

People in glass houses: the disappearance of 'Crystal Valley', Warriewood, NSW and implications for heritage conservation

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One of the characteristic features of modern Australia has been its transformation from essentially mono-cultural to genuinely multicultural. Migration and integration into the Australian social and economic system is, for most non-English speaking migrants, a multigenerational process, which generally includes becoming part of a large pool of labour for certain industries where lack of English language skills is not a hindrance. Market gardening has traditionally been one of these industries. This paper looks at one particular market gardening area and how the material evidence of its history has almost disappeared as a result of development. The paper raises issues of sustainability in heritage conservation and the problems of dealing with multi-ethnic heritage.

The case study for this paper is Warriewood on Sydney's northern beaches, and parts of adjoining suburbs of Ingleside, Elanora Heights and Mona Vale. The Warriewood Valley was for about 60 years the centre of one of the major glasshouse tomato production areas in Sydney, and was notable for its glasshouses, which gave it the name of 'Crystal Valley'. The start of glasshouse production represented a particular technological development, which is discussed further below. The work was carried out by a number of different ethnic groups although Yugoslavs predominated. However, by the 1990s the industry was in severe decline and the land began to be developed for residential and light industrial use. Two decades later there are almost no operational farms left, and the characteristic glasshouses are well on their way to disappearing.

This process has occurred with almost no recognition of the loss of a significant heritage taking place. There are a number of reasons for this including a failure to recognise modern heritage as having value, and probably class, social status and ethnic bias. It is also because of the nature of the industry and its broader social context, where the market gardeners themselves see it as a transitional phase only, and one that lacks value relative to a broader quest for security within their new country.

This process is directly relevant to the theme of unloved modern heritage. Modernity is more than a time-period; it defines our relationship to the heritage, it is not distanced to the point where it ceases to have connections other than broad historical interest and empathy. In principle it should be loved precisely because it retains the resonance and presence and multiplicity of emotional and experiential connections to our own lives, in a way that more distantly placed heritage cannot. However, as seen at Warriewood, these expectations are not met.

Market gardening in Sydney

Market gardening in Sydney has been carried out by a succession of migrant groups, from the English, German, Chinese, Yugoslavs and Italians, mainland Southeast Asians and most recently Sudanese. Each created a material culture that was an amalgam of established cultural practice and adaptation to Australian conditions. Market gardening was dominated by Chinese migrants from the late 19th century, initially by ex-gold seekers, and then by their descendants [Williams 2001; Frost 2002; Wilton 2004]. Many of the standard practice as that are still associated with market gardening are attributed to Chinese introduction, but there has been no real study undertaken. In general terms it has been open area farming, usually on alluvial flats that have a higher flood risk. Close to Sydney manuring was carried out using nightsoil [bio-solids from the cleaning out of privies], and elsewhere animal manure was used where available [eg Gaynor 2006]. The layout of market gardens into fields allowed for a fairly simple irrigation, either into feeder canals that would be further reticulated to individual beds or by pump into holding tanks or direct pressure pipe.

The choice of produce was largely market driven, favouring a fairly traditional English diet of green leafy vegetables, carrots and root vegetables [eg Pinn and Makin 1920]. Tomatoes became popular only in the late 19th century with the introduction of salads into the diet. Urban market gardens now also produce more specialist vegetables, mainly Asian greens, for an increasingly diverse range of customers.

Market gardening generally followed the urban fringe as Sydney grew. In the late 19th century Botany and Waterloo were major areas for vegetable production, extending down to the Rockdale-Kogarah wetlands, which were seen as undesirable for residential development. There are some remaining Chinese market gardens still operating in the same location for in excess of a century. More typically, as Sydney grew, the value of market gardening land became higher and eventually most farms were closed and subdivided for residential development or for structured open space such as golf courses and sports fields. Market gardens continued to reposition themselves on the urban periphery, but there is little further room for expansion in the Sydney Basin, and there are now policy concerns about the loss of high-productivity agricultural land for housing.

