

MONASH UNIVERSITY
FACULTY OF BUSINESS AND ECONOMICS

**MIGRANTS AND
TECHNOLOGICAL TRANSFER:
CHINESE FARMING IN
AUSTRALIA, 1850-1920**

Warwick Frost

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Abstract

Chinese farming in Australia between 1850 and 1920 has generally been given little attention, being usually characterised as just market gardening, but with little other detail especially about its development and characteristics. This article argues that Chinese farming was both complex and dynamic. Initially Chinese farming was primarily casual labouring along European lines. However, from the 1880s onwards, Chinese farming became more specialised, focussing on a wide range of high-value, labour-intensive crops. The skill of the Chinese was not just the transference of farming techniques from China, but also in their entrepreneurship and ability to adapt their techniques to the Australian environment. Despite widespread European racism, some Europeans sought to capture the benefits of Chinese farming, developing European - Chinese partnerships. After 1900 Chinese farming declined in scale and diversity. The adoption of labour-intensive techniques by European farmers led to a decline in European-Chinese partnerships and the squeezing of Chinese farmers out of niche markets.

MIGRANTS AND TECHNOLOGICAL TRANSFER: CHINESE FARMING IN AUSTRALIA, 1850-1920

INTRODUCTION

Thomas Edison once reflected that most of the important inventions and innovations in the USA had been the work of immigrants rather than native-born Americans (Brookes, 1982: 38). According to the demographer Julian Simon, 'the most important effect of immigrants is their contribution to our stock of useful knowledge' (Simon, 1989: 165). However, in his history of technology and economic progress Joel Mokyr took a different perspective, arguing that migrants are only successful in transferring their skills if the host society is receptive (Mokyr, 1990: 186-190).

It is surprising feature of Australian economic historiography that while there has been a great deal of interest in technology transfer and adaptation, there has been little consideration of the role of migrants or the receptiveness of Australians to migrants' ideas. This lack of discussion is particularly apparent in agriculture, despite the ample evidence of high concentrations of a wide range of non-British migrants in farming. In addition, while social historians and sociologists have been greatly interested in the migrant experience, their emphasis has been on discrimination, assimilation and cultural maintenance rather than on the economic consequences of migration.

These patterns are well illustrated by the case of the significant Chinese migration which occurred after 1850 as a result of the Gold Rushes. As one of the largest and most visibly different of the non-British groups which came to Australia in this period, their difficulties have attracted a great deal of interest (Choi, 1975; Yong, 1977; Markus, 1979; Cronin, 1982; Ryan, 1995; Rolls, 1996). However, there is little detailed consideration in this literature of the characteristics of Chinese farming in Australia. Instead most works only present brief generalisations as background to the more detailed considerations of social issues. Generally the Chinese are characterised as sojourners rather than settlers. Throughout this literature there are fragmentary references to their skill in market gardening, but the details are usually brief. Beyond generalisations about the labour intensive nature of their agriculture, there is little detailed consideration of their technology, methods, labour arrangements and interactions with Europeans. There is even less discussion of how Chinese farming developed over time and how their imported skills were adapted to Australian environmental conditions. Typical of this lack of detail and clarity is the widely quoted line that the Chinese grew 75 per cent of Australia's vegetables, usually unattributed to any specific source or time period.¹

The specialist literature of Australian agricultural history is especially limited on the question of Chinese farming. Most broad agricultural histories make no mention of any Chinese contribution at all (for examples see Wadham, Wilson & Wood, 1939 and Clarkson, 1971). Similarly, a recent historiographical survey makes no mention of the Chinese (L. Frost, 1998). Others, while noting the existence of Chinese farming, argue it had little or no effect on general agricultural and technological development. For example, Peel, in her agricultural history of Melbourne and its surrounding area, argued that the, 'Chinese ... did not influence the agriculture practised by their neighbours to any great degree' (Peel, 1974: 74).

