

Title: A tale of three cities – Food in Aboriginal, European and Chinese Geelong

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A tale of three cities – Food in Aboriginal, European and Chinese Geelong

Abstract

Djillong, the place where modern day Geelong stands, has been an urban centre for millennia. At the time of European colonisation, the traditional owners, the *Wadawurrung*, lived in low-density houses and gardens in settlements as large as most other sedentary communities across the world. Most of their basic needs (food, water, fibre, medicine, etc.) were met where they lived, and these attributes are what also drew the first European colonisers to settle on the shores of Corio Bay. Over the course of contemporary Geelong's history, the places where the *Wadawurrung* lived progressively became Westernised suburbs. While the *Wadawurrung* erected their settlements working with the underlying ecological processes, the Europeans who followed did not. Whether it is retrofitting existing suburbs or building new ones, it is now acknowledged that several of Geelong's suburbs need to change in their ecological perspectives, values and characteristics. While an understanding of Aboriginal land management at the time of European settlement is increasingly being recognized as invaluable, there was another culture that significantly influenced the urban landscape of Geelong - Chinese market gardeners. Arriving as part of the 1850s goldfields migrations, and staying until just after World War 2, Chinese settlers provided most of the vegetables consumed in Geelong in this period. Like the *Wadawurrung*, the Chinese were pushed to the parts of the Geelong landscape that the Europeans did not want. The result is that today Geelong is the second least sustainable of the twenty largest urban centres in Australia. This paper looks at three different ways that one basic human need – food – was historically sourced and provided in Geelong, and what lessons can be learnt from these different approaches in ensuring that 21st century Geelong lives within its ecological means.

City

Cities have existed for millennia to meet a range of human needs, both physiological and psychological. Food production is one of these. Until the Industrial Revolution, most food was grown within the city, or nearby in the hinterland. The sustainability of food production has been linked to the sustainability of societies e.g. Diamond (2005), Flannery (1994, 2002), Pascoe (2003, 2007, 2014). This paper defines sustainability at three levels:

1. Able to be maintained at a certain rate or level (Oxford Dictionary, 2018);
2. Maintaining the health of ecosystems, which provides a variety of benefits over time (Steiner, 2000); and
3. Development which meets the needs of the present without compromising the ability of future generations to meet their own needs (United Nations, 1987)

The Aboriginal City

Contrary to common belief, before European contact, Aboriginal Australia contained cities in south west Victoria that were at least 10,000 years old that could service a population of 10,000 people (Builth, 2002). Thus, Aboriginal ‘cities’ are among the oldest and, prior to the Industrial Revolution, largest in the world.

Villages of over 500 people occupied on a seasonal, multi-seasonal or permanent basis were a common observation of early European explorers and travellers in early European settlement Victoria. Such was evident not just in the south west of Victoria, but also in other parts of Victoria around Cape Otway (Pascoe, 2007) and Western Port (Gellibrand, 1836) and Australia including the Murray Darling basin in New South Wales (NSW) and South Australia (SA) and in southern Western Australia (WA) (Gerritsen, 2011; Memmott, 2007). A number of these villages were located around Geelong, the traditional lands of the *Wadawurrung Balug*, a clan of the Indigenous *Wadawurrung* peoples, also known as the ‘Barrabool Tribe’.

These villages were commonly situated in the middle of clan ranges (Jones, 1993) on mounds, along rivers and wetlands, on the edges of woodlands and higher ground or vantage points (Jones, 1993; Memmott & Long, 2002; McGaw, 2010; Gerritsen, 2011). The junction of a number of different ecosystems provided a diversity of food and other resources to meet their living needs (Lane, 1984; Jones, 1993; Gammage, 2012). The *Wadawurrung Balug*-established Kardinia Creek Living Station was located at such a junction. Hunters would typically roam up to 15 km to find fast game like marsupials (Lane, undated B) while women walked about half as far to obtain the vegetable components of their collective diets (Lane, 1992c).

Kardinia Living Station

Kardinia Creek, or *Ka:Din:Iu* in *Wadawurrung* language, was a place name meaning ‘the hissing of a snake’ and came from the sound of tidal water made as it ripped upstream past the living station (Lane, 1991a). The Kardinia Creek Living Station is found within the valley section of the Barwon River, approximately 3 km upstream of where the floodplain begins (see Figure 1). This was the winter residential settlement for the *Wadawurrung Balug* for at least 5,000 years (Lane, 1991a), quite probably over 30,000 years (Canning, 2009; Canning & Thiele, 2010) and maybe 40,000 years (Lane, 1991a). The *Wadawurrung* were last known to have lived here after Fyans built his house ‘Baliang Bellbird’ (Figure 2) around 1845, ‘looking down with instinctive dread’ (*Geelong Advertiser*, 1904, p.4).



