently sent to the Illawarra Light Railway and Steam Museum Society at Albion Park.

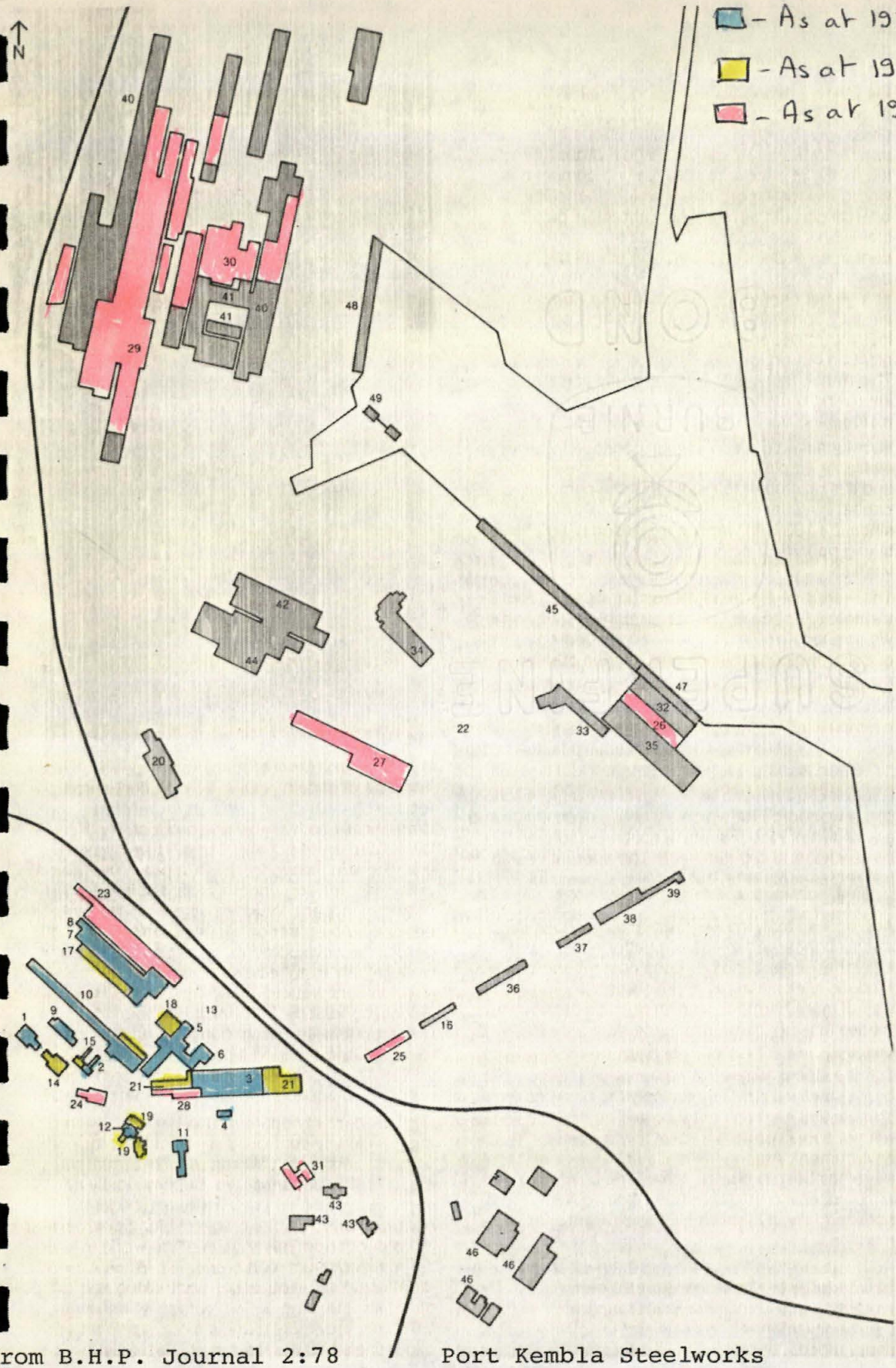
Part of the harbour works and jetties are also original.

Of particular historic significance are the following:-

No. 1 Blast Furnace[1] which produced its first steel in 1931 after G. & C. Hoskins moved from Lithgow to Port Kembla with its associated centrifugal Spun Pipe Plant[11], Bloom Mill[6], 914 mm (36") and 36" Mill[5], now Rail and Structures Mill, and Merchant Mill[8].

Hot Roughing Mill[29], opened in 1955 by Sir Robert Menzies as beginning of the major expansion of the Flat Products discussion (following B.H.P.'s discussion to expand in the late 1940s).

Tin Mill[30] providing first Australian production of tinplate, followed by the Electrolytic Tinning Line.



From B.H.P. Journal 2:78 Port Kembla Steelworks

1. Blast Furnace No. 1 (1928) (10.71)

5. 36inch Mill (Now Rail and Structures Mill) (1931) (10.76)

6. Bloom Mill (1931) (10.75)

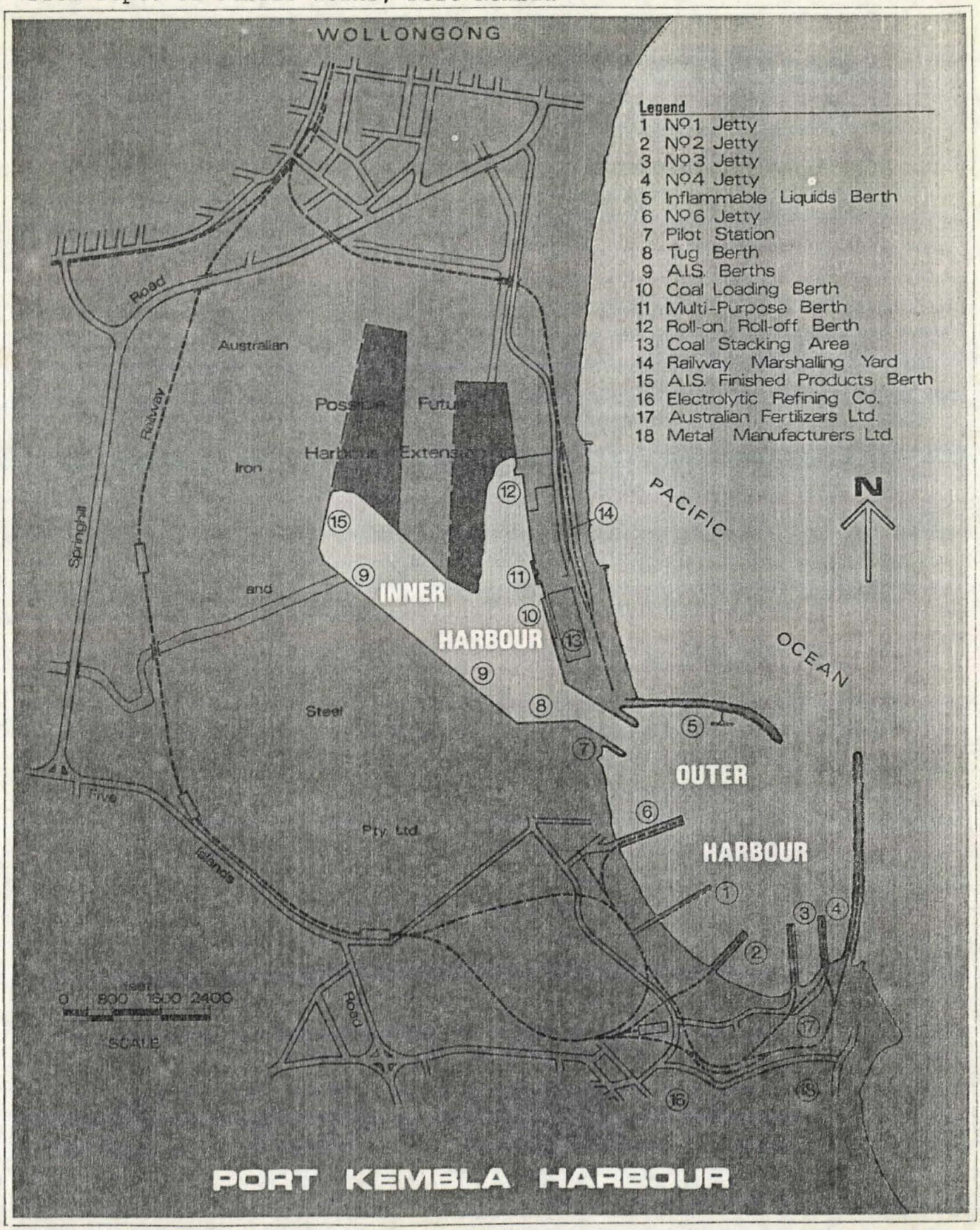
8. Merchant Mill No. 1 (1934) (10.78)

11. Spun Pipe Plant (1929) (10.7111)

29. Hot Roughing Mill (1954) (10.79)

30. Tin Mill (10.711)

From Dept. of Public Works, Port Kembla



LUDENNAM
ELMSHALL PARK
BADGERY CREEK
SOUTH CK
HINCHINBROOK
CABRAMATTA
MOULSEY
REISSELLY CK
COATE PARK
LOWE'S CK
EASTWOOD
VERMONT
CURTIS PARK
COBBITTY CK
HARRINGTON PARK
NARELLAN CK
BROWNLOW HILL
NARELLAN
CAMDEN
GLENLEE
WEST CAMDEN
CAMDEN PARK
UPPER CAMDEN
MENANGLE
RIVERSFORD
SOUTH CAMDEN
ROSSLYN
MELROSE
MORETON PARK
LOWER PICTON
PICTON
CLIFTON
JERVIS FIELD
DOUGLASS PARK
WILTON
THE ROUND HILL
SUGAR LOAF
PHEASANT'S NEST
EAST BARGO
NEPEAN RIVER
CORDEAUX RIVER
CALMSLY HILL
CECIL PARK
HOXTON PARK
BERNERA
LEPPINGTON
YARRAWVILLE
ST ANDREW
BUCKINGHAM
CAMPBELLTOWN
GLENCORE
MOUNT SUGARLOAF
GILEAD
OUSEDALE
MALTON
APPIN
Bingles Falls
LACHLAN VALE
CATARACT CREEK
CATARACT RIVER
KENTISH CREEK
GOONDARRIN CREEK
CREEK PADDOCK
GENEY VALLEY CK
SCHOOL CK
IRISHTOWN
LIVERPOOL
CARRAMATTA CREEK
COLLINGWOOD
MACQUARIE FIELD
GREAT SOUTHERN RAILWAY
GEORGES RIVER
WILLIAM CK
DRAPERS CK
LITTLE FOREST
BOTTLE FOREST
WORONORA
O'HARES CK
STARWELL PARK
BULGO
COAL CLIFF
LONG PT
BULLI OR WONIORA PT
BELLAMBI PT
TOWRADGI PT
Line of Conduit
"The Sydney Wate
Trial Section prop

LITHOGRAPHED AT THE SURVEYOR GENERAL'S OFFICE, SYDNEY, N.S.W. MAY, 1869.

12. Sea Routes and Harbours

Illawarra Harbours and Jetties

The inhospitable coast of Illawarra is notorious for its lack of good anchorages and both Captain Cook and Matthew Flinders attest to the difficulties of landing on those beaches. Small bays and reefs give some protection from the southerlies--Coal Cliff, Bulli Point, Bellambi Point--but the natural harbours were for most of the 19th century, the key to coastal trade ie. Wollongong, Shell Harbour, Kiama and south to Gerringong. Even so, all those harbours needed extensive improvements as well as aids, and the story of those successive changes can still be clearly read in the surviving structures.

Wollongong was the first to receive attention. A breakwater planned in 1834 was abandonned in favour of a basin with a pier forming its northern side which took seven years to complete. stanchions for the mooring chains, used during this period to cut the speed of ships under sail can still be seen.

Its second major improvement was the construction of the Belmore Basin completed in 1868, which comprised 3 high oval staithes for coal loading with railway connections to the Mt. Keira and Mt. Pleasant railway lines and much increased wharfage. Essentially the layout of Belmore Basin today is that of this sound phase.

Its third additions came in 1880-5 with the addition of the Tee-Jetty and steam crane, as well as the 1881 seawall constructed for greater protection, and two extra staithes.

Kiama, like Wollongong, began in a small way for coastal trading in butter, milk, passengers and other goods but expanded with the export of blue metal. The Robertson Basin, to allow for increased capacity, was excavated out of solid rock, and

was opened in 1876.

Shell Harbour was particularly important as an outlet for produce of the Macquarie river, but only in 1858 was the jetty built which allowed efficient shipment of goods. The second jetty, which was larger, was completed in 1874.

Three lighthouses were built. The first in 1872 at the end of Wollongong breakwater, a second at Wollongong in 1937 and one at Kiama near the Blowhole in 1887.

By the later 19th century Wollongong Harbour was proving inadequate for increasing shipments of minerals from the Illawarra. In 1890 therefore the Lake Illawarra Harbour scheme was undertaken whereby coal was to be exported via a railway line from mine to Tallawarra Point where a dredged channel was to allow access to large ships. Breakwaters at the entrance to Lake Illawarra were to facilitate entry. The Dapto metal smelters developed in association with this scheme which rapidly foundered however because of the shallowness of the entry. Thus the development of Port Kembla and the transformation of Tom Thumb Lagoon into a major industrial harbour.

North of Wollongong Harbour a series of jetties were built from 1860 onwards to facilitate the loading of coal daily into ships--first from horse drawn tramways into sailing ships and paddlewheelers then from steam driven locos into steamers wheelers and their offshoots--Bellambi, Bulli and Coalcliff. Unfortunately when the main line trains came through the coal trade moved away from the sea and all those jetties were demolished by the mid 20th century.