In contrast to the general lack of interest in Chinese farming there are two small groups of regional studies which do consider Chinese farming methods and technology. One group is from far northern Queensland, particularly Cairns and the Atherton Tableland (Bolton, 1963; Birtles, 1982; May, 1984). They provide an excellent detailed picture of how Chinese farming and technology developed in this tropical region. Unfortunately we do not have matching studies of similar detail from other parts of Australia. In addition there has been some consideration of Chinese farming technology in recent postgraduate theses concerning Victoria (Chou, 1993: 141-155; W. Frost, 1994: 317-350)

Australia and California are valuable comparative studies, though rarely used (Tyrrell 1999; W. Frost, 2000). They are of particular relevance to this topic, as they share significant Chinese migration arising from the Gold Rushes and a similar farming history for much of the nineteenth century. However, in contrast to

Australia, California has been the subject of a number of excellent studies of Chinese farming and its effect on agricultural progress. The most important and detailed is by Sucheng Chan. Drawing heavily on US Census manuscripts and other primary sources, she argued that the Chinese in California were great innovators and adaptors and that their success was due to their organisational skills as well as their technical knowledge. In particular they were skilled at developing new markets and obtaining capital through beneficial share-farming arrangements with European farmers (Chan, 1986). Other valuable studies deal with the Chinese in particular regions and industries. These include as labourers in the wheat industry (Smith, 1969: 182); land reclamation and irrigation in the Sacramento River Delta (Arreola, 1975); the wine industry around Napa and Sonoma (Heintz, 1975) and labour-intensive small scale farming around Monterey (Lydon, 1985). Such detailed research and analysis leads to the question of whether Chinese farming in Australia and California followed similar patterns. However, apart from a brief consideration by Tyrell (1999: 138-9) there has been little attempt to compare Chinese farming in Australia with California.

This purpose of this article is to explain the growth, diversity and influence of Chinese farming in Australia between 1850 and 1920. It considers a number of key questions. What farming activities did the Chinese engage in and why? What were their strengths and weaknesses as farmers? Did they just rely on Chinese technology and methods? Or did they adopt European methods? How did they interact with European settlers? How did they adapt to the Australian environment? The article is divided into three parts. The first describes the development of Chinese farming, dividing it into three distinct periods. The second considers the methods and technology used by the Chinese and how they may have developed. The third analyses their interaction with European society and how and why technology may have transferred (or not transferred) between the two groups.

In considering these issues, the conclusions reached are tentative. Analysis of Chinese farming in Australia is severely limited by the availability and nature of the sources. Generally in agricultural history the chief sources are the farmers – their accounts, letters or reminiscences. However, these type of sources simply do not exist for the Chinese farmers in Australia in the period covered. In writing her history of the Chinese in California, Chan drew heavily on the manuscript returns for the US Census, using them to first identify individual Chinese farmers, their crops, holdings, employees and equipment and second to create aggregated data (Chan, 1986: 51). However, Australian census authorities have never kept individual returns, so that path is unavailable to Australian researchers.

Instead this article is based on generally fragmented sources. Chief of these are a number of Royal Commissions and parliamentary enquiries from Victoria and Queensland. In the nineteenth century Royal Commissions were often used to investigate major policy issues, particularly in agriculture and the development of new technology and institutions (W. Frost & Harvey, 1997: 431). The Royal Commissions used here were especially interested in successful Chinese farming and how their successes could be transferred to European farmers. Other primary sources used are the accounts of European farmers and travellers. These are used with some reservations as they are typically brief, often focus on the novelty of Chinese farming and are highly coloured by the prejudices of the writers. Nonetheless, better quality sources are very scarce.

THE DEVELOPMENT OF CHINESE FARMING

A commonly held, though mistaken, view of Chinese farming, is that it arrived fully-formed during the Gold Rushes of the 1850s and changed little during the rest of the century. Or to put it another way, the Chinese started off as market gardeners and always were market gardeners. It is better to view Chinese farming as having three broad stages. The first, from say 1850 to 1880, was of initial adjustment. The second from 1880 to 1900, was the golden period of Chinese farming. The third from 1900 to 1920, was a period of decline. Such a view may be an oversimplification, but it does provide some sort of structure for understanding the development of Chinese farming.

