CHAPTER 1

THE ENVIRONMENT

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"We must strive to discern clearly, understand fully, and report faithfully; to love truth in things physical as in things moral; to abjure hasty theories and unsupported conjectures; where we are in doubt not be positive; to give our brother observer the same measure of credit we take to ourselves; not striving for mastery but leaving time for the formation of the judgment which will inevitably be given whether for or against us by those after us; contented if we are able to add but one grain to that enduring pyramid which is now in the course of erection as the testimony of Nature to the truth of Revelation."

—Rev. W. B. Clarke, 1866.

(Inaugural Address to the Royal Society, p. 27)

Can you imagine filling the kerosene lamp and trimming the wick, chopping wood to make a fire to boil the kettle and cook the meal and doing the washing in a galvanized tub? The grandparents of most of us and the parents of many were used to doing these things.

Changes in our ways of life follow scientific discoveries which lead to various new inventions or improvements to articles in common use. We take for granted the new models of motor cars and the faster types of aircraft from year to year. We are not now too excited about the space craft which may soon reach the Moon.

I can recall the days when telephones were only in the homes of the wealthy, motor cars were uncommon and we all went out to the paddock to see an aeroplane. There were no mysterious black boxes with knobs on, no washing machines, refrigerators, motor mowers, electric irons or electric toasters.

My mother was born in the year that the first telephone system was introduced into Sydney. This new invention excited much interest but at least one high official was hostile. He called it a "Yankee Toy" which had no commercial value.

I can recall making a crystal wireless set which really worked. The cat's whisker, crystal and coils could be bought and assembled. The ones with valves were full of static on many nights.

If we go back to 1866 and try to think what life was like and what people did in New South Wales in those days we can better appreciate how advances in science have changed the ways in which individuals

carried out their usual duties and the ways in which they worked and amused themselves.

In this chapter an attempt will be made to give an impression of what New South Wales looked like and what life was like there a hundred years ago.

New South Wales in 1866 was still a colony of Great Britain and had a population of only 411,388. The railway from Sydney had crossed the Blue Mountains to Hartley and branch lines had reached Windsor and Campbelltown. Main roads ran from Sydney through Goulburn and Gundagai and through Bathurst to Orange and Wellington. There was a road from Newcastle to Aberdeen. Transport between coastal towns was by boat. Elsewhere the links between the settlements were little better than tracks.

Sydney

Sydney, the capital of the Colony, was very much smaller than it is to-day, having a population of but 93,686. The extract quoted below, taken from J. W. Waugh's "The Strangers' Guide to Sydney" published in 1862, gives an idea of its extent.

"It is built on two ridges of land, terminating in two points which stretch out into the harbour and form the boundaries of Sydney Cove; on the eastern one is built Fort Macquarie and on the western, Dawes' Battery; while the valley that intervenes is occupied by George and Pitt Streets, the main arteries of the city."

Public transport within the city was by means of horse omnibuses and hansom cabs. The first tramway along Pitt Street operated between 1862 and 1865. The vehicle consisted of cars twice the length of an omnibus. There was a driving box at each end of the car and on arriving at Circular Quay from the Railway Station the driver had to move to the opposite end and shift the pole and the horses. The four horses took ten minutes for the mile-and-three-quarter trip.

* Figure 1 and Figure 2 give some idea of how Sydney looked.

The "electric telegraph" had been installed in the Colony and a number of telegraph offices had been established in the country towns and as far north as Armidale, and through to Melbourne and Adelaide. A telegram from Sydney to Parramatta cost one shilling; it cost four shillings to send one of ten words to Armidale. Letters posted for delivery within the city or in a country town "not exceeding ½ oz." cost one penny. Those between towns cost twopence.

The first sod of the Sydney railway had been turned in 1850 and by 1866 the line had been pushed out west to the Blue Mountains and

* These and the other illustrations are from original photographs in the Mitchell Library, Sydney.

