



The White Horse Press

Environmental Experiences of Chinese People in the Mid-Nineteenth Century Australian Gold Rushes

Fei Sheng

Global Environment 7/8 (2011): 98–127

The migration of Chinese people to Australia was part of a global migration that occurred around 1850, stimulated by gold discoveries around the Pacific Rim. The research analyzes the deep ecological factors in China that spurred the migration at a time when the discovery of gold as a natural resource in Australia made the country an ideal migration destination. The author shows how the Chinese migrants applied their native environmental experience in a white settler colony. Through unique mining methods and market gardening, the Chinese transformed the indigenous landscape and shaped their “New Gold Mountain” in Australia. Although the Chinese environmental experience benefited both themselves and other migrants, there were also negative effects. Environmental cooperation was eclipsed by environmental conflicts between Chinese and white miners. Both cultural and natural factors limited the spread of Chinese environmental experiences in the Australian gold rushes. The Chinese environmental experience in the Australian context was also a result of existing racist policies. Within a broader perspective, the paper demonstrates how different migrants interacted with the indigenous environment and with each other.

Rights: All rights reserved. © The White Horse Press 2011. Except for the quotation of short passages for the purpose of criticism or review, no part of this article may be reprinted or reproduced or utilised in any form or by any electronic, mechanical or other means, including photocopying or recording, or in any information storage or retrieval system, without permission from the publishers. For further information please see <http://www.whpress.co.uk>.

Environmental Experiences of Chinese People in the Mid-Nineteenth Century Australian Gold Rushes

Fei Sheng

In his two marvelous books, *The Columbian Exchange* and *Ecological Imperialism*, Alfred Crosby argued that environmental exchange had dramatically influenced the trajectory of modern world development.¹ The impressive success of European settler colonies depended significantly on the transplanting, deliberate as well as accidental, of European ecosystems into the temperate zones of the new settlements. Australia was absent from Crosby's analysis, yet it seems that it could easily have



been included among his cases. The country was divided into several penal colonies far from Britain and did not receive massive waves of free migrants until the mid-nineteenth century. The decisive stimulus was newly discovered gold in 1851. The Australian population tripled over the following ten years and Victoria, which had the largest goldfields, absorbed 573,000 arrivals by sea, almost eight times more than its population before the gold rushes.² Many Chinese were part of this huge migration. The Chinese soon named Victoria, the “New Gold Mountain”, to contrast it with California, the “Old Gold Mountain”. Although available statistics are incomplete, official documents show that at least 42,000 Chinese migrants were living in Victoria by the end of 1850s. In some of the main goldfield areas, Chinese accounted for 25% and even up to 35% of the male population.³ From its very beginnings, the Australian gold rush was an international affair.

Crosby’s argument focuses on the interaction between European and indigenous ecosystems. In an Australian context, Geoffrey Bolton observes that “the impact of European on the Australian environment before 1850 would seem puny compared with what came after gold”.⁴ However, Crosby simplifies his framework to consider only the interchange between Europe and new frontiers. By contrast, Ian Tyrrell observes that environmental interaction also happened *between* new frontiers, including the important environmental ex-

¹ A. Crosby, *The Columbian Exchange: Biological and Cultural Consequences of 1492*, Greenwood Pub. Co., Westport 1972. Id., *Ecological Imperialism: the Biological Expansion of Europe, 900-1900*, Cambridge University Press, New York 1986.

² On this population increase, see I. McCalman, A. Cook, A. Reeves, “Introduction”, in *Gold: Forgotten Histories and Lost Objects of Australia*, I. McCalman, A. Cook, A. Reeves (eds), Cambridge University Press, Cambridge 2001, p. 19. C. Fahey, “Peopling the Victorian Goldfields: From Boom to Bust, 1851-1901”, in *Australian Economic History Review*, 50, 2, 2010, p. 149.

³ See “Legislative Council on the Subject of Chinese Immigration”, *Votes and Proceedings of the Legislative Council*, Victoria (hereafter VPLC), 1856-57, D.19. V. Lovejoy, “The Things that Unite: Inquests into Chinese Deaths on the Bendigo Goldfields 1854-65”, in *The Journal of Public Record Office Victoria*, 6, 2007, p. 41.

