The Virgin Forest Harvest and the Development of Colonial New Zealand

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FEW NINETEENTH century western communities owed more to the forest harvest than did colonial New Zealand. The first British colonists built mainly in wood, and made wood their main fuel—as the Maoris had done for centuries before. Brick and stone were discouraged by the fine indigenous timber resources and the earthquake risk. Firewood met little competition as a domestic fuel until the railways began to tap the coal fields in the late 1870s. The settlers fenced largely with wood, while timber shaped by the cooper, wheelwright, shingle-splitter, cartwright, ship builder and cabinet maker met a remarkable variety of the community's needs. Beyond doubt, the forests made a major contribution to colonial development.

Nevertheless, one finds that scholarship has left this topic almost entirely to the amateur. [1] There is no account which relates it to the wider context of the colony's economic and social development, and aspects of primary importance remain unexplored. This neglect may owe something to the fact that the forest harvest has not the obvious colour and drama of such topics as the gold rushes and the land wars, and a growing concern with conservation of the natural environment will scarcely have enhanced its popularity. A 'colonial' fascination with terms of reference provided by the Old World may also have proved a distraction. The story of nineteenth century Britain is dominated by the spread of iron and steel, and by the multiplying of mills to serve overseas markets: whereas colonial New Zealand was a world built predominantly of wood and its most characteristic mill harvested the virgin forest and served a home market. There are also problems relating to the sources. Franklin (1969, 124) notes the inadequacy of the available information on what was 'by nature a transitory sort of economy associated with few permanent settlement forms and a markedly male population'. Writing of Wellington Province, he concludes that one can obtain a statistical and locational picture only for the industry's declining stage. Certainly the coverage improves greatly in the twentieth century, with comprehensive official reports in 1905 and 1907 (A.J.H.R., 1905, 1907), the founding of national associations of timber merchants (in 1915) and sawmillers (in 1917), and the setting up of the State Forest Service in 1920. But we should not lightly despair of an adequate account of a subject so important in the general history of the colonial period. I hope to demonstrate that a fairly firm picture can be built up.

COMPARISONS WITH BRITAIN AND AUSTRALIA

The forest industries were vastly more important in the colonial than in the homeland economy. In Britain, stone, brick and plaster had long since

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supplanted wood as the main building materials, while coal had become the main domestic fuel Centuries of heavy use had greatly depleted Britain's forests, and from the middle of the nineteenth century she imported 95 per-cent of her needs in wood (Anderson, 1950, 799–800). In contrast, after New Zealand's four founding decades, her 1881 census showed seven-eighths of the settlers' houses to be of wood, and the proportion was to increase over the following decades, as dwellings of sod, cob, raupo, etc., were replaced in wood (Department of Statistics, 1881, Part I, Table II). When in 1876–77 Captain Campbell-Walker, from the Indian Forest Service, served briefly as New Zealand's first Conservator of Forests, he found a large timber industry, more highly mechanised than any he had seen in Europe, providing building timber at rates 'very low compared with those of other countries'. He commented that the quantity of wood converted into fencing materials and firewood, 'must be very large, in proportion to the population.' (A.J.H.R., 1877, 40–41). His estimates of firewood consumption taken together with railway goods traffic returns, first published in the 1880s, suggests an annual consumption of from two to five tons per head[2], the amount varying according to availability, local climate and local industries (A.J.H.R., 1877, 38). A. Lecoy, another Old World expert consulted by the New Zealand Government at this time, contended that the 'enormous' quantity of timber cut yearly for purposes other than the sawmill 'could not be estimated at less than the cubic volume of sawn timber.' (A.J.H.R., 1881b, 1). It may well have been several times greater. Timber statistics collected at the 1881 census, suggest an output of 320,000 tons of sawn timber in 1880. Even at the lower level of two tons per head the year's firewood consumption would have amounted to nearly 1,000,000 tons. To this we must add the year's output of posts, palings, shingles and the round timber so widely used in the crude industrial and communications engineering of a pioneer community. Clearly the colony's *per capita* consumption of wood must have been many times greater than Britain's. One very rough, but nevertheless suggestive, comparison can be offered. In June 1881 Lecoy estimated the annual market value of New Zealand's forest harvest at roughly £2 million (A.J.H.R., 1881b, 1). The declared value of Britain's timber imports for 1880 was £17.3 million (Mitchell, 1962, 298), so the year's wood and timber consumption cannot have been above £20 million. This gives New Zealand a sevenfold greater *per capita* consumption, in terms of market value.

One would, of course, expect a new, well-timbered land to consume more than Britain, but New Zealand's circumstances clearly encouraged a particularly heavy reliance on wood. A comparison with Australia is informative. Here brick stone and concrete were more widely used. The 1911 Commonwealth census returned 34 percent of dwellings as of these materials; the corresponding New Zealand figure was a little over 4 percent. With a generally warmer climate, Australians would have consumed much less firewood, and mining statistics suggest that coal was used as a domestic fuel earlier and more widely than in New Zealand. A useful rough comparison is provided by the 1891 censuses, which show the proportion of New Zealand's population engaged in forest production to be more than twice as large as Australia's. Australia, as one would expect, had a much larger proportion of brickyard and quarry workers (Coghlan, 1896, 300).

PATTERNS OF DEVELOPMENT

In the early decades of colonisation local mills, in forests handy to the settlement sites, met most of New Zealand's needs. Production beyond local needs occurred only where good stands of timber were accessible to shipping. The northern Kauri forests were first tapped in this way in the 1790s. After 1840 development became more widespread, with considerable exports, mainly to Australia. When these fell off in the 1860s, the growth of New Zealand's population, and the exhaustion of local forest resources in several districts, gave rise to a considerable coastal timber trade. Although the North Island had the larger share of the country's forest resources, outside of North Auckland little was accessible by water, and so Wellington, Taranaki and Hawke's Bay imported much of their timber. As a result, for a decade or two the South Island had the larger timber industry. In 1871 the South had 109 mills to the North's 41, with 792 sawmill owners and workers to the North's 726 (Department of Statistics, 1871, Table 31). The 'Vogel' boom of the 1870s brought a major restructuring of the industry. By the mid 1870s the new railways were tapping large areas of previously inaccessible forest, and mills based on railway sidings rapidly overhauled the water-based mills in output. By 1880 the railways had enabled the North Island to firmly establish its predominance in the industry. Although the North still had fewer mills (100 to 123), it was employing more hands (2,278 to 1,920), and turning out approximately 60 percent of the colony's sawn timber (Department of Statistics, 1881, 302). Large quantities were being railed to the ports and shipped to the South Island. This shift from water to rail-based mills had important social and economic consequences for the colony. The water-based industry had been situated mainly in districts such as Banks Peninsula, the Marlborough Sounds, and North Auckland, where the cut-over forest land had only limited farming potential. Hence the build-up of sawmilling population was followed in due course by the dispersal of the greater part of it to other parts of the country. In contrast, the rail-based mills of the latter decades of the century were almost all situated in districts of high farming potential, where the timber industry was better able to serve as a springboard for the founding of more permanent agricultural industries. In the 1870s and 1880s, Southland and the Rangitikei-Manawatu provide good examples of this type of development.

THE MID-CENTURY WATER-BASED TIMBER INDUSTRY

A detailed account of the earlier water-based industry would require a careful collation of local history source materials with data on the coastal shipping trade. The timber trade played such a vital part in the rise of coastal shipping that the two subjects need to be unravelled together. We will attempt here only a broad outline of this phase of the industry, using as our main sources Campbell-Walker's survey of 1876–77, which coincides roughly with the height of its development, and Thomas Kirk's remarks on its decline in his reports of 1885–86.