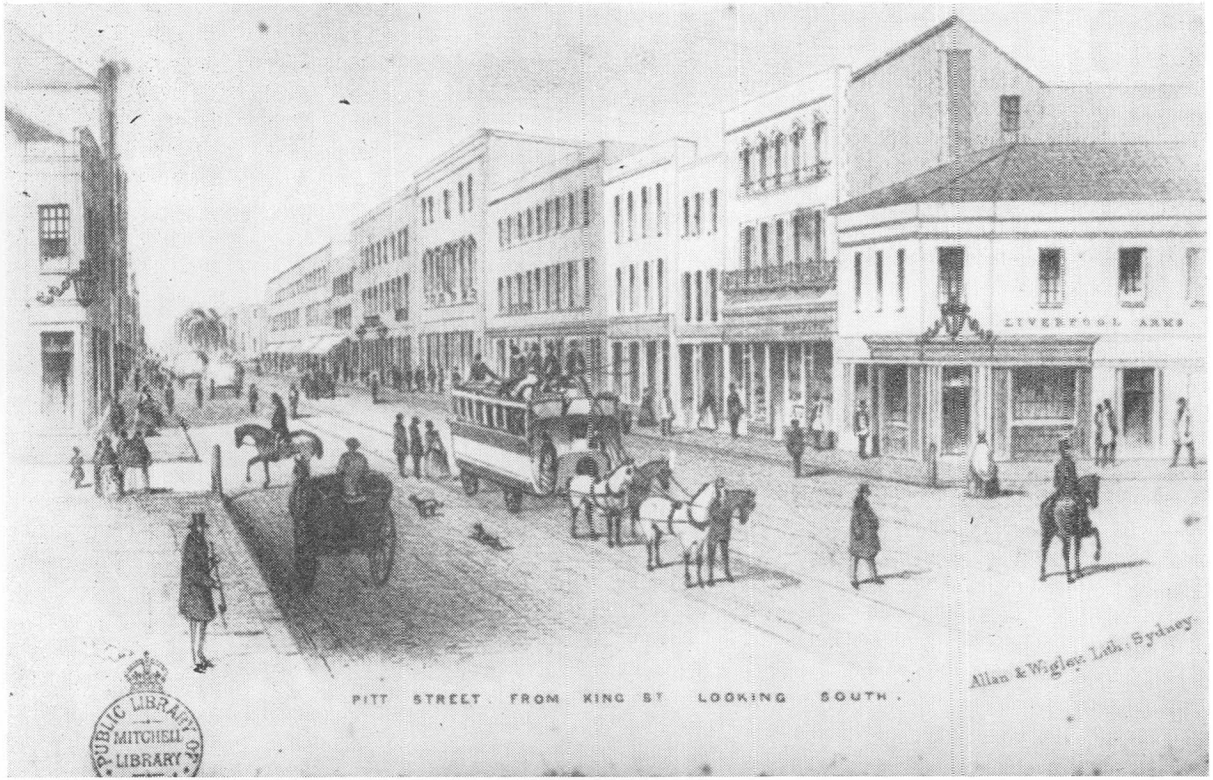


FIGURE 1.
Sydney street in 1866.

FIGURE 2.
Sydney street in 1866.

south beyond Picton. Trains ran frequently to Parramatta—stopping at Newtown, Ashfield, Burwood and Homebush. The time for the trip was only 52 minutes. The journey to Parramatta could also be made by a paddle-steamer. A description of the trip for the benefit of the visitor was given by Waugh.

"Continuing our sail up the Parramatta River the first port the steamer lands at is Bedlam Ferry, so called from the Tarban Hill Lunatic Asylum being in the neighbourhood; Hunters Hill is next in the succession, displaying several neat residences, but although a great deal of building has been going on lately, there is little sign of it to be seen from the steamer; one may, however, form an idea of it from the number of detached private residences and clearances which meet the eye in all directions in the sail thus far. A little further on, the steamer makes another stop to let out and take in passengers. This is called Kissing Point, for what reason it is, however, difficult to imagine. There are some beautiful orange groves in this locality.

"Nothing further occurs worthy of notice till near Parramatta where a large mansion on the right hand, with gardens down to the water's edge cannot fail to be observed. This was long the residence of a well-known columnist, Mr. Hannibal Macarthur.

"Nearly opposite, in fact before we come to it on the left bank of the river is the large establishment of Mr. Blaxland, where a manufactory of salt was for many years carried on. It is now being converted into a butchering and boiling-down establishment."

Public transport to other places was not so well established. According to Waugh: "It is to be lamented that omnibuses do not run regularly to Botany; but in their absence the stranger should by no means lose the opportunity of visiting it. The road passes through the populous suburbs of Chippendale and Redfern; there is nothing worthy of remark on the way, if we except the tunnel (which he will observe traces of) that conveys the water to the city from the swamps that surround Botany on its northern side. The Water Works will be seen at a distance."

The trip to Manly by steamer was well recognized, but the scenery somewhat different from that to-day, as Waugh wrote: "On all sides of the Harbour numerous indents of the sea may be observed; these Bays surrounded by thick scrub render its scenery such as is rarely equalled in any part of the world."

Life in Sydney was much more comfortable than that in the country. The country towns were all quite small and communications between them were difficult.

THE COUNTRY

The populations of some of the main towns were:

Maitland	7,528	Tamworth	800
Bathurst	5,000	Camden	685
Newcastle	4,000	Deniliquin	632
Grafton	1,400	Wagga Wagga	627
Yass	1,123	Bega	625
Albury	981	Queanbeyan	526
Braidwood	959	Port Macquarie	514
Campbelltown	938	Young area	400
Armidale	910		

Bradshaw's Guide gave the time-tables of transport into the country towns of New South Wales. Cobb and Co.'s Telegraph Line Royal Mail Coaches ran to and from Sydney to Goulburn, Yass and Braidwood — taking mails daily. These coaches ran to Queanbeyan and Cooma three times a week. They conveyed the gold escort to and from Sydney to Cooma once a week, leaving Sydney on Monday mornings and arriving in Cooma on Thursday evenings.

Travelling in New South Wales was not easy according to a contributor to *Chambers Journal,* written about this period.

"In this comfortable and convenient country of England ladies often talk of the difficulty and inconvenience of travelling alone; but few of those who have lived in England, or even extended their journeyings over the European continent, can form any idea of the inconveniences, or rather the miseries, of female travelling in the antipodes. Men can always ride on horseback and make themselves tolerably comfortable at roadside inns; but for women there are almost equally wretched modes of locomotion; first in a private carriage, in which with good horses, good luck in having no breakages, they may, if the roads are in good condition, get over thirty or forty miles a day.

"Secondly, women may travel in the coach which conveys 'Her Majesty's Mails'; it is more like a wagon; sometimes it boasts of a tarpaulin covering; but usually it is merely a wagon on springs, with seats running from one end to the other. The third and lowest degree of travelling is in the top of a wool drag."

The trip from Parramatta to Carcoar was certainly an endurance test as the following extracts from an account of it by the lady who wrote the above will demonstrate.