⁴ G. Bolton, *Spoils and Spoilers: Australians Make Their Environment 1788-1980*, George Allen & Unwin, Sydney 1981, p. 68.

changes between Australia and California.⁵ Tyrrell proposes a new view of the impacts on the Australian environment, which takes into account the wider Pacific Rim context. However, the environmental experiences of Chinese arriving in Australia are seldom discussed. “Gold rush migration provided an unusual experience for Britons, many of whom had never mixed so freely with foreigners, especially the Chinese”, historian Charles Fahey notes.⁶ Still, the cultural and environmental exchanges between different migrant groups at this time have been poorly investigated. There are three main reasons for this. For one thing, mining history as a whole has been neglected in the environmental literature on Australasia. Goldfields histories have been rather more focused on social rather than environmental conditions.⁷ Although there are passing mentions to the environmental problems of gold rushes in Australian environmental history studies, these mentions are generally brief and superficial.⁸ Only two papers so far have actually addressed the environmental effects of mining activities on goldfields.⁹ Besides, gold rushes did not occur in isolation. Environmentally detrimental activities might arise as much from associated activities (such as deforestation) as from mining itself. The second reason is that, with increasingly discriminative policies against

⁵ I. Tyrrell, “Peripheral Visions: Californian-Australian Environmental Contacts, 1850s-1910”, in *Journal of World History*, 8, 2, 1997. A more systematical argument can be seen in his *True Gardens of the Gods: Californian-Australian Environmental Reform, 1860-1930*, University of California Press, Berkeley 1999.

⁶ Fahey, *Peopling the Victorian Goldfields* cit., pp.148-161.

⁷ L. Robin, T. Griffiths, “Environmental History in Australasia”, in *Environment and History*, 10, 4, 2004, pp. 439-474.

⁸ Besides Bolton’s *Spoils and Spoilers*, there are several important works discussing the gold rush, such as S. Dovers (ed.), *Australian Environmental History: Essays and Cases*, Oxford University Press, Melbourne 1994. Id. (ed.), *Environmental History and Policy: Still Settling Australia*, Oxford University Press, New York 2000. D.S. Garden, *Australia, New Zealand, and the Pacific: An Environmental History*, ABC-CLIO, Santa Barbara 2005.

⁹ B. McGowan, “Mullock Heaps and Tailing Mounds: Environmental Effects of Alluvial Goldmining”, in *Gold: Forgotten Histories*, McCalman, Cook, Reeves (eds) cit., pp. 85-102. A more comprehensive study is D.S. Garden, “Catalyst or Cataclysm: Gold Mining and the Environment”, in *Victorian Historical Journal*, 72, 1-2, 2001, pp. 28-44.

Chinese migrants in the years leading up to the “White Australian Policy”, the Chinese in Australian society became dramatically marginalized. The existing records on early Chinese experience in Australia were rarely collected or researched until the 1970s.¹⁰ Third, most Chinese migrants in the gold rush years left few personal records in any form, whether diaries or letters. Generally speaking, early Chinese migrants were poorly educated, especially as regards their knowledge of English. The records that do exist show that, although their living circles were not segregated from others, the Chinese rarely shared personal experiences with Europeans. The situation was aggravated by the structure of local Chinese society, which was represented by ‘headmen’ or interpreters who might miscommunicate with authorities and other miners, and even intentionally foster division between Chinese and non-Chinese people to strengthen their own power.¹¹

Although there are limited sources on the environmental experience of early Chinese migrants in the gold rushes, some scholars researching the history of the Australian Chinese have recently made major contributions on this theme. Today it is possible to build a more comprehensive picture of both the steady migration of Chinese to the goldfields and Chinese environmental activities around gold rush areas. Valerie Lovejoy and Keir Reeves have systematically organized new archival materials and impressively exposed the complex feelings of Chinese migrants towards their homeland and Australia.¹² With specific case studies, they have also reinforced the argu-

¹⁰ From 1900 to 1970, the only serious historical study focusing on early Chinese migration was G.A. Oddie’s *The Chinese in Victoria 1870-1890*, MA thesis, University of Melbourne, Melbourne 1959.

¹¹ A very typical case was that of Howqua, a Chinese miner who had spent nine years in England then moved to the Victoria goldfields, where he gave completely wrong information to the Commission appointed to enquire into the conditions of the gold fields in 1855. My examination of the document suggests that he could not even discern between the different Chinese ethnic groups. “Evidence Presented to the Commission on the Chinese, including those of J.A. Panton and the Chinese Howqua”, in *VPLC*, 1855, pp. 335-338.