Figure 1 (left) Old Village Pump at Kardinia Living Station, c. 1860.

Figure 2 (right) H88.21-107 Baliyang near Geelong, Foster Fyans House c1851 (Source: State Library of Victoria).

Lane (1984a) refers to this site as the ‘Sheltered Cup’ because it lay under a rain shadow of the highlands west and south (the direction of the prevailing wind during winter, and the rocky walls (on the western side) trapped solar heat in the enclosure. She links these site characteristics to those of good *Fung Shui* (Lane, 1984a), the Chinese philosophical system of harmonizing everyone with the surrounding environment.

European City

Davison (1994) calls Australia the first suburban nation. There are four distinct periods of urban development in Geelong since the European settlement in 1835: Victorian (1835-1900), Garden Suburbs (1901-1950), Modern (1951-2000) and contemporary (2001-). This paper is focused between 1835 and 1939, the beginning of World War II.

Geelong’s non-Aboriginal population was 454 in 1841 and reached 22,000 in 1853 (Edmonds, 2004); a level it would remain at until the early 20th century. This fifty-fold population increase in a decade meant that by the discovery of gold, Geelong was the fourth largest town in Australia. Even at this time, Australia was much more urban than most other countries at the time. Kelly (2010) identified that 40% of Australians lived in cities.

By the 1851 Victorian gold rushes, Geelong had two distinct suburban centres - Chilwell and New Town (Seaton 1983). Chilwell is what Lewis (1999) identifies as the typical Victorian suburb that consisted of rows of cottages cramped together on narrow blocks of land to form a compact entity that was easily traversed by artisans or labourers who commonly walked or cycled to work. Here the size of allotments were ‘one eighth of an acre’ [@ 50 m²] (Davison, 1978)

New Town, later Newtown (see Figures 3 and 4), reflects the trend identified by Davison (2013) in Britain in the late 18th and early 19th centuries of the emergence of the appearance, on the fringes of towns, of the new urban estates such as London’s Regent Park (1811-) that displayed a new awareness of the town-dweller’s need for fresh air and semi-rural vista’s. Allotments of one quarter

acre [$\approx 100 \text{ m}^2$] were the norm from the 1850s (Lewis, 1999) until the early post-World War II period when allotment sizes were reduced as on-site sewage management and garbage disposal was provided by local government (Troy, 2004, p.7).



Figure 3 (left): Newtown in 1866, overlooking Chilwell (foreground) and Belmont (in distance). Figure 4 (right): Newtown in the same location in 2014 (Source: R.Wissing)

Belmont, on the southern side of the river opposite Chilwell, was described in an 1865 Directory as a “small postal township, agricultural, one state school, one denominational, population 428” (Pescott, 1985). The population remained at this level until World War 1 (Pescott, 1985), until the ideals of the town planning movement began to be proposed by prominent local supporters of this movement, including Percy Everett (*Geelong Advertiser*, 1915; Freestone, 2010, p.262). Such ideals were applied in subdivisions around the Belmont Primary School by local architects and urban planners, Buchan & Laird (now The Buchan Group; <http://www.buchan.com.au/>). Geelong’s population at the start of World War II was 40,450.

Chinese City

Much less is known about the Chinese living arrangement in Geelong. At the nearby Ballarat diggings, the Chinese usually lived and worked with their clans or societies who shared the same dialects (Macklin, 2017, p.29). On arriving in Geelong, the Chinese continued to stick together. They recreated peasant life in south China (Chou, 1993, p.155) (see Figure 5), which led to numerous complaints. This included a report by the Geelong West Borough in 1915 about the need to ‘compel the Chinese to provide better living accommodation and make provision for storing their produce in more healthy surroundings’ (*Western Champion*, 1915).