"At seven o'clock on a pitch dark night we took our places in the mail bound for Bathurst; the jolting was quite equal to that we had

suffered the previous day, but it was too dark to see what sort of a road it was; and at a quarter to twelve at night we reached Penrith where we were to sleep.

"Our bedroom was across a large yard; and on each side of the room door hung the newly-slaughtered carcass of a sheep, which had a most ghastly appearance by the light of the candle. The room was as uncomfortable as possible; no sheets or pillow cases on the bed; no water in the pitcher; and I gladly paid a shilling to procure a whole candle instead of the inch and a half that was offered me, for I could not have remained in the dark in that lonely, wretched room.

"I laid the children on the bed, and sitting in a chair by their side, tried to get a little sleep; but alas, the room and bed were full of those abominable dirty insects which are one of the pests of the Colony. They ran about in such number that the room smelt of them; and I was really thankful when we heard the coachman knock."

The coach left at four o'clock, and the journey must have been somewhat uncomfortable as the writer continued:

"It rained fast but the coach to-day had no covering, and was simply an open wagon with springs of some sort. I was the only passenger that morning except a gentleman who went on the seat with the driver, and I found to my horror that the coach (by courtesy) was full of hay piled up in great trusses; and really all the space left for me and the children was about eight inches on each side of the door, which was at the end of the wagon (or coach).

"We must have been travelling for about an hour from Penrith when we came to the Nepean River, the bridge over which had been totally destroyed by the late floods. We drove to the bank of the river and the driver coo-ee'd several times. I began to wonder how we were going over, when I saw in the dim light a monstrous black thing slowly making its way across the wide river; it must have been, I think, a sort of pontoon. We drove on to it and in some manner which still remains a mystery to me, the driver and the other passenger kept pulling a rope and we slowly crossed to the other side. On we went again, jolting over Emu Plains, and before long, commenced the ascent of the Blue Mountains. Here the scenery was magnificent; but I shall not attempt to describe it, as this is only an account of my own sufferings."

Of the descent of the mountains to the west the writer continued: "The road is wonderfully good in most places; it was cut out of the side of the mountain by convicts; we passed the ruined stockade where the wretched prisoners slept at night, strongly guarded; and the driver pointed out the precipice down which, he said, the bodies

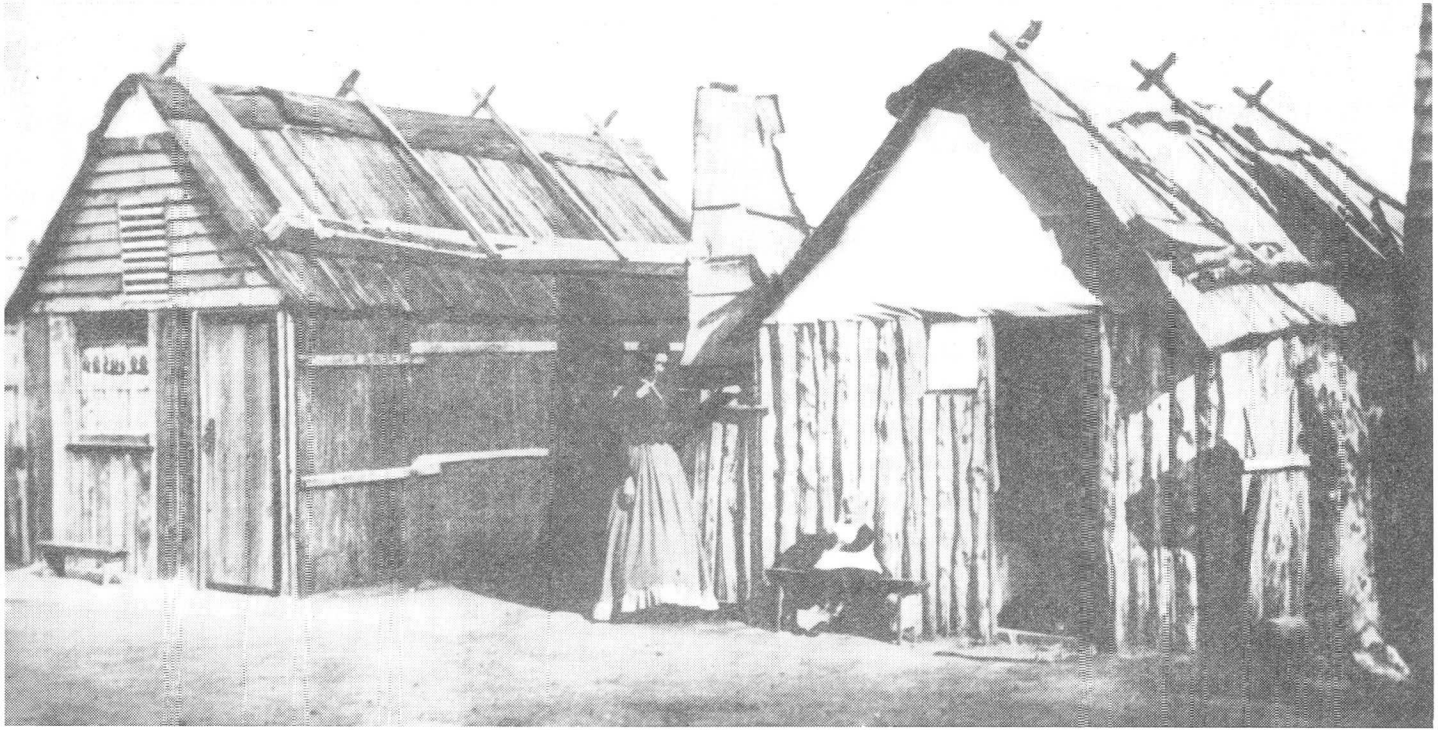


FIGURE 3.
Homes in the country.