1850 to 1880: Initial adjustment

Following the discovery of gold in 1851, large numbers of Chinese came to Australia, particularly Victoria.² In the 1850s there may have been as many as 50,000 at their peak. For the rest of the century their numbers ranged from just below 30,000 to 40,000. While primarily attracted by gold, not all of these Chinese spent all their time mining. Some spent some of their time growing vegetables which could be consumed by their fellow Chinese or sold to Europeans. However, while the presence of Chinese market gardeners on goldfields was often recorded, such descriptions were generally brief. One account from 1855 simply stated that, 'they are splendid gardeners and nearly all the vegetables for the mining towns are supplied by them' (Skinner, 1995: 56). In the case of the Moorabool Goldfields in Victoria, in 1861 about one third of the miners were Chinese and there were Chinese market gardeners nearby in the early twentieth century, but there was no documentary or archaeological evidence of Chinese market gardeners in the nineteenth century (Lawrence, 2000: 45-6).

It is not clear how many Chinese on the goldfields were involved in vegetable growing. Indeed it is not clear whether some Chinese became specialised growers or whether it was a part-time activity. Nor is it clear whether these early growers were primarily producing for their own needs and selling their surplus to Europeans miners or mainly producing for the general goldfields markets.³

There is evidence of Chinese miners involved in other agricultural activities. During dry periods, alluvial mining was curtailed and the Chinese, like their European counterparts, were forced to take other work. In the 1850s and 1860s seasonal agricultural labour on European farms became an important income supplement for the gold-mining Chinese, perhaps as important as market-gardening. In 1868 the Reverend W. Young reported to the Victorian Parliament on the economic conditions of the Chinese in the goldfields. His tally of those engaging in agriculture is shown in Table 1.

Young reported on over 17,000 Chinese on the goldfields, of whom nearly 1,000 (six per cent) were employed in harvesting for four to eight weeks, over 240 shearing sheep and 813 as market gardeners. Not only were there more Chinese involved in traditional European agricultural labouring than market-gardening, but Young suggested the growth of market gardening was quite recent, commenting that, 'Besides miners and shopkeepers, who were always to be met with, we have now marketgardeners' (Young, 1868: 21-2).⁴ The involvement of Chinese labourers in the European harvest continued in 1869, when John Jenkins noted in his diary that the farm he was working on near Ballarat recruited 12 Chinese miners for binding hay (Jenkins, 1975: 10).⁵

Table 1: Chinese in agriculture, Victoria, 1868

Region	Market gardeners	Shearers	Employed in harvest	Total Chinese in region
Ballarat	47	0	100 plus	2,300
Avoca	10	0	30	250
Ararat	20	60-70	40	1,076
Maryborough	50	1	400	1,400
Castlemaine	30	0	8-10	1,000
Daylesford	56	0	150	1,021
Beechworth	400	70	150	7,000
Bendigo	200	100 plus	100 plus	3,500
TOTAL	813	231-241 plus	978-980 plus	17,547

Source: Young, 1868: 5-14.

Chinese were noted in other traditional European agricultural labouring roles. In the 1850s the de Castella's in the Yarra Valley of Victoria had a Chinese servant, who was in charge of their dairy and also enthusiastically reared horses (de Castella, 1987: 76-80). In north-east Victoria Chinese were employed in the very unoriental activity of grape-growing and wine-making (as they were also in California). Between 1874 and 1876 Roderick Kilborn used Chinese for fencing and pruning on his vineyard at Wahgunyah. In 1876, the Olive Hills Vineyard at Rutherglen employed only Chinese labour and in the 1880s another Rutherglen vineyard, that of the famous George Morris, employed 40 Chinese labourers (Dunstan, 1994: 116, 162-3; Sayers, 1994: 45-6, fn 27, 144).

1880-1900: Domination of intensive agriculture

Up to about 1880 Chinese farming consisted of ordinary agricultural labouring on European farms and some small-scale intensive market gardening. The Chinese worked as wage labour and mainly in and around the goldfields. From 1880 this rapidly changed as the Chinese became specialists in labour-intensive farming throughout Australia, especially in market gardening and tended more and more to be both managers and labourers.

At the Victorian Census of 1871, 75 per cent of Chinese males were miners and just six per cent were engaged in market gardening. In 1881 56 per cent were miners and 19 per cent market gardeners, by 1891, 25 per cent were miners and 30 per cent were market gardeners. In 1901 only 21 per cent were miners, 33 per cent market gardeners and in all 40 per cent engaged in agriculture. Indeed, while between 1871 and 1901 the number of Chinese males employed in Victoria fell by 63 per cent, the number in agriculture rose by 130 per cent (Victoria, 1873: 106-7; Victoria, 1893: 223; Victoria, 1904: 180-1).