Campbell-Walker found Auckland Province to have the colony's largest timber industry, its 1876 production from 25 mills being 46,000,000 feet of sawn timber.[3] He infers that the Aratapu mill on the Wairoa River was the colony's largest. It could cut 150,000 feet a week without overtime

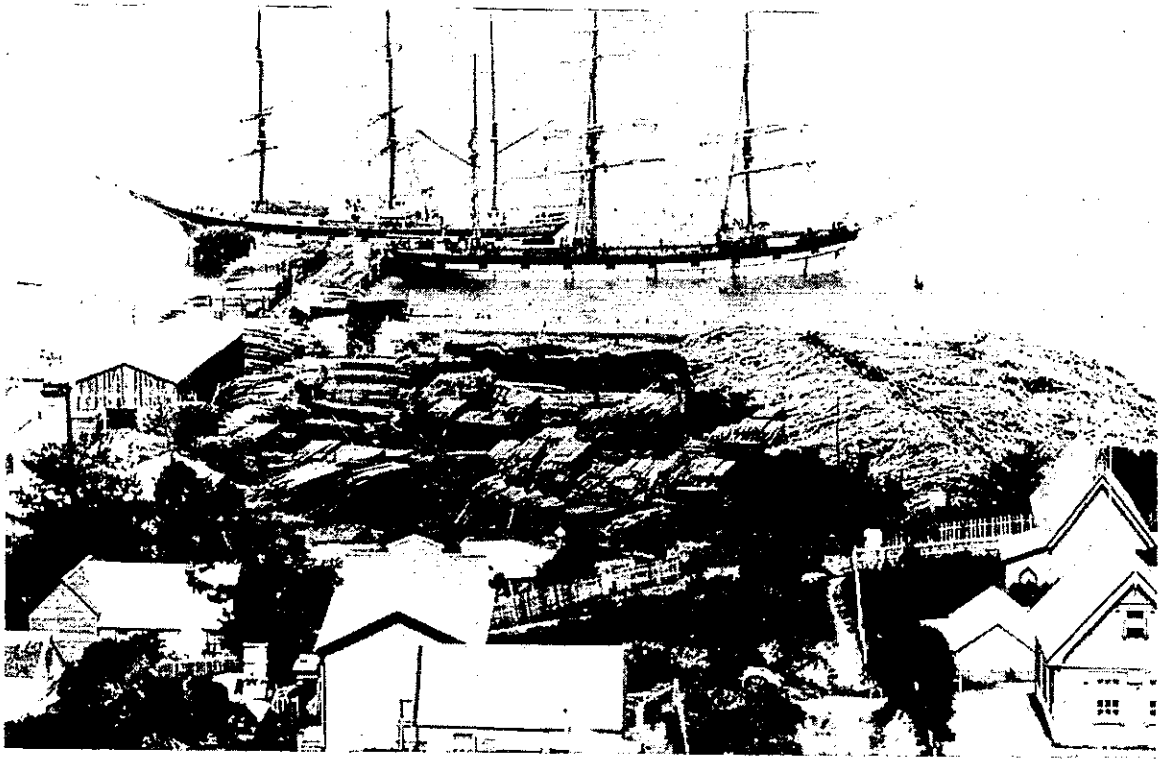

Fig. 1. The North Auckland water-based timber industry. Kohukohu wharf, Hokianga Harbour, probably 1890s.
Photo: Dickie Collection, Alexander Turnbull Library.

(A.J.H.R., 1877, 40–41). Auckland's kauri timber industry was to retain a unique place in New Zealand sawmilling throughout the nineteenth century, and into the twentieth. Due to the physical geography of North Auckland and the Coromandel Peninsula, it remained a largely water-based industry (Figure 1). The scope of the forest resources involved, the superb qualities of kauri timber, and the resultant considerable export overseas, gave Auckland timber-milling a stature not matched elsewhere, and a different rhythm of industrial development. The considerable trade in foodstuffs for the industry's workforce both of men and beasts must have provided a welcome stimulation to farming in various other parts of the colony.

All the other significant water-based milling districts were in the South Island.[4] The most important were the Marlborough Sounds, Golden Bay, Westland, Banks Peninsula, and the Catlins River region of South Otago (Figure 2). The first steam sawmill in the Marlborough Sounds was established in 1861 by Alexander Scott Duncan, at the Grove, at the head of Queen Charlotte Sound. His first shipment went to Lyttelton. By 1864 two further mills had started a few miles away on the Mahakipawa arm of Pelorus Sound, and in 1866 another was founded at the Grove (Wilson, 1962, 46–68). The West Coast gold rush stimulated brisk exports from the district. In May 1867 the *Marlborough Press* reported the despatch of over a hundred shiploads from Mahakipawa in the previous twelve months. The mills took nearly twenty years to cut out the Linkwater Valley between the two Sounds, and a local historian estimates the total production at about 68,000,000 feet (Wilson, 1962, 68). By the 1870s the industry had become more widely spread, its main centre having shifted to Pelorus Sound with Havelock as its headquarters. Until the railways tapped its own forests, the southern North Island provided

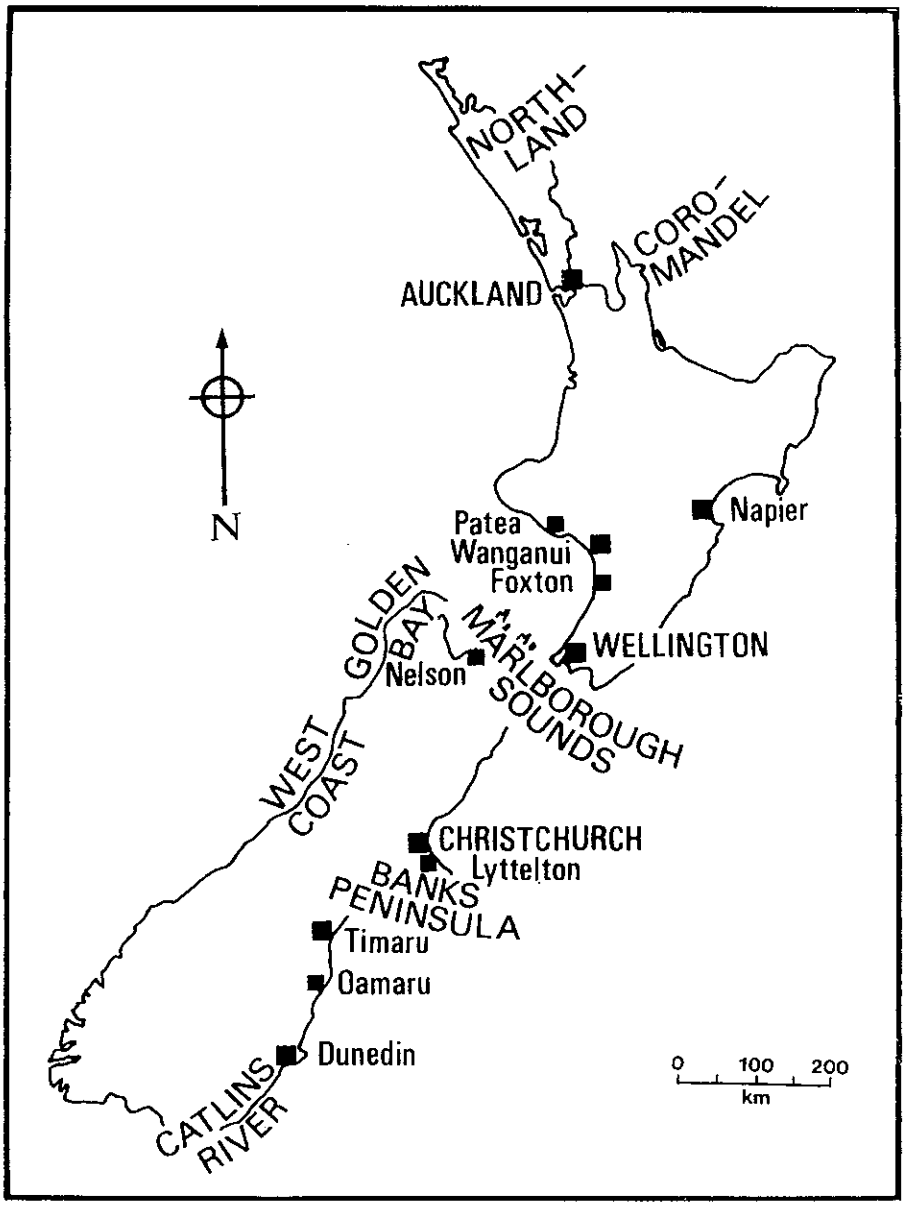

Fig. 2. Location Map. The water-based timber industry, c. 1870.

an important market. Thus Foxton imported most of her timber from the Sounds until the spring of 1873, and Wanganui depended on the Sounds and North Auckland until 1878 (*New Zealand Mail*, 8 June 1872, 8 March 1874; Wanganui *Weekly Herald*, 20 March 1875, 16 June, 1877). When the new rail-based local mills captured these markets, the northern South Island provided the main outlet for the Sounds. Campbell-Walker found that in 1876 Marlborough had produced approximately 15,465,000 feet from 16 mills (A.J.H.R., 1877, 41), all but one or two of which would have been in the Sounds (Figure 3). In 1885 Kirk found that most of the forest near the sea