Perhaps the most distinctive market gardening landscape in NSW was the 'crystal valley' of glass houses found in a few areas of Sydney, notably Warriewood, Ingleside and more sporadically in other parts of outer Sydney. These reached their peak in the 1950s when there were about 3,500 specialised glass houses in the Warriewood Valley growing tomatoes by an almost exclusively migrant workforce. In the next 40 years the ageing of the workforce, its non-replacement by first and second generation children, changing market economics and new industrial processes benefiting competitors resulted in the collapse of tomato farming in the area. Now there are about 20 glass houses still standing, and two operators, both about to retire. Warriewood is transforming into a medium density suburb and few glass houses remain, their owners expecting to make money from development.

Warriewood – the 'Crystal Valley'

Prior to its subdivision in 1906 the Warriewood Valley contained only a few small farms at most, and the entire Northern Beaches area was only sparsely settled. The valley itself is an almost completely landlocked drainage basin, separated from the coast by rising land, with a swampy valley floor, susceptible to flooding [Figure 1]. The subdivision by Henry Halloran was promoted as 'The Great Warriewood Estate', making a virtue of the streams and 'fertile' level land. It offered mixed residential and farming lots, with smaller lot sizes on the hillsides and larger on the valley floor maximising the frontages onto the main creeks [Figure 2].