Chinese market gardeners followed the markets and they dominated both in the city and in the bush. From the 1880s their small labour-intensive market garden plots became a feature on the fringes of most Australian cities and towns. Unfortunately, though their existence was widely commented upon, there was a real dearth of detailed descriptions of these urban-fringe market gardens. The best picture of Chinese agriculture in this period comes from the evidence given to Royal Commissions.

In 1889 Queensland conducted a Royal Commission on the Sugar Industry. While its chief focus was on sugar, its terms of reference also included tropical agriculture in general. The Royal Commission reported on Chinese farming all along the coast of far northern Queensland. Typically the Chinese leased small lots of around 20 acres from European landowners. Their main crop was maize, but they also grew rice, bananas and a wide variety of vegetables. Their methods were highly labour-intensive, characterised by the use of hand-held hoes, rather than European ploughs and draught animals. The Chinese had been drawn to the region by a gold rush on the Palmer River, but as gold petered out, many had drifted towards agriculture. At first they had worked as agricultural labourers, but by 1889 they preferred to be leaseholders. An initial emphasis on maize was being rapidly replaced by rice and bananas, which were exported to the southern colonies (Queensland, 1889: Q. 16, 53-66, 103, 127, 693-4, 1795-9).

The Queensland Royal Commission on Land Settlement eight years later was told a similar story. Around Cairns the Chinese dominated banana-growing while Europeans concentrated on sugar (Queensland, 1897: Q. 4375). On the Atherton Tableland, which had been opened for selection in the 1880s, European farming had seemingly failed. Adam Haldane, the local Crown Land Commissioner, reported that, 'I do not think any farmer here is making it pay' (Queensland, 1897: Q. 4000). Most of those who had survived were now leasing their land to the Chinese (Queensland, 1897: Q. 4102, 4183-5). The Chinese grew maize which could be sold locally to mines or sugar plantations on the coast.

During the 1880s Chinese farmers specialised in high-value labour-intensive crops such as tobacco and hops in the alluvial valleys of north-eastern Victoria. As in Queensland they were probably initially attracted as miners, shifted into labouring and then took to up leases (however, there is little direct evidence of this and we should be careful of such assumptions). In 1887 the Royal Commission into Vegetable Products heard evidence of the Chinese success and how they operated under share-farming agreements (Victoria, 1888: evidence of 8 September 1887).

These three Royal Commissions provided detailed snapshots of Chinese farming towards the end of the nineteenth century. They show the Chinese farmers as highly successful and as developing specialised institutional arrangements for leasing land from Europeans. However, some care must be taken in interpreting this evidence. The Royal Commissions provide only a snapshot in time, the ongoing development of techniques and institutions are hinted at, but not fully covered. In addition, they focus only on two regions. This leaves unanswered questions about whether these developments were typical or aberrations.

The 'art' of clearing

The three Royal Commissions in the late nineteenth century emphasised the value of Chinese in clearing land. In both northern Queensland and north-eastern Victoria they typically held their land under *clearing leases*. European landowners leased their land to the Chinese at very low rentals, one shilling an acre for five years was common. Over that time the Chinese cleared it and grew a number of crops. At the end of the lease, the European landowner commenced farming and the Chinese moved on to take up another lease (Queensland, 1889: Q. 66, 1610 & 1732-4; Queensland, 1897: Q. 4183, 4204-6; Victoria, 1887: Q. 8358-63).

The witnesses before the Royal Commissions argued that clearing and farm establishment was only possible through these arrangements with the Chinese. The Royal Commission on Land Settlement asked Adam Haldane, Crown Land Commissioner for the Atherton Tablelands, 'Do you think that but for the presence of the Chinese the work would be carried out by white men?' Haldane replied, 'I do not think half the country would be cleared as it is. The Chinese are very good at clearing. It is an art to clear scrub here' (Queensland, 1897: Q. 4006).⁶ Thomas Behan, a rice-grower at Cairns, told the Royal Commission on the Sugar Industry, 'If the land was not leased to Chinamen it would still be scrub' (Queensland, 1889: Q. 1681).