Figure 5: House in Chinese Market Garden 1910s, believed to be in Hawthorn, Melbourne (Source: Trove)

As reticulated water became available in the 1870s, the Chinese market gardens moved into suburban Chilwell. As Seaton (1983) describes:

At various dates gardens were worked by groups of two, three or four Chinese in Percy Street, one opposite St Peters church and one east of it; at the corner of Pakington and Marshall Streets, where shops were built later; in Fyans Street where Stinton Oval is now, in Bond Street, in Mervyn Street, on a block running through to Nicholas Street, where St Robert's school was later established; on land in Aphrasia Street that later became Geelong College's oval; and in Skene and Aberdeen Street, next to Silas Harding ...

Feeding the City

Aboriginal Food

A classic distinction between civilized and primitive societies is whether they produce food, or simply hunted and gathered food (Kerwin, 2012, p.20). While Jared Diamond (2005) suggests that 'food production' occurred on every continent except Australia (Diamond, 1998 in Kerwin, 2012, p.20), the past couple of decades have seen a strong movement away from the view that Aboriginal Australians were hunter gatherers at the point of European contact, to one where Aboriginal people, as Gammage (2012) puts it, were not ruled by chance and hope but knowledge and policy. Aboriginal knowledge and policy meant that people actively harvested both plants and animals in a manner that had a positive impact on the environment in which they lived. As Cooper (2006) says, these human, plant and animal interactions were dependent on each other. Aboriginal people used their knowledge of the seasonal availability of resources to achieve what Stevenson (1985) calls a high production/labour input ratio (Clarke, 2009).

Regarding meat, Armytage (1853) noted that the *Wadawurrung* depended on fishing in summer and autumn and hunting in winter and spring (Richards & Jordan, 1999). Possums, arguably the most valuable creature for the *Wadawurrung*, provided a staple meat food during autumn and winter and their fur was used to make cloaks (Lane, 1992c). Numerous writings of early European explorers and settlers of Geelong and the Western District also identify the key role that Aboriginal people had in maintaining animal numbers and how quickly these numbers declined once active Aboriginal management was removed.

To facilitate hunting, virtually all *Country* owned by the *Wadawurrung* would have been seasonally burnt. People burnt useful land most and sterile or sensitive land least (Gammage, 2011). Most fires were to make succulent grass, particularly on the best soils on valley floors and flats (Gammage, 2011). Grasslands were burnt every three to five years (Lunt & Morgan, 2002), while grassy woodlands were burnt between four and twelve yearly intervals (White, 2012) and riparian woodlands were burnt between ten and thirty year intervals (White, 2012).

Hunting

Kangaroo (*Macropus giganteus*), emu (*Dromaius novaehollandiae*), wallaby and bustard (*Ardeotis australis*) could be hunted in the basalt plains grasslands up the Kardinia Creek valley between the Barwon and Waurin Ponds Creeks (Lane, 1991a). Both escape convict Buckley (Flannery, 2002) and land surveyor John Helder Wedge (Brown, 1989) make reference to the use of dogs, the dingo (*Canis lupus dingo*), in catching and killing kangaroos in and around Geelong.

Likewise, inaugural Geelong police magistrate Foster Fyans observed the *Wadawurrung* working in concert with dolphins (*Tursiops truncatus*) to herd fish at Stingaree Bay [inside Corio Bay] (Fyans, 1986). Fishing platforms, such as those found on the Barwon River opposite the Kardinia Creek Living Place, were constructed and used to catch fish during flooding.

Fishtraps

Animal harvesting practices in aquatic environments were generally much smaller in scale and more intensive, but like land practices, were finely tuned to how the local ecosystems worked. The main exception is the extensive aquaculture structures of *Budj Bim* (Australia 2004). While there is no evidence that structures of this scale occurred in and around Geelong, an Aboriginal-constructed stone weir still exists just above Buckley's Falls today, there are numerous records of eel (*Anguilla australis*) traps on the Barwon River in these areas and of fish traps on the estuary of Thompsons Creek (Bream Creek) and on the shores of Corio Bay around Point Liliias (Lane, 2009). This was common on all rivers of south-western Victoria (Pascoe, 2014).

Riverine fishtraps were located adjacent to apparently natural outcrops of basalt where rivers narrowed, were shallow and could be dammed with relatively little effort (Lane, 2009). Fishtraps made of wood were also common and escape convict William Buckley used one on the estuary of Bream Creek when staying there (Flannery, 2002). Although not recorded in wetlands around Geelong, square traps used as holding bays for fish stocks were readily seen at Lake Gnarpit, Lake Corangamite, Lake Purrumbeet and Lake Colac. As Buckley is known to have spent considerable time at Lake Corangamite (Flannery, 2002) and visited the extensive aquaculture villages of *Budj Bim* before 1836 (Pascoe, 2014), it is likely that they also existed throughout the Geelong region at point of contact.