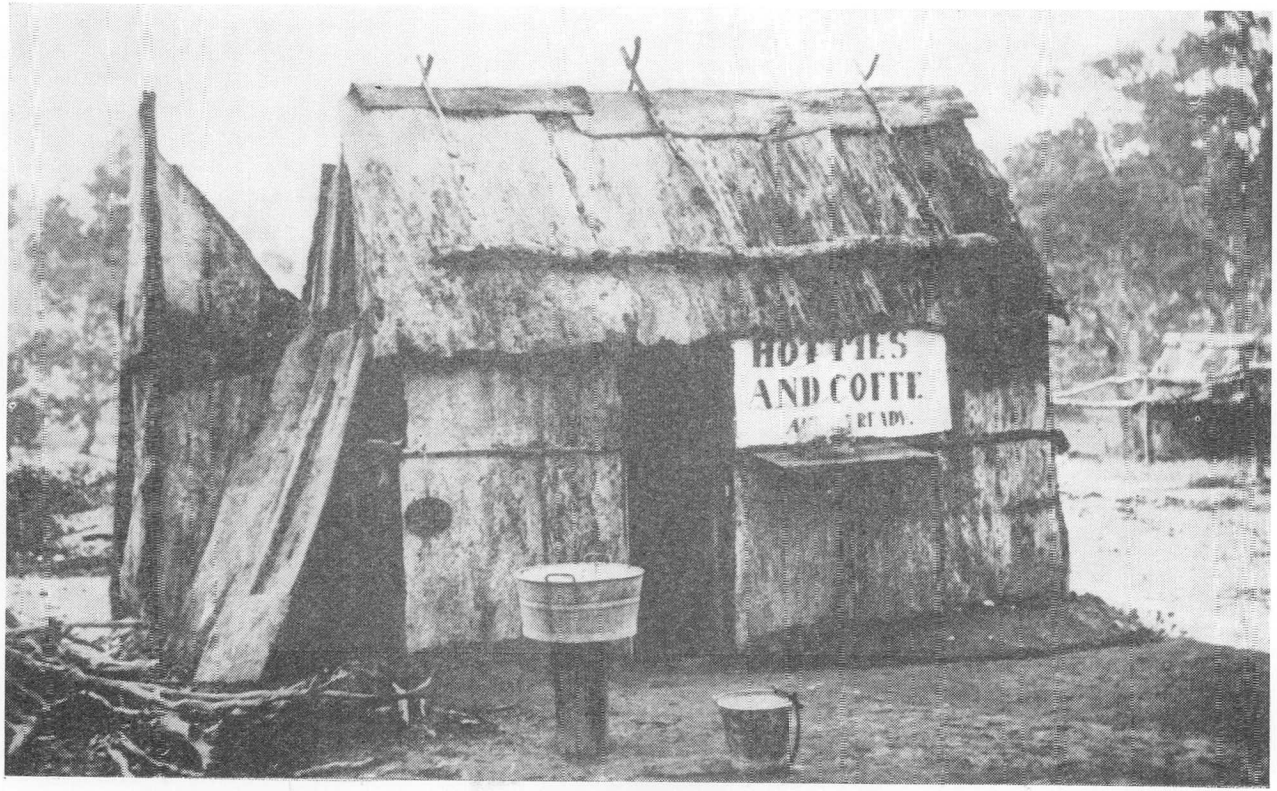
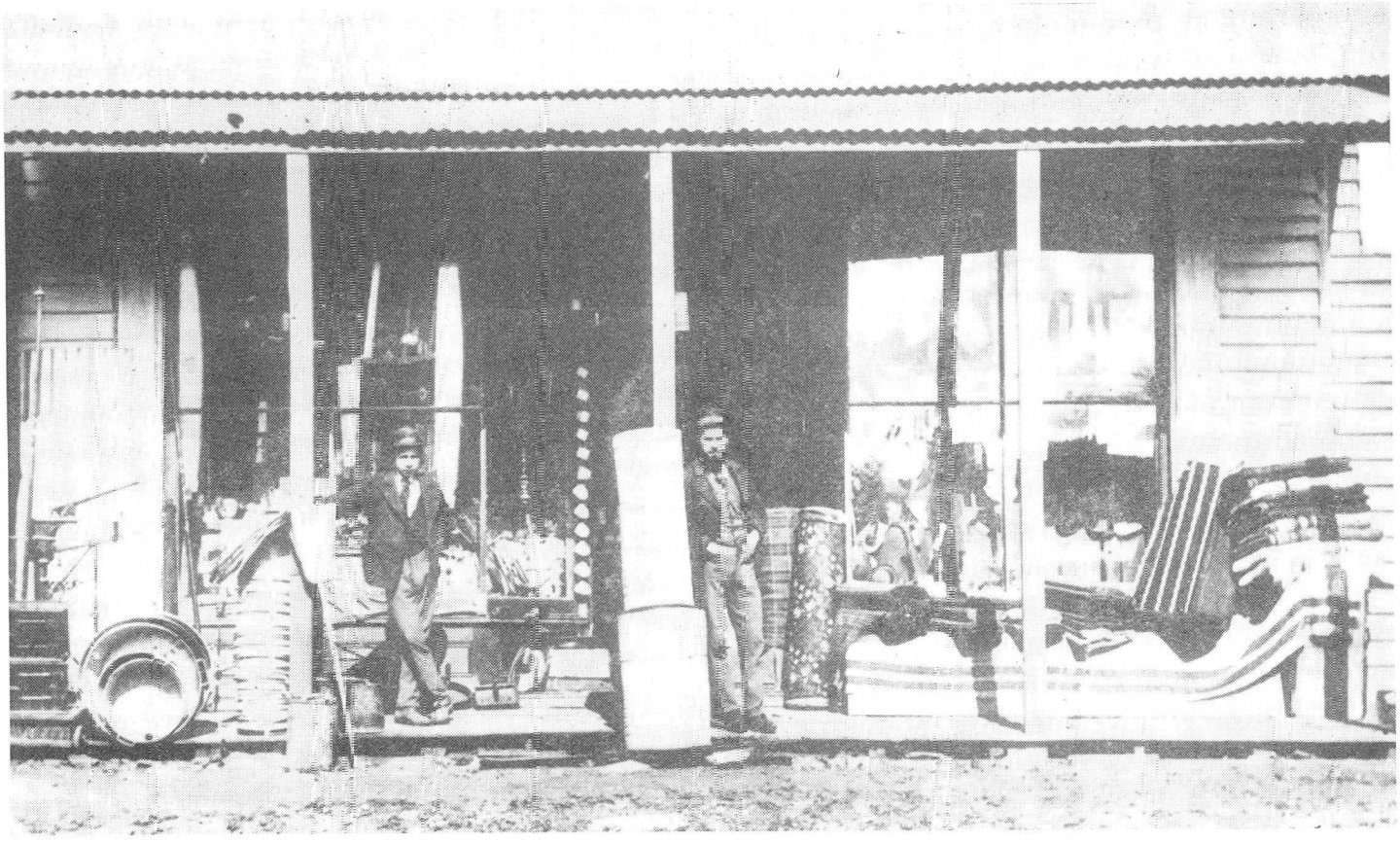