In some instances, the use of the term *clearing lease* was a misnomer. The land had already been cleared in the early 1880s and the Chinese had been brought in to deal with the rapid regrowth (W. Frost, 1997: 24). William Kelly, an early farmer at Atherton, even argued that, 'there has not been any land cleared by Chinese labour. Malays and Kanakas have cleared land, but no Chinamen' (Queensland, 1897: Q4202). It was also reported by Ernest Eglington, the Police Magistrate at Port Douglas, that the Chinese took up clearing leases but then sub-contracted the clearing to Kanakas (Queensland, 1889: Q. 870). Perhaps this organization of others was the real art of clearing.

Elsewhere in Australia there is evidence of large scale clearing being contracted to groups of Chinese. From 1881, pastoralists in NSW were allowed to count ring-barking of trees as an improvement (and therefore an important tool in discouraging selectors who were required to compensate pastoralists for their improvements). This led to a boom in ring-barking carried out by gangs of Chinese (Stubbs, 1998: 150-1). Key features of this development were that the gangs worked on contract not wages and were managed by the Chinese. One Chinese contractor, Jimmy Ah Kew, engaged 500 of his countrymen in such work and by 1901 there were about 1,000 Chinese in clearing gangs in NSW and Victoria (Yong, 1977: 40).

1900 - 1920 Decline

After 1900 Chinese farming declined. The range and scale of agricultural activities shrank significantly. The twentieth century Chinese were mainly involved in small-scale market gardening on the urban fringes. The Chinese were no longer associated with innovations in techniques or new crops. This shift in Chinese farming was reflected in changes in the nature of our sources. Official interest dropped away, in contrast to the flurry of activity in the 1880s and 1890s, later Royal Commissions showed almost no interest in the Chinese. They continued to appear in travellers' and journalists' accounts (for example Clowes, 1911), but the focus was usually on the Chinese as a quaint and novel part of the Australian landscape.

There are three possible reasons for the decline of Chinese farming. First, the generally held view is that it was due to a shrinking and ageing of the Chinese population as immigration restrictions meant that there was no influx of new blood (Yong, 1977: 38; May, 1984: 39; Ryan, 1995: 79; Chou, 1993: 150). Second, it has been argued that the Chinese became trapped by their own success with labour-intensive methods. Being so successful, they ignored opportunities for further innovation and were after 1900 overtaken by their

competitors (Chou, 1993: 149-152). Third, another possibility, which will be explored in greater detail later in this article, is that Chinese success in the 1880s and 1890s had influenced European farmers to copy some of their methods and compete with them.

CHINESE SKILLS AND TECHNOLOGY

In the 1880s and 1890s the Chinese came to dominate market gardening and specialist crops. How were they able to achieve this? What special skills and technology were they able to utilise? For most contemporary Europeans, it was simply they worked so much harder than others that their competitors had no chance. James Dunlop commented that, 'they are the gardeners of Australia, as we don't remember a single white man engaged in market gardening in Queensland' (Dunlop, 1912: 60). Douglas Gane noted that, 'no place is too barren or arid for him ... an Englishman or colonial has little chance against him' (Gane, 1886: 58-9).

One observer, E.M. Clowes, started with the inevitable comparison, but then she shifted to a more detailed consideration of why the Chinese were successful,

You see a lot of white men working in the market gardens round Oakleigh and Garden Vale [in Melbourne's sandbelt]. They stop to talk with each other, to look round at the sky and distant landscapes, to enjoy a few quiet puffs at their pipes; above all to spit on their hands. The Chinaman never looks up, never stops from dawn to dark. He divides his ground into little oblong patches, with channels between to conserve every drop of moisture; he pampers the young weak plants, shading them from the wind and sun with bits of sacking, boards or slate; he loosens the ground unceasingly round them and waters untiringly (Clowes, 1911: 196-7).

The Chinese skill with labour-intensive techniques of growing vegetables and specialised crops and their knowledge of irrigation may have been directly imported from China, part of the Chinese *cultural* or *invisible baggage*. Certainly most were peasants from Canton, a region with both irrigated and dryland farming and intensive cultivation of vegetables, rice, tobacco and sugar (Choi, 1975: 4-5). However, such a conclusion may be too simplistic.