¹² Both V. Lovejoy and K. Reeves have done case studies on Chinese migrants and use inquest records in the Public Record Office and local Courts records,

ment that Chinese migrants were not simply reduced to “Colonial Victims” or “Sojourners”.¹³ These studies contain some information on Chinese environmental interactions with Australian nature and other migrants. Research on Chinese farming activities in the latter half of nineteenth century has broadened our understanding of this interaction.¹⁴ These works all prove the diversity of environmental experience of early Chinese in Australia. From a theoretical standpoint,

respectively, to reconstruct the personal experiences of Chinese miners. See V. Lovejoy, “Depending Upon Diligence: Chinese at Work in Bendigo 1861-1881”, in *Journal of Historical and European Studies*, 1, 2007, pp. 23-38. Id., *The Things that Unite* cit., pp. 39-56. K. Reeves, “Goldfields Settler or Frontier Rogue? The Trial of James Acoy and the Chinese on the Mount Alexander Diggings”, in *The Journal of Public Record Office Victoria*, 5, 2006, pp. 1-13.

¹³ The term “colonial victim” derives from K. Cronin, *Colonial Casualties: Chinese in Early Victoria*, Melbourne University Press, Melbourne 1982. This book was widely recognized as the first systematic research on Chinese social history in the gold rush and criticized the racist discourse against Chinese migrants. However, the book underestimated the importance of the agency of the Chinese themselves. In 2004, *Journal of Australia Colonial History* put out a special issue on “The Chinese in Colonial Australasia” including eleven papers that demonstrated the actual complexity of Chinese activities in the context of the Australian gold rush. In 2011, further light was shed on the subject by a new special issue “Re-interpreting Chinese Australian History”, in *Australian Historical Studies*, including case studies illuminating further aspects of the life of Chinese migrants. Other important works include: B. McGowan, “Reconsidering Race: The Chinese Experience on the Goldfields of Southern New South Wales”, in *Australian Historical Studies*, 39, 124, 2004, pp. 312-331. Id., “The Economics and Organization of Chinese Mining in Colonial Australia”, in Oddie, *The Chinese in Victoria* cit. K. Reeves, B. Mountford, “Sojourning and Settling: Locating Chinese Australian History”, in *Australian Historical Studies*, 42, 1, 2011, pp. 111-125.

¹⁴ See C. Webb, J. Quinlan, *Greater Than Gold: a History of Agriculture in the Bendigo District from 1835 to 1985*, Cambridge Press, Bendigo 1985. Recent latest contributions to the subject include W. Frost, “Migrants and Technological Transfer: Chinese Farming in Australia, 1850-1920”, in *Australian Economic History Review*, 42, 2, 2002, pp. 113-131. Z. Stanin, “From Li Chun to Yong Kit: a Market Garden on the Loddon, 1851-1912”, in *Journal of Australian Colonial History*, 6, 2004, pp. 14-34. C. Trevarthen, “After the Gold Is Gone: Chinese Communities in North-East Victoria, 1861-1910”, in *Journal of Chinese Australia*, 2, 2006, available at: <http://www.chaf.lib.latrobe.edu.au/jcal/issue02/09Trevarthen.html>.

the new “material culture” or “cultural landscape” approach provide a meaningful environmental perspective on Chinese migrants in gold rushes. Both Barry McGowan and Keir Reeves argue that historians could benefit from environmental archeological explorations of gold rush sites. McGowan and Reeves have investigated environmental relics of Chinese communities on goldfields, finding data that supplements our knowledge of these communities’ daily working and living conditions.¹⁵ These latest Australian Chinese studies have dramatically improved our knowledge in three ways: they provide close readings of individual sites; they highlight the relationship between Chinese-Australian studies and the broader narratives of imperial and transnational history; and they use new methods and frameworks to look at the agency of Chinese migrants in environmental change.

Although these works have made an important contribution towards an environmental study of Chinese migrants in the Australian gold rushes, it is still hard to go deeper, because very few scholars who study this theme read Chinese or have access to records kept in China.¹⁶ Besides, in the light of John McNeill’s consideration that “there are three main varieties of environmental history: one that is material in focus, one that is cultural/intellectual, and one that is political”, we realize that there are still many unanswered questions about the specific environmental interaction of early Chinese with the land and other people in Australia.¹⁷ How did environmental forces propel Chinese migration to Australia? What exactly

¹⁵ See B. McGowan, *Dust and Dreams: Mining Communities in South-east New South Wales*, University of New South Wales Press, Sydney 2010, based on his Ph.D dissertation. K. Reeves insightfully argues for a “cultural landscape” study on the Chinese. See K. Reeves, B. Mountford, “Court Records and Cultural Landscapes: Rethinking the Chinese Gold Seekers in Central Victoria”, in *The Journal of Public Record Office Victoria*, 6, 2007, pp. 23-38. These authors also launched the project “Down at Street Level: Chinese Landscapes from Colonial Australia”.