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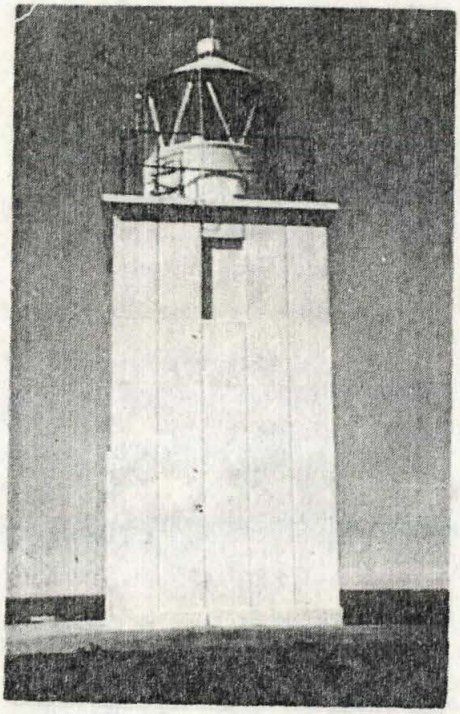
CAPE BAILY:

The last "Illawarra" (again technically outside the district) light to be commissioned went into service on 21 December 1950. Constructed by Golding Constructions Pty. Ltd. of Matraville it cost £6,500 ($13,000) with an additional £2,717 ($5,434) for plant and equipment.



CAPE BAILY (C. LAW, OCTOBER, 1972)

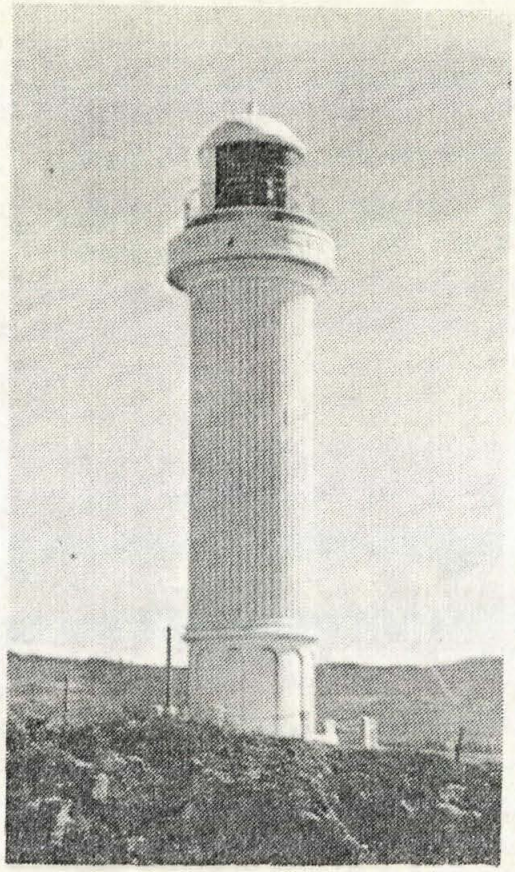
The Department of Shipping and Transport advised the light was needed as a navigational aid for ships northward bound and keeping close in shore to avoid the strength of the south flowing east coast current.

The light stands on Cape Baily south of the entrance to Botany Bay and was named after the Cape.

The name Cape Baily is shown on an Admiralty map dated 1867, revised to 1885, but extensive research by the Sutherland Shire Historical Society and the I.H.S. has not been able to determine satisfactorily who was the person or place from which the Cape received its name.

WOLLONGONG HEAD:

The post economic depression trade revival of the mid 1930's with the consequent expansion of harbour traffic at Port Kembla (nominated by the N.S.W. Government 40 years previously to be the principal port of Illawarra) was the impetus for the erection of the new lighthouse on Wollongong Head. It is located slightly south east of the old Breakwater tower.

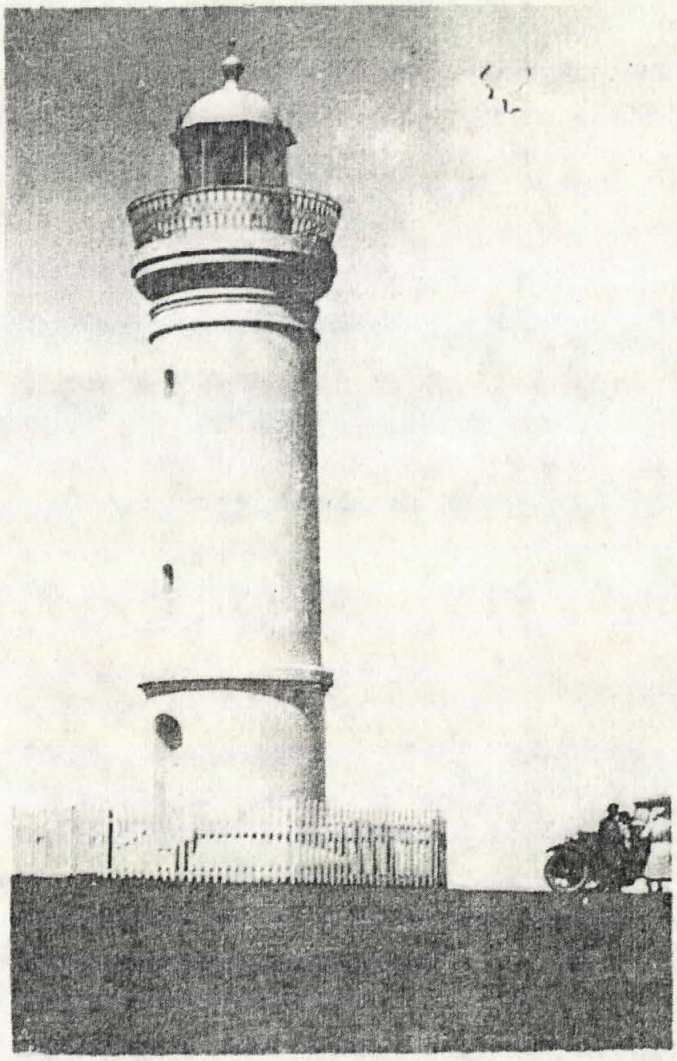


WOLLONGONG HEAD — C. 1953

The Department of Shipping and Transport was responsible for the erection using local labour under the supervision of the Department's Lighthouse Foreman, Mr. Sweney. The structure cost £6,800 ($13,600) with plant and equipment £2,607 ($5,214).

Ready for service in October 1936, like its elder sisters on the Breakwater and Kiama there was a delay before use.

In July 1937 a temporary acetylene gas light was employed whilst awaiting the arrival of the electric apparatus from England. The Pilot's diary of July 1937 recorded on Monday 12 the light



KIAMA, 1928 (WOLLONGONG PUBLIC LIBRARY)

are no less diverse. To those who have journeyed for a lengthened period over the ocean, the cry of "land" comes not only as a relief, but sends a thrill of joyous anticipation through the hearts of the voyagers. The desired haven may be many hundreds of miles from where land is sighted, and when "Night's hemisphere had veiled the horizon round" the anxious mariner on our coasts looks for some friendly light to lead him on. The various Australian governments with eager rivalry have endeavoured to supply these beacons,

and 18 automatic lights. It did not take over the lights on Wollongong Breakwater and at Crookhaven Heads which are still the responsibility of the M.S.B. All local lights with the exception of Cape Baiiy are maintained from the land.

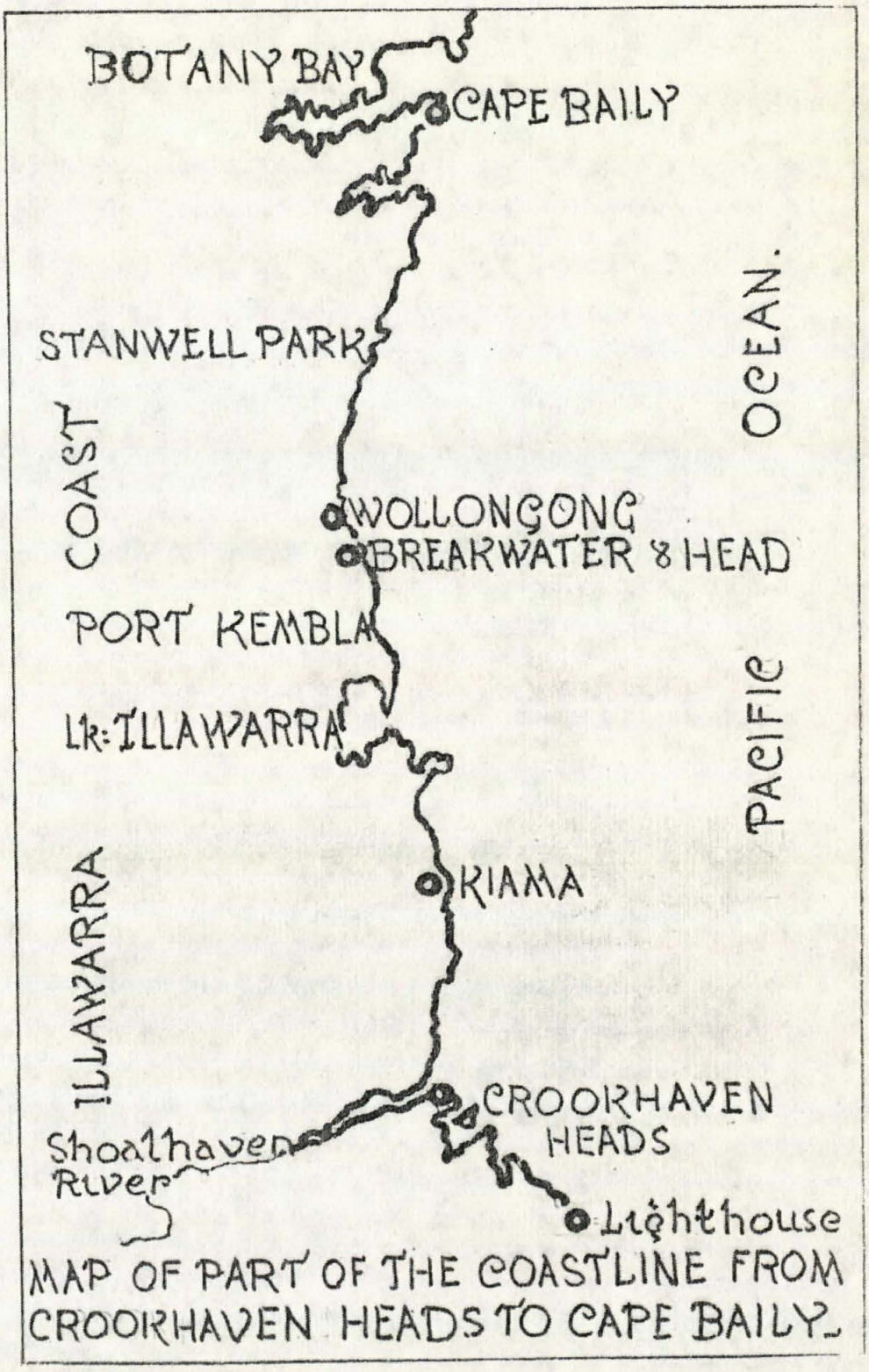
The Commonwealth acquired the Kiama installation and has since provided lights at Wollongong Head (1936) and Cape Baily (1950) — infra.

CROOKHAVEN HEADS:

Farthest south of the Illawarra lights (and "technically" outside the district) it was the second established but not always on the same site.

A Pilot Station was commissioned by the N.S.W. Marine Board on 1 February 1872 with a Pilot and four boatmen, the light quaintly and yet most accurately "keeps the light".

CROOKHAVEN — C. 1908



MAP OF PART OF THE COASTLINE FROM CROOKHAVEN HEADS TO CAPE BAILY.

C. 1890 — I.H.S. COLLECTION

Undoubtedly there was some artificial aid to the pilot in his nocturnal duties but it has also been advanced that the old-time skippers came in on their own skill and local knowledge.

However, one year after refusing the Borough Council's request for a better light, Captain Hickson, Superintendent of the Pilot Board, arrived in January 1867 to investigate the placing of a better and more suitable light on the wharf, presumably opposite

12.1 Wollongong Harbour

12.11 Belmore Basin 1859/60-1868

In 1859 plans and estimates for additional harbour accommodation at Wollongong, prepared by Mr. Moriarty were approved. In August 1861 the steamer 'Kembla' brought down the necessary plant and work began. The size of the original proposed basin was increased during the work to 455 ft. by 153 ft. and three high level staiths were constructed for coal loading (being used by the Mr. Keira and Mt. Pleasant mines).

During the years of the construction work a temporary jetty was used c1864-68, a timber construction 550 ft. in length. The Belmore Basin was officially so-named and opened on Tuesday 6th October 1868, being still used to the present day. The cost of the enterprise was 44,892.

(Gardiner Garden 1975,)
(Eardley 1968, 9(A)).

The second courthouse to be used in Wollongong, built in 1858, became the office and residence of the Custom's Officer of the port in 1885 (when the Dept. of Justice moved to a new courthouse in Market Street). Added on to the back of the Custom's officer's residence was the earlier customs house, a weather board building to be used as a kitchen, with the addition of a chimney).

In 1901, with the commonwealth customs activities were transferred to Port Kembla and with the Preference Act of 1911 the customs headquarters became the Military Area Headquarters of the District and has continued to be a military establishment ever since.

(Gardiner Garden 1975,26-7,49)

12.12 Fortifications

Signal Hill - (Flagstaff Hill)

In 1890, a gun pit 45 ft. in diameter, with an access tunnel and chambers for ammunition, stores and quarters for the gun-crew was built on Signal Hill. A 6 inch breach-loading pneumatic disappearing swivel gun was mounted in the pit.

Access was bricked up and the pit filled in during 1950.

(Gardiner Garden 1975,47)

Wollongong harbour

2.13 Tee-jetty

Built in 1880 for a crane operated by a steam winch and vertical boiler. The jetty was of heavy timbers, the crane column being on a substantial concrete base, which remains.

Tee-jetty was reported to be in ruins in 1923, but the date of demolition is not reported (Gardiner Garden 1975,40)

2.14 Masonry sea-wall, 1881

The masonry sea wall, 12 ft. high, runs from near the beginning of the breakwater to the cliff formation (just beyond where the coke ovens were) and a stone in the walls bears the inscription 'Erected 1881'. Two other walls, one 12 ft. high, of rubble and one 4 ft. high rubble embankment connected the sea wall with Pulpit Rock and Pulpit Rock with the base of the cliff.

The sea wall and the 12 ft. rubble wall remain.