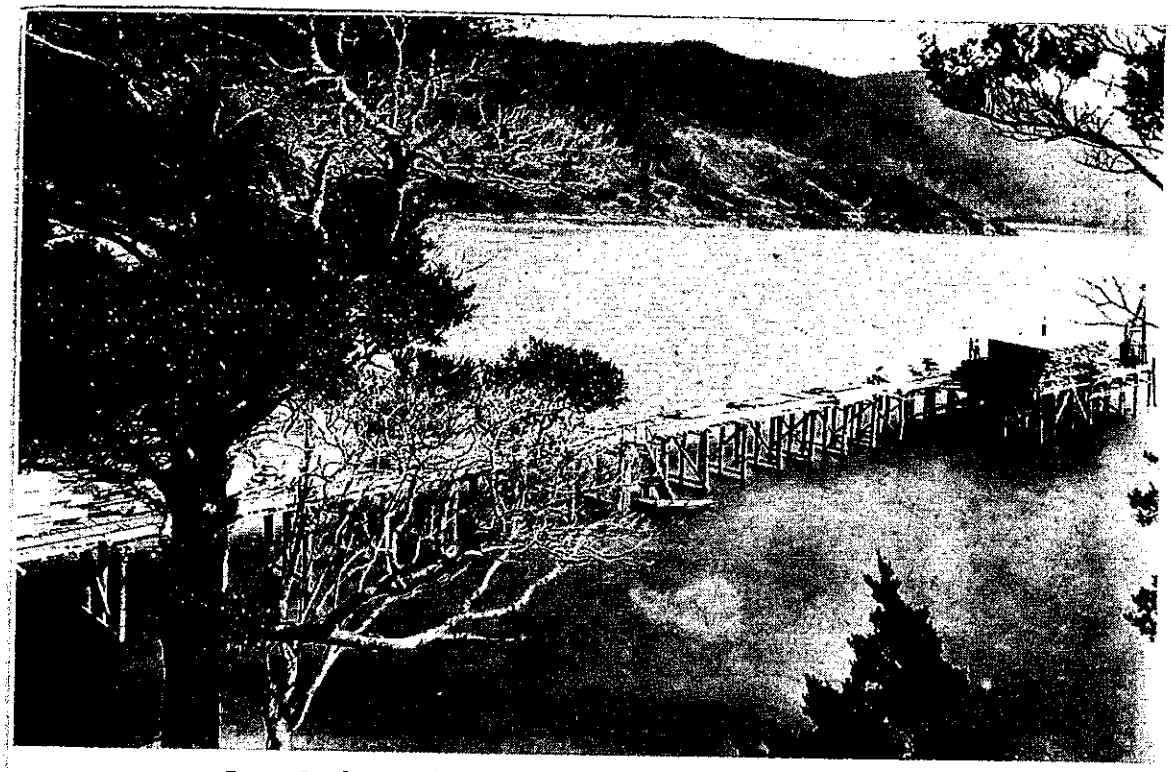

Fig. 3. Landscape of the water-based timber industry. Probably Marlborough Sounds. *Photo:* Alexander Turnbull Library.

had been practically worked out, and the annual output had dropped to less than 9,000,000 feet (A.J.H.R., 1886a, 17–18).

The gold rush to Collingwood in 1857 led to the first considerable development of sawmilling in Golden Bay. Wharves were built at Waitapu and Motupipi in 1864, mainly to facilitate the coastal trade in timber. In 1882, with some government assistance, eight miles of tramway were constructed in the Takaka Valley to convey timber from the mills to the Waitapu wharf. In 1885 Kirk found six mills in the valley, cutting about 3,000,000 feet annually—about half of the province's total production (A.J.H.R., 1886a, 16; Millar, 1948, 53–66).

Sawmills were hard on the heels of the diggers at the West Coast rush, with two steam powered mills in operation near Hokitika before the end of 1865 (May, 1967, 480–481). For some years the local mills could not meet the booming demand, but by the 1870s the coast had become a net exporter of timber. The local Crown Land Office told Campbell-Walker that Westland's output was nearly 10,000,000 feet, half for local consumption, half for export, mainly coastwise, but the millers returned their 1876 output as only 6,824,500 feet, from ten mills (A.J.H.R., 1877, 41–43). In 1885 Kirk reported 13 mills capable of cutting 11,500,000 feet a year, but working at little more than quarter of their capacity. The former large coastal trade had been gradually destroyed, mainly by the growth of the rail-based Southland mills. A rise in coastal freight rates, caused by the growing coal trade, had aggravated the depression (A.J.H.R., 1886a, 14–15).

On the founding of Canterbury the forests of Banks Peninsula became an important source of timber. Pitsawing predominated for a decade, but by 1860 steam sawmills were taking over. The main milling era lasted from

1860 to 1880 (Petrie, 1963). In 1877 Campbell-Walker found four sawmills at work, and rather prematurely predicted that, due to widespread milling and destruction by fire, 'the timber trade on Banks Peninsula is nearly at an end,' (A.J.H.R., 1877, 6–7, 58). In 1885 Kirk found that while Oxford had become the main centre of the industry in Canterbury, Banks Peninsula still had six mills at work. These two districts together were cutting 'fully two thirds' of the province's output (A.J.H.R., 1886a, 12). Railway statistics show that in this year about 1,000,000 feet was railed along the Little River branch line, which had reached Birdlings Flat. Hitherto millers in the Little River valleys had faced considerable difficulties in getting their timber to market, having no convenient harbour (Petrie, 1963, 56–57). Kirk considered that in 1885 the Banks Peninsula forest was nearly worked out.

The Catlins district of southeast Otago possessed that province's main millable timber resources. Until the construction of the Catlins River branch line, around the turn of the century, these forests could be tapped only by sea. McLintock remarks that the area possesses a character all its own, suggesting 'a forested island where bush-clad range succeeding bush-clad range fades into a misty haze, sombre yet alluring.' (McLintock, 1949, 13). Sawmilling began in the early 1860s, based on the two safe harbours, Catlins River and Waikawa, and continued to flourish until the late 1870s. At its peak in the 1870s this timber trade kept a dozen small craft fully engaged, and the industry employed nearly 200 hands. In 1885 Kirk reported that this district, possessing the greater part of Otago's milling capacity, had been depressed for the previous five years, due mainly to the competition of the Southland millers (A.J.H.R., 1886a, 8–9).

THE IMPACT OF THE RAILWAYS

Kirk's 1886 report tells of the widespread restructuring which followed the coming of the railways. The most striking developments had been in Southland and Wellington. Kirk attributed the rise of the Southland industry to the opening up of the country by the railways, and their ability to transport timber to more distant markets. As a result:

> The rapid development of the Southland trade has closed the mills in Catlin's River, annihilated the coastal timber export of Westland, and greatly restricted that of Marlborough and Nelson. The timber converted in the Otago District does not amount to more than one-fourth of the annual output of Southland; so that Southland practically supplies the market of the southern portion of the colony, from Invercargill to Ashburton, with red and white pine, and exports cargoes to Lyttelton and other ports farther north (A.J.H.R., 1886a, 5).

In the northern South Island, however, the Southland mills had to compete with 'the mills of Queen Charlotte Sound, the Wairarapa and the Manawatu.' (A.J.H.R., 1886a, 5). As with Southland, the Wellington mills were in forest districts opened up by the railways, which were crucial in moving timber both to local markets, and to the ports for shipment south. In the year to 31 March 1886, Wellington Province's lines handled 48,541 tons of timber, almost a quarter of the total consigned in the colony. They also carried 21,655 tons of firewood, and timber and firewood together provided over half the province's railway freight for the year (A.J.H.R., 1886c, xi).

The 1885–86 railway freight figures show the forest harvest as an important element throughout the colony, and it clearly provided the main rationale for the existence of some lines. We have already noted one such: the Little River branch line. The returns show it carrying a tonnage of firewood almost equal to the timber, and the forest harvest clearly provided a major justification for the line's construction. The same could also be said of various short lines which represented disconnected fragments of the projected national system. It was their tapping of the forests which rendered most of these fragments viable. Timber and firewood made up nearly half the freight on the Nelson line, and over half on the Picton line. On the Napier line the 33,658 tons of timber and 12,420 tons of firewood made up nearly 58 percent of the goods traffic. On the line north from Auckland the 12,773 tons of timber from Helensville and 3,200 tons from Waitakere made up a major part of the traffic. In all, 202,572 tons of timber, and 80,280 tons of firewood, were consigned throughout the colony during the year, representing over 15 percent of the freight carried. This was nearly four times the tonnage of wool and over eight times the tonnage of livestock.