FIGURE 4.
The country restaurant.



FIGUEE 5.
The country store.

FIGURE 6.
The country hotel.

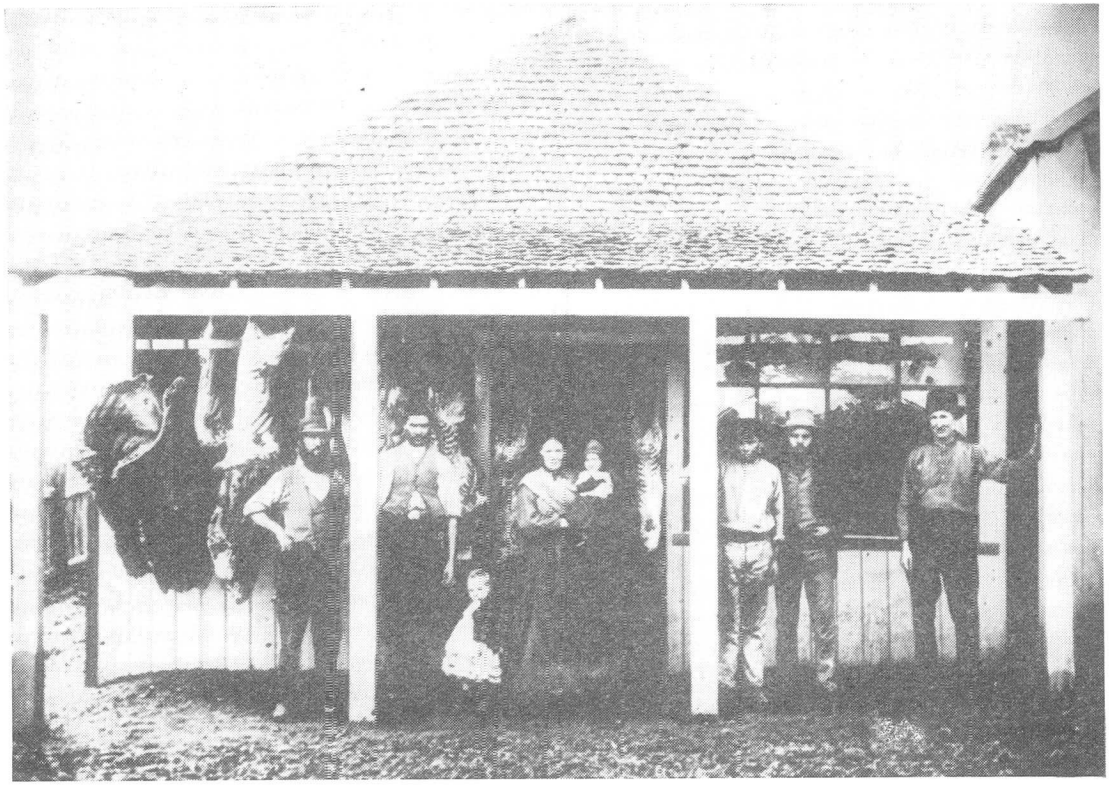


FIGURE 7.
The country butcher's shop.