(Ill.Hist.Soc. or Gardiner Garden 1975)

2.15 Wollongong Harbour Trust League 1889

2.16 The Harbour Trust planned two breakwaters and substantial land reclamation in the harbour area, but little of the plan was put into operation. A short breakwater about 80 yds. long running north of the Breakwater Light remains and "some evidence remains today of the start made of the northern breakwater nearby to Pulpit Rock" (Gardiner Garden 1975, 45-7)

2.17 Fishermen's Co-op

No details of date etc. yet found. In the report on Wollongong Harbour development it is referred to as:-

"a dilapidated cargoshed" at least 50 years old.

a weatherboard building, previously used by a now defunct shipping company. A shed however in the same location is clearly shown on an undated map of the mid-late 19th century.

2.18 Lighthouse

commissioned in 1871 and completed in 1871-2 the lighthouse was designed by E. U. Moriarty, Engineer-in-Chief for Harbours and Rivers. The illuminating apparatus, originally lit by acetylene gas was in 1916 changed to provide an electric group triple flashing light which went into operation on October 1st, 1916.

(Gardiner Garden 1975, 38)

Wollongong Harbour

First harbour basin and pier

Built by Capt. George Barney, Wollongong's first harbour basin, semi-circular with a pier forming its northern side was built with convict labour between 1837 and 1844 (the first stone being laid in 1839) at a cost of 3,500. The basin was excavated through solid rock and the pier was faced with stone.

Dimensions

from the point of the pier to the bank of the basin 300 ft. from the point of the pier, across 350 ft. basin itself being 150 ft. broad at the base at low tide 8 ft. of water in the basin, at high tide 14 ft. of water in the basin (Gardiner Garden 1975,17-19).

A second pier was built in 1856, a timber structure projecting from the south side of the basin (ibid,21).

12.110 The stone steps in the eastern section of the structure are said to remain

(Ill.Hist.Soc. report re: Wollongong Harbour development)

Illustrations

Gardiner Garden (1975)

Mitchell Library : T. G. Sawkins (nid.) view of jetty and steamers

12.111 ### Ladies Baths/Old Chain Baths

In 1856 there was already a ladies bathing house at Flagstaff Point, Wollongong harbour, some improvements being made in that year with dressing rooms added, and some large stones moved to form a barrier to large waves. The area once had a chain spanning the barrier built between the rock formations to enclose the water, hence the name 'Chain baths' or 'Ladies baths'.

(Gardiner Garden 1975,22-24)

13. Land Communications

Land Routes

From Charles Throsby's first discovery of the rich grazing land of the Illawarra coastal plain a dominant theme of its regional history was to be and to remain the difficulties of its landward approaches. The lack of natural harbours giving shelter from the pounding surf was a problem anyway; the towering scarp of 300 and more metres and the rocky swampy and ravined plateau behind with its innumerable rivers and creeks proved more difficult again.

Between Throsby's first track of 1815 and the present system of roads a number of successive routes were tried and used, most to be abandonned in due course. Remains of several of these can still be found in the bush. Recognition of the following points makes their successive roles and time spans more comprehensible.

1. Blazed Tracks versus Wheeled Vehicle Roads

There is a clear distinction between a track, whether blazed only, or cleared, which is usually suitable only for those travelling by foot or on horseback, with the passage of goods by pack horse only, and a surveyed and made line of road suitable for wheeled vehicles such as passenger coaches or carts and drays. From 1815 until 1834 the settlers of the Illawarra coast were hard put to it to maintain two of the former in a useable state (first Throsby's Bulli track, then after 1821 Cornelium O'Brien's southern track) and only in the later 30s was a road built (Mitchell's Mt. Keira road) along which drays could travel - but only if roped from trees along the road. From 1840 onwards this road appears to have been increasingly used by wheeled vehicles, but it is evident that strenuous attempts to improve the approach roads to the point where they could accommodate regular mail and passenger coaches did not occur before the arrival of the Great Southern Railway from Sydney to Campbelltown in 1857.

2. Horse, Steamer and Train-Coach Routes

Even when viable approach roads had been made their use and direction was dictated by a range of factors outside regional control.

In the first place, because the earliest expansion south from Sydney lay through Liverpool to Appin, the accepted land route from the Illawarra to Sydney was the circuitous one via Appin and Campbelltown, a journey of about 70 miles, and some 30 miles longer than the much later direct route across the Georges River. Before 1857, in spite of the intermittent coaches appearing in the 40s, most passengers preferred to travel by steamer, avoiding the terrible surfaces and steep descents of the land journey.

In 1857, with the coming of the Great Southern Railay, however roads improved and linked coach-train services set up, all still via Appin to Sydney. The fashion swung away from the steamers, and from 1857 to 1887 road and rail travel boomed; in 1871 the first dog cart reached Sydney by the direct route by punt across Georges River, and this road also got increasing use.

In 1887, the Illawarra railway revolutionised transport along the coast. Use of the roads across the plateau dwindled once more-many of the roads themselves being submerged in the early years of this century by the dams successively built for Sydney's water supply.

The revival of road transport with the coming of the motor vehicle marked the 1920s. The road pattern was largely that of previous phases apart from the deviations due to the dams, and the long-departed importance of Appin.

3. Physical Topographical Features

The physical difficulties responsible for the variety of tracks and roads from the coast to Appin until the 1880s can be grouped as follows:-

a. The Scarp

At the coast end, the scarp could only be crossed at a

limited number of points because of its steepness. The first line, Throsby's, and the last, Captain Westmacott's, were both located at the north end of the coastal plain near Mt. Bulli, where the coach road managed to achieve a grade of one in five. Not far south was Rixon's Pass, closer to the town of Wollongong but with grades of one in two and a half. The more southerly routes, McEvoy's (1847), Mitchell's Mt. Keira route (1834) and the earliest of them, O'Briens route of 1821, all utilised the more broken country to the south and west of Wollongong to achieve an easier climb but at cost of longer distance.

b. The River Crossing

Near Appin again was a choice of river crossing. The most northerly route (and the one giving the most direct access to the coastal plain north of Wollongong) was the old Appin-Bulli route which avoided crossing the difficult Cataract River altogether although thereby necessarily crossing the Georges River at Kings Falls. The most southerly, Mitchell's route crossed the Cataract at the comparatively easy Broughton's Pass ford while McEvoy's and Rixon's roads crossed it much further upstream where the reservoir now is. The most difficult crossing was that used by O'Brien's road at Jordan's Pass -a spectacular and daunting sight even today!

The road used by the Appin coach in its last days took a variant of the early direct route, via the Bulli pass and Sherbrooke, then joining the line of Rixon's road.

Throsby's Track (and Bulli-Appin Road)

This was the most northerly of the Bulli group of routes from Appin, and remained the only one used in the Bulli area until Captain Westmacott's discovery of an easier track a mile or two south in 1844. Thereafter, the two routes continued in use together until Captain Westmacott's increasingly superseded it from 1859 onwards.

Throsby's route, not mapped by him, is presumably that followed by Surveyor-General Oxley and James Meehan in 1816, for which Meehan gives bearings to mountains A, B and C (Sublime Point, Brokers Nose and Mt. Keira). Both these, and the line of track shown on Mitchell's Map of the day of New South Wales (1834) make it clear that this route descended the scarp north of Sublime Point (between Coledale and Wombarra where Denmark St. now joins the Lawrence Hargrave Drive-Marshall, Early Roads). It ran north-west to Appin well to the north of the Cataract River approaching via King's Falls. Its line is very close to the present Appin-Bulli road except for the section approaching the present Bulli Pass. The earlier track must have continued straight for the coast where the present road bends to the south (approx. 0606, Bulli 9029-11-N First ed. 1:25,000). It is interesting that Mitchell's map also shows a turn-off just before this proceeding to the north and east towards Scarborough and Coal Cliff along the line of the existing secondary road forking at 048064 (Bulli ibid.)

Westmacott's Pass (subsequently the Bulli Pass)

Discovered in 1844, this rapidly superseded the old Throsby's pass. It remained a bridle path until 1859, when the Illawarra Mercury reports it was cleared and improved by the mailman George Organ to the point where he could drive a vehicle up it. From then on it was the main north route, being properly upgraded in 1867 to become the Bulli Pass.

The route followed, apart from traversing the scarp, was much the same as the last.

The Sherbrooke - Appin Road

Sometime between the upgrading of the Bulli Pass in 1867 and before the construction of the Cataract Dam in 1905, a coaching road existed to Appin which passed through Sherbrooke and continued northwest along the southside of Cataract River, either to join the Appin-Bulli road (as shown in the Marshall's plan, which has Sherbrooke too far north) or more probably approaching Appin roughly on the line of Cataract Road. If the latter, it would appear that much of this line of road was the

same as the earlier coaching road, i.e. Rixon's, except for the section related to Bulli Pass and Sherbrooke. An old inhabitant recalled seeing these coaches passing through when he was a child in Sherbrooke School. This road is not marked on the 1869 survey of the area by the Surveyor-General for the Enquiry into the Sydney Water Supply Scheme.

Sherbrooke School was started in 1870 (as Bulli Mountain Public School) and in the 1880s there were 14 families in the settlement. The road is most likely to have flourished in the 70s and 80s when coach traffic to the railway at Cambelltown was at its peak. From 1887 such traffic must have dwindled, and in 1907 anyway the township of Sherbrooke was transferred to make way for the Sydney water supply schemes. The new road from Sherbrooke ran some 5 kilometres northwest to intersect the old line of Rixon's Road.

Ruins of Sherbrooke survive, although its fine stone school was removed to Milperra; the timber schoolmaster's residence burned in the 1968 bushfires.

13.05 Rixon's Pass and Line of Road

The most southerly of the northern passes was that discovered in 1847 by Ben Rixon, a line of road 7 m wide being cut to the top of the mountain in the following year. This route crossed the scarp between Bellambi and Woonona and ran between Cataract River and Cataract Creek just east of the present dam and following a line similar to that of Cataract Road to Appin. In this way it would have avoided crossing both the Cataract River and Georges River.

The location of early land grants, and ruins near Appin as well as old road surfaces on parts of the road substantiate that there was entry from at least three directs (i.e. from the West Appin-Bulli via Kings Falls, from the South via the Cataract Dam line of road, and from the South-West over both Jordan's and Broughton's Crossings.)

Ben Rixon's name occurs frequently between 1847 and 1859 as a road contractor sometimes on his own road, sometimes for the improvement of McEvoy's road (q.r.) which in 1850 was selected as the better of the two routes. However, in 1857-9, with the opening

of the Great Southern Railway, there was a renewal of interest and activity in Rixon's Road as being shorter and wheeled vehicles were in fact driven down the pass. The upgrading of Westmacott's Pass in 1859 ended its use for the mail coach and Rixon's Pass fell into disuse.

This line of road can be traced clearly on the County of Camden and relevant parish maps and there seems little doubt that this was essentially the line of road shown as the main coach road as the Post Towns and Roads map of 1859. It does not coincide closely with any of the existing Catchment area roads and tracks, although some parts can be overlaid. This presumably means it is still traceable on the ground.

03.07 McEvoy's Road

Just as Rixon's Road was a variant on the old Bulli Pass track, so McEvoy's road discovered by Thomas McEvoy also in 1847, was a variant on the southern Mt. Keira/O'Brien route. Partly because of complaints that floods at Jordan's Pass were delaying the movement of cattle, the new line kept to the left bank of the upper Cataract, between the Cataract River and Lizard Creek, thence crossing the Cataract River and Cataract Creek near their junction in the vicinity of the present dam, and continuing to Appin on Rixon's line. Southwards, it joined the Mt. Keira road already known just N.W. of the crossing of that road over Kentish Creek. Traces of it can be seen on the 1869 Water Board Plan and even on the existing Bulli 1:25,000 sheet, 9750 0090-0250.

Surveyor Labatt's enquiry into the respective merits of Rixon's and McEvoy's roads in 1849-50 chose the latter, with its descent from Mt. Keira, and work was carried out on this road from 1850-2. Thereafter, little is heard of it - possibly the Cataract crossing proved too difficult or the additional length had no compensating advantages and the 1857 enquiry returned to favour the choice of Rixon's Pass.

13.09 O'Brien's Road

O'Brien's Road was the second oldest of the approach roads to Wollongong, discovered in 1821, and was the first of the tracks to take advantage of the gentler descent via the southern mountains. O'Brien's route in fact was the most southerly of all, from Figtree

skirting Mt. Nebo before swinging north across Kentish Creek, keeping to the higher land on the right bank of Walandoola Creek to reach Appin via Jordan's Pass across the Cataract River.

This route remained a bridle track for many years, but was largely superseded after 1834 by the Mt. Keira Road. The line of it can easily be followed on the Bulli chart.