¹⁶ An exceptional work is V. Lovejoy, “Chinese in Late Nineteenth-Century Bendigo: Their Local and Translocal Lives in ‘This Strangers’ Country”, in *Australian Historical Studies*, 42, 1, 2001, pp. 46-61. With the help of a translator, she worked on a Chinese miner’s last letters.

¹⁷ J. McNeill, “Observations on the Nature and Culture of Environmental History”, in *History and Theory*, 42, 2003, p. 5.

did this migration bring to Australia and how did it work? How did Australian environmental factors influence the migrants' practices? Did the Australian gold rushes influence Chinese ideas about the environment? Combining Chinese materials – especially historical records of regions from which the Chinese miners migrated – with local English newspapers, archives, and case studies by other scholars, this study investigates the environmental experience of Chinese migrants in the gold rush era. I will first discuss the social-environmental background of Chinese migrants in Australia and then focus on how they interacted with the Australian environment.

Local environmental experiences in See Yap and environmental pressures to migrate

Most Chinese migrants to the Australian gold rushes came from See Yap (*Si Yi*). See Yap is an informal name for four small adjoining counties sharing a similar environment and culture. It lies south of Guang Zhou (Canton), the capital city of Guang Dong Province.¹⁸ The social history of these migrants to Australia has been discussed by Jean Gittins and Eric Rolls.¹⁹ In this paper I will be focusing more on their local environmental experiences, particularly those they might have transferred overseas.

A very distinctive climate shaped people's lives in See Yap. The district lies on the border of the tropical zone, a very small part of China. The annual rainfall here is higher than in most other residential areas of China, ranging between 1600-1700 mm. The annual average temperature is around 23°C.²⁰ Although the annual rainfall

¹⁸ The four counties are Tai Shan, Xin Hui, En Ping and Kai Ping. The first two are coastal places.

¹⁹ J. Gittins, *The Diggers from China: The Story of the Chinese on the Goldfields*, Quartet Book, Melbourne 1981, Chapter 1. E. Rolls, *Sojourners: The Epic Story of China's Centuries-old Relationship with Australia: Flowers and the Wide Sea*, University of Queensland Press, St. Lucia 1992, Chapter 2.

²⁰ Statistics for the nineteenth century do not appear to be available. This figure is based on statistics for the last 60 years, seen in *Local Chronicles of Xin Hui County (Xin Hui Xian Zhi)*, Guangdong People Press, Guangzhou 1995, p.

is not evenly distributed over the year, See Yap historically has suffered no lack of water. On the contrary, the area is often seriously flooded by typhoons and sometimes by prolonged rainy seasons. All the four counties are hilly and separated by low-lying plains with small creeks and water holes. In the nineteenth century, the roads that connected See Yap to Guang Zhou were usually very rough, so people used the water courses to reach the sea. The rural people of See Yap were also skillful in agricultural works, and notably in irrigation and building small dams. Since they had only limited level ground for fields, people grew grain on hill slopes, where they built terraces. They also built small dams at the foot of the hills to collect rainfall. These dams worked well, except when neglected in times of social upheaval, or in cases of very heavy rainfall, when a sudden flood could wash everything away.

The people of See Yap were also adept at building dams for orchards and vegetables. Liang Qichao, one of the most influential intellectuals in modern China, who visited Australia in 1900, records a unique method for planting oranges in his hometown of Xin Hui, one of the four counties of See Yap:

My birthplace is a coastal county. In order to protect orchards from high tides every orange planter has to build dams. When planting, the first step is to dig small canals to divert or drain waters into the dams... The second step is to plough the field and divide it up with little trenches... Then the third step is to plant small orange trees... Five years later they may bear fruit.²¹

Building dams and irrigation were thus an important part of the activities of a local farm worker in See Yap.

From the early-nineteenth century, See Yap developed a strong tradition of gardening for the market, taking advantage of its hot and wet season. Xin Hui regularly supplied high-quality vegetables to big cities, including Guang Zhou. In the same period, Tai Shan

180. H. Jianyun (ed.), *Survey on Tai Shan County, (Tai Shan Tong Lue)*, printed by Committee of Jiangmen Chorographic Society, Jiangmen 1988, p. 9.

²¹ L. Qichao, "The Orange", in *Complete Anthology of Liang Qichao* ("Shuo Ju", in *Yin Bing Shi He Ji*, Vol.1), China Book Store, Bei Jing 1989, p. 114.

could produce thirty different kinds of vegetables.²² Migrants from See Yap to Australia could easily have applied these skills to dig gold, or more directly to grow vegetables in the goldfields.