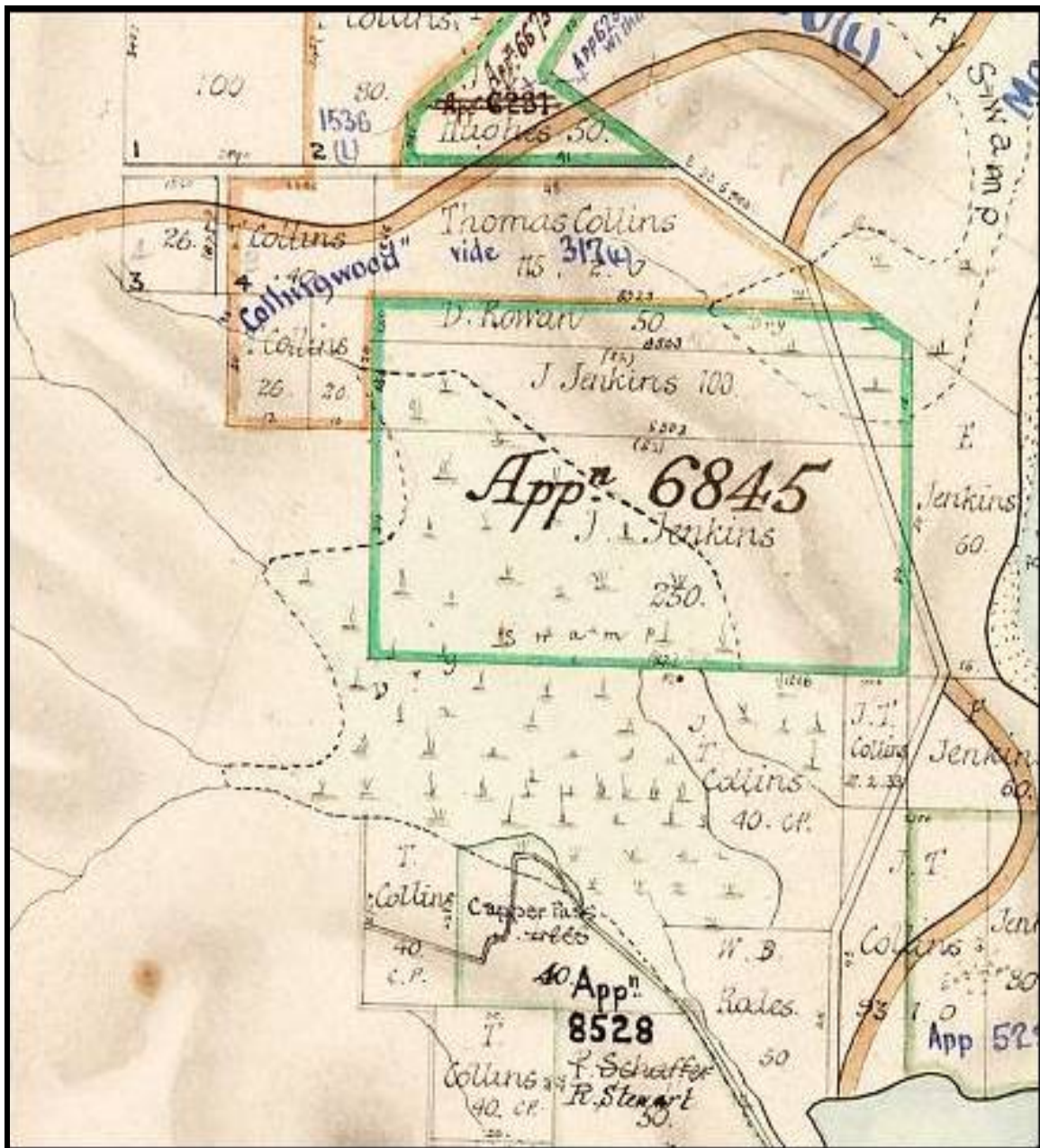


Figure 1. An undated early edition of the Parish of Narrabeen plan shows the swampy nature of the valley [NSW Dept of Lands Image 14073201].