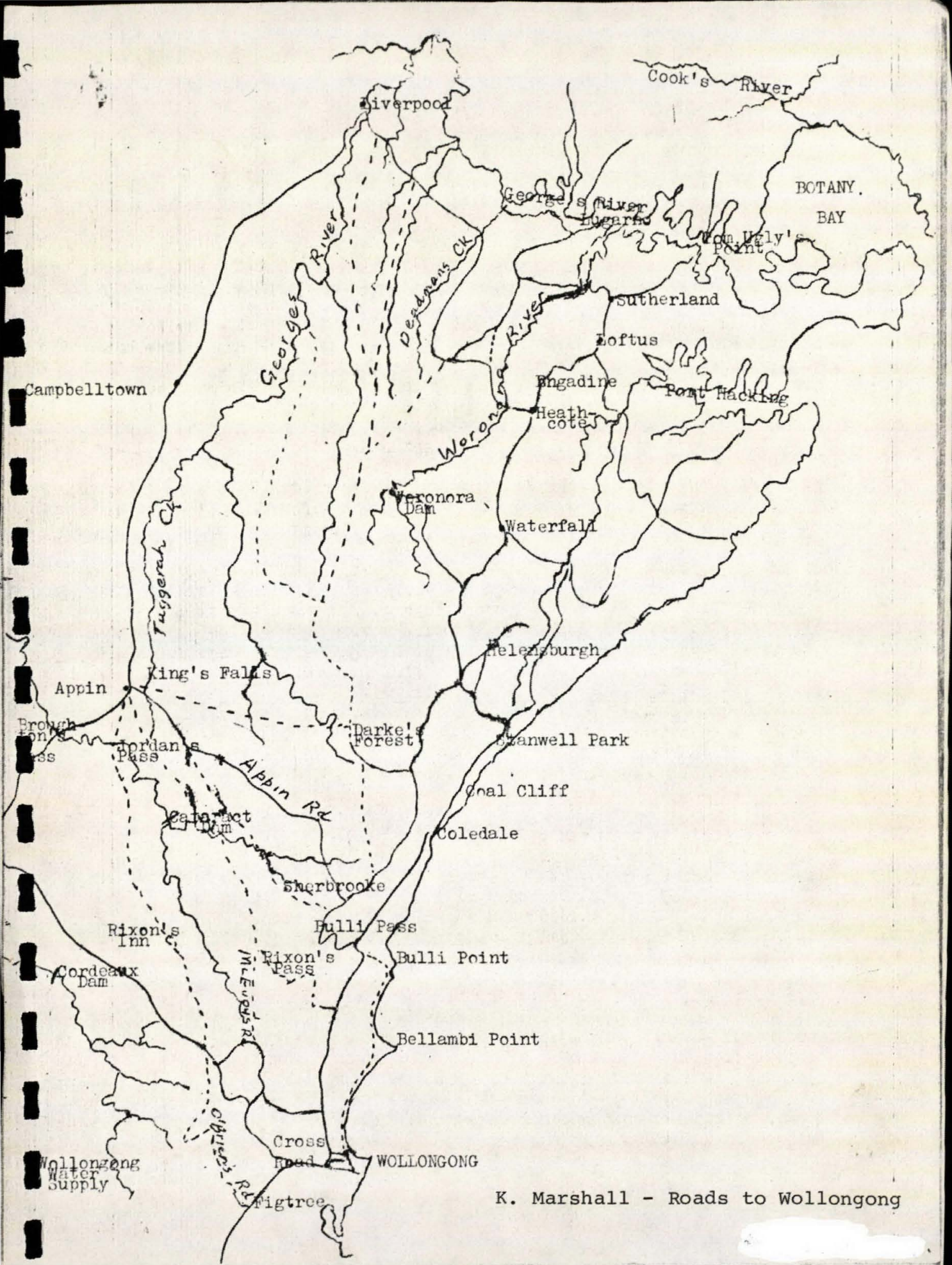
13.08 Mt. Keira Road

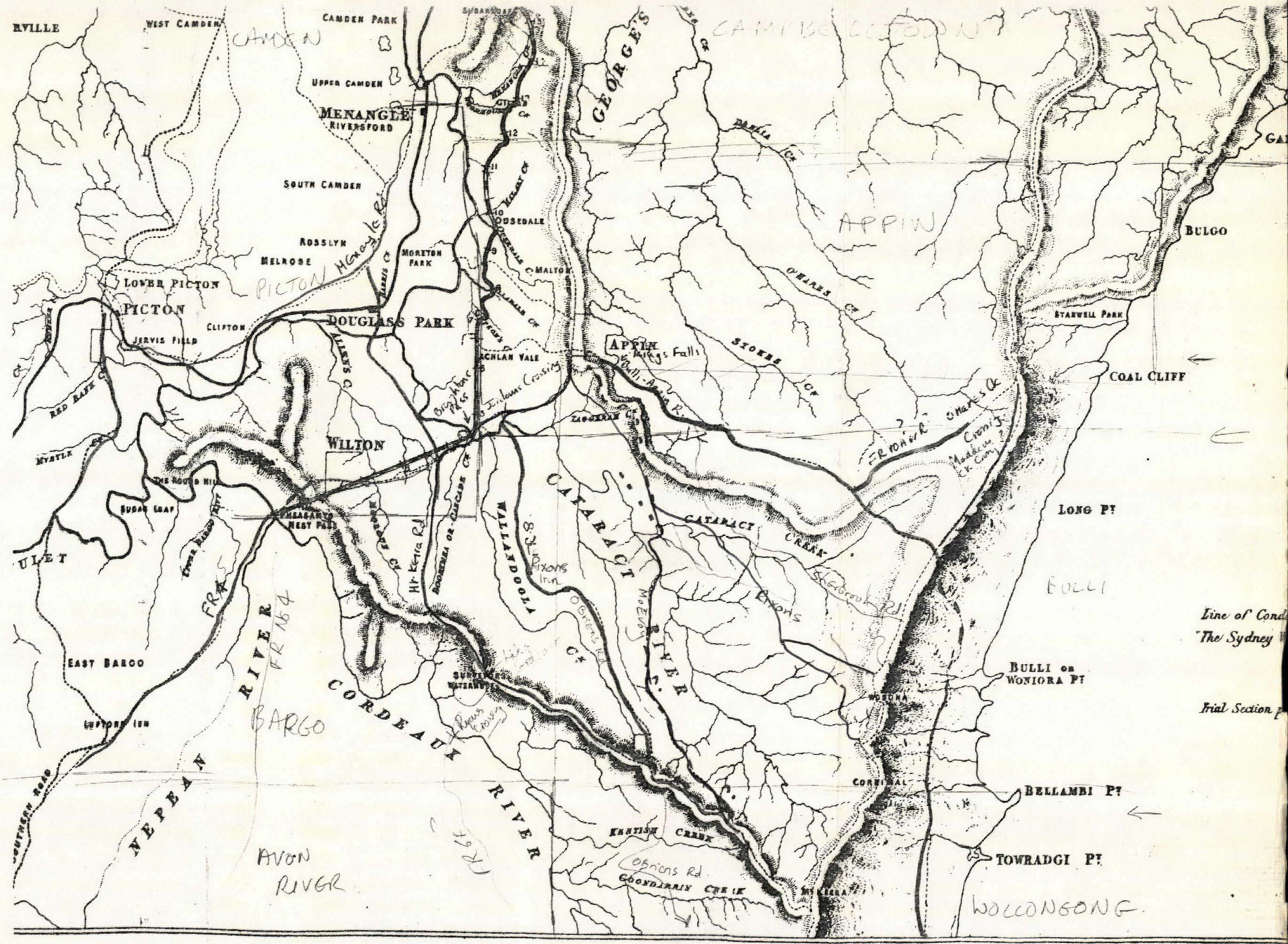
The new line which Surveyor G. Mitchell surveyed in 1834 was called, and so remains, the Mt. Keira Road. This followed some of O'Brien's line, but started from Cross Roads west of Figtree and skirted Mt. Keira rather than Nebo, thus proving both gentler in grade and shorter. Thereafter, instead of turning north-west along the right bank of the Cordeaux River before turning north just past Cascade Creek to cross the Cataract River finally at Broughton's Crossing, a much gentler gradient than Jordan's Pass.

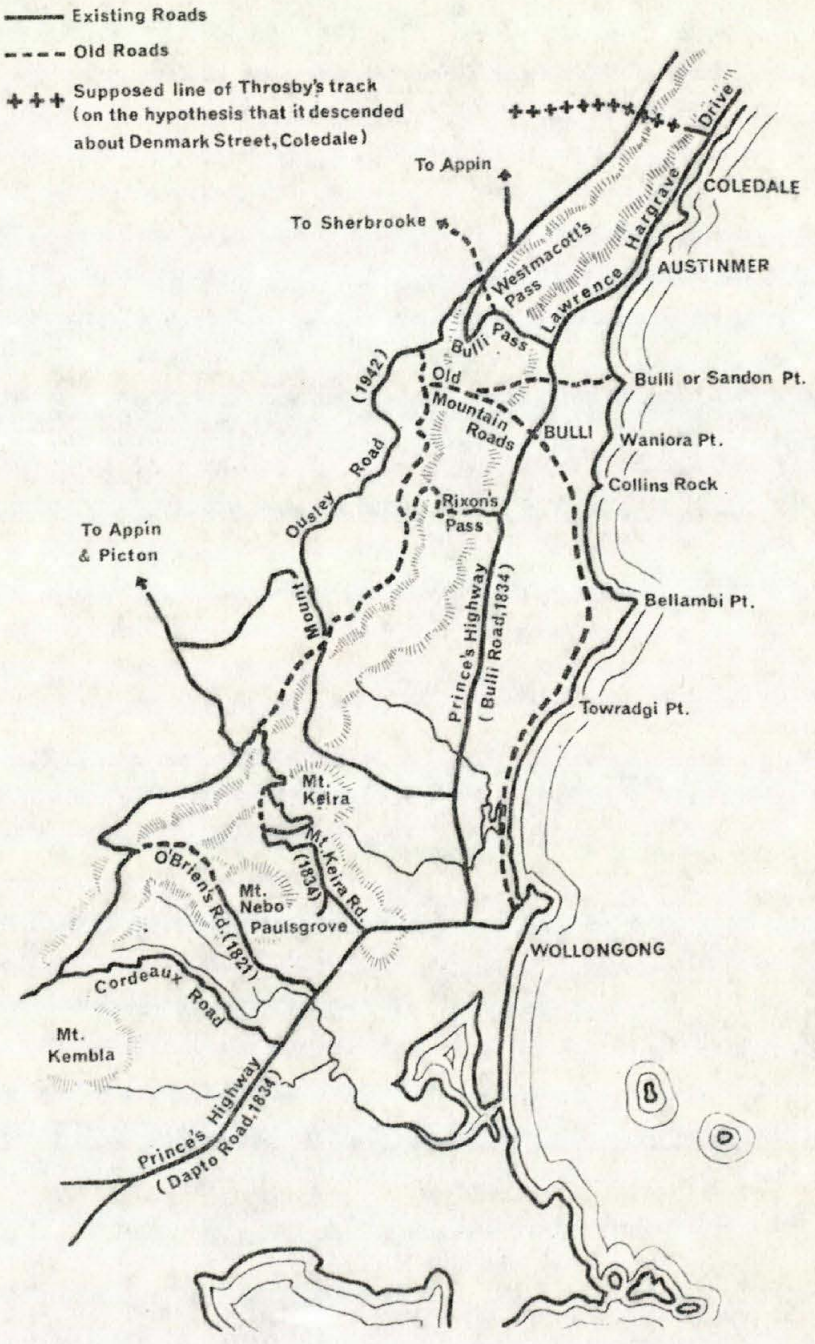
The line of this survey can be clearly seen as Mitchell's map of 1834, and also in the Water Board's map of 1869. The Mt. Keira Road in town remained the main approach to Wollongong throughout the 1930s-50s apparently yielding precedence when the coaches servicing Campbelltown via Appin wanted a shorter, faster and more scenic route.

13.12 Major Mitchell's Georges River Road (Princes Highway)

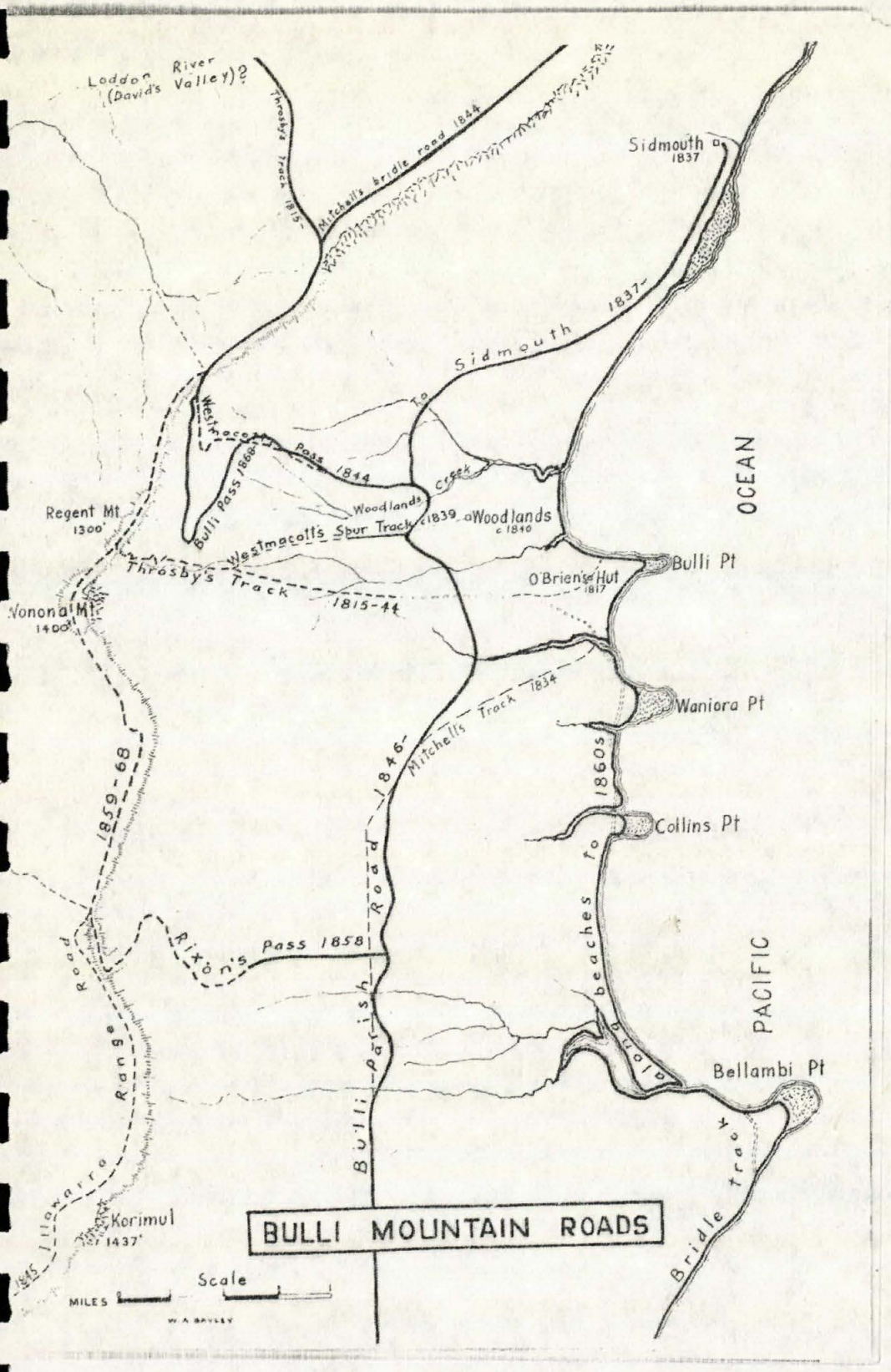
Originally proposed by Mitchell in 1831, he carried out a further survey in 1843 and announced that a direct line could be found which was at least 20 miles shorter than that via Appin. It was not until the 1870s however, that the road began to be used to any great extent, rapidly thereafter supplanting the older route via Appin. (cf. article on Princes Highway in Main Roads Vo. XVI, 1951 from the Department of Main Roads).