Gardening

The importance of fire as a key broadscale management tool to create ‘templates’ is well known. Less well known are the approaches undertaken at a local, residential scale, which were responsible for much of the plant component of the *Wadawurrung* diet.

Until recently, Aboriginal people were seen as hunters and gatherers. Any activity that appeared like conscious cultivation (Flannery, 1994; Lourandos, 1997) was considered ‘accidental’ or ‘natural’ (Gott, 1982). This included observations by Batey, an early settler of Sunbury to the north west of Melbourne in similar country to that to the west of Geelong commented on the hilling up of mounds of rich basaltic clay at right angles to slopes (Gott, 1992). This gardening may have worked very closely with the ecological processes, but as Gammage (2012) says, there was nothing accidental about it. In fact, the similarities between European and Aboriginal horticulture and agriculture are striking (see Table 1).

Aboriginal women were the normal plant gatherers, whose harvest often exceeded the value of the huntsmen’s catch (Brown, 1989). A range of plants were harvested (Lourandos, 1997), with Pascoe (2003) identifying perhaps 50-60 being harvested this way. The most important was the tuber, yam daisy (*Microseris lanceolata*) or Myrnong or Murnong which was collected in large quantities daily by women on the open plains (Lourandos, 1997). Along the wetlands adjacent to the Barwon River in Geelong, Nardoo (*Marsilea drummondii*), Club rush (*Ficinia nodosa*) and a range of other aquatic bulbs were also harvested and formed a key part of the diet.

Land-based plant resources were exploited so that their abundance was maintained (Gott, 2005; Denham, 2008). Murnong plots were between 2-5 acres (0.8-2.0 ha) in size and cultivated by a sharp stick called a *karni* to collect roots, separate the bulbs and cultivate the soil (Pascoe, 2003). The Wedge illustration (Figure 6), drawn at Indented Heads about 30 km from Geelong at the time that Buckley met Batman’s party, shows that cultivation occurred during the winter months. In fact, Buckley was collecting tubers when told of Batman’s arrival (Maynard and Haskins, 2016). All areas of a plot would have been covered in the course of a year or two (Gott, 1992).



J.H.W. Native Women getting Tam bourn Roots 27 August 1835

Figure 6: Wadawurrung women cultivating plants near Indented Heads (Source: Brown, 1989).

Murnong may have been a feature of Aboriginal diets from the time of the earliest known occupation of the area (Canning, 2009), perhaps over 60,000 years, (Gott, 1992). Because Murnong seed does not last in the soil and therefore crops need continuous mature plants (Gammage, 2012) and that crop regeneration was enabled by Aboriginal people leaving a portion of yam tubers (Pascoe, 2007) behind when harvesting, this suggests that gardening practices have been undertaken around Geelong for tens of thousands of years. The *Wadawurrung* exchanged Murnong with neighbouring clans in the Geelong region and with other language groups of the Western *Kulin* (Flannery, 2002).

European agriculture and horticulture	Koorie gathering
Preparation of soil, cultivation	Digging, loosening soil, incorporating litter and ash
Fertilising	Burning at specific times to produce ash
Thinning of perennial plants	Separating clumps of perennials, removing tubers
Sowing and planting	Some tubers left or replanted, burning timed after seeding
Spreading of cultivated plants	Tubers and seeds carried to camps, traded from tribe to tribe

Table 1: Comparison of Aboriginal environmental management with European horticulture and agriculture. Source: Gott (2002, p.2) in Aitken and Looker (2002) *The Oxford Companion to Australian Gardens*

Food storage

The extent to which food was stored has been underestimated (Laudine, 2009). Stored food included eels (*Anguilla australis*) and animal meat, and large quantities of acacia gum (Lourandos, 1997), plums, caterpillars, moths, quandongs, figs, seeds and nuts (Pascoe, 2014, p.45). Locally, to prevent scarcity, Buckley captured abundant fish when they were available and dried and preserved them for when they were not (Flannery, 2002).

Health

Numerous European explorers and early settlers, including Major Mitchell, John Batman, John Helder Wedge and Foster Fyans effused about the health of the landscape before them. Similar observations were made on the fine health of the Aboriginal people, with Hodgson and Wahlqvist, (1993) identifying that prior to the European settlement of Australia, the quality of life and health of Aboriginal people was probably better than that of Europeans with a life expectancy at birth estimated at about 40 years and some reaching ages of 65 years or more. In comparison, Davison (2013, p.5) identifies that in the 1840s, life expectancy of the average English city-dweller was barely half that of the rural dweller.