While the inhabitants of See Yap, as we have seen, were skilled agricultural workers, few had any experience of mining. There were a few non-metal mines in the district, as well as some limestone quarries. However, mining never developed into a major economic industry. En Ping was the only county where some deposits of alluvial gold were reported, but their exploitation remained insignificant until the 1930s.²³ To a great extent this explains why Chinese miners in Australian goldfields used almost the same tools and technology as the European miners.

From the nineteenth century onwards, environmental and population pressure had a significant impact on See Yap. The first major change was the rapid increase of population. Although the population explosion was a nationwide problem in China, it was much more severe in Guang Dong, which became the most densely populated area in China. From the early eighteenth to the early nineteenth century, the population in Guang Dong increased twenty-fold. In the same period, cultivated land increased only by 25%. The population density of Guang Dong was three times higher than the national average.²⁴ Farmland was at a premium:

Daily life is extremely tough, it is getting harder day by day, ...almost every slope, every piece of river bank and shoal have been cultivated...Although a man toils diligently throughout the year, he still cannot save anything by the end of it.²⁵

²² *Local Chronicles of Xin Hui County*, p. 308. H. Jianyun (ed.), *Local Chronicles of Tai Shan County*, (*Tai Shan Xian Zhi*), Guang Dong People Press, Guangzhou, p. 261.

²³ *Local Chronicles of En Ping Count* (*En Ping Xian Zhi*), Fang Zhi Press, Bei Jing 2004, p.151.

²⁴ L. Wenzhi (ed.), *Modern Chinese Agriculture Historical Material* (*Zhong Guo Jin Dai Nong Ye Shi Zi Liao*), Vol. 1, San Lian Press, Bei Jing 1957, pp. 6-9. Id., "Southern China Sea Area Study, (Nan Yang Yan Jiu)", Vol. 5, published in 1935, in Chen Hanshen (ed.), *Materials on Overseas Chinese Labor* (*Chu Guo Hua Gong Zi Liao*), Vol. 4, China Book Store, Bei Jing, p. 478.

²⁵ X. Fucheng, "Diary in Visiting to Four Countries" (*Chu Shi Si Guo Ri Ji*), in *Materials on Overseas Chinese Labor*, C. Hanshen (ed.), Vol. 4, p. 569.

Moreover, natural disasters threatened agricultural infrastructures that had already been poorly managed since the Opium War. In April 1852, a huge flood caused by abnormal spring rains destroyed dams and left large quantities of mud that silted up small water courses. The grain harvest was wrecked. In 1856, again a major flood washed away most crops in See Yap, which had still not recovered from the previous disaster.²⁶

The conflicting trends of population increase and food supply reduction were exacerbated by unequal land distribution. In See Yap, landlords, who accounted for just 5% of total population, owned 60-70% of arable lands. Peasants comprised 60% of the population, but had access to only 9% of the arable land. In fact, most of the population in See Yap could not get enough food. For example, the population of Tai Shan was more than 600,000 and the yearly food production was only sufficient for half of them. In Xin Hui, more than 60% of the rice supply was thus imported from overseas, although it historically had grown enough rice for the whole community.²⁷

During the 1840s and 1850s, constant ethnic conflicts intensified the predicament of the community, already afflicted by natural disasters and disparities in land ownership. A central issue was the conflict between the Hakkas (*Ke Jia*) and the local Cantonese in See Yap. Infightings broke out in different villages over the distribution of natural resources between the immigrant Hakkas – people who had escaped from wars in northern China and found refuge in Guang Dong. The situation eventually detonated in 1854: many local Cantonese from rural areas of See Yap placed themselves under the banner of the Tai Ping Rebellion and besieged the counties, although they used a different name – the “Red Scarf”. A large number of Hakkas were hired by authorities for defense. This quickly became an excuse for violence, banishment and robbery directed against all the Hakkas. In 1856, one year after the failure of the “Red

²⁶ *Local Chronicles of Xin Hui County* cit., p. 28. Jianyun, *Local Chronicles of Tai Shan County* cit., p. 94.

²⁷ M. Qiangwe, Z. Guoxiong, *A History of Overseas See Yap People (Wu Yi Hua Qiao Shi)*, Guangzhou Higher Education Press, Guangzhou, pp. 29-30.