Liverpool
Cook's River
BOTANY BAY
George's River
Lugarno
Port Hacking
Sutherland
Loftus
Engadine
Heathcote
Waterfall
Helensburgh
Campbelltown
Georges River
Deadmans Ck
Woronora River
Woronora Dam
Tuggerah Ck
Appin
King's Falls
Brough
Jordan's Pass
Darke's Forest
Wanwell Park
Coal Cliff
Coledale
Appin Rd
Cataract Dam
Sherbrooke
Rixon's Inn
Bulli Pass
Rixon's Pass
Bulli Point
Cordeaux Dam
Bellambi Point
Cross Road
WOLLONGONG
Wollongong Water Supply
Figtree
K. Marshall - Roads to Wollongong

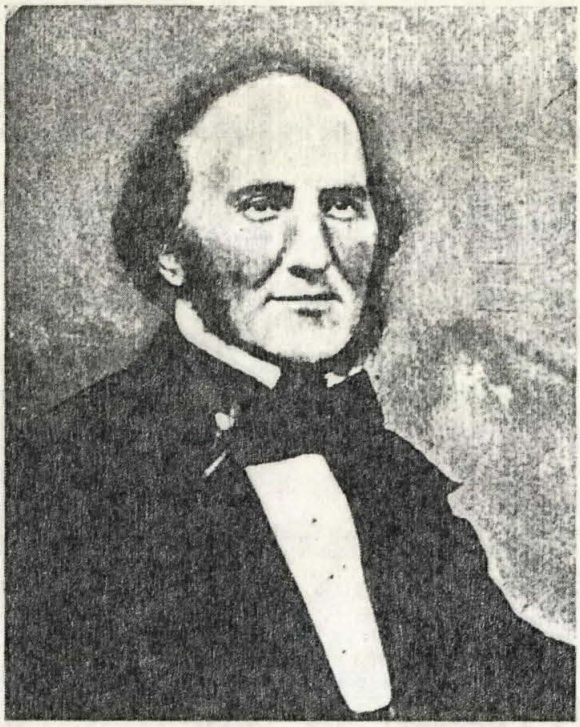

CAMDEN PARK
WEST CAMDEN
CAMDEN
UPPER CAMDEN
MENANGLE
RIVERSFORD
SOUTH CAMDEN
ROSSLYN
MELROSE
MORETON PARK
PICTON
LOWER PICTON
PICTON
CLIFTON
JERVIS FIELD
DOUGLASS PARK
WILTON
THE ROCKS
SUGAR LOAF
MEAGHER'S WEST PASS
EAST BARGO
NEPEAN RIVER
CORDEAUX RIVER
WILLANDOOLA
CATARACT
CATARACT CREEK
APPIN
Falls
SOUTH ARGYLE R.
STOKES CK
O'HARA'S CK
GEORGES
BULGO
STANWELL PARK
COAL CLIFF
LONG PT
BULLI
BULLI or WONIORA PT
BELLAMBI PT
TOWRADGI PT
WOLLONGONG
KNIGHTON CREEK
GOONDARRIN CREEK
Pixons Inn
Lithographed at the Surveyor General's Office, Sydney, N.S.W. May, 1865.



From W. G. McDonald The Oldest Road



From N. S. King, Cornelius O'Brien, Pioneer of Bulli



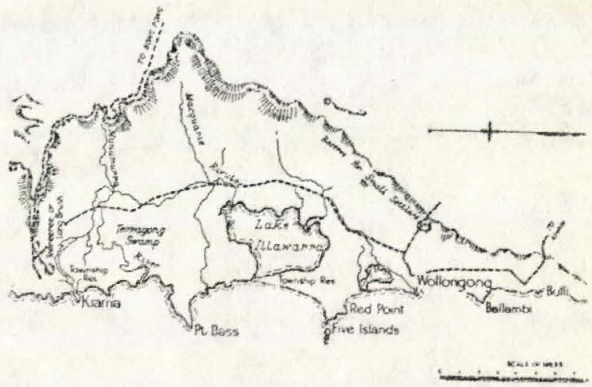
Alexander Berry.

trading, came to Australia with his partner, Edward Wollstonecraft, in 1819. At first the two established themselves in Sydney as merchants in the cedar trade, but attracted by the prospects of land-owning, they decided to apply for a grant in the Shoalhaven area. By tendering to maintain 100 convicts, they were given a grant of 10,000 acres, and selected the site for their home, which was called Coolangatta, at the mouth of the river. The Berry Estate prospered and grew eventually to an area of 60,000 acres.

Governor Macquarie suggested that below Shoalhaven "if a small Establishment were once formed in Jervis Bay, there might be a chain of Settlements and Farms continued from thence, till they joined those already Extended from Port Jackson to Illawarra, with Land, as well as Water Carriage all the way from Port Jackson to Jervis Bay . . ." (*Historical Records of Australia*, Volume IX). It was not till 1840, however, that the plan for a town at the head of Jervis Bay was approved. Governor Bourke chose the name Huskisson in honour of William Huskisson who became Colonial Secretary in the British Government in 1827. Development brought with it the need for some form of authority, and in 1826 a detachment of troops was stationed in the Illawarra district for the protection of sawyers and settlers against the aborigines. Settlement continued to creep further south, the Reverend Thomas Kendall arrived at Ulladulla in 1828 to make his home. The southern boundary of settlement which had been fixed at Bateman's Bay was extended to Moruya in 1829. Five towns were gazetted in the Illawarra district in this year, Five Islands, Kiama, Gerringong, Coolangatta and Ulladulla. Embryo towns were also springing up at Nowra and Bomaderry.

Settlement began in the Moruya district in 1827 Francis Flanagan, and in 1830 by John Hawdon had travelled down the Moruya River Valley f Braidwood. Due to the lack of overland commun tion the port of Broulee became the commercial ce of the district and a town was surveyed there in 1 Bateman's Bay was surveyed in 1850. In 1860 Tho Mort started dairying and cheese manufacture Bodalla.

Following Tarlinton's favourable account of Bega district in 1829, Braidwood settlers begar send cattle to the Bega pastures. Governor Bou who visited the south coast in 1834, reported, "Alr the flocks and herds of the colonists spread themse over a large portion of this southern country (Twe Bay) . . . The excellence of the pastures in the of the colony I am describing has induced the gra to resort to it, and much of the fine wool, whic exported to England, is taken from sheep depast on vacant Crown land beyond the limits assigned the location of settlers". (*Historical Records of tralia*, Volume XVII). The Governor's recomme tion for a town at Twofold Bay was sanctioned by Home Office in 1836, and the town of Eden was out in 1843. The district of Twofold Bay exte



South Coast Road. Bulli to Kiama, 1834, from a r by Mitchell.

from Broulee to approximately the site of the pre Victorian border. Three brothers, Alexander, Ge and Peter Imlay, had established themselves at T fold Bay, originally with the intention of engagin whaling, but realising the potentialities of squattin well, they used the whaling depot as a shipping for the produce of the district, of which they qui became the leading citizens. In 1842 the Twofold district received a fresh impetus when Ben I arrived from London with a grandiose scheme, ported by a wealthy financial syndicate, for the mencement of large-scale whaling. Within two y he had acquired vast holdings, and built the prospe and seemingly permanent Boyd Town on the s shore of Twofold Bay. But the financial bac suddenly failed in 1849 and Boyd's whaling indu and model town collapsed almost overnight. In the district was visited by Governor Sir Charles Fit and in the same year the site for the town of

14.1 THE ILLAWARRA RAILWAY

In 1874, 20 years after the first railway out of Sydney, a survey was undertaken for a railway from Sydney to the Illawarra coastal plain. The route had severe problems to combat, necessitating eight single-line tunnels and a gradient of 1 in 40 in the section between Waterfall and Coalcliff, i.e. the main descent from the plateau to the coast. The route followed here was the straightest practicable one, involving tunnels directly through the ridges between the creeks.

The Illawarra railway was opened in sections, that from Sydney to Waterfall, still on the plateau, being completed in March1886, an isolated section from Clifton to Wollongong in June 1887 and the extension of this isolated section from Wollongong South to North Kiama in November 1887. Main difficulties lay in the section from the Clifton tunnel north to Coalcliff, which was opened in July 1888, and in the eight tunnel section from Coalcliffe north to Waterfall which was finally opened in October 1888 to complete the rail link to Sydney.

By 1900 traffic had increased on the railway straining its capacity considerably. Some improvements had already been undertaken. Duplication for example was completed on the Sydney-Hurstville section to cope with suburban traffic by October 1884, and from Hurstville to Waterfall, except for the bridge at Como, by 1890. From Waterfall to Wollongong however the line was designed as a single track with duplication only where the cost was not prohibitive. The problem was intensified by the opening to full production of the Metropolitan colliery at Helensburgh in 1890, heavy coal trains had difficulty in the 1 in 40 grade between Stanwell Park and Otford, and between Lilyvale and Waterfall. Thus in 1903 work began on improving it by reducing the ruling grade to 1 in 80, necessitating almost total deviation and relocation of the railway for this section. Another problem with the single line tunnels had been a serious deficiency in ventilation, especially in the notorious Otford tunnel (1.55 km long, at a 1 in 40 grade) and the longest single-line tunnel in Australia); others, of the eight tunnels between Waterfall and Coalcliff, were 900 m, 600m and two of 300m long,causing hardship to employees and passengers alike with their heat and smoke. Since twin single-bore tunnels promised no improvement, the section was resurveyed around instead of through the headlands giving long sweeping curves and eliminating all but the Clifton single line tunnel. A total of 5.633 km was added to the overall distance of the journey.

Duplication was also begun at several other points on the line where congestion from colliery siding shunting was most urgent. The first was from Mr Pleasant crossing

to Mr Keira crossing, opened May 1913. This section included the Mt Pleasant colliery sidings, North Wollongong station, Federal coke works, Wollongong Gas Works and Mr Keira colliery sidings.

The next section to be duplicated, completed in September, 1913 was between Woonora Crossing and Bellambi Station, covering the Illawarra Fire brick siding, the BHP coke works, the Bellambi Colliery sidings and level crossing for the line to the Bellambi jetty.

The next section to be duplicated, completed on September 25, 1913 was 402 m between Woonona crossing and Bellambi station, and covered the Illawarra Firebrick siding; the BHP Coke Works which was in operation between 1903 and 1935; the Bellambi Colliery sidings; and level crossing for the line to the Bellambi jetty.

By this time the 71202km Waterfall to Helensburgh deviation was complete and opened on February 27 1914, eliminating two tunnels- the Waterfall tunnel which was opened into a cutting and the Helensburgh No 1 tunnel. This was followed on June 14, 1914 with the 3.621km duplication from Scarborough to Coledale, covering sidings to the Clifton Colliery and Coke Works at Scarborough and the new South Clifton Tunnel Colliery.

The 4.245km Helensburgh to Lilyvale deviation was opened together with duplication to Otford on May 30 1915. This involved the relocation of Helensburgh station, the elimination of four single-line tunnels, replaced by three double line bores, together with the relocation of the junction for the Metropolitan Colliery.

The duplication from Coledale was extended 4.426km to Thirroul station by November 14 1915 including austinmer station and connection to the North Illawarra Colliery north of Austinmer and Excelsior Colliery to the south. On October 25, 1916 the duplication was extended to Bulli station covering the Vulcan Firebrick sidings and the Bulli Colliery crossing to Bulli jetty and Coke Ovens, these ovens being in operation from 1889 to about 1930. The Bulli Colliery railway level crossing was eventually replaced by an overhead bridge by Australian Iron and Steel Pty. Ltd in 1949.

The 1914-18 war interrupted further duplication work and delayed piercing of the Bald Hill tunnel, destined to replace the notorious Otford tunnel. With this work eventually completed, the 6.598km Stanwell Park deviation from Otford to Coal Cliff was opened on October 10, 1920, involving in addition to the Bald Hill tunnel a new Stanwell Park station on the mountainside 58.2m above the old station, an eight-arch brick viaduct, the highest in Australia, 65.5m above Stanwell Creek and two short tunnels.

In 1923 the resumption of duplication saw the closing of the remaining gaps, firstly on April 29, 1923 from Mount

Remains

The relocation of the line between Waterfall and Coal Cliff left eight tunnels and most of the line of the track to return to the bush. Although some of the tunnels have been put to other uses, e.g. mushroom growing and the track has been bulldozed in some places (i.e. around the Metropolitan Colliery) it remains largely identifiable although thickly overgrown. The historic Otford tunnel survives, although one end was blown up in World War II.

Many of the railway station buildings along the line now surviving post-date construction of the line, but the following appear to be earlier:-

Bulli eastern side 1890
Shellharbour (one of two or three examples only in N.S.W.)
Wollongong, eastern side, original station buildings.

Recommendations

- that the Otford tunnel be preserved as a historic industrial site,
- that steps be taken in due course to open up as much as possible of the original Illawarra railway line with its tunnels as a sign-posted bush-walk,
- that the above historic railway station buildings be preserved as far as possible.
- that the Environmental Heritage Committee should encourage working parties to carry out detailed surveys of significant features along all lines (footbridges, plates, signal boxes etc.) and record in detail.

References

There is no shortage of reference material on railway history in the Illawarra and major items are listed below (see also Part 3 of this Gazetteer). However, such works are not always written with special emphasis on the identification of existing significant remains, and this is true in the present instance (cf. Recommendation in Part 1 of this Gazetteer).

J.L.N. Southern - "A Railway History of the Illawarra" B.H.P. Papers, December, 1978.