CASE STUDY—RANGITIKEI-MANAWATU 1870–1885

We turn now from sketching the broader outlines to a more detailed case study of a limited area, in order to elucidate the origins and workings of the industry, to examine the data on the size and location of mills, and to give some account of the industry's influence on economic and social development. We will choose the Rangitikei-Manawatu, tracing the forest harvest from a stage of primitive beginnings in 1870, through the rise of a major rail-based industry in the mid and late 1870s, to the beginnings of decline in 1885, when much of what had formerly been 'one of the best-timbered districts in the colony' was found by Kirk to be cleared and settled (A.J.H.R., 1886b, 9). Fortunately Campbell-Walker's report of 1876–77 gives a good brief description of the area just as the millers were beginning their major assault. He found extensive reserves of rimu, the colony's most popular building timber, and of totara, in strong demand for railway sleepers and bridge building in the 1870s. The rimu was more frequent on the higher land, commonly associated with tawa. The totara was of frequent occurrence, either more or less scattered in mixed forest, or forming groves of considerable extent in the more open valleys, but not in nearly such large quantities as rimu. There was also a good deal of white pine of large dimensions, particularly on low-lying and swampy land. In general it was the most accessible timber, being found in ample quantities closer to the rivers and the coast than the other varieties, but being poorly regarded as a timber it was largely bypassed in the 1870s. Two highly-regarded timbers, matai and miro, occurred frequently with the totara in the valleys. Titoki, common in the Rangitikei Valley, was much prized by the settlers for tool handles. (A.J.H.R., 1877, 15–16).

John and Thomas Kebbell set up the first sawmill on the Manawatu river early in the 1840s (Wakefield, 1908, 515–516), and a little milling must have been done continuously from then on. The *Wellington Almanack* records three sawmillers at work on the river near Foxton in 1870: James Tawes, Peter Bartholomew and Peter Manson. Exports coastwise are indicated by the

wreck of a small schooner at the river mouth in 1871, when leaving laden with tongued, grooved and dressed timber for Waitotara (*Wellington Independent*, 2 August 1871). As Foxton was importing most of its timber at this time, the millers probably had access to little but the poorly esteemed white pine, which they were dressing as lining timber. On the banks of the Rangitikei was a thriving sawmill which James and Charles Bull had developed in the 1860s in the private township which was to take their name. The Bulls had access to a better range of timbers than the Manawatu millers, and were less hampered by swamps in dispersing their output to the settlers.

An early concern of the colonial development programme launched in 1870 was to build a strategic road through the Manawatu Gorge to link the East and West Coasts. To this was soon added the idea of a wooden tramway inland from Foxton to tap the forests around Palmerston North, particularly for totara for the railway builders. With this project a new day dawned for the district's sawmilling. The two Foxton millers, Bartholomew and Manson, formed a partnership to establish Palmerston North's first sawmill during the winter of 1871. With 'much labour and expense' they got their steam engine up the capricious Manawatu river, and began cutting in August. In February 1872 a team of 24 bullocks toiled for nearly a week, hauling in a larger new engine. An early contract was sawing rails for the Foxton tramway, which would give them access to wider markets (*Wellington Independent*, 15, 19 July, 16 August 1871; *N.Z. Mail*, 24 February 1872). Due to frustrating delays caused by an unsatisfactory contractor, it was not until 30 September 1873 that the tramway brought down the first load of timber from Palmerston North (Wanganui *Weekly Herald*, 4 October 1873). The opening of the tramway, coinciding with a rapid buildup in the district's population, sparked off a notable advance in sawmilling in 1874. At least seven new mills started cutting during the year, with two more early in 1875.

With their bush at Bulls nearly cut out, the Bull brothers began early in 1874 to set up a mill at Aorangi on the Oroua, having negotiated with the Awahuri Maoris for timber rights. The whole of the Bulls' magnificent stud of 15 carthorses hauled in the boiler, directed by a renowned teamster. He narrowly escaped with his life when the carriage broke near its destination, and the boiler fell to the ground. This mishap probably explains why the mill did not start cutting till 1 December (*Weekly Herald*, 21 February, 14 March, 12 December 1874). Others of the new mills were closely associated with the 'Vogel' development. On 24 March 1874 the *Woodlark* reached Wellington from London with a mill destined by the Emigrant and Colonist's Aid Corporation for Feilding, the township they were founding, to begin the settlement of their 106,000 acre Manchester Block. This mill was cutting by May, and the Corporation had another operating in the settlement by July (A.J.H.R., 1874, 9). John Brogden and Sons, a large English railway contracting firm with whom Vogel had arranged contracts for works in various parts of New Zealand, turned to the Manawatu for some of their timber requirements. By early July 1874 they had a large mill working at Te Matai cutting totara on a native reserve just east of Palmerston North, while they had another mill under construction on the lower Oroua. Early in 1875 they had a third mill cutting at Hokowhitu (*Weekly Herald*, 11 July, 28 November

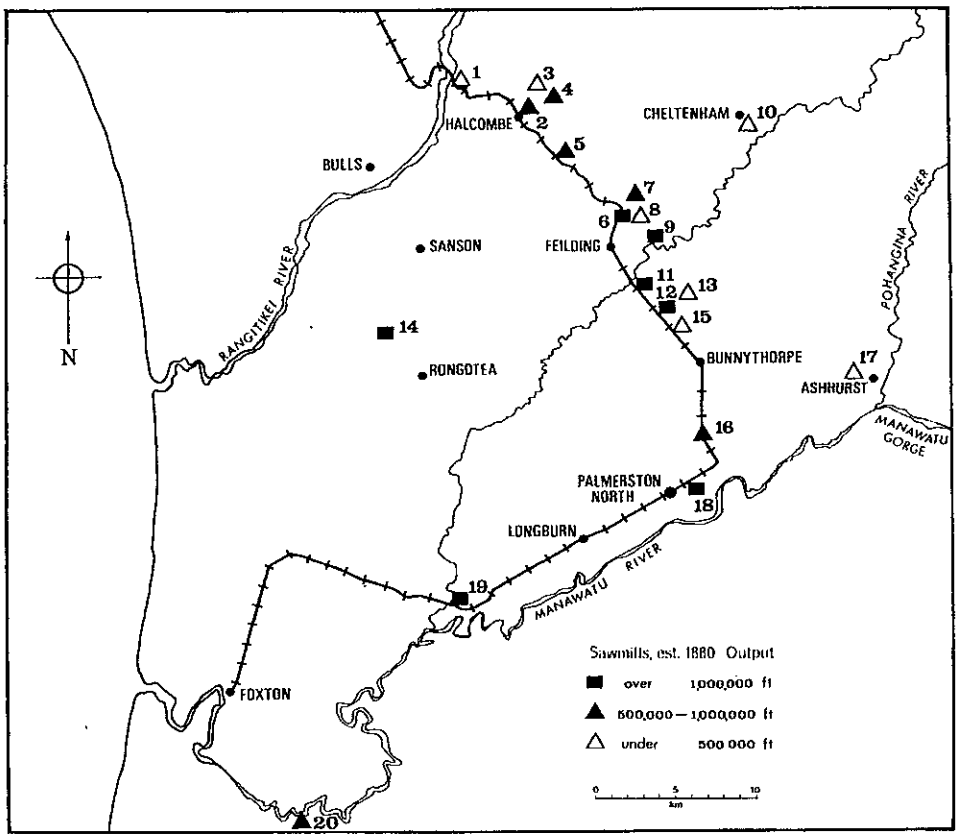

Fig. 4. Rangitikei-Manawatu Sawmills, 1880.

Mill

1. Robert Brown, Kakariki Mill began working 1874; estimated 1880 output, ?250,000 superficial feet. (*Weekly Herald*, 7 August 1875; *Rangitikei Advocate*, 20 March 1879).
2. W. H. Lash, Halcombe. 1876: ?800,000 ft. (*N.Z. Mail*, 25 May 1878; *Rangitikei Advocate*, 15 July 1878; *Weekly Herald*, 16 June 1882).
3. Taylor and Whitlock, Stanway Road, Halcombe. 1880; ?100,000 ft. (*Rangitikei Advocate*, 6, 27 November 1880).
4. G. Copeland, Stanway Road, Halcombe. 1878; ?600,000 ft. (*N.Z. Mail*, 10 August 1878; *Rangitikei Advocate*, 24 October 1878).
5. Henderson Bros. and Wratt, Swainson's Crossing. 1879; ?500,000 ft. (*Rangitikei Advocate*, 31 May 1879; *Cyclopedia of N.Z.* 6, 543, 545).
6. Malcolm, Russell and Co., Makino. 1879; 1,400,000 ft. (*Rangitikei Advocate*, 7 August, 23 November 1876, 29 March 1877, 22 February 1879).
7. Nichols and Tarrant, Makino. 1879?; ?600,000 ft. (*Rangitikei Advocate*, 27 March 1879; *Wellington Almanack* 1880, 293–294).
8. Roots and Co., Makino (also known as 'Makino Union' mill, and 'The Brethren' mill). 1877?; ?450,000 ft. (Gibson, 1936, 54; *Cyclopedia of N.Z.* 1, 1258; *Rangitikei Advocate*, 7 September 1880, 22 June 1882).
9. Bartholomew and Manson, Kimbolton Rd., Feilding. 1877; 1,750,000 ft. (Manson died 13 August 1880). (*Cyclopedia of N.Z.* 6, 713; *Weekly Herald*, 7 October 1876; *Rangitikei Advocate*, 8 January 1877).
10. Mills and Bydder, Cheltenham. 1879; ?300,000 ft. (*Rangitikei Advocate*, 11 January, 22 May, 6 November 1879, 27 November 1880).
11. James and Charles Bull, Aorangi. 1874; 1,000,000 ft. (*Weekly Herald*, 12 December 1874; *Rangitikei Advocate*; 7 February, 5 October 1880).
12. Bailey Bros., Taonui. 1878; 2,000,000 ft. (*Cyclopedia of N.Z.*, 1,1220; *N.Z. Mail*, 1 June 1878; *Weekly Herald*, 3 April 1880; A.J.H.R., 1909, 421–423).