Chinese farming in Australia was not just Chinese farming transported as a whole from Canton to Australia. While they grew some crops they were familiar with from Canton, they did grow the common Cantonese crops of tea, mulberries, peanuts and sweet potatoes as commercial crops in Australia. One significant omission from their Cantonese repertoire in Australia was sugar cane (Queensland, 1897: Q. 4375), probably because many European farmers were trying to grow it. The environmental range of Chinese farming, from north Queensland to Tasmania, from tropical rainforest to arid interior, was far greater and more varied than in Canton.

Nor were their technical skills exclusively those of the Chinese. Europeans marvelled at their ingenuity in interplanting other crops between rows of maize, so that they were protected by the faster growing maize (Queensland, 1889: Q. 58). However, such a technique was initially invented by Native Americans and was common amongst maize-growers in Mediterranean countries. The use of clearance leases was widely and exclusively associated with the Chinese in northern Queensland in the 1880s and 1890s. Furthermore Chinese farmers entered into clearance leases in the Sacramento Delta of California (Arreola, 1975; Chan, 1986: 173-197). However, clearance leases had initially been developed by European farmers in NSW in the 1820s. This was an existing institution adapted to the Chinese.

The Chinese in Australia were typically successful growers of European vegetables and crops for a European market. The vegetables they grew were European, for example cabbages (Jenkins, 1975: 158). They grew Irish potatoes rather than sweet potatoes (Queensland, 1889: Q. 1795-9; Brady, 1919: 263). They did not import maize-growing, Europeans had been growing it since 1788. Tobacco, bananas and rice were grown for European tastes.

Writing of the Chinese in California, Chan argued that they were successful due to their entrepreneurship and ability to adapt and innovate rather than just sheer hard work or the technical skills they imported (Chan, 1986: 20). For the Chinese in Australia, success was also often due to organisational rather than technical skills. In particular Europeans admired their skill in crop selection and planning, labour management and marketing of their produce.

Against the monocultural trends of their European neighbours, Chinese farmers opted for variety. For example, at Port Douglas in Queensland, two Chinese farmers mixed market gardening with rice and maize growing (Queensland, 1889: Q. 693-4). Market gardeners especially could not be like other farmers and concentrate on one or two crops harvested once or twice a year. In 1885 John Jenkins praised the Chinese for not only selling, 'every variety of vegetables from door to door', but having, 'cabbage and green vegetables on sale all the year round' (Jenkins, 1975: 150 & 158).

Though they often started as labourers under European direction, the Chinese did best when they organised themselves. By the 1880s the Chinese were typically found working in small groups with big results. Near Cairns in Queensland, four Chinese formed a partnership and leased 20 acres. They then hired two more Chinese. At the end of one year their sales were £550, out of which they paid £20 rent. Assuming equal distribution of the proceeds, each of the Chinese was earning nearly £90 a year, nearly double the rate for European agricultural labourers (Queensland, 1889: Q. 1795-9).⁷

The Chinese were especially adept at identifying niche markets. In land-rich but labour-poor Australia they went against the trend to land-extensive farming and concentrated on labour-intensive production. The Chinese saw the value of providing fresh produce, establishing their gardens close to their consumers. The major markets were the cities and large towns, but they also located near isolated towns, pastoral stations and mining camps. One exceptional example of the lengths they would go to occurred in 1861. Two Chinese commenced a market garden on New Years Island in Bass Strait, selling fresh vegetables to passing ships and workers salvaging shipwrecks on nearby King Island (Hooper, 1973: 44).

INTERACTION WITH EUROPEANS

Chinese farming in a European society

At the heart of the Chinese farming experience in Australia was a paradox - Europeans discriminated against Chinese, but they eagerly consumed the produce of Chinese labour. Many Europeans developed a bizarre dual attitude towards the Chinese, on the one hand denigrating them on racial grounds, but on the other hand valuing (often in an unspoken way) their industry, adaptation and cheap prices.

An example of this dual attitude was recorded by E.M. Clowes,

"I would give anything to have a Chinaman to teach my boys vegetable growing", said the Principal of a Horticultural College near Melbourne to me some years ago. "But the Minister [of Agriculture?] would never allow it, and if he did I should have the whole country about my ears". He was right, for no free-born Australian boy would tolerate for a minute being taught anything by an Asiatic (Clowes, 1911: 198).