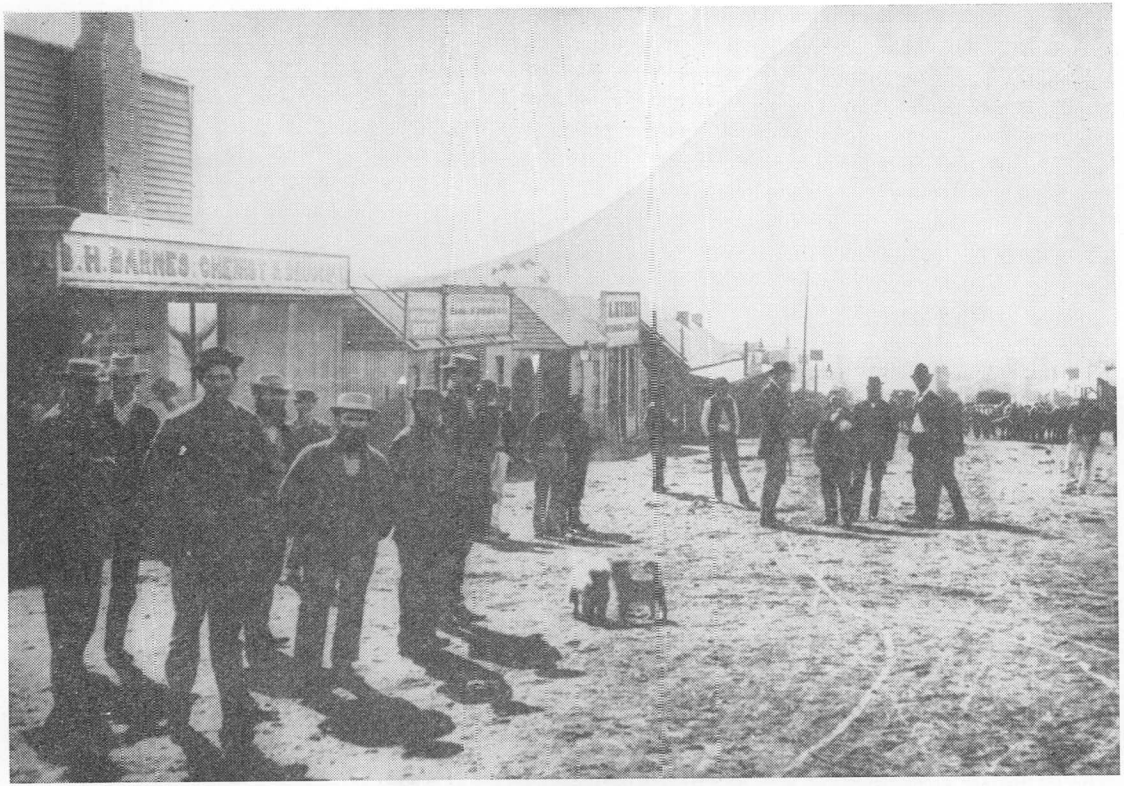


FIGURE 8.
Local residents in Gulgong street.

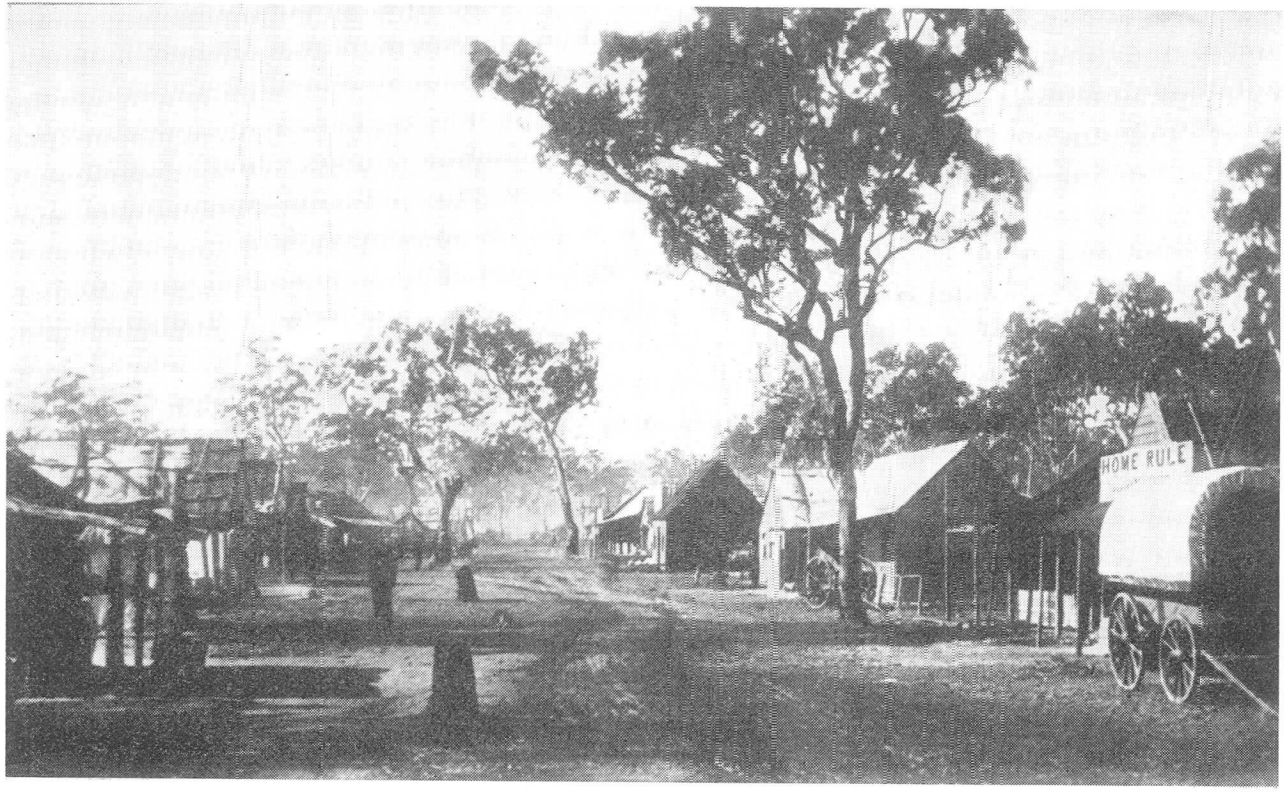


FIGURE 9.
Main street—Home Rule.