Mill (continued)

13. West and Cooper, Taonui Branch Line. 1880; 500,000 ft. (Clevely, 1953, 30–33; A.J.H.R., 1880a, 78).
14. C. N. Rowe and Sons, Sanson. By 1877; 1,000,000 ft. (*Wellington Almanack*, 1871, 213; 1872, 222; *Rangitikei Advocate*, 20 September, 4 October 1877; A.J.H.R., 1880b, 7; *N.Z. Times*, 8 November 1901).
15. Richter Nannestad & Co., Trondheim. 1877; 100,000 ft. (*Weekly Herald*, 6 January 1877; *Rangitikei Advocate*, 8 January 1877).
16. Gillies and Henderson, Kelvin Grove. 1879; 750,000 ft. (*Manawatu Times*, 11 September 1880; *Yeoman* (Wanganui), 19 March 1881).
17. P. Bartholomew, Ashhurst. 1879; ?400,000. (*Rangitikei Advocate*, 18 March 1879; *Weekly Herald*, 18 December 1880).
18. Richter, Nannestad & Co., Hokowhitu. 1874; 1,250,000 ft. (Petersen, 1973, 93–95; *Weekly Herald*, 13 June 1875).
19. Freeman and Wylds, Oroua Bridge. 1878; ?1,250,000 ft. (*N.Z. Mail*, 20 December 1879; *Manawatu Times*, 3 January, 2 October 1880; *Cyclopedia of N.Z.* I, 1196).
20. J. McBeth, Paiaka. 1878?; ?750,000 ft. (*Manawatu Times* 19 December 1877; *N.Z. Mail*, 21 June 1879; *Wellington Almanack*, 1880, 298).

1874; *N.Z. Mail*, 27 February 1875). In June 1874 a Scandinavian partnership, Richter, Nannestad & Co., began milling near the centre of Palmerston North (Petersen, 1973, 94). About March 1875 Palmerston North's fifth mill, owned by Amos Burr, began cutting with a small engine he had imported from Melbourne (*Weekly Herald*, 10 October 1874, 27 March 1875). By 1875, then, Palmerston North was an important sawmilling centre, and the Foxton tramway was heavily taxed to handle its output (*Weekly Herald*, 28 November 1874). Elsewhere one or two mills had appeared to meet local demand. Michael Coyle, a settler at Sandon, began cutting about September 1874 (*Weekly Herald*, 11 July, 5 September 1874). The press mentioned a mill operating at Kakariki on the Rangitikei, in December; in July 1875 its owner was named as C. Dougan, using an eight horsepower engine to cut an excellent stand of totara. (*Weekly Herald*, 12 December 1874, 7 August 1875).

Throughout 1875 the mills enjoyed a buoyant demand. In March 1875 a Foxton correspondent told of sleepers and timber coming down the tramway 'in incredible quantities', and six vessels in port, including the smart brigantine *Julius Vogel* from Auckland. Palmerston North's local demand was also strong, one mill alone was selling 5,000 feet a week there in July (*Weekly Herald*, 13 March, 10 July 1875). The Rangitikei mills, of course, had as yet little but a local outlet. Building was going on rapidly in all the townships, and was hampered over the winter and spring when quagmire roads prevented the draying of timber from the Feilding and Sanson mills (*N.Z. Mail*, 9 October 1875).

In February 1876 a mill started cutting in the E.C.A. Corporation's second new township, Halcombe—this probably represented the transfer of their main Feilding mill (*Weekly Herald*, 12 February 1876; *N.Z. Mail*, 8 July 1876). During 1876 Charles Nees acquired Burr's small Palmerston North plant, greatly enlarged it, and added a sash and door plant (*Weekly Herald*, 2 September 1876). However, the industry did slacken somewhat in 1876. Brogdens had closed their Te Matai mill by March, complaining that the tramway tariff was too high (*N.Z. Mail*, 18 March 1876). Local demand was falling off, and a higher tariff on the Foxton line, following its conversion

to a railway, raised the fear of depression. However, spring brought rising demand, and a local mill won a large sleeper contract (*N.Z. Mail*, 18 March, 14 October 1876; *Weekly Herald*, 18 November 1876).

The industry grew and prospered throughout 1877. Palmerston North's two main local firms moved promptly to reap the benefits of the recently opened Palmerston North-Feilding railway. In a comparatively effortless operation, Bartholomew and Manson had a 12 ton engine and boiler railed up from Foxton for their new mill on Kimbolton Road. Timber was coming down their tramway to Feilding station by January (*Weekly Herald*, 7 October 1876; *Rangitikei Advocate*, 8 January 1877). In January 1877 Richter, Nannestad & Co., were erecting a new mill near Bunnythorpe, and their siding at Trondheim (named after the birthplace of one of the partners) was granted in April (*Weekly Herald*, 6 January 1877). At the year's end the *Manawatu Times* (19 December 1877) took 'some trouble to find out a few particulars' about Palmerston North's forest harvest for the year. About 100,000 railway sleepers, 100,000 fence posts, and large numbers of telegraph poles had been sent away. The district's local timber needs had all been met, and an 'immense quantity' shipped from Foxton to Wellington, Dunedin, Christchurch and other distant centres. In addition 'palings, shingles, house-piles, doors, sashes, mouldings, and turnery of every description' had been exported.

So far we have traced the fortunes of individual mills, to demonstrate that the sources allow of an adequate account of the industry's pioneer stage. We will now proceed in broader terms, but provide figures summarising the details of individual mills. The increase in the number of mills and output in 1878–9, following completion of the Feilding-Wanganui railway, far surpassed the earlier expansion of 1874. To meet pressing Wanganui demands, heavily laden timber trains used the unfinished line from Feilding by night for a month before it was officially open. Rangitikei business men were also given large orders for firewood, sleepers and fencing posts (*N.Z. Mail*, 25 May 1878). Leaders of the Manawatu timber trade, called together by the E.C.A. Corporation's local agent, A. F. Halcombe, met in the Feilding immigration barracks on 17 June 1878 to press for better conditions for the transport and export of timber. Five further mills were reported under construction. Richter, Nannestad & Co., were exporting 60,000 to 70,000 feet of timber a month from Foxton. Cross, a Wanganui timber merchant gave 200,000 to 300,000 feet as the average monthly consumption of (presumably) the Wanganui district. The millers' wanted reduced railway rates for white pine consigned for shipment, as it was lighter than rimu by a ratio of 5 to 3. Without a reduction there was no profit in milling it. Cross estimated that at least 150,000 feet could be exported monthly. Also wanted were more railway rolling stock, and better facilities at the Aramoho wharf. The memorial which Halcombe took to Wellington met with little immediate response (*Weekly Herald*, 22 June 1878). At Foxton a public meeting on 3 July 1878 pressed for wharf extensions there, more railway rolling stock, and lower timber freight rates. The resolutions claimed that ten mills were working in the Manawatu County, and estimated their monthly output at 1,000,000 feet (*Manawatu Times*, 3 July 1878).

With timber merchants chasing the millers, and existing plant quite unable to overtake orders (*Patea Mail*, 7 August 1878), new entrepreneurs pressed

into the industry. The Commissioner of Railways' report for the year ending 30 June 1879 noted the extraordinary development of traffic on the Wanganui line. A year earlier there had been only 6 sawmills along the line, all exporting through Foxton, now there were no less than 17 at work, 2 more going up, and the bulk of the timber went to Wanganui for local consumption (A.J.H.R., 1879, 74). There is evidence, though, of not inconsiderable exports coastwise. Thus in January 1879, Cross Bros. of Wanganui exported 175,000 feet of timber from Wanganui to Lyttelton, Oamaru and Dunedin by three chartered ships (*Rangitikei Advocate*, 21 January 1879). Early in 1879 the government was forced to order 100,000 railway sleepers from Tasmania, the local millers having failed to enter a single bid (*N.Z. Mail*, 1 February 1879). Yet just when all seemed auspicious for the timber industry, it was to receive a rude surprise.