When Buckley brought together all *Wadawurrung Balug* (Clark, 1990, p307) around Geelong in 1836, Fyans counted 275 people. Yet just three years after the first European squatters arrived in Geelong, Dr Jonathon Clarke wrote to the ‘Protector of Aborigines’ Charles Wightman Sievwright

describing the deplorable state of health of the original Geelong-based Aboriginals. By 1885, reputedly none remained (Clark, 1990).

European Food

Most of Australia has been Anglo-settled for much less than two hundred years, far too short a time for adequate adaptation (Seddon, 2001). The traditional form of development of Australian cities grew out of recognition that early settlers had to largely fend for themselves as there was no established agricultural hinterland (Troy, 2004, p4). Consequently, in the 1790s colonial Governor Arthur Phillip decreed that house blocks in Australian towns be roughly a quarter of an acre (@ 100 m²) in size because many households had to be responsible for producing their own food and absorbing their own waste (Kelly, 2010). Once developed, the effect of this relatively low-density form of development was to enable successive generations of households to attain a high degree of self-sufficiency (Troy, 2004, p6) as Halkett (1976), Mullins (1981a, 1981b, 1988) and Gaynor (2006) all identify.

Until after the gold rush peak, Geelong residents largely grew their own food, sourced it from Melbourne or Sydney (Jones, 1984) or from farmers around Belmont, Highton and Grovedale (Pescott, 1985) where Prussian immigrants established market gardens along Waurn Ponds Creek from 1848. These dairies, piggeries, orchards, and vineyards, continued, particularly along Kardinia Creek, Waurn Ponds Creek and the Barwon River, until well after World War II (Pescott, 1985).

On 16th August 1849, the *Geelong Advertiser* reported that, “For every acre of land under orchard cultivation last year in the neighborhood of Geelong, there are now at least six” (Jones, 1984). Within a year, the first market garden near the Barwon River appeared with Thomas Sheppard’s garden in Skene Street (Seaton, 1983). European market gardeners continued well into the 20th century (Seaton, 1983).

Private food production was particularly prominent. In 1841, three years after the establishment of Geelong, suburban allotments with the potential for garden grounds were advertised (Seaton, 1983). Around 1845, William Roadknight had a ‘magnificent garden, filled with fruit trees - cherry plums, mellow pears’, and by 1849, the ‘Fairview’ property had for five years been in a high state of cultivation ‘under a system of farming which had added to the natural fertility of the soil, and improved it at great pecuniary outlay’ (Seaton, 1983). In the late nineteenth and early twentieth centuries, large private gardens had areas set aside for fruit and vegetable production, which was often undertaken by professional gardeners (Gaynor, 2005). This best example of this in Geelong is the National Trust ‘Claremont’ property in Noble Street, Newtown (see Figure 7). Until the end of World War II, the middle and working classes used their backyard gardens and poultry to produce a significant proportion of their diet (Gaynor, 2005). Apart from the enjoyment gardening provided, other significant drivers were food that was fresh, healthy and free from contamination by the hands of the casual ‘dirty’ poor or Chinese people (Gaynor, 2006) and economics. By the end of the nineteenth century, Australians spent about 40% of earnings on food and (non-alcoholic) drink (Dingle, 1984, p.204). Today, these account for just 17% of the family budget (*Herald Sun*, 14 September 2017).



Figure 7: Productive 19th Century residential garden still in operation at 'Claremont', Newtown (Source: R. Wissing).

Native Australian soils are often described as infertile, with phosphorus being most deficient and nitrogen and soil organic matter also being low (Jones, 2010, p.2). Yet, the descriptions by early explorers and settlers of the basalt plains to the west of Geelong were anything but this. As Gammage (2012) identifies, the soil was soft enough to push a finger into and water was able to soak in rather than runoff and that less rain sustained more plants. This was the result of up to 60,000 years of 'management' by the *Wadawurrung*. Unfamiliarity with Australian soils and climatic conditions (Seddon, 2001), meant that within 15-20 years of cultivation using European ploughing techniques established in soils with a different tilth, Australian soils would have lost half of their stored organic matter (Jones, 2010, p.2-3).