of those convicts who died, were thrown. This dreary place is called Blackheath, though it has not the slightest resemblance to its namesake near Greenwich.

"The road was strewed in most places with skeletons of bullocks, who had died in the preceding summer, of thirst and fatigue, whilst dragging the heavy wool-drags up the mountain."

After spending the night in the inn at Great Hartley the journeying commenced again at four the next morning and Bathurst was reached at about three o'clock in the afternoon, "and started again the next morning at four a.m. for Carcoar in the mail-cart, a sort of dog-cart meant to carry only one passenger besides the driver; with one horse between the shafts and another attached as outrigger. There is no real road from Bathurst to Carcoar, only a bush track, but it was less rough than the main roads, because there was less traffic and therefore it was not so much cut up."*

Buildings in the smaller country towns were built of local materials, mainly wood and bark, as shown by the simple residences in plates 3 and 4.

The street scene at Gulgong (Plate 8) is typical of the mining towns of these days. It is hard to imagine a more primitive pioneering village than that of Home Rule as expressed by Plate 9. Little has been written of the covered waggons of Australia but one can be seen in this photograph.

Navigation of the Murray River system was completed by 1860 and a powerful river trade followed. The steamers ran regularly to Bourke, Hay, Echuca, with extensions to Gundagai and Albury. They were trading shops, selling everything from needles to fencing wire, boots, tinned milk and liver pills. They carried back wool and timber.

Industry

There was comparatively little in the way of manufacturing in New South Wales, and the discovery of gold and consequent departure of many able-bodied men to the gold-fields in the "fifties" had a further bad effect upon the situation.

In the "Geography of New South Wales", written by W. Wilkins, Chief Inspector of National Schools, the following statement appears:

"Up to the present time, the manufactures of the Colony have been restricted to materials intended for home consumption, with the exception, perhaps, of tallow and leather. Since the gold discoveries, several of the most important colonial manufactures, which had

* From paper cutting from *Chambers Journal* in book in Mitchell Library—no date given but in the "sixties".

declined, now appear to be in the process of revival. Brewing and distilling are carried on to some extent, and the manufacture of soap and candles has assumed a position of considerable importance in Sydney and most of the larger towns of the Colony.

"Materials for building, such as bricks, lime and timber, requiring some degree of manufacturing skill in their preparation, are also used in considerable quantities; while the excellent wood of the cedar furnishes occupation to the makers of furniture. Tobacco is grown and manufactured in the Colony.

"The manufacture of woollen cloth is again very important, and furnishing occupation for large numbers of workmen."

The exports of New South Wales in 1866 were valued at sterling £8,512,215 and imports £8,867,071. The chief exports were wool (£2,408,494), gold (£532,000), gold coin (£2,815,437), ox hides (£110,000) and tallow (£56,000). Coal was worked extensively and exported to California and the East.

Stock were listed for settled districts and pastoral districts. Figures at the end of March, 1866 being set out below:

	Settled Districts	*Pastoral Districts*
Horses	178,693	103,894
Horned cattle	536,712	1,415,193
Sheep	1,811,255	6,321,256
Pigs	117,969	28,932
Alpacas, etc.	210	—

Land under cultivation was 381,400 acres.

Amusements

Amusements and occupations in the days before moving pictures, television, motor-cars and clubs were still quite satisfying. The Saturday half holiday for most employees was accepted and holiday makers played cricket or football or went rowing, yachting and fishing. Excursions and picnics were popular and horse racing at Randwick was well patronized.

Theatrical productions, recitations and play readings provided evening entertainment in Sydney's theatres and the School of Arts. Examples of special imported performances in the sixties were: The Lancashire Bell Ringers, Burton's Circus Company and Madame Schier's Wax Works Exhibition.

An illustration of the favoured kinds of entertainment offered by Sydney is indicated by a summary of highlights in the itinerary of His Royal Highness the Duke of Edinburgh in 1868, taken from the "Cruise of H.M.S. Galatea", by J. Milner and G. W. Brierley, January 20. He was met at Sydney Heads by a fine fleet of 22 steamers and later at the gates of the Domain by nearly 10,000 school children.

During his visit the Duke attended a dramatic performance by members of the University of Sydney in the Great Hall; went to the races at Randwick with 30,000 others and had a lunch there highlighted by wonga pigeons and a haunch of alpaca; watched a yacht race on the harbour and saw a great horticultural exhibit at the Botanical Gardens. He was taken on a picnic to the summit of the Blue Mountains after a 62-mile train trip to Weathertop "where there are a few scattered houses used by draymen who meet the trains there with wool and other produce from the interior". A light waggonette and pair, which the Duke drove, took His Royal Highness' suite. The Governor and the rest of the party followed in large covered carts, each drawn by two horses.