In north-eastern Victoria, around 1880, the successful Aboriginal artist Tommy McRae produced a number of paintings of Aborigines with spears chasing Chinese. These pictures were popular amongst Europeans probably because they confirmed a view that the Chinese were even inferior to the Aborigines. However, the models for McRae's works were most likely the valued Chinese agricultural labourers on the next property. Roderick Kilborn, the owner of the next property, employer of the Chinese and beneficiary of their industry, was also a key patron of the artist (Sayers, 1994: 45-7).

Not far away the bushranger Joe Byrne grew up in the Woolshed Valley on a farm bordering a small Chinese settlement. Chinese farmers built and maintained a water race which cut across the Byrne's land. The construction was mutually advantageous, both the Byrnes and the Chinese shared the water. Byrne grew up

fluent in Cantonese, was a frequent visitor to Beechworth's Chinatown, became an opium user and utilised Chinese rockets for signals at the Siege of Glenrowan. On the other hand, in 1877 a swim in a Chinese irrigation dam led to an argument and Byrne being charged with assaulting three of his Chinese neighbours. His fellow bushranger Ned Kelly was similarly charged in 1869 with beating a Chinese hawker (Jones, 1992: 7, 24 & 48-9).

The double standard for the Chinese reinforced the prevailing attitude that the Chinese should be restricted in their occupations. As the Tasmanian newspaper, the *Wellington Times*, argued in 1893, 'most of the boys have no objection to letting the Chinamen go in for vegetables, but they cannot brook their interference or taking up of bush work'(quoted in Stokes, 1969: 348). The lack of objection to their market gardening was probably for two reasons, first, the bush workers had little desire to venture into that activity and second, their efforts in vegetable-growing were of immense benefit to the community.

European-Chinese partnerships

The recognition that the Chinese engaged in profitable farming, encouraged some Europeans to seek to grab a share of those profits. The most common mechanism for Europeans benefiting from the Chinese was the *clearing lease*. However, the Europeans' share of these gains were often relatively small. In one case a landowner reported that his Chinese tenants sold their crops for £550, but he only gained £20 in rent (Queensland, 1889: Q. 1795-9). Such leases (and the benefits they brought) were also only short term, only lasting three to five years before the land reverted to the owner.

Some European landowners went further, seeking ongoing share-farming partnerships with the Chinese. The Europeans provided land and often capital, the Chinese, their farming skills. Such offers were attractive to the Chinese, for they often lacked capital and found that as non-British subjects their ability to buy land was restricted. In California such partnerships were used to circumvent anti-Chinese feeling – produce could be labelled under the European landowner's name (Chan, 1986: 125) – and its possible similar strategies were adopted in Australia.

The most detailed descriptions of Chinese-European partnerships in Australia were of the highly successful intensive cultivation of high value crops such as tobacco and hops on the fertile river flats of the Ovens and King Rivers in north-eastern Victoria. In 1887 William Lyons told the Royal Commission on Vegetable Products of his share-farming agreement with Chinese tobacco-growers. He provided the land, its ploughing and advanced them stores, they provided the labour for growing and curing and were responsible for their own management. The sale of the crop was split 60 per cent to the Chinese and 40 per cent to Lyons (Victoria, 1888: Q. 8717). In 1897 H.V. Hyem of the King Valley was recorded as entering an agreement with Chinese, whereby he provided 200 acres of ploughed and fenced land and erected curing sheds. The Chinese grew and cured the tobacco. Hyem took one third of the profits and the Chinese received two thirds (Robertson, 1973: 126). It is significant that in both instances the Chinese were able to negotiate to receive the majority of the profits.

Closer settlement

The Chinese success in carving out a profitable niche in labour intensive farming attracted Europeans. However, rather than share the spoils, for many it was attractive to occupy that niche and exclude the Chinese. Late in the nineteenth century there was a sudden change in attitudes to both the Chinese and labour-intensive cultivation. This was especially so with the boom in development of irrigation colonies and areas.

The advocates of closer settlement (and it is fair to call them 'boosters', such was their enthusiasm) developed their own double attitude towards the Chinese. On the one hand they highlighted that the Chinese had skills which the Europeans seemingly had not. John West prefaced his boosterism of irrigation along the Murray River with, 'the average farmer ... is in the unfortunate position ... with the belief ... [that] irrigation will do no good in the hands of any other than a Chinaman (West, 1889: 86).