Scarf” insurrection, violent clashes broke out between the two communities. This conflict lasted for twelve years and ruined numerous settlements, including those in See Yap, causing massive population loss.²⁸ Tai Shan’s population was reduced by 100,000 during the clashes. Death on the battlefield accounted for only part of this loss; male civilians were systematically captured and sold as slaves or expelled to Macao and Hong Kong as overseas laborers. Both sides used this strategy to weaken the power of their enemies.²⁹ As a result, both prisoners and refugees swelled the ranks of overseas migrants. This helps to explain why Chinese migration, particularly from See Yap, peaked in Australia in the late 1850s.

In sum, people in See Yap historically enjoyed a mild, wet climate that fostered their significant agricultural industry and skills. However, from the early to mid-nineteenth century, ecological and environmental changes combined with social turmoil led to a massive emigration movement. These Chinese with their native environmental experiences would actively make their lives in a strange land—the New Gold Mountain.

Chinese environmental experiences on the way to the Australian goldfields

The Australian gold rushes can be seen as a more practical and profitable version of the earlier quest for legendary mineral riches in the New World from the Age of Discovery onwards.³⁰ The gold-rush fever soon extended to the whole of eastern Australia, with the biggest finds in the colony of Victoria, which had separated from New South Wales just before the gold was discovered.

²⁸ H. Daoji, L. Chongmin, “The Origin of Overseas Interaction and Migration in Tai Shan”, in *Journal of Overseas Chinese History of Tais Han*, (“Tai Shan Ren She Wai Jiao Wang Yu Chu Yang Su Yuan”, in *Tai Shan Qiao Shi Xue Bao*), 1, 1989.

²⁹ L. Chongmin, “Impact of the Opium War on See Yap”, in *Journal of Overseas Chinese History of Tai Shan*, (“Ya Pian Zhan Zheng Dui Qiao Xiang De Ying Xiang”, in *Tai Shan Qiao Shi Xue Bao*), 2, 1990.

³⁰ R.A. Butlin, *Geographies of Empire, European Empires and Colonies (1880-1960)*, Cambridge University Press, Cambridge 2009, p. 562.

The increasing population of Chinese migrants to the goldfields had an important influence on the local environment, although it is not easy to accurately estimate their number. Since 1848, Australian squatters had systematically transported Amoy laborers to New South Wales to do farm work under labor contracts. However, the recorded total of these migrants was just 2864 between 1848 and 1853.³¹ Some of these Chinese presumably joined in the earliest gold rushes, like many non-Chinese farm laborers.³² Most of the Chinese who arrived in the Australian goldfields came from Guang Dong, and especially See Yap, through the “credit-ticket system”. The “credit-ticket system” was a freer migration channel mainly operated by private local Chinese merchants and agents.³³ However, the migrants who came through this channel were often not recorded officially in Australia.

The two newest colonies, Victoria and Queensland, which separated from New South Wales in 1859, witnessed a conspicuous growth of Chinese migration. This was due to the richness of their natural resources: Victoria yielded 50 times more gold than New South Wales over the next half century,³⁴ and hence drew much larger numbers of overseas miners. It was consequently also more reshaped than other areas by Chinese environmental experiences. When Queensland was established, it had very few European settlers, and in the 1860s-70s it quickly attracted strong migration from China to support its gold mining and tropical farming industry.³⁵ As I mentioned above, there were as many as 42,000 Chinese in Victoria, while their number in

³¹ See “Correspondence Respecting Emigration From China”, *British Parliamentary Papers*, No. 1686 LXVIII, August 1852, Attached Document, No. 9.

³² There were reports of Chinese fleeing from contracts even before 1851. See “Letters from M. Bell to La Trobe, 11 July 1849”, in *Accounts and Papers of the House of Common (Session 4)*, Vol. XL, No. 2, p. 3.

³³ See C.Y. Choi, *Chinese Migration and Settlement in Australia*, Sydney University Press, Sydney 1975, Part One.

³⁴ R. Murray, “What the Gold Rush Wrought”, in *Quadrant*, 1, 2001, p. 39.

³⁵ More detailed studies include: C.R. May, “The Chinese Community in North Queensland”, in *Lectures on North Queensland History Series I*, 1974. Id., *The Chinese in Cairns District, 1876-1920*, James Cook University of North Queensland, Townsville 1977. H. Reynolds (ed.), *Race Relations in North Queensland*, James Cook University of North Queensland, Townsville 1978.

Queensland peaked at 25,000 in the 1870s.³⁶ Although the two colonies were mostly undeveloped wild areas in the eyes of European settlers, the new workers quickly transformed them. This growth shows how international migration lured by natural resource exploitation can soon change the fate of a new frontier.