On his return the Duke watched a cricket match between some aboriginal cricketers and officers of the Army and Navy on the Albert Cricket Ground at Redfern; attended a citizens' ball in a very large temporary pavilion built in Hyde Park; went on a shooting trip by train to a rabbit warren near Douglas Park and went on a trip to Parramatta by steam yacht.

An unexpected development during a picnic at Clontarf was the attempted assassination of the Duke by an Irish sympathizer who shot him in the back. Even in a young colony like New South Wales, a hundred years ago life had its eventful moments.

Education

By 1867 there were 1,069 schools in New South Wales. National schools numbered 286 with 18,126 scholars, but there were more denominational schools, the Church of England having 174, the Roman Catholic Church 128, Presbyterian Church 28 and Wesleyan Church 21.

The country school house was built in the same style as the other buildings as shown by Plate 10.

The University of Sydney had 43 students but it had a magnificent building.

Most of the school books were brought from Great Britain and were on literature, grammar, foreign languages, history and geography. What we call science now, was natural philosophy. There was much more emphasis on geology than upon chemistry and physics because these were at a very early stage of development. Biology was generally descriptive in character.

Scientific Advances

Living in Sydney in 1866 must have been like living in a large country town without the great transport problems that arise to-day when so many people live miles away from the centre of the city. The

FIGURE 10.
The country school.

growth of the city and the associated problems which arose moved together and intelligent application of scientific investigations has been required to overcome the mushrooming needs of water supply, sewerage, lighting, cooking, communications and transport. The higher cost of land in the centre of the city has led to the increasing height of buildings. Erection of these has been made possible by increased strength of building materials and advances in the methods of construction.

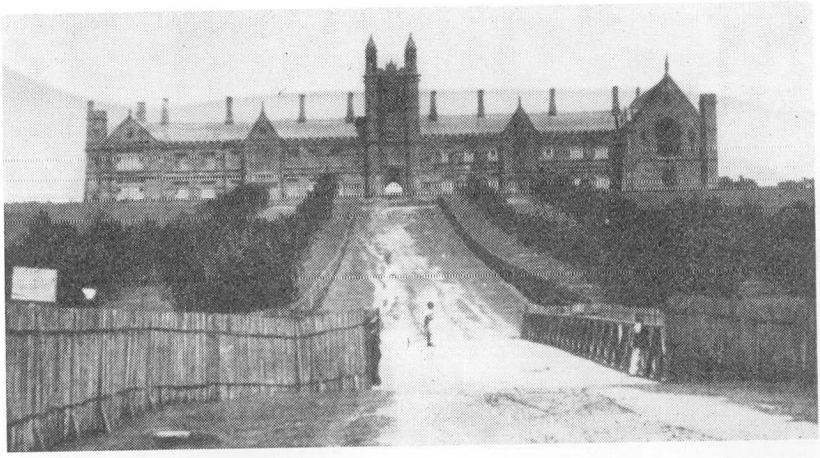


Fig. 11.—The University of Sydney, 1867.

Consider the nature of the scientific advances involved in these facilities.

1. The application of steam power in England during the first half of the nineteenth century made it possible to have steam trains substituting horse-drawn vehicles, and steam boats taking the place of sailing ships. These advances had been implemented to some extent in the colonies, first by the steam boats and then by railways. However, the first steam trams did not run in Sydney's streets until 1879.
2. Steam was then used to produce electricity which was substituted for the oil and acetylene lamps in streets, public buildings and in private homes. The first electric tram ran along Military Road, North Sydney, in 1893 and electric trains were much later.
3. With the application of steam and electric power, many other inventions were necessary and advances had to be made in the preparation and use of metals and their alloys for various purposes.

4. Fuel for most of the period was coal and later oil derived from shale, both were obtained near at hand. The use of petroleum has, until recently, involved the importation of enormous quantities of these substances and their derivatives.

Transport outside the city and into the country has gone from horse-drawn coaches to steam-driven, electrically-driven and then diesel-driven trains, by motor buses, motor cars and, in recent years, by regular services by aeroplane.

5. Constructions of railways and roads has progressed from the pick-and-shovel to the grader, bulldozer and other complicated equipment.

6. In the early days of the Colony the first huts were made of soft slabs of the cabbage-tree palm, then with upright posts wattled with slender twigs and plastered with clay. Later on, bricks and tiles were made from the clays around the city. Stone buildings were erected, making use of the sandstones around Sydney.

A wide variety of other materials arose after the discovery of metallic ores; galvanized iron was substituted for the slates and tiles for roofs in some areas. Later, asbestos plaster sheets and various kinds of board made from a variety of materials were used in buildings. Portland cement, leading then to the use of reinforced and pre-stressed concrete, was used and modern building construction methods emerged.

To some extent the progress was foreseen. At the conclusion of Rev. W. B. Clarke's Inaugural Address to the Royal Society, he said (p. 26):

"We have before us in the Colony a vast region, much of which is still untrodden ground. We have, as it were, a new heaven for astronomy and a new earth for geology . We have climatic conditions of the atmosphere, which are not to be viewed by us merely as phenomena interesting to the meteorologist. We have facts to accumulate relating to droughts and floods which have a deep financial and social importance.

"We have a superficial area which may engage the attention of surveyors, agriculturalists and engineers for years to come. We have unrevealed magazines of mineral wealth in which chemists and miners may find employment for ages after we have all mingled with our parent earth."

Much more development of these resources is still ahead of us a hundred years after Clarke's address.