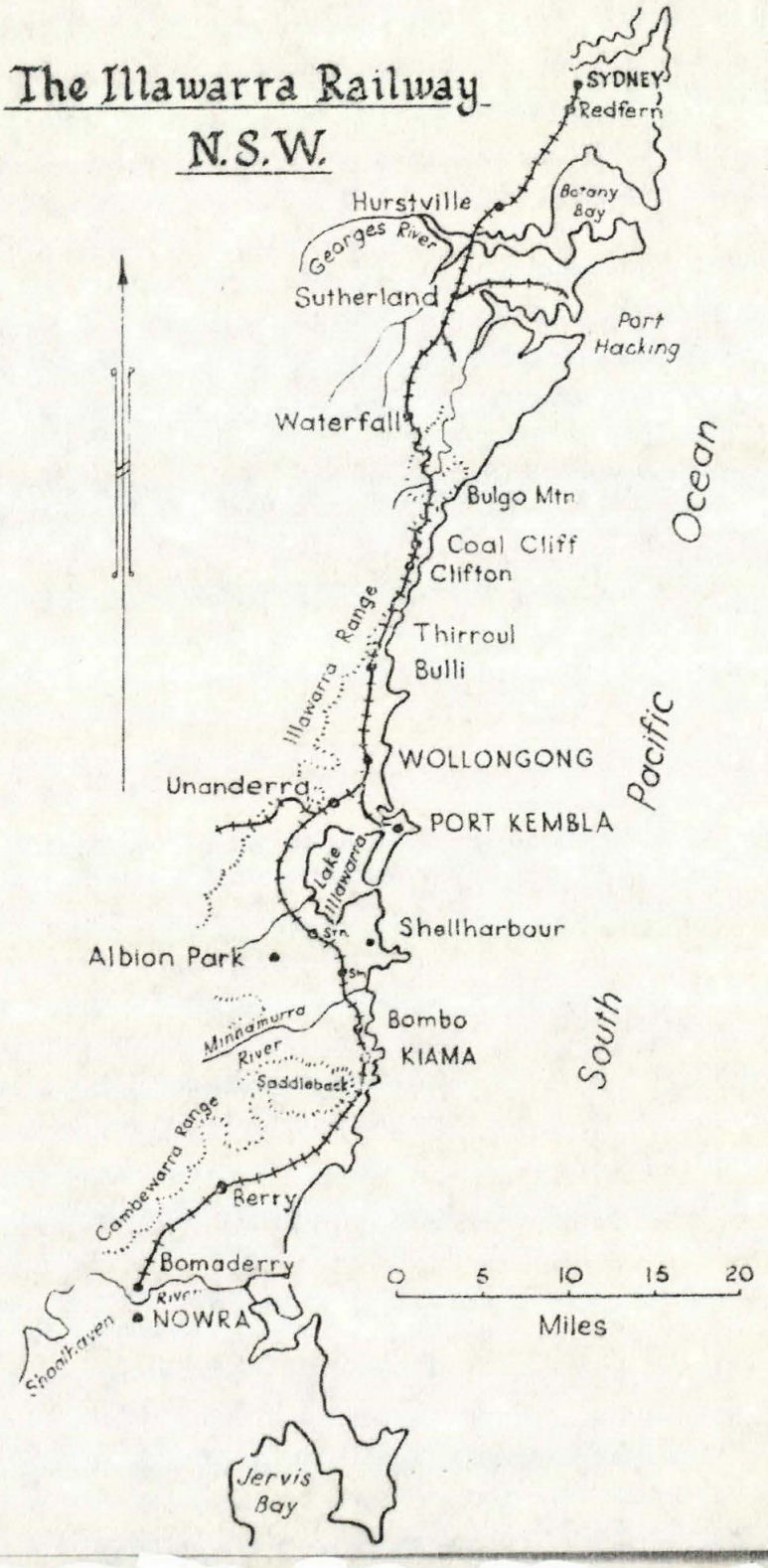
C.C. Singleton - "Railway History in Illawarra, N.S.W." Illawarra Historical Society 1972.

K. McCarthy - "The Corrimal Colliery Railway" Light Railways No. 60, April, 1978) The Light Railway Research Society of Australia.

Gifford Eardley - "Transporting the Black Diamond" 1968 Traction Publications, P.O. Box 438, Canberra City. 2601

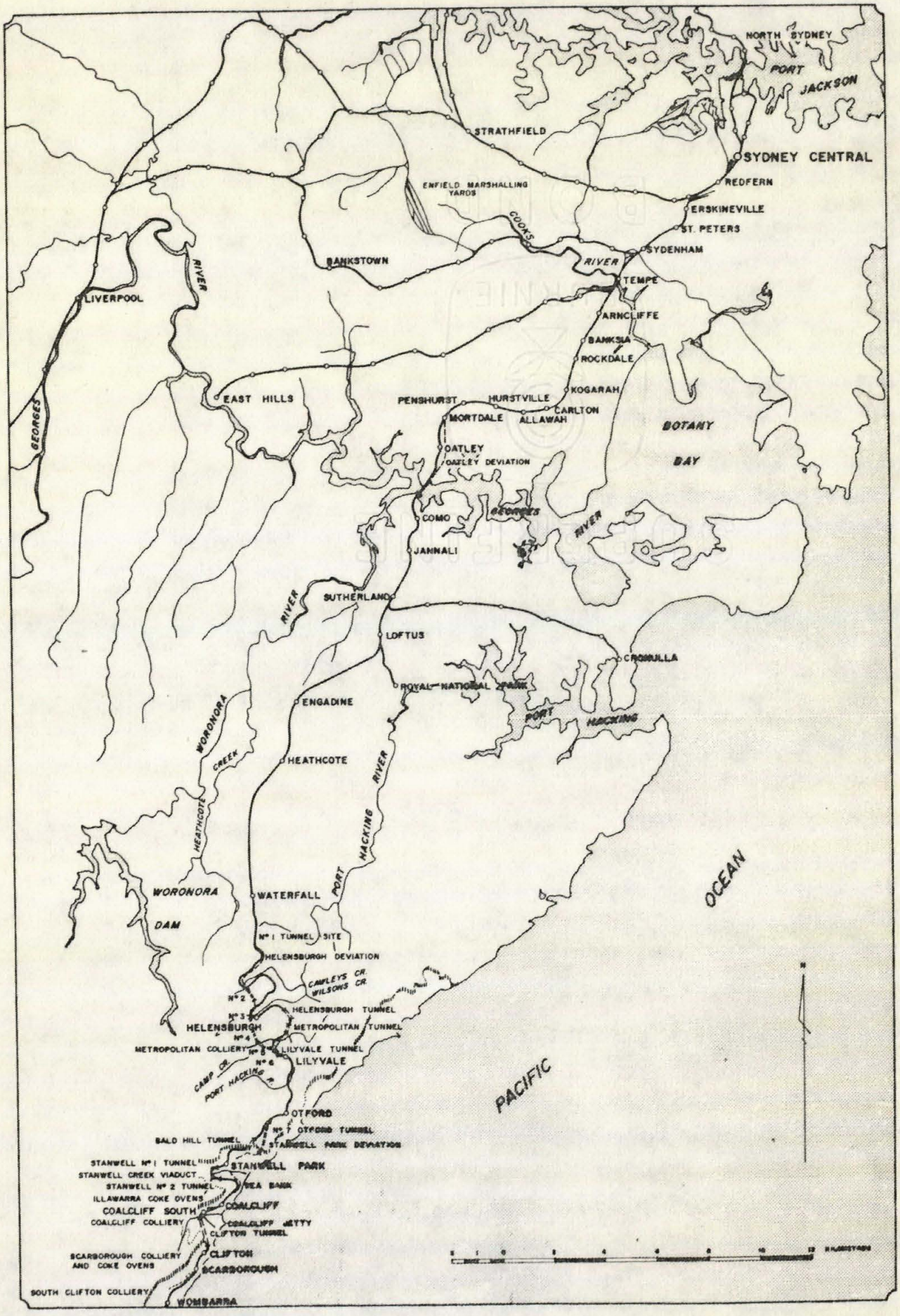
Reference should also be made to the following journals:-

Bulletin of the Australian Railway Historical Society
Trolley Wire
Light Railways


The Illawarra Railway
N.S.W.
SYDNEY
Redfern
Hurstville
Georges River
Botany Bay
Sutherland
Port Hacking
Waterfall
Bulgo Mtn
Coal Cliff
Clifton
Thirroul
Bulli
Illawarra Range
WOLLONGONG
Unanderra
PORT KEMBLA
Lake Illawarra
Shellharbour
Albion Park
Minnamurra River
Bombo
KIAMA
Saddleback
Cambewarra Range
Berry
Bomaderry
Shoalhaven River
NOWRA
Jervis Bay
Pacific Ocean
South
0 5 10 15 20
Miles

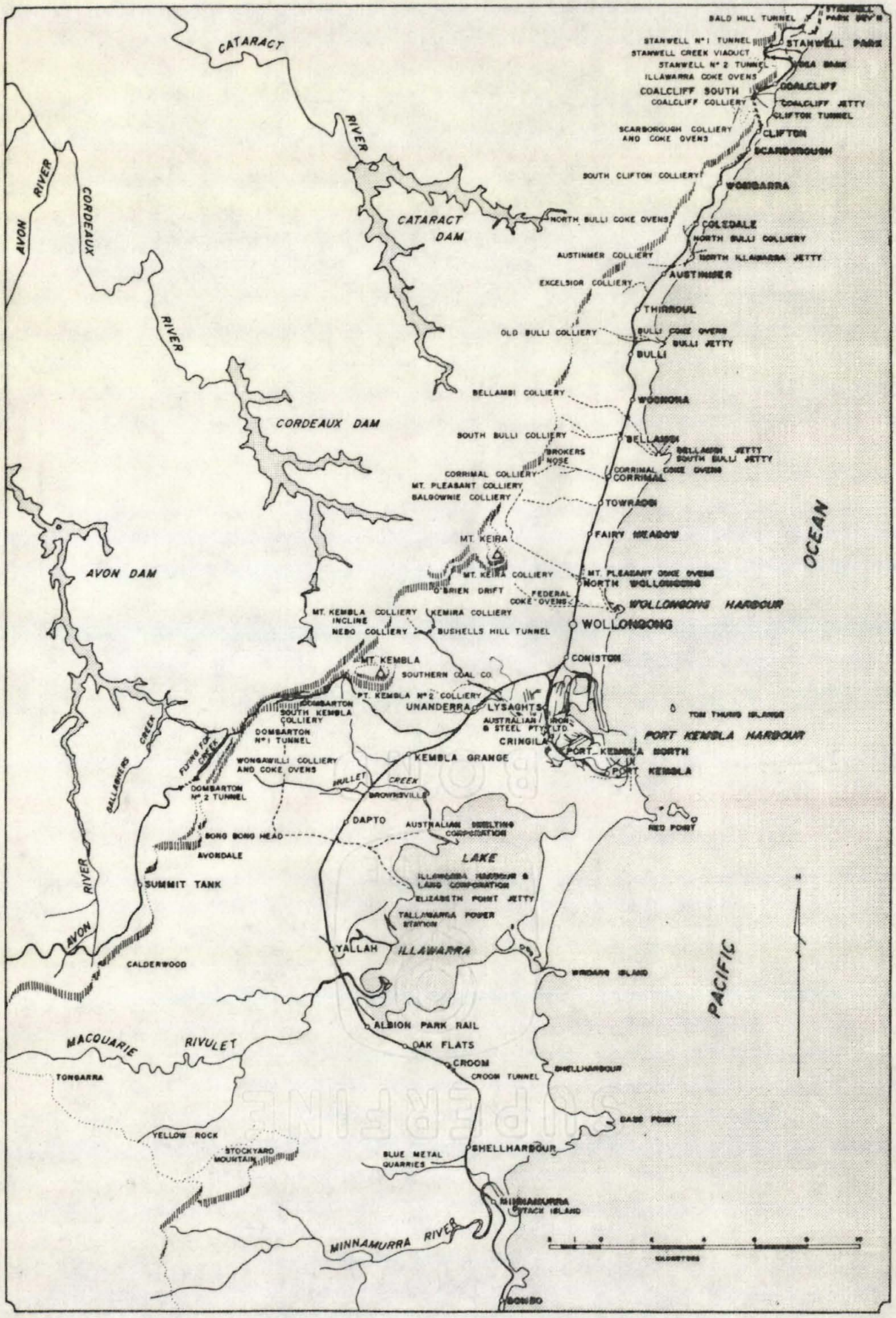
THE ILLAWARRA RAILWAY

SYDNEY TO WOMBARRA



THE ILLAWARRA RAILWAY

STANWELL PARK TO BOMBO



15. Town Services: Gas and Electricity

Although there was an interesting but abortive suggestion by Benjamin Fawcett in 1864 that a town gas works should be erected since it would provide a cheaper form of lighting than either candles or oil, nothing came of it and not until 1881-2 was the idea revived. The gas
15.11 works was begun in 1882 in Mariette Street near the hospital. The gas works were opened and the first gas lamps were lit on August 20, 1883.

There is a good description of the gasworks in the Illawarra Mercury of August 24, 1883 and the plant continued to give good service until 1950 when the Gas Company changed over to a new plant.

In 1977 came the change to natural gas and the works were converted to its processing. The manufacture of coal gas ceased in October, 1977 and demolition of the retort house begain in 1979.

15.12 Kiama began its gas works nearly at the same time, with 15 gaslights working in 1884. Thereafter the supply appears to have been interrupted from time to time; gaslighting lasted in Kiama until 1925 when electricity was supplied from the PWD power house in Port Kembla.

Electricity equally came early to the Illawarra with a number of colliery power houses supplying adjacent colliery villages with light as well as power to the colliery itself. South Bulli, Corrimal and Wollongong itself had electric lighting from 1912, Bulli from 1913, but some places were electrified much earlier - Balgownie Hotel had an electric light plant in 1908, Mt Kembla colliery in 1903.

15.22 The construction of the PWD powerhouse at Port Kembla from 1913 to 1920 resulted in the reticulation of electricity rapidly throughout Port Kembla (1920) Kiama and Bombo quarries (1924) Moss Vale (1925); in 1950 Bulli was transferred to the PWD powerhouse supply.