Chinese Food

While the first Chinese arrived in Victoria before the gold rush as shepherds for squatters (Macklin, 2017, p.3-4), the most significant numbers came during the 1850s gold rushes (Brown-May & Swain, 2005, p.131). Geelong was a key arrival point (Keneally, 2009, p. 515; Macklin, 2017, p.4). In 1848 the correspondent for the *Geelong Chronicle* described the Chinese as 'cut-throat barbarians, waiting like so many wild beasts to be portioned off to their captors' (Macklin, 2017, p.5). Similar complaints about the Chinese were common in the *Geelong Advertiser* during the 1850s. But the prejudice was not one way. The Chinese deeply proud of their history, customs and values that produced a rich and impressive culture were no less racist than the Europeans onlookers (Macklin, 2017, p.8). Likewise, Aboriginal people, as the missionary William Schmidt told the Select Committee on Aborigines in 1845, 'considered themselves superior to us ... They preferred

their way of living to ours ... They have expressed the opinion that they were our masters in the bush ... they pitied us that we troubled ourselves with so many things' (Shaw, 1996, p.30-31).

The Chinese 'coolie' were valued by the squatters because of his 'untiring industry, frugality and perserverence' [sic.], which were 'the inherited instincts of their race' (Macklin, 2017, p.3-4). Many worked in occupations that drew on labour intensive, pre-industrial skills and moved into niches which Europeans failed to enter (Chou, 1993, p.64-65) because 'the great bodily powers of British labourers would be a misapplication of strength' (Macklin, 2017, p.3-4). Some 70% of the Chinese immigrants were bound by contract or debt (Macklin, 2017, p.28). Unable to pay for wives and children to the diggings (Macklin, 2017, p.29), most chose low-risk, quick-return ventures and went home (Brown-May & Swain, 2005, p.131). This desire to make quick money and return home was something that the Chinese had in common with many early European immigrants.

Market Gardens

After the gold rushes subsided, the Chinese were officially relegated to the outer fringes of colonial society (Macklin, 2017, p.48). Market gardening provided the greatest employment to the Chinese (Chou, 1993, p.64-65). Unlike pastoralism and wheat farming, it required little capital to set up and within months of operation, a steady flow of income could be generated (Chou, 1993, p.70). The Chinese were major commercial producers of fruit and vegetables in Australian regional towns prior to World War II (Aitken & Looker, 2002; Brown-May & Swain, 2005, p.131; Jones, 2010, p.14).

The Chinese were successful because they were skilled agriculturalist who brought the best in traditional farming techniques with them (Chou, 1993, p.155). Their disappearance was due to a combination of aging workers, an increase on Western scientific approaches including the use of artificial fertilisers (Chou, 1993, p.148), their conservative nature, the introduction of prepared seed packets and seedlings (Chou, 1993, p.151) from companies such as Yates and Brunnings, government sponsored irrigation schemes in Werribee and Narre Warren (Chou, 1993, p.152) and the increasing involvement of migrants from southern Europe (Aitken & Looker, 2002).

Most Chinese market gardeners were Cantonese-speaking male villagers from the densely populated Guangdong delta (Brown-May & Swain, 2005, p.131; Keneally, 2009, p. 515) near Hong Kong. Guangdong has a tropical and subtropical monsoon climate with a long time summer and abundant rainfall with the average temperature of spring about 20°C; summer is 28°C; autumn is 25°C; winter is 12°C. The rainy season is between April and September, with an annual average rainfall of 1,500-2,000mm. While temperatures in Guangdong are similar to those in Geelong, the rainfall is three to four times more in Guangdong.

As market-gardening was highly labour-intensive, only about one to two acres of land (0.4-0.8 ha) per person was required (Chou, 1993, p.71). A team of 3-4 people (*The Argus*, 1866a; Seaton, 1983) worked a 'family' farm meaning that the typical Geelong holding was 4.5 (Boileau, 2017, p. 46) to 6 acres (*The Argus*, 1866b, p.1). Additional labour was hired seasonally (Aitken & Looker, 2002, p.400). Land was generally rented in the suburbs (Aitken & Looker, 2002) and was fragmented and dispersed into several half acre (0.2 ha) parcels, sometimes separated up to half a mile (0.8 km) from each other, for insurance purposes (Chou, 1993, p.145-147).