However, on the other hand, they argued that it was possible (and desirable) for European farmers to adopt labour-intensive methods and equal the success of the Chinese. One fruit-grower, A.F. Spawn, argued that, 'large numbers of farmers only growing wheat and leaving fruit and vegetables to Chinese should be a thing of the past' (Spawn, 1889: 120). Edwin Brady, champion of the notion that agricultural progress was unlimited under closer settlement and irrigation, recorded details of high yields by Chinese farmers at Nowra (NSW), Cairns, Atherton, Hughenden and Texas (all Queensland) as evidence that Europeans could also achieve such results (Brady, 1919: 263, 438, 445, 470 & 498).

In some cases the Chinese were excluded from the new closer settlements. In 1894 booster publicity for an irrigation colony in Renmark, South Australia, proudly proclaimed to prospective farmers, 'wonderful to relate, there are no Chinese or Hebrews in the settlement' (quoted in Tyrell, 1999: 139). In 1903 the extension of a railway to the Atherton Tableland, boosted the prospects of dairying so that the local *Tableland Examiner* rejoiced, 'The advent of the cow, will rid us of the Chow' (quoted in Bolton, 1963: 301). In 1920, the NSW Department of Agriculture reported that in Victoria, 'the Celestial [market gardener] has long ago been almost forced out of business by the white grower (Pinn & Makin, 1920: preface).⁸

Closer settlement was not built upon the European adoption of Chinese technology. European farmers developed and introduced their own versions of labour intensive settlement. Most of its elements: co-operative dairy factories, railways and massive irrigation works, were very different from the small scale techniques developed by the Chinese. What the Europeans had borrowed from the Chinese was the simple idea that labour-intensive farming could be highly successful in Australian conditions.

CONCLUSION

Chinese farming was a major part of the Australian landscape from 1850 to 1920. Historians have recognised that, but have tended to see that farming as merely a background for consideration of discrimination and racism. However, examination of Chinese farming raises four main issues which lead us to see the Chinese experience in Australia as perhaps more complex than we may have thought. The first is that Chinese farming and farming technology changed over time, as suggested in this article there were distinct periods of different types of Chinese farming. The second is that Chinese farmers were innovators, successfully adapting their technology and organisation to an environment that was doubly foreign (a British culture and an Australian physical environment). It is not sufficient to see Chinese farming technology as something which was simply imported intact from China. The third is that Chinese farmers often worked in with European farmers and investors in a mutually advantageous way. Nonetheless, paradoxically discrimination often came from those who benefited greatly from Chinese agriculture. Fourth, the success of Chinese labour-intensive farming, stimulated some Australians to consider closer settlement alternatives to the usual pattern of wheat and sheep farming on extensive holdings. European farmers did not adopt Chinese technology, rather they were influenced by Chinese success and developed their own technology to imitate that success.

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¹ Originally in Coghlan, 1918: p. 1331. While Coghlan was the NSW Government Statistician, he gave no basis for arriving at this percentage. It was perhaps intended to be only an approximate indicator rather than an exact statistic.

² Some Chinese had come as indentured labourers before the Gold Rushes.

³ Similarly, while we know large numbers of Chinese engaged in alluvial gold mining we have almost no detailed evidence of their particular techniques (Lawrence, 2000: 6).

⁴ Young's count was confirmed three years later by the Census, which recorded that of 17,899 Chinese males in Victoria, only 1,062 (six per cent) were market gardeners (Victoria, 1873: 106-7).

⁵ Chinese were involved on a far larger scale and over a longer period in the Californian wheat harvests (Smith, 1969: 182). Their lesser involvement in Australia was probably due to the greater emphasis on small family farms.

⁶ In northern Queensland *scrub* meant rainforest. The term rainforest was not coined until 1898 and was hardly used in Australia until the 1970s.

⁷ Some care is needed in making such comparisons. The rate for labourers was understated as it allowed for food and board. Even so these Chinese were earning above European wages.

⁸ It is important to note that they recorded that Chinese market gardening was still widespread in Sydney, though they predicted it would fall away as in Melbourne (Pinn & Makin, 1920: preface).

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