The difficulty of estimating the number of Chinese who came to Australia is compounded by the fact that some arrivals undoubtedly left Australia to re-enter later, so that they were counted twice or more. According to Chinese official statistics, 10,000 Chinese left for Australasia during the 1801-1850 period, while the number increased to 60,000 from 1851 to 1875.³⁷ Considering that Australia was always the principal destination for these people, these statistics suggest that a higher number of Chinese went to Australia than Australian records suggest. This is borne out by some Chinese official documents and other documents held in private hands. Tan Kailing, a reputed Australian-Chinese society leader interviewed by the Australasian branch of the Chinese Nationalist Party (Kuo Min Tang) in 1935, when he was ninety years old, said that almost 200,000 Chinese arrived in Australia in the years until 1870.³⁸ Although Tan probably exaggerated the figure, his estimate suggested that Chinese migration to Australia in that period might have been much larger than officially recorded. For example, Louis Ah Mouy, a native of See Yap who first came to the Victorian gold rushes in 1851, by 1854

³⁶ L. Pei, Z. Jiarui, "People from Zhong Shan City in Australia, in *The Local Historical Studies of Zhong Shan City* ("Zhong Shan Ren Zai Ao Zhou" in *Zhong Shan Wen Shi*), Vol. 24, p. 19, available on the web at: http://henglan.com/zt/zsxx/showindex_1156.shtml.

³⁷ P. Jiali, "The Pillage to Chinese Laborer Resource by Western Invaders in Nineteenth Century", in *The Compiled Materials on Oversea Chinese Laborers* ("Shi Jiu Shi Ji Xi Fang Dui Zhong Guo Lao Gong De Lu Lue", in *Chu Guo Hua Gong Zi Liao*), C. Hanshen (ed.), Vol. 4, China Bookstore, Beijing 1985, p. 241. As showed above, the Victorian official record said that the Chinese on goldfields reached 42,000 at its peak in the late 1850s.

³⁸ C. Zhimin (ed.), *Records of the Development of Kuo Min Tang in Australasia* (*Guo Min Dang Ao Zhou Dang Wu Fa Zhan Shi Kuang*), Australasian Branch of Chinese Nationalist Party, Sydney 1935, p. 10. Tan actively appealed to the Chinese government for the protection of Chinese migrants in Australia in the 1870s.

had brought more than 3000 of his compatriots to the goldfields, in three trips.³⁹ Whether they were sojourners who later went back to China or eventually became Australian and settled down, these migrants significantly interacted with the Australian environment.

The environmental experience of Chinese migrants in the goldfields was distinctive from the very beginning. As the first toehold of the British Empire in China, Hong Kong became the largest transit port for Chinese moving to Australia in the later nineteenth century. Chinese migrants traveled to destinations other than Melbourne, although this was the most convenient port for Europeans headed for the goldfields. In 1855 Victoria declared its first bill to restrict Chinese migration. In order to escape custom duties or fines, Chinese migrants were increasingly landed in South Australia instead of Melbourne. After a short stop to buy basic equipment, the new immigrants walked to the Victorian goldfields in groups led by a local guide. Both Adelaide and the port of Robe in Guichen Bay were starting points for the Chinese headed for Ballarat, the largest alluvial goldfield in Victoria. Although it was 320 kilometers long, the Robe route was the shorter alternative. The Adelaide route was longer, but was preferable in winter because the Robe road became too boggy and was exposed to heavy and chilly rains. Both routes were rough and dangerous, travelling through hilly terrain that was scarcely settled by Europeans and other migrants. A report of 1856 revealed the hidden cost of arriving to the goldfields through South Australia: there were already many tombs of Chinese along the route.⁴⁰

According to some miners' memoirs, some Chinese tried even more formidable routes to the goldfields. They were therefore understandably bitter about their experiences with the Australian environment. As late as the 1860s, some groups of Chinese migrants landed in Darwin and then walked all the way to the "southern goldfields".⁴¹ In his ref-

³⁹ This probably happened in 1853. See C. Hanshen (ed.), *The Compiled Materials on Oversea Chinese Laborers*, Vol. 2, p. 51. H. Daoji, L. Chongmin, "The Origin of Overseas Interaction and Migration in Tai Shan", p. 8. Qiangwei, Guoxiong, *An History of Overseas See Yap People* cit., p. 124.

⁴⁰ *Argus*, June 16, 1856.