Chinese market gardens appeared in the 1860s (Seaton, 1983; Pescott, 1985) with numerous articles in the local *Geelong Advertiser* and other newspapers describing their appearance, function and

quality of produce. Such descriptions are some of the best from nineteenth century Australia (Boileau, 2017, p. 45). Produce mainstays were cauliflower, cabbage, potatoes, radishes, spring onions, parsnips, and tomatoes, while weeds were the main challenge to the business (Chou, 1993, p.153).

In Geelong, most Chinese market gardens were established on the Barwon River on land that the Europeans did not want. On the north side of the river, one was on the riverbank between West Melbourne Road (now Shannon Avenue) and Bridge Street, another, on low lying land between the site of the late R.S. & S. Mill and the Barwon where a windmill near the river pumped the necessary water (Seaton, 1983). They also resided on the south side of the river in Belmont where Kmart and the Geelong Lawn Tennis Club are now located (Pescott, 1985) and in South Geelong at the far end Gravel Pits Road among the tanneries and woollen mills. Their residencies lasted until the late 1930s (Seaton, 1983).

The ground was manured chiefly with horse-dung (*The Argus*, 1866b, p.1). In Geelong, most market gardens were located in and around industry that either used horses in their business (*The Argus*, 1866b, p.1; Everist, 2014) or produced organic waste products that could be used as fertiliser (Aitken & Looker, 2002). Human manure often purchased directly from the 'nightsoil' man (Boileau, 2017, p. 46) was also used extensively (Jones, 2010, p.14; Aitken & Looker, 2002) and was mixed with urine fermented in stone jars, guano and the ashes from grass, stalks and bark (Chou, 1993, p.72). Cow manure was sourced from the Belmont Common (Jones, 1984).

While considered ugly and 'not complimentary', there was widespread recognition that Europeans could learn much from, and should follow, the gardening techniques used by the Chinese market gardeners (*The Argus*, 1866a, p.7; *The Argus*, 1866b, p.1; Jones, 1984; Chou, 1993, p.141), in particular, '... that the successful results of the gardening operations will set at rest the conceived ideas that the waters of the Barwon were inimical to the growth of vegetation (*The Argus*, 1866a, p.7). This redemption of the land in a 'neglected swamp' to producing garden crops occurred within a few months and was accomplished by 'drainage on the one hand and irrigation on the other' (*The Argus*, 1866a, p.7). Even by this time, the

*... Chinese garden is a feature in the district of much practical significance, and it stands as a reproach to the much-vaunted intelligence of the Anglo-Saxon, who unable to detect a flaw in his own national character, can see only the beam in the eye of the children of Confucius (*The Argus*, 1866b, p.1).*

The Argus (1866a, p.7) provided a description of the market gardens in operation on the Barwon:

At a first glance of the Chinese irrigation system, as practiced on the banks of the Barwon, one would think that the Celestials had committed some crimes - had been convicted, and were undergoing an open-air sentence on a treadmill, worked in public. A closer examination shows that the action of hands and feet is used for the purpose of working a Chinese pump to bring water from a dyke, which dyke is cut from the garden to the river. The affair is simple and efficacious, there is no pretence to engineering about the matter. No particular notice is taken of delicate gradients and possibly no theory of gravitation ever disturbed the ideas of the projectors. The garden, which is close to Captain Fyans estate is apparently trenched. The manure stacked shows that rich as the alluvial deposit is, the Chinese cultivators know the necessity of replenishing the soil and more than that, they enrich it. The area cultivated is

divided into tilled beds, athwart and across are low pathways, and here and there are square holes sunken, lined with wood. All is done by hard labour ...

Another article in *The Argus* (1866b, p.1) outlined care for plants...

All the young plants are mulched with long grass, and in some places a temporary paling roof is erected over the beds, to protect the more tender plants from the scorching rays of the sun during their early growth.

These descriptions echo those in the seminal *'Farmers of Forty Centuries'* (King, 1911) released nearly 50 years later, and identified as being highly influential on the formation of Permaculture, the contemporary Australian approach to the conscious design and maintenance of agriculturally productive ecosystems. This is well illustrated in Figure 8.