COMPETITION FROM NORTH AMERICA

In March 1879, Guthrie and Larnach of Dunedin advised the Manawatu millers that they would henceforth use American lumber, as it was cheaper than New Zealand timber (*N.Z. Mail*, 29 March 1879). This was a quite unforeseen consequence of Ballance's 'Free Trade' budget of August 1878. Influenced by English Liberalism, Ballance abolished the duty on many products, including timber (A.J.H.R., 1878, 58). He mistakenly believed that the small amount of duty hitherto collected meant that New Zealand millers need not fear outside competition.[5] The lumbermen of the North American West Coast, with excellent timber resources adjacent to deep water anchorages, a multitude of swift running streams to drive sawmills, and a limited home market, quickly grasped the opportunity. On 18 March 1879, the Rangitikei-Manawatu sawmillers met in Feilding to discuss the threat, and appointed a committee of three to take steps to ventilate the subject (*Rangitikei Advocate*, 20 March 1879). Over the next few months various repercussions of the American competition became apparent, while in their largely ineffective counter measures the local sawmillers and timber merchants revealed a good deal of the inner workings of their industry.

A worse blow followed the loss of South Island markets. The Marlborough Sounds mills, having likewise lost their southern markets, were by May 1879 shipping to Wanganui, undercutting the local mills. The local sawmillers meeting in Feilding on 17 May, decided to combine with other timber districts to press for the reimposition of the duty. There was strong feeling against the timber merchants, for having turned elsewhere for their supplies, after being allowed a discount of 2s per 100 feet by the local millers. The millers decided to cancel the discount, and establish their own general timber depot in Wanganui. They also agreed to reduce their workmen's wages by 20 percent (*Rangitikei Advocate*, 20 May 1879).

Apart from the wage reductions, the millers' plans did not come to much. Little more was heard of their association, but the local press provided some interesting revelations concerning the industry. Apparently while timber was short the millers had negotiated a convenient 'compact' with the Wanganui merchants. The latter were to take all the timber offered at a fixed price, in return for a monopoly of the trade. The merchants complained of unsatisfactory timber supplied under this arrangement—ends not squared,

bark left on. They had another inducement to break the compact. They owned several schooners, for taking local exports south, and bringing kauri from Kaipara. Rather than see these vessels idle, they employed them to bring timber from the Sounds at cut rates (*Rangitikei Advocate*, 22 May 1879).

The winter of 1879 saw many of the Rangitikei-Manawatu mills virtually at a standstill. This was 'a very serious thing' for Feilding, as it drew 'the chief of its support from its timber revenue.' (*Rangitikei Advocate*, 15, 22 May 1879). Yet the hard times did some good. The millers were forced to raise their standards and give more careful thought to markets. One firm opened an agency in Patea; others scoured the colony for orders; one shipped samples of totara, rimu and matai to London (*Rangitikei Advocate*, 22 May, 20 September 1879; *Weekly Herald*, 18 October 1879). In November 1879 Atkinson, the new Colonial Treasurer, reimposed the timber duties, and by December large timber shipments to the South Island had resumed (*N.Z. Mail*, 20 December 1879). The year's developments had exposed the internal workings of the Manawatu timber industry, and demonstrated that it was an integrated element within both the colonial and the world economy.

THE RANGITIKEI-MANAWATU TIMBER INDUSTRY IN 1880

From Figure 4 it will be seen that a useful statistical and locational picture can be built up as early as 1880. Our choice of 1880 needs explanation. The 1881 census is the first to give a useful breakdown of the industry (Department of Statistics, 1881, 302). It records 43 sawmills and sash and door factories operating during 1880 in Wellington Province: all were steam powered; total horsepower, 771; hands employed, 512; sawn timber produced, 29,114,105 feet. This was about one fifth of the colony's output, and compares not unfavourably with the 48,631,206 feet of the main sawmilling province, Auckland. By choosing 1880, we can fit our data into this overall picture and relate it to other census statistics. Also, by 1880 the industry was settling down after the 'Vogel' boom and the restructuring caused by the coming of the railways. Finally, for 1880 we have, for the first time, returns for private railway sidings (A.J.H.R., 1881a, 90).[6]

Certain basic facts and assumptions underlie Figure 4. In a submission to a Parliamentary Railway Commission, Palmerston North's mayor claimed in July 1880 that Manawatu County had 25 sawmills (*Manawatu Times*, 31 July 1880).[7] We have taken the districts' 1880 output as 17,000,000 feet, since the province's 43 mills averaged 677,072 feet for the year, and a variety of evidence suggests that the Manawatu mills would not have averaged less. The *Feilding Star* (24 June 1882) claimed that Feilding's eight mills (approximately Nos. 6–13 of Figure 4) had averaged 8,000,000 feet annually over the previous four years. From railway statistics it can be calculated that the Waitotara-Foxton line carried about 18,000 tons, or 9,000,000 feet in 1880. Station returns give only 'goods inward' and 'goods outward' figures. However, by collating with returns for mill sidings, with the breakdown of goods by items for stations which begins with the 1885–86 returns, and with information from other sources, the main pattern of rail transport can be deduced. It is estimated that the Halcombe district mills (Nos. 1–5) railed out 1,500,000 feet, the Feilding district mills 6,000,000 feet,[8] and the Palmerston North district mills 1,500,000 feet. Local consumption in these three districts has

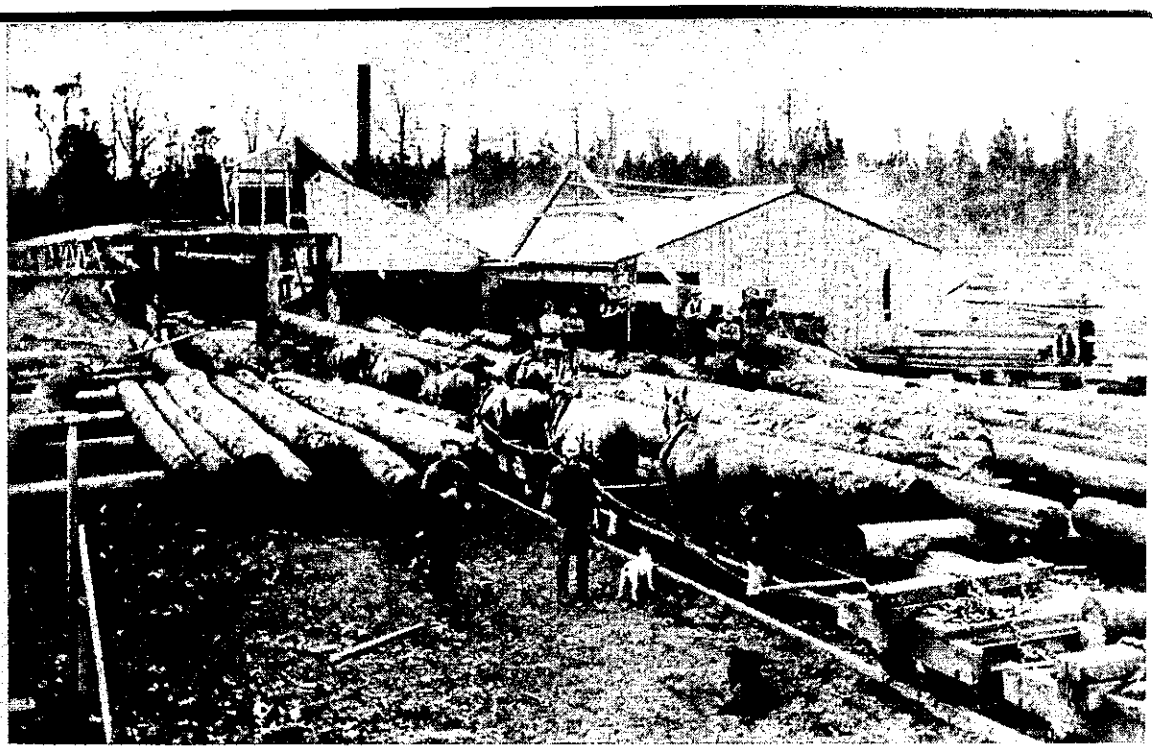

Fig. 5. Rail-based timber industry. Bailey's mill, Taonui, 1890. *Photo:* Alexander Turnbull Library.

been taken as 750,000 feet, 2,000,000 feet and 1,000,000 feet respectively. Outlying mills serving their local markets, and exports by water from the Manawatu River, account for the remaining 4,250,000 feet. Of the 9,000,000 feet railed, it is assumed from 'goods inward' figures that 1,500,000 feet went to the Waitotara terminus, 4,000,000 feet to Wanganui, mainly for local use, 1,000,000 feet to Aramoho, mainly for export coastwise, and 2,500,000 feet to Foxton, largely for export coastwise. In the notes to Figure 4 the firmer output estimates are based either on calculations from railway siding returns, with some addition to cover local sales, or on other specific quantitative information. Where a query precedes the figure, it is purely my personal assessment, taking all known factors into account. On timber varieties it is known that most mills cut mainly totara, matai, rimu and kahikatea in varying proportions. No. 1 cut mainly totara, and Nos. 19 and 20 probably had a large proportion of kahikatea.