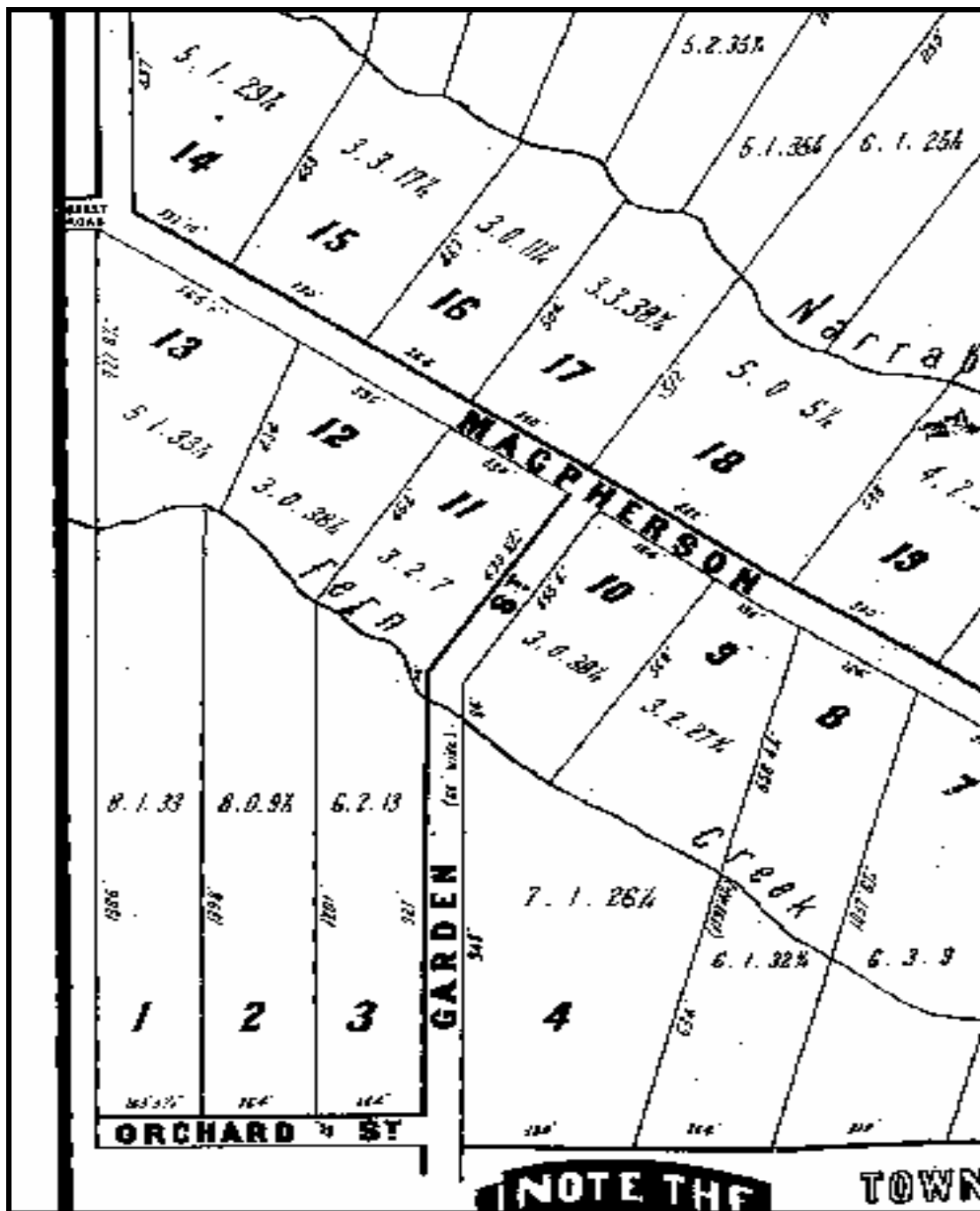


Figure 2. Part of Halloran and Co's subdivision map of 'The Great Warriewood Estate'. All measurements are in imperial units [Halloran and Co. 1907].

Warriewood Valley was transformed from the late 1920s onwards as it gradually became the major tomato growing area supplying Sydney. This industry only became feasible with the improvement of access roads and the construction of the Spit and Roseville Bridges.

The Warriewood Valley was first identified as having potential for market gardening by holidaying Yugoslav miners from Broken Hill in the early 1920s. Farming in the Valley had commenced with Anglo-Australian families with the first documented Yugoslav arriving in 1925, being George Jovanovich and his

Australian wife Doreen. Glasshouses began to be erected in the area from about 1927 onwards [Stenning 1996]. The Broken Hill community consisted mainly of Dalmatians who had left what they saw as a repressive home government, and actively pursued socialist politics [Jupp 1988; Sutalo 2004]

Originally all the tomato farming was practised as open field farming, with paddocks being laid out in long elevated beds separated by narrow walkways. The beds were bordered around the edges with a raised bank of soil, and an additional bank running across every 3 metres or so, creating separate rectangular cells. The tomato plants sat within this raised border, which could be watered so that it fed all surrounding plants in the same cell, reducing the effort required if all plants needed to be watered individually. Water would be drawn from the nearby creeks and associated drainage lines, often stored into holding tanks or reservoirs. Diesel, electric or other mechanical pumps would not necessarily have been available early on, meaning that water would have to be moved to a point where it could be distributed by gravity.

The alternative to open field farming was to grow produce in glasshouses. In colder climates, such as Britain and the US these allowed the short growing season to be extended, and for produce to be grown outside its natural climatic zone, but in Australia it was more to permit protection against bad weather and to create a predictable growing season attuned to market demand.

In the 1920s standard commercially produced glasshouses, also referred to as greenhouses, had masonry wall bases and iron modular framing, allowing for a range of building dimensions. They do not appear to have been used for commercial scale market gardening in the early 1920s in Australia, with the only glass structure mentioned at that time being low weather-protection planter boxes with glass pane covers for growing seedlings [see Pinn and Makin 1920]. The first home-made glasshouses appear to have been built in Warriewood in c.1927 [Stenning 1996], and rose in prominence rapidly after this time. By 1933 glasshouse production of vegetables, particularly tomatoes, had become sufficiently common for a NSW Department of Agriculture horticulturalist to inspect and write about the relative efficiencies of the commercially produced glasshouses found in North America and England, versus their homebuilt Australian counterparts.

The comparisons with the overseas examples are instructive [Hendersson 1933]. Overseas growers were said to obtain twice the yield from glasshouses as their Australian counterparts. Their glasshouses were only superficially similar in being elongated rectangles with a steep gabled roof running down the long axis. They were generally built upon brick or concrete dwarf walls up to a metre in height, and the superstructure was a series of modular timber or metal trusses that allowed the building to be extended as long as desired. The glass panes were caulked to minimise air and heat exchange and watering and heating systems could be suspended from the truss ties at above head height [Figure 3]. Some were, rightly, referred to as 'Super glasshouses'. The initial expense was offset by their minimal repair bill and efficiencies in production. They could not relocate the glasshouses as soils were depleted, as was done in Australia, but they practiced crop-rotation, manuring and other farming methods to compensate. The poorly regulated internal temperatures of the Australian ones did not allow for the best and highest yielding tomato varieties to be grown, contributing to their relatively poor performance compared to the overseas glasshouses. In most cases the foreign ones were taller as well, allowing more room for growth and efficient temperature management. Australian farmers relied heavily as well on pesticides and soil fumigation to reduce disease and pest impacts.