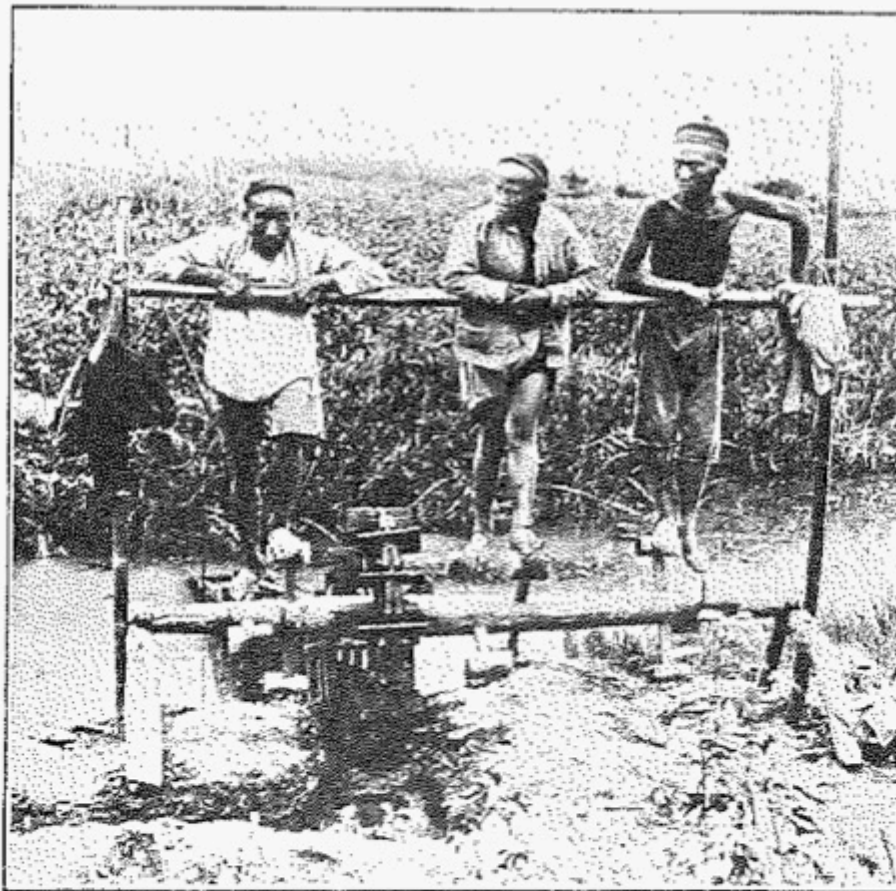


Fig. 42.—The wooden foot-power of China, being used to propel the wooden-chain irrigation pump.

Figure 8: '...the simple yet efficient foot power seen ... where a father and his two sons are driving an irrigation pump, lifting water at the rate of seven and a half acre inches per ten hours ... (Source: King, 1911, p.78, Figure 42).

The result of all of the above was, as Chou (1993, p.144) identifies, that 'traditional Chinese crop yields gave returns of twenty to thirty times the amount of seed sown, whereas in medieval Europe, returns of three to four times were the average'. It illustrates why from early on, the Chinese market gardens were seen as being particularly important in rendering Geelong '... independent of the

supplies now poured in from distant markets' (*The Argus*, 1866a, p.7). Food security was as important to Geelong then as it is now.

Conclusion

Like cities, gardening activities have occurred around Geelong for tens of thousands of years. Over this time, there have been three distinct cultural approaches, all of which used intensive agricultural techniques, generally on land 2-5 acres in size. Two cultures - Aboriginal and Chinese - have been sustainable. Aboriginal and Chinese people designed living places and food production with the underlying ecological processes. Their food production techniques actually improved the productivity of the land where they lived.

But, the Aboriginal landscapes that European settlers colonised had lost half of their stored organic content within twenty years of European arrival. Yet within months of the establishment of Chinese market gardens, the 'neglected' swamps that the Europeans did not want had been reclaimed and made productive. These Chinese market gardens were crucial to Geelong's food security for nearly a century. The low tech, simple, frugal and conservative approaches used by the Chinese resulted in food production levels twenty to thirty times those of the Europeans.

A key sustainability question for Geelong residents in the twenty-first century is how people can utilise intensive gardening techniques such as those of the Chinese, to meet a most fundamental human need of food, where they live. Around 80% of Geelong residents live in low-density houses surrounded by private gardens. Contemporary surveys of Geelong residents show that almost everyone of these people garden, that they overwhelmingly prefer living in low density housing and that over 75% produce some of their own food (Wissing *et al*, 2017). These all suggest universal needs. Like nineteenth century Aboriginal and Chinese approaches to cities and food, to enable a sustainable Geelong in the future we need to work with both ecological and human universal processes. Today, both are most evident to people in their home backyard.

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