15.21 In 1952 the Tallawarra powerhouse on Lake Illawarra was begun and from 1955 it became the dominant electricity supplier in the region.

References

Most of this material has to be put together from primary material (cf. sources in Part 3 of this Gazetteer). However, some collation has been done in local accounts such as:-

W.A.Bayley — Green Meadows

" — Blue Haven

15.11 Wollongong Gas Works

Although the retort house was recently demolished, the remains of several other older structures can be traced, e.g. the base of the oldest gasholder, also an old shed which was the earlier horizontal retort house. Some pipes survive at the east end of this shed, and an old loading bay. Nearby are the former gasworks, office (currently blue-painted) and the manager's house.

Much historical information and some historic photographs are held by K. McCarthy (Wollongong) and also by Mr. McLeod who works at the Illawarra Mercury. A full description of the gasworks appears in the I.M. 24.8.1883.

15.12 Kiama Gas Works

Tow substantial structures of the Kiama gas works survive (used for L.P. gas since the 1960s) together with the old gas holder, and may well retain features of historic significance. Further investigation necessary (in the light especially of research available in Pt. 3 of this Gazetteer). A gas works map is said to be available from Kiama Council.

15.22 P.W.D.Powerhouse

Two structures remain.

The older structure is of brick construction. External appearance is good, but in derelict condition (i.e. smashed windows, etc.). The more recent structure is of poured concrete construction. Concrete flaking off in several areas. Overall condition good. Coal shutes on roof looked in good condition. In grounds there is recent generator gear, one end of the site still being used. Wooden tressle railway bridge enters site next to the older structure. Still in use. Further investigation necessary.

7.011 Metropolitan Colliery Power House, Helensburgh

This structure survives at the Metropolitan Colliery (used as a store) and is both a good typical industrial building and one with particular historic interest in that it supplied power to the T.B. hospital near Helensburgh until the development of antibiotics during and after World War II virtually eradicated this killing disease. Associated with it is a surviving power line and pole.

Interior not investigated.

7.022 Coal Cliff Power House

7.120 Corrimal Power House

Surviving, but in an extremely vulnerable condition.

7.101 South Bulli

Recently demolished, foundations only surviving. Built on terrace of scarp above South Bulli colliery, and used to drive both the haulages and the fan. (cf. Mr. Neil Barraclough, South Bulli, for details on early lay-out).

16. Water Supply

One of the most dramatic sets of archaeological evidence surviving in this region is that associated with Sydney's fourth water supply scheme.

16.1 The scheme itself formulated in 1867 as the Upper Nepean Scheme was far-sighted and soundly-based, tapping the headwaters of the Nepean and its tributaries (the Avon Cataract and Cordeaux Rivers) and bringing them by tunnel and canal to a new storage reservoir at Prospect thence by a further canal to Pipehead, Guildford; and from Pipehead by pipeline to Potts Hill and Crown Street reservoirs. Completed in 1888, a fair proportion of its works have survived with only moderate modifications through a combination of circumstances, the main one being that the original construction was sound in both design and execution. In addition, maintenance costs are low, the scheme has continued to fulfil first its original and then a part of its original function, and necessary booster water supply schemes have been developed elsewhere rather than attempting to change or enlarge this one.

None of the other water supply schemes can compete with this one in the grandeur of their remains, but the history of each of them has its own sociological interest. Some of the towns and villages of coastal Illawarra did not receive piped water until well into the 20th century, and in each of them there survive visible traces of 19th century lagoons, conduits and dams which supplemented household tank and well water with a town water cart.

16.2 Wollongong was the first to get a more reliable supply than the lagoon behind the Belmore Basin could provide, from the first dam built on the Cordeaux river in 1903. A second was added in 1915 and the third major dam in 1925.

History (Sydney Upper Nepean scheme) (cf. Part 4 for detailed description)

The critical state of Sydney's water supply in 1867, caused by the growth of population in city and suburbs together with recurring dry seasons caused the Governor to appoint a Commission to a scheme for a more reliable future water supply.

The Commission examined at least seven such schemes, and finally selected the Upper Nepean scheme as the most suitable. This involved tapping the headwaters of the Nepean River and its tributaries, the Cataract, Cordeaux and Avon Rivers. The catchment area comprised 347 square miles on top of the South Coast range between Appin and Mittagong to the south-west and north-west, and above Clifton and Robertson to the north-east and south-east, an area which remains closed to the public to this day as the Metropolitan Catchment.

The Commission recommended as follows:-

(i) A weir to be built across the Upper Nepean River at Pheasants Nest, just below its junction with the Avon and Cordeaux Rivers, by which a proportion of the flow of these streams was to be diverted into a tunnel to connect with the Cataract River.

(ii) A similar weir to be built across the Cataract River at Broughton's Pass by means of which the intermingled waters of the four streams were to be turned into a 36 mile conduit (later known as the Upper Canal) consisting of a series of tunnels, open canals and aquaducts.

(iii) A storage reservoir of 11,000 million gallons capacity to be constructed at Prospect.

(iv) A five-mile canal (now known as the Lower Canal) to be built from Prospect reservoir, ending in a basin at Guildford (now known as Pipe Head reservoir).

(v) A five-mile wrought-iron pipeline, 6 foot in diameter from the basin at Guildford to a service reservoir with a capacity of 96 million gallons at Potts Hill, together with a 48 inch cast-iron pipeline from that reservoir to the existing reservoir at Crown Street, with a branch into a new reservoir to be built at Petersham.

This scheme was accepted in 1869 and construction began immediately. It was completed in 1888, and survives substantially in the same form today although long since superceded as Sydney's main water supply scheme.

The main features of the original scheme which survive today comprise the system of dams, sluices and tunnels near the junction of the Upper Nepean, Avon, Cordeaux and Cataract Rivers which united them into a single source, the Upper Canal which then brought it 63 miles to the reservoirs at Prospect, and the Lower Canal which carried it to Pipehead at Guildford.

In the course of its 63 miles, the Upper Canal 9-12½ft wide and 8 feet deep, lined with stone blocks where necessary, crosses major creeks by means of aquaducts or siphons carved in stone or brick piers Minor ones are either carved below by brick siphon sulverts, or cross it by wrought iron or timber flumes. The canal passes through 13 tunnels after the Nepean and Cataract Tunnels all but the first two of which are brick-lined with three, sometimes four, rings.

In addition to dams, siphons, culverts, and flumes, mention should be made of the wrought-iron pipe aquaduct or brick piers which carries the water across the Great Southern Railway and the vertical drop just below the Sugarload tunnel which contains a sluice gate whereby in emergency, the water could be diverted across a waste weir back into the bed of the Nepean river a mile away.

Other features of the system include the covered sections of the canal and have rare examples of Water Board workers' cottages. Particular mention should be made of the archaeological sites intermittently along the whole area. Outlines of the spoil heaps apparently undisturbed since this excavation line its course. While at several points ruins survive from temporary workers' encampments - several stone chimneys, a stone forge and also the remains of what appears to be a Scotch brick kiln.

The outflow into Prospect Reservoir ends in a basin with overflow wier, sluice gate and gauging weir from which it flows into a concrete channel leading into the Reservoir.

Prospect Reservoir retains many features of its original form including much of its inner stone facing and the round house above the outlet pipes to the pump-house. Similarly, the pump-house, pumps, tunnels and pipes pumping the water into the Lower Canal are substantially unchanged.

The Lower Canal is 4 3/4 miles long, with either vertical sides or V-shaped in sections. This section has one fine aquaduct, the Greystanes aqueduct. It ends at the Pipehead reservoir, Guildford, after which the water is conveyed by pipe.

After the initial scheme was completed, its storage capacity was increased by additional dams on the Upper Nepean and its tributaries. For the construction of each of these, an entire construction camp had to be established and these are particularly good records of the construction of the Cataract Dam.

The main alterations to the Upper Nepean shceme since its original construction are noted in the following extract:-

> "The Nepean tunnel has remained unaltered, although during 1937 its capacity was temporarily increased to 108 million gallons per day by raising the crest level of the Pheasants Nest weir by 4-ft. (by timber construction).
> The Upper Canal has required extensive re-conditioning. This began in 1896 when, owing to the deterioration of the cement lining and of the lengths lined with shale or stone pitching, it became necessary in that and the succeeding three years, to improve its watertightness and to recondition a length of approximately six miles. This was followed in 1909 by similar work on a further length of 3½ miles (during which certain sections between Cataract tunnel and Campbelltown service reservoir, in which a rocky, uneven bottom provided lodgement for silt, etc., were re-graded and the flow improved), and between 1911 and 1918 the remaining length of the canal was similarly treated.
> During 1935-37 the nine wrought-iron aqueducts were completely cleaned of rust internally (by sand blast) and lined with cement mortar 1½-in. thick, jetted on by compressed air. In the same period a paved road (including bridges across the gullies) was laod alongside the Canal to facilitate access for maintenance. Sixteen reinforced concrete bridges have been built over the Canal for road and access purposes."

1902-3	Upper Cordeaux No. 1 Dam, 173 million gallons, lake area of 49 acres. 10" steel trunk main along Cordeaux River and Kembla Creek to O'Brien's Gap: 6" steel main from here to service reservoir in Wollongong plus some reticulation.
1909	Extension to Port Kembla and Unanderra.
1915	Upper Cordeaux No. 2 Dam, 260 million gallons and lake area 58 acres.
1915	Extension to Figtree, Mount Kembla, Kembla Hts., Mt. Keira, Keiraville and the towns north of Wollongong (Balgownie up to Clifton).
1920	Extension to Dapto (1955 extension there to Shellharbour).
1921	Eight filters installed just below No. 2 Dam.
1922	Extension to Mt. Drummond, Tallawarra, Reidtown, Fern Hill and Fairy Meadow.
1926	Completion of main Cordeaux Dam.

Additional mains

1915	14" woodstone pipeline from No. 1 dam to O'Brien's Gap - thence 11" - 9" - 6" steel high pressure gravitation main carried the supply to various break-pressure tanks between Wollongong and Clifton.
1916	A 10" cast iron main laid from Mt. Nebo to Wollongong service reservoir thence to Keira Street, Wollongong.
1922	A third main (15" reinforced concrete) from No. 1 dam to O'Brien's Gap to supplement the other two.
1927	An additional 8" main, part cast iron, part steel, was laid from O'Brien's Gap to Mt. Nebo Junction.
1935	A 30" reinforced concrete main was laid from Cordeaux Dam to O'Brien's Gap.

Water Supply in the Illawarra Region

16.2 Wollongong Water Supply

A first need for the early settlers was a good supply of water for stock and crops. In fact, there was an abundance of natural fresh water along the coast in creeks and lagoons which was quite sufficient for a small population.

1st Supply

The main supply for Wollongong itself was the lagoon at the lower end of Market Street near the waterfront. Until the early 1890's, the town water carts were filled from here; householders obtained water from these water carts when their own tanks ran dry. This lagoon was filled in and one of the only surviving traces of this system is the water channel immediately behind the harbour.

2nd Supply

Moves for a piped water supply began in 1897, as much for fire control as for domestic supplies. A system was adopted which drew water from the Cordeaux River above the escarpment and a reservoir was begun at Cross Roads in 1901.

Stage 1:

The first dam across the Cordeaux was completed in 1903 and water stored in it could be delivered over the ridge (1045') by gravity.

Stage 2:

However, as demand increased, greater storage capacity was needed; a second dam was built in 1915 1¼ miles downstream from the first. This meant that the water needed to be pumped over the scarp.

Stage 3:

In 1926 the major Cordeaux Dam was completed 5 miles below the second dam and additional local supply was achieved from this by the use of a separate pumping station.

16.3 Kiama Water Supply

Kiama also in its early years drew upon a spring beside Torrawong Street which never ran dry.

In 1897 a dam was built west of Kiama at Fountaindale Creek and water piped to the town. Water supply remained a problem, however, until Kiama was connected to the M.W.S. & D.B. system via the Avon Dam.

16.4 Shellharbour Water Supply

Shellharbour differed from both Kiama and Wollongong in being surrounded by salt marshes on three sides with the sea on the fourth. Its water was brackish and only the well sunk for the bacon factory and pumped by windmill produced even reasonably sweet water. Thus, when household tanks ran dry, water had to be brought from springs and dams miles away.

A gully 1 mile west of the town was suggested for a dam 80' asl, but in spite of the great drought of 1897, this was not proceeded with. Only in 1955 was water supply from the Cordeaux Dam extended via Dapto to Shellharbour and Albion Park.

17. Defensive Sites

The need for defence has not left a major imprint on the Illawarra countryside.

In 1826, following an attack on settlers by escaped bush-rangers, a Captain Bishop took soldiers to Red Point for protection. Subsequently, a convict barracks and gaol was set up by Wollongong Harbour.

17.2 17.1 The harbour itself was protected against seaward attack from the 1840s on by guns immediately to the north (Flagstaff Hill) and south (Smiths Hill). There were said to have been more guns mounted at Bulli. Volunteer Rifle Corps were formed in Wollongong and Kiama in the 1860s and the Illawarra Light House (formerly the Lancers) followed in 1870. A number of the early muzzle loaders survive in the district, and their likely histories are added below. The fort on Red Point dates from World War II. There are a number of official memorials to those lost in two World Wars. A particularly conspicuous trace of World War II is the rampant regrowth of noxious weed on the escarpment following the clearing of its natural vegetation to hinder invasion.

History (Wollongong Harbour fortifications)

The Port of Wollongong shared with Sydney and Newcastle the importance of warranting fortification, as can be seen from Col. George Barneys recommendation (14.9.39) to the Inspector General of Fortifications in England for permanent defences for the harbour.

However, the first guns appear to have been installed only about 1854 when the Russian threat during the Crimean War caused two 64 pound muzzle loaders described as of Waterloo vintage to be installed, and a militia formed to man them. They were set up
17.2 facing north on Flagstaff (Signal) Hill.

In July 1879, three additional smooth bore cannons (68 pounds) of 1861 date were landed from the S.S.Havilah and installed alongside the others in consequence of the renewed Russian threat. A local unit of garrison artillery was formed and became extremely proficient.