Despite these negative observations there were very few changes ever made to the Australian types in ensuing years. They all relied heavily on seasoned hardwood post frames with flat glazing bars of softwood, and galvanised iron rafters. Individual sheets of glass were sided along the glazing bars set so that they were touching but not overlapping. On the roof the sheets overlapped by about 20 mm, using a small galvanised iron glazing clip to fasten them at the correct spacing. The door may have been made of a sheet of corrugated or flat iron nailed over a frame, but this was considered lavish. Wherever possible the materials were obtained second-hand by re-use or passing on from another farmer.

Despite Hendersson's negative comments about their cheapness and flimsiness, and also their vulnerability to hail storms, they proliferated. By the late 1950s there were in excess of 3,000 glasshouses in the Warriewood Valley, the greatest concentration in Australia. The farming population of the

Warriewood Valley appears to have peaked in this period, with outlier farming communities taking up available land in Ingleside, Mona Vale and North Narrabeen as well [Rutherford *et al* 1971].

The Australian glass-houses appear to have been a local innovation. They are not recorded elsewhere in the same form. They appear to have been constructed to approximately match the designs of the industrial versions referred to by Hendersson, but made so that as much as possible could be built with minimal expense. Only the glazing bars, galvanised rafters and glass were specialised manufactures to any extent.

Local innovation and unintended consequences

It is clear from the historical record that from 1927 to the early '30s there was a sudden burst of construction of home-made glasshouses in Warriewood. There are no clear causes for this to be found in food consumption patterns, immigration of labour, new technologies or other factors. The actual stimulus appears to be an unintended consequence of a war between local glass manufacturers and glass importers.

In the mid-1920s the Australian Window Glass Company [AWGCo.] indicated that it was going to begin making sheet glass in Australia. It bought the necessary equipment but also started to import glass which it sold under its own brand, the aim being to develop a market in advance of local production. As was Australian government policy at the time, if there was local manufacture then it imposed a tariff on any competing imports. A tariff on the importation of sheet glass was approved in June 1926, but was to be triggered only once local production began. The glass importers, worried that this would threaten their trade, especially as the tariff would increase the price of imported glass, began a deliberate strategy of circumventing the AWGCo's plan. They began to import enormous quantities of sheet glass before the local plant was operational. The figures are:

1926-7 11,000,000 square feet

1927-8 12,000,000 square feet

1928-9 10,000,000 square feet

1929-30 20,000,000 square feet

[1 square metre is roughly 10 square feet. A typical glasshouse contained 3,000 – 4,000 square feet of glass].

This enormous stockpile allowed the glass to be sold extremely cheaply, and certainly less than the price at which the AWGCo. was able to produce it locally, meaning that it could not even start its sheet glass plant in Australia [Commonwealth of Australia 1931: 4966-7]. The unintended consequence was that enormous of extremely cheap sheet glass flooded the market, making the construction of glass houses a viable proposition for a market gardener for the very first time. The direct relationship between the sheet glass battle and the explosion of glass house construction shows that the farming community was actively looking at improving yields and turnover and were very willing to adopt any affordable technology that allowed such improvements.

The issue did not end there. Even though the AWGCo. never began to manufacture glass as promised, the new Scullin government decided to impose the tariff. Foreign glass was embargoed with an additional 'foreign duty' above the general tariff, to provide some market benefit for British imperial products. Belgium, source of much of the imported glass, then placed a ban on Australian cereal products, which eventually caused the government to remove the additional foreign duty and retain only the tariff [Canberra Times 23 October 1934: 4].



Figure 3. Empty glasshouses at Ingleside. These are conjoined, which is an uncommon form [D.Gjak / BH+A].



Figure 4. A typical glasshouse showing the dilapidated condition that they assume once active maintenance ceases [D. Gjak / BH+A].

Peak and decline of market gardening

Market gardening and especially glasshouse production reached its peak in the 1950s, aided by the high volume of post-World War II migration. This provided much additional labour through share-farming, where sections of farms were rented out. The area began to decline during the 1960s, probably due to the aging of the pre-war population. While improved transport links to Sydney made it easier to reach markets, produce from coastal areas outside of Sydney began to dominate, and there was also more competition from peripheral market gardening areas in western Sydney such as Fairfield and Leppington.