The years of 1881–85 saw the maturity of the Rangitikei-Manawatu industry, and the first indications of decline. Table I indicates a shift outwards from the early centring on Palmerston North and Feilding. The older mills were also reaching well back into the bush. In February 1883, for example, P. and J. Bartholomew had twenty miles of tramway, and were about to add several more miles (*Feilding Star*, 7 February 1883). With costs rising as they went further for their logs, the millers revived their association in mid-1881. They successfully petitioned the government, gaining a railway tariff concession of 25 percent on white pine consigned to Wanganui or Foxton for shipment to Australia. Large resources of this timber stood close to the mills, untouched because of the limited local demand. Without the concession, much would have been burnt, to clear the land for farming. The government's assistance made possible a useful trade with Australia, where white pine

TABLE I

SAWMILLS ESTABLISHED, RANGITIKEI-MANAWATU 1881–1885

Mill	*Owner*	*Site*	*Began Working*	*Other details*
21.	Alexander Bell	Stanway Rd. Halcombe	1883	22 h.p. in 1883; increased 1885.
22.	Alexander Bell	Mangaona Rd. Halcombe	1885	12 h.p.
23.	Wanganui Sash & Door Co.	Halcombe	1883	New plant on site of No. 1. (Burnt down 1882)
24.	Warne & Beard	Ashhurst	1882	20 h.p.
25.	Richard Webb	Halcombe	1881?	May be same mill as No. 21, with Webb as lessee.

Sources:

21. *Yeoman* Wanganui, 30 March, 12 April, 22 June 1883.
22. *Yeoman*, 3 April 1885.
23. *Yeoman*, 22 June 1883.
24. *Yeoman*, 13 July 1883.
25. *Yeoman*, 28 September 1883.

'wides' were popular for shelving (*Yeoman*, 7 May, 30 July, 10 December 1881; *N.Z. Mail*, 21 May 1881; *N.Z. Gazette*, 1881, 876). Over the years 1881–85 a total of nearly 3,000,000 feet of sawn timber was exported overseas from Wanganui, and most of this would have been white pine for Australia. Not much passed through Foxton, as the port was unsuitable for trans-Tasman shipping. The millers combined to visit the Australian market, and to charter ships and make up cargoes (*Yeoman*, 22 October, 17 December 1881). However, the South Island remained the district's main outside market, and set the pace for the mills. Thus when there was a good demand in the south in the latter part of 1882, five timber ships entered the Manawatu River in one day, 1,000,000 feet of timber was consigned from Feilding station in four weeks, and local timber prices were raised (*Feilding Star*, 13, 20 September 1882). In May 1883 the closing of Henderson and Wratt's mill provided a portent of the future. Their site at Swainson's became a deserted village, and they took their plant to Dannevirke, to reap the benefits of forest country newly opened by the railway (*Feilding Star*, 17 May 1883). As the railways opened up the Horowhenua district, extended further into the Seventy Mile Bush, east of the ranges, and the Main Trunk moved north, the Rangitikei-Manawatu mills dispersed east, south and north. Maps published with the 1905 and 1907 official reports show the Rangitikei-Manawatu

almost devoid of mills, but a heavy concentration in areas more recently opened by the railways.

ORIGINS OF CAPITAL AND INDUSTRIAL SKILLS

Whence came the capital resources, and entrepreneurial and labouring skills, which made possible the rapid, almost dramatic, rise of the Rangitikei-Manawatu indigenous timber industry? We will begin our search on the local scene, and then look beyond it in widening circles. A significant local happening was the rapid rise and sudden collapse of the flax industry between the late 1860s and 1873. By early 1870 there were five mills at Foxton and one on the Whangaehu River, south of Wanganui. The 1871 census showed 14 mills in Wellington Province, and most would have been on the west coast (*Weekly Herald*, 22 January 1870; *Wellington Independent*, 7 April 1870; Department of Statistics, 1871, Table 29). While prices remained high, some of the mills grew to a considerable size. Newspaper reports told of two mills north of Wanganui with over 20 hands each, and one near Bulls with over 50 (*Weekly Herald*, 23 November 1872; 4 January 1873). Continued prosperity led some flaxmillers to adopt steam engines. When the industry collapsed following a sharp drop in price in 1873, organising skills, manpower, and a certain amount of equipment, became available for other enterprises, and not surprisingly the burgeoning sawmilling industry was among those that benefited. Brogden's Oroua sawmill was powered by two steam engines from a burnt-out flaxmill at Foxton, and other engines used, or ordered, for flaxmilling probably found their way to timber (*Weekly Herald*, 25 July 1874). Two of the partners of the sawmilling firm of Richter, Nannestad & Co., (No. 18) are recorded to have been earlier involved in flaxmilling (Petersen, 1973, 93–94). C. N. Rowe (No. 14) also moved from flaxmilling to timber-milling. Detailed study could probably add others and also examples of skilled workmen moving from flax to timber.

The declining West Coast goldfields were another significant source of capital, skills, labour and possibly plant. The gold rush population was noted for its venturesomeness, industry, enterprise and ingenuity; these were the very qualities needed for the pioneering of a new sawmilling district. The second sawmill to serve the West Coast rush in 1865 was that of McBeth, Nees and Cornfoot, who demonstrated their initiative and ingenuity by powering their plant with boilers salvaged from two wrecked steamships (May, 1967, 480–481). Each of the three partners seems later to have become separately involved in the Manawatu timber industry. J. McBeth who began milling at Paiaka about 1878 (No. 20) must be the James McBeth of the West Coast firm. He probably bought his plant from his former partner Charles Nees, whom we have already noted buying Burr's Palmerston North mill in 1876. In December 1877 Nees sold the plant, and it was to be shifted to the banks of the Manawatu a few miles above Foxton. Cornfoot, the third West Coast partner, would seem to have been the man of that name who in 1879 entered the timber trade in Wanganui, where he formed strong links with the Manawatu millers (*Cyclopedia of N.Z.*, 1, 1439, 1453–1454). A. H. Wylds (No. 19) had immigrated from England in 1865. He entered sawmilling after eight years on the West Coast goldfields and a period of subcontracting on the Hutt-Wairarapa railway works. Peter Bartholomew

(Nos. 9 and 17) crossed from Australia in 1867, bound for the West Coast goldfields. When bad weather diverted his ship, he changed his plans, and entered the Wellington timber trade in Wellington. During his five years in Australia he probably spent time on the goldfields. Ex-diggers from the West Coast also probably supplied a good deal of labour for Manawatu sawmilling.[9]

This West Coast flow is really only a special case in a movement from the South Island water-based industry to the rising rail-based industry of the southern North Island. Let us illustrate migration from other South Island areas. About 1870 John Duncan, son of the Marlborough Sounds pioneer sawmiller, entered the Wanganui trade timber (Wilson, 1962, 66). Walter Bailey, a partner in the large Manawatu mill (No. 12), came north after seven years sawmilling on Banks Peninsula. John Pawson moved from Banks Peninsula to Feilding in the late 1870s, with talk of shipping up a sawmill plant he had purchased in Akaroa Harbour. Apparently the scheme came to nothing, but he settled in Feilding, probably to work in the mills (*N.Z. Mail*, 19 April 1879). Walter Parsons, an Akaroa sawmiller's son born in 1861, learnt his father's trade as a youth, and then moved north. After several years at Palmerston North, he worked in mills in the Seventy Mile Bush, before acquiring his own mill at Norsewood in 1895 (*Cyclopedia of N.Z.*, 6, 537). Andrew Quinlan, who spent most of his life as a sawmill worker, contractor and miller in various parts of the southern North Island, began his working life cutting railway sleepers at Catlin's River in 1873 (A.J.H.R. 1909, 664).

We could, of course, pursue this search for origins further back, to the Old World. We will pause only for one significant link. Just before New Zealand's 1870s development era British shipping had been making the change-over from wood to iron and steel. The origins of the E. & C.A. Corporation had close links with the phasing out of the Royal Navy's dockyards at Deptford on the Thames, which was associated with this shift from wooden hulls (G.B.P.P., 1890, 90; Banbury, 1971, 78, 83, 85; *N.Z. Mail*, 27 February 1875). There is also good evidence that early Palmerston North had an unusual proportion of London workingmen in its population (Arnold, 1973, 38). One direct link between the London shipyards and Manawatu sawmilling is provided by Henry Adsett, who took over mill No. 13 (Figure 4), in 1882 (A.J.H.R., 1882, 33; *Cyclopedia of N.Z.* 1, 1211, 1256).