From 1880 to 1888, the first permanent gun emplacements were
17.1 built on Smiths Hill, in response to recommendations by the Royal Commissions on Defence. Another gun emplacement, this time on Flagstaff Hill was constructed between 1889 and 1891.

Adapted from The History of the Fortifications around Wollongong by Greg Scott 28.2.80.
(cf. also The Funs of Wollongong, Illawarra Historical Society Bulletin October 1973; ibid November 1973; Illawarra Mercury 2.8.1937 Town and Country Journal 2.2.1873;) C. Gardiner Garden The Port of Wollongong p.4).

Accompanying plan of Smith's Hill Fort by courtesy of Victoria Barracks, Sydney.

17.1 Smith's Hill Fort Map 4

This site is now Battery Park. The only visible remains of the Fort are two gun barrels and the outline of the Fort on the ground.

Construction of the Fort was recommended by Col.P.H. Scratchley. Plans were completed by 1882, the Fort itself by 1888. The armaments consisted of two 80 pound rifled muzzle loaders, and later one 1.5 inch Nordenfeldt quick-firer was added. There were two underground magazines, and the Fort was of brick construction. In 1946, the site was filled with ash and sealed.

The two cannons surviving above ground (dated 1872) appear to be the only two 80 pound rifled muzzle loaders left in position out of an original twenty four in New South Wales.

17.2 Flagstaff Hill (Signal Hill) Map 4

In 1889 a second defensive position was planned for Wollongong Harbour on a site which had been the location of three 68 pounds muzzle loaders since 1879 and of earlier 64 pound cannons before that. The Fort was completed in 1890, and in 1891 equipped with a 6 inch disappearing gun. There was a single gun pit, shell room and store rooms. The pit is 25 feet in diameter, and 9 feet from the top of the apron to the concrete floor. In 1937, the gun was dismantled and removed, and in 1950 the pit filled.

The outline of the gun pit can be seen beside the light-house, with only the apron of the lip visible. The entrance to the underground magazines opens onto the existing car park.

Remains

Plans of the two 19th century Harbour Forts are illustrated. Both have been filled and sealed, although outlines of sub-surface structures can be clearly distinguished. In addition, the entrance to the Flagstaff Hill disappearing gun pit has been retained near the lighthouse.

The present location of the ordnance known to have been on these sites is not wholly clear. The following account lists existing guns in the area with possible sources, then discusses the fates of the remainder.

1. Two cannons on Smith's Hill dated 1872, and reasonably assumed to be the two 80 pound rifled muzzle loaders installed in 1888 on that site, on metal sliding garrison carriages on a circular rail.
2. Two 68 pound smooth bore cannons on the C.M.F. compound.
3. One 68 pound smooth bore cannon in the Sea Scouts Drill compound (Old Court House).

- These three are assumed to be the three 68 pounders landed in July 1879 and installed on Flagstaff Hill.

4. One 64 pound smooth bore was reported to be in the Wollongong Tow Hall yard in 1937, having been used as a 1 o'clock gun long after it was pensioned off active service. G. Scott reflects this in his report, stating that the 1 o'clock gun in the Town Hall was a small brass cannon, subsequently moved near the Boar War Monument from which it disappeared without trace.
5. The four-barrelled Nordenfeldt rapid-firing gun was reported to be lying in the Smith's Hill emplacement in 1937. Its present whereabouts is unknown.
6. The 6" breech loading disappearing gun from the Flagstaff Hill explacement was dismantled in August 1937 by the army and removed to Sydney. So far it is untraced.

17.3 Red Point Fort Map 5

Second World War Fort with three observation posts and two command posts, and small positions visible on low headland.

The command posts have been made accessible as tourist observation platforms, painted white and with doors and windows bricked up. The observation posts are structurally intact with internal fittings removed.

17.4 Fort Drummond Map 4

Constructed during World War Two to protect Wollongong. The construction was of poured concrete, forming a shallow "arc" above the surface. The gun sat in a position below ground level with only the barrel protruding from under the shelter. The guns could be directed from the observation posts at Red Point.

17.5 Second World War Concrete Harbour Blocks

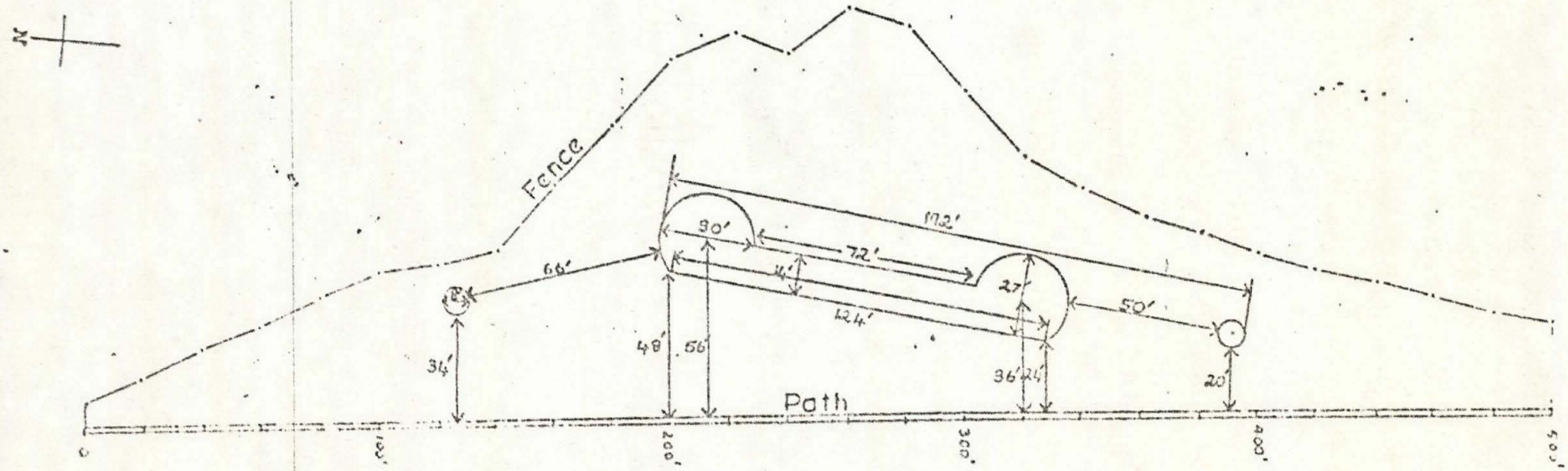
The row of concrete tetrahedral blocks forming a mole around the Berkeley fishing village anchorage dates from World War II defence policy.

17.6 Second World War Canal

As part of the anti-tank defences of Port Kembla, a canal was dug from Mullet Creek to the north of Hooka Creek.

Park Area . 34720 sq ft

Battery Area 2540 sq ft (approx.)



BATTERY PARK, WOLLONGONG.

Scale as indicated.

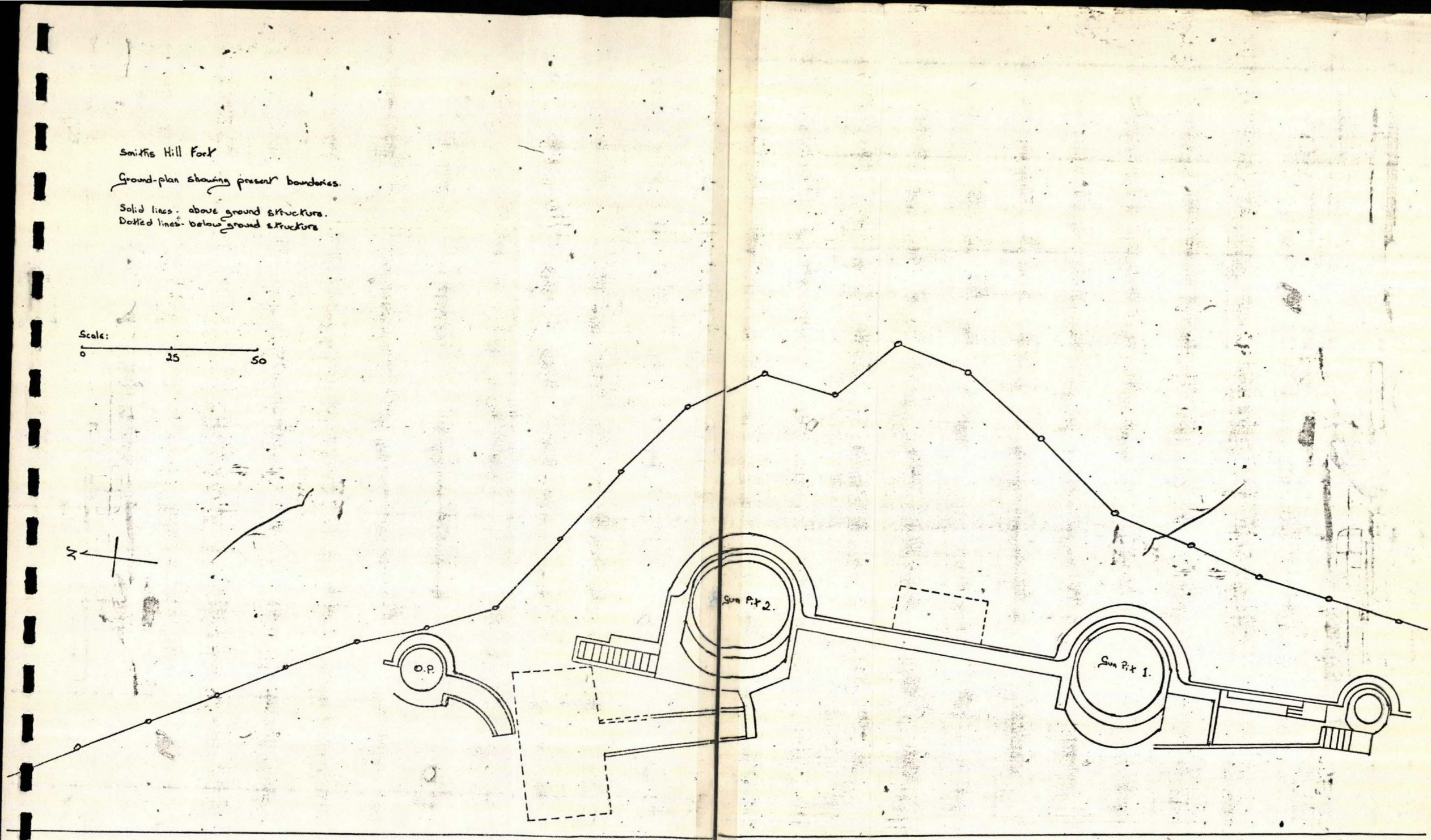
G.I

Smiths Hill Fort

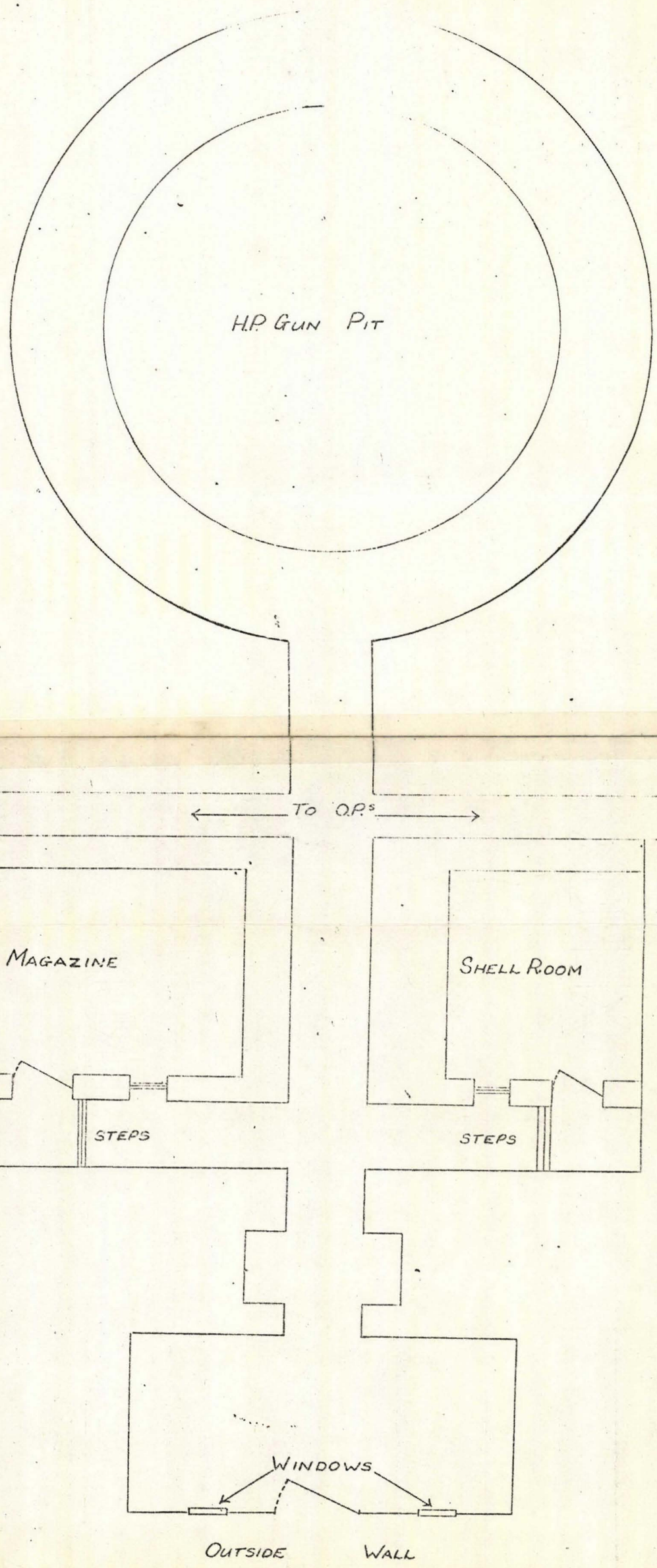
Ground-plan showing present boundaries.

Solid lines - above ground structure.
Dotted lines - below ground structure

Scale:
0 25 50



Present-Day Road


H.P. Gun Pit
To O.P.s
Magazine
Shell Room
Steps
Steps
Windows
Outside Wall