In the late 1960s a detailed study of the Warriewood Valley was undertaken by Rutherford *et al* [1971]. This analysed the demography of the community, showing it to have been primarily dominated by single owner-operated farms in the 2-4 acre range, most either operating with glasshouse or mixed glasshouse and open area production. The predominant crop, for which the glasshouses were best suited, were tomatoes. Many farmers also produced a range of other open area crops, mainly beans, potatoes and lettuce. The farmers themselves were predominantly Yugoslav [see Jupp 1988 for a discussion of the changing terminology identifying Yugoslav migrants], making up about two-thirds of the total, with a small proportion of Australians, and representations from countries such as Greece, Italy, the United Kingdom, along with a number of other European nations. More than half of these people had been farming in Warriewood since before World War II, adding credence to the idea that demographic collapse was a strong factor in its decline since the early 1960s. It also highlights the multi-ethnic character of market gardening, even though it was locally dominated by one particular group, which is also observed in other market garden communities in Sydney [Rannard 2005].

Rutherford's study also made extensive use of time series of air photos. These showed that there was considerable movement in the placement of glasshouses, as they were dismantled and re-erected to move to less exhausted soil [for example Figure 5].



Figure 5. The study area in 1951 [left] and 1965 [right], showing changes in the location and patterning of both glasshouses [solid black] and open farmed land [hatched] [Rutherford *et al* 1971, Figures 9 and 10].

One unresolved question concerning the community was how it structured itself internally. The initial settlement by unionised former Broken Hill miners and sustained by chain migration, should be expected to have resulted in a very different community organisation to the traditional Slavic models such as the *zadruga*, a family-based collective property unit [eg Halpern 1958]. The Australian pattern of land subdivision, which is very different from Balkan patterns that reflected patrilineal and extended family inheritance, may also have exerted a strong influence and created a different type of community structure. The Yugoslav Social Club on Vineyard Street formed a focus for men on weekends, and families for special events.

The Valley floor at Warriewood remained primarily agricultural, but increasingly urban development started to take over elevated ground, and light industry also moved in to the Valley. By the late 1970s the decline in market gardening production was accelerating, and soon many retiring farmers began to be hopeful of capitalising on the sale of their land for residential development [see for example Dearden 1989]. Warringah Shire Council and the state government were in a quandary about the development process. Both wanted the land transformed but were concerned about the ability of infrastructure to support increased residential growth. A new population segment was also actively trying to protect their lifestyle by discouraging development, which frustrated the expectations of the retiring market gardeners as well.

The replacement of glasshouses with suburban development has proceeded rapidly. Aging farmers were keen to capitalise on their investment. Within the farming community the development value of land is considered to be 'superannuation' – it is there to be liquidated as a return for a lifetime of work. Culturally there were no impediments to the sale of land, as the Warriewood land has no long family ownership history and is not part of any complex networks of mutual obligations. Wealth among the market gardening community also was demonstrated by being rich enough to live away from the farm in a 'proper house', which also weakened the link between land and occupancy.

Development of the Warriewood Valley has continued into this decade, leaving perhaps half of the former rural blocks undeveloped, but allocated for future subdivision. The surviving market gardening landscape consists at present of a range of decaying and collapsed glasshouses, some modest fibro shacks that were lived in by market gardeners packing sheds and other farm buildings. Farms left untended have become overgrown with invasive weeds, particularly lantana along the creek lines. Some of the mounds and ditches of the open field systems are still legible, but also overgrown. A hidden legacy is a depauperate soil, containing natural and synthetic fertilisers and chemicals. Rubbish was disposed of locally, mainly in smaller drainage lines. There are three market gardens still operating in the area, including one in Ingleside. Some of the glasshouses have been reused for plant and flower nurseries but the majority are untended, which results in their collapse within a few years.

Significance

The initial heritage study that guided the master-planning of the development of the Warriewood Valley did not recognise the significance of the market gardening heritage [McDonald McPhee Pty Ltd and Craig Burton 1989; Tropman and Tropman 1993]. A few of the older farm residences which were more substantial than the typical 2-3 room fibro shacks were recommended for local heritage listing. None of the other aspects of the landscape were considered to meet the threshold. At this time there was a far more intact farming community, and more of the landscape and its buildings were maintained. The assumption may have been that this situation would continue, and that the underpinning mechanisms that created the landscape would remain in operation.