THE FOREST HARVEST AND RURAL DEVELOPMENT

The forest harvest played a major part in the rapid transformation of much virgin forest land into developed farmland. Drawing mainly on our Rangitikei-Manawatu case study and the 1909 Royal Commission's Report, we will illustrate how it assisted impecunious labourers to become relatively prosperous settlers. While clearing his land, the settler could, with simple tools, turn much of the felled timber to profit. It provided his first home and sheds, his fences and his firewood. In the 1880s, while South Canterbury settlers paid £4 a cord for firewood, it cost the bush settler only his labour (*Hawera Star*, 27 October 1886). There was money in it too. The *Feilding Star* of 24 June 1882 reported that many, even among landless men, were making comfortable livings cutting posts, rails, slabs, sleepers and shingles, while paying the landowners liberal royalties. In 1880, besides the 18,000 tons of

sawn timber, the Foxton-Waitotara line also carried 12,000 tons of firewood.

However, the sawmilling industry was the bush settler's greatest boon. It bought his labour and his standing timber, helped clear his land, fostered the growth of local communications, and provided a local market for his first farm produce. The industry's labour requirements are difficult to estimate. Wellington Province census returns show 562 workmen in 1880, rising to 787 in 1885, and Kirk gives the 1885 labour force as 550–600, yet in May 1881 the Manawatu sawmillers alone claimed at least 1600 workmen, and in August 1882 the Feilding millers claimed that their eight mills supported 1,268 men and their dependents (*Feilding Star*, 9 August 1882). The discrepancy is partly accounted for by the subcontracting of tasks such as logging and building bush tramways. Such workmen would not be returned as sawmill workers. Neither would the many bush settlers taking irregular casual work in the mills. Andrew Quinlan, a Wairarapa miller, told the 1909 Royal Commission that he knew 'of no article the selling-value of which is so largely returned to labour as that of sawn and manufactured timber.' Over the preceding decade wages paid at his medium-sized mill totalled £14,000, much of it going to settlers (A.J.H.R., 1909, 655). Undoubtedly sawmill wages and sub-contracts played an important part in financing pioneer farming in many districts.

Andrew Quinlan also told how the mills helped settlers by removing heavy timber and paying a royalty for it. He provided a list of 21 small settlers to whom in the preceding ten years he had paid royalties totalling £1,288. (A.J.H.R., 1909, 656). Other witnesses told of millers paying royalties for logs which settlers had felled years earlier. (A.J.H.R., 1909, 649, 736). This tended to happen in districts such as the northern Wairarapa where settlement went in years ahead of the railways. Strictures on the wanton destruction of the forests need to be tempered with facts such as these, and by an understanding that farmers commonly recovered wood for their own use for several decades after felling. Where there was a good local market for the forest harvest, the reaping could be very thorough at the time of felling. Campbell-Walker found that in Canterbury's Oxford Forest the land was let three times, first for the removal of logs for the mills, then for fencing timber, and finally for firewood, with royalties for each harvest. (A.J.H.R., 1877, 57).

Several millers told the 1909 Commission that their workforce and draught animals provided a valuable local market for the settlers' produce. The chairman of the Taupo Totara Company considered that this local produce market was more profitable than more distant ones (A.J.H.R., 1909, 795). A Hawke's Bay witness calculated that due to depression in the timber trade at least 150 draught horses were idle in his province, representing an annual loss of at least £2,500 to the local fodder trade (A.J.H.R., 1909, 825).

Not least among the benefits brought by sawmilling to the bush settlements were those arising from the qualities of the millers themselves. These new small farming communities were being created largely by working class settlers, many of whom had recently escaped from virtual servitude in the homeland villages. They needed to be guided beyond a limited vision and petty attitudes, and it is clear that the sawmillers as a class made a notable contribution to this broadening of outlook. Our Rangitikei-Manawatu case

study has shown the millers organising their own industry on a regional scale, searching far and wide for timber markets, lobbying the government in the interests of their industry and district, and serving as pace-setters in the development of local communications. As one would expect, they were also prominent in local government and other community affairs. Repeated in sawmilling districts throughout the colony, this story of leadership is a notable element in our social history. It seems highly probable that the sawmillers also made an important contribution to the development of the agricultural processing industries whose rise in each district coincided with the decline of sawmilling. Let us again illustrate from the Rangitikei-Manawatu. In 1878 Richter, Nannestad & Co. (No. 18) started Palmerston North's first flourmill (*Weekly Herald*, 18 May 1878). In 1883 W. W. Corpe (who took over No. 8 in 1882) was the leading force behind the launching of the Makino Butter and Cheese Factory, the first of a number which he established (*Feilding Star*, 27 November 1883, 8 January 1884; Philpott, 1937, 92). A little later Charles Warne (No. 24) founded a cheese factory on the Pohangina Road (Philpott, 1937, 92). In 1884 Alexander Bell (Nos. 21, 22) started a boiling-down works and fellmongery at Halcombe (*Feilding Star*, 10 January 1884).

The sawmilling era, commonly about a decade in length, which formed the foundation stage of so many New Zealand rural communities, had important effects in the more subtle areas of personal development and family life. These can only be hinted at here. Some of the consequences of regular and reasonable hours of work, steady income, and opportunities for community recreation, are indicated in a letter sent 'home' in February 1877 by the wife of a farm labouring immigrant from Lincolnshire. He had taken work in a sawmill at Koromiko, on the Picton-Blenheim line. She writes:

> My husband is worth two men to what he was. Then he gets in more and better company: nearly all the men at the mill are men of property: one milks four cows. They get cleaned and change their clothes, and then play at cricket, or go for a walk. (*The Labourer*, Boston, Lincs., 19 May 1877).

I have commented elsewhere on the way in which mill settlement circumstances commonly resulted in excellent school attendance figures (Arnold, 1974, 176–177).

It is our contention, then, that the forest harvest played a highly significant role in the development of colonial New Zealand, and that we are not excused from unravelling its history by a lack of adequate source material. The broad patterns we have sketched in need testing against further careful regional studies. The main migrations of the timber industry need to be discerned. It is surely not too much to hope that research in economic and geographic history will eventually provide us with a set of locational and statistical maps (preferably at five-yearly intervals to fit in with the censuses) for at least the closing decades of the nineteenth century. The general historian should then find that the industry provides him with a valuable integrating element, helping to link gold rushes and immigration drives to a meaningful pattern of internal migration, and leading on naturally to the rise of the meat and dairying industries. Let us conclude with a comment on one of the broader implications of our subject. Brickworks, quarries and coalmines are static

industrial concerns, tending to arise from, or give rise to, urban development. By turning rather to her indigenous forests for her main building materials and domestic fuel, colonial New Zealand channelled a continuous and significant flow of capital and labour to the frontiers of settlement. This represented a dynamic reinforcement of other biases favouring rural development.

NOTES

1. For example, Reed (1953), Simpson (1973). The only extended scholarly treatment of a major part of the industry of the colonial era appears to be the chapter on 'Timber' in Stone (1973).
2. Since the paper relates exclusively to the forest industry of the nineteenth century Imperial measures are used throughout.
3. This measure refers to 'board feet' i.e. one foot square, by one inch thickness.
4. Petrie's study is the only scholarly investigation to date of any of the South Island water-based sawmilling districts. His discussion of source material difficulties is of interest (Petrie, 1963, 3–4, 58–61). He had some success in solving locational and statistical problems.
5. The tariff on sawn timber had been 2s. per 100 superficial feet (N.Z. *Statutes*, 1871, 6).
6. The return is useful even though other evidence, including returns of subsequent years, shows it to be quite incomplete. In calculating 1880 output of mills, it is assumed that all timber railed from Nos. 1–15 went to Wanganui, even though some will have gone to Foxton, the closer port for most. For railway tariffs see *N.Z. Gazette* 1879, 1637; 1880, 1395–1396.
7. The discrepancy between this figure and the total of Figure 4 is probably partly due to the mayor's inclusion of the district's two or three sash and door factories. He may also have counted the idle mill of the bankrupt partnership of McChesney and Baird, at Trondheim (*Rangitikei Advocate*, 3 May 1879; *Weekly Herald*, 18 October 1879). Our search may also have missed one or two small mills.
8. *Feilding Star*, 24 June 1882, and *Weekly Herald*, 22 June 1883, provide good support for this figure.
9. For one party who almost certainly went into sawmilling see *Rangitikei Advocate*, 22 February 1879.

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