Partly in reaction to the dramatic changes that have taken place to Warriewood in the intervening decade, a very different view of the significance of this landscape has emerged [BH+A 2004, 2008]. As heritage professionals our eye tends to be either caught by the promise of its unique fabric, especially if we are archaeologists, or to be repelled by the decaying and *ad hoc* nature of the farms and their structures, perhaps if we were architects. As an archaeologist and someone connected by family to the former market gardening community I have a particular perspective that colours my understanding of the

significance of the market gardening landscape. However, applying the NSW State Heritage Register [SHR] criteria identifies a range of elements that are of definite local, and arguably national, significance.

The primary significance is that Warriewood Valley remains the main example of a distinctive market gardening community using homemade glass houses. Although this has now ceased, it reflects a period of about 60 years when this was the dominant form of agriculture in the Warriewood Valley, and the area was the main production area for tomatoes in NSW. It also has the potential to tell us about processes of acculturation, maintenance of ethnic identity and adaptation to a different culture. Evidence of this is likely to remain in the archaeological resource, as well as oral and documentary resources. This archaeological potential is of probable state significance for its ability to contribute to our knowledge of Australia's migration heritage. The area can also contribute to our knowledge of the history of market gardening technology, which appears to be largely developed in an ad hoc and 'do-it-yourself' way and is distinctive to other areas and periods.

While the main ethnic group within Warriewood was the Yugoslav community the available evidence does not demonstrate a strong association within the former Yugoslav community with the area. This is a result of the process of generational change, and active disassociation through the sale of land, and also because of political developments that have fractured the migrant community, so that the category of 'Yugoslav migrant' does not have a single clear successor.

Managing market gardening significance

In the early 2000s I managed the preparation of a conservation management plan for five market gardens owned by the NSW Department of Planning, and operated by Chinese lessees. These were located within the Rockdale local government area, and were among the last surviving examples of the extensive market gardens that were present in this area from c.1850 onwards [Humphreys / Spackman and Mossop 2000]. It was clear from the historical analysis that although the market gardens had survived for one and a half centuries without any active government intervention or support, the economics of farming made their continued survival precarious.

One of our key concerns was to make sure that the CMP process helped the market gardens to survive, rather than adding constraints that would risk their sustainability. Another was to manage change. They had begun with English, then Irish, German and eventually Chinese market gardeners. As each group underwent transformations over generations they became less likely to be heavily involved in market gardening. We would expect these market gardens to eventually make the same transformation. Would this compromise their significance as 'Chinese' market gardens? Should we try to conserve something in its current form, when it exhibited a history of continual change to remain viable? How much future change should be permissible, when it may be necessary to their continued operation? Many people comment on the incongruity of the farm near Sydney Airport, when they see people working in Chinese and Vietnamese work clothes. Would they tolerate a change to something far less aesthetically pleasing, perhaps more commercial, if this was necessary to maintain use? These and other issues had to be worked through in the development of conservation policy in the CMP.

Warriewood presents a different challenge, because there is no likelihood of market gardening continuing beyond the present remaining operators. The combination of demographic change, transformation of agricultural economy and unsustainable practice resulted in the gradual death of Warriewood. If so, what is worth conserving? We have state significance under risk, deteriorating because the people who used to maintain it have passed away or left, and being developed. The mechanisms that kept the market gardens going have ceased to operate, making it only possible to preserve buildings and land by artificial means. Because of the changes in the community itself the descendant generations do not have a strong identification with the land as their particular heritage. And, perhaps most important, there is a concern that imposing heritage controls over what remains would rob market gardeners of their only saleable asset for their retirement. We are not

There is no ready answer to these concerns. At the start of this paper I spoke of the expectation that the recent past should speak more closely to us and command our attention. The case of market gardening at Warriewood shows that this is not necessarily so. It is unloved because it reflects a marginal

community, both ethnically and economically, it is untidy and unromantic. As the descendants of this community have become successful first and second generation Australian themselves they have shown no desire to reconnect with the tangible elements of their parents' heritage. Elements of this heritage reflect unique and innovative vernacular building practice, which may be tempting to preserve. How this can be done so that they do not just convey their novelty but something of their social significance remains a challenge.

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