⁴¹ L. Chengji, "My Respectable Father Li Minzhou and Sin Sin Company", in

erence to this southern location of the goldfields, however, the writer may be actually mistaking Queensland for Victoria. Be that as it may, other documents bear witness to very long marches. In 1864, when the Tai Ping Revolution was finally repressed, Huang Dezi, a leader native to See Yap, summoned his subordinate fellows and led a flotilla of dozens of ships on a voyage to Darwin. Some of the people made their way to Victoria to work as gold-diggers and laborers on pastoral properties. Of these, some eventually settled down in the Melbourne area. This migration sponsored by Huang is the largest free-will migration to Australia in the nineteenth century in Chinese records.⁴²

Traveling from Darwin to either Queensland or Victoria must have been extremely risky: “We never stopped cutting down trees and bushes to cross the wetlands. We passed through wild desert areas, original forests and big flooded rivers”.⁴³ Aside from the natural hardships, attacks from hostile Aboriginal people cost some Chinese their lives too. Tan Shiwei, a See Yap miner, described in his autobiography the fearsome experiences he had with Aboriginal resistance on the dangerous journey to the goldfields. He had to always stay with the rest of the group lest he be caught and eaten by Aborigines.⁴⁴ Tan Kailing wrote: “I once met an old Aboriginal man in a jail. He told me that when he was young he had eaten human flesh. [He said that] the flesh of Chinese and Malays was delicious, while that of white men was smelly.”⁴⁵

The Local Historical Studies of Zhong Shan City (“Xian Fu Li Min Zhou Gong Yu Xin Xin Bai Huo Gong Si”, *Zhong Shan Wen Shi*), Vol. 24, p. 93, available on the web at: http://henglan.com/zt/zsxx/showindex_1156.shtml

⁴² Qiangwe, Guoxiong, *A History of Overseas See Yap People* cit., p. 125.

⁴³ Chengji, *My Respectable Father* cit., p. 93.

⁴⁴ “Ji bu gan li qun suo ju, yi bug an du xing yu yu. Wei kong shi san hou bei ye ren an suan, kai tang po du, sheng jian huo bo.” See T. Shiwei, *My Experience to be Learned by Descendants* (*Yue Li Yi Xun*), unpublished brochure. Part of this account is cited in Liu Weiping, *A Drafted History of Oversea Chinese in Australia* (*Ao Da Li Ya Hua Ren Shi Shi Cong Gao*), Tian Di Press, Hong Kong 2000, p. 16.

⁴⁵ “Hai you yi ge bei bu de lao nian tu zhu shuo, ta shuo hua ren yu ma lairen de rou, xi nen er tian, bai zhong ren zhi rou, xing er wu wei.” See in Zhimin, *Records of the Development* cit., p. 10.

Although the strange Australian environment limited their activities, most Chinese successfully survived their travails and made their way to the Gold Mountain. Except for some Aboriginal clans, the goldfields area “was usually a solitary wilderness, wandered over by flocks and herds, and rarely trod by a casual shepherd or herdsman, unconscious of the stores of mineral wealth”.⁴⁶ The trip to the remote goldfields could be harsh for any newcomer. However, the Chinese suffered more than the Europeans, because, as we have seen, they were forced by the law that excluded Chinese from Victoria to make their journey on foot over much greater distances. Their previous experience in China gave them the capacity to survive physical hardship as they struggled for their lives in the bush and outback country. Tan Shipei remembered: “We were just a peasant family. When I was eleven years old, I had to quit school. Then I worked with my father planting mulberries and feeding fish. I used to get up early in the morning and never stopped working in the fields until very late”.⁴⁷ He quickly acclimatized to trudging along the wild paths, covering the distance to the goldfields in just eleven months.

Chinese environmental experience in mining

In the gold rushes, miners opened claims and exploited the soil. They also extracted other natural resources necessary to producing gold. Water was critical for alluvial mining, since both washing and puddling made abundant use of water. Trees, mostly eucalypts, were also cut down for fuel and lumber. Chinese migrants worked collaboratively to convert nature into treasures. Although recent studies suggest that some Chinese were involved in quartz mining, which required a larger investment and more sophisticated equipment, most

⁴⁶ F. O’Neill, “How Gold Shaped Victoria”, in *Victorian Historical Journal*, 72, 1-2, 2001, p. 118.

⁴⁷ Shipei, *My Experience to be Learned by Descendants* cit.

⁴⁸ There were two Chinese quartz mining companies in the 1860s, contrary to the commonly held notion that Chinese were not allowed to organize this kind of mining. See A. Kyi, “Unraveling the Mystery of the Woah Hawp Canton Quartz Mining Company, Ballarat”, in *Journal of Australian Colonial History*, 6, 2004, p. 59.

Chinese were confined to low-cost alluvial mining.⁴⁸ They quickly acquired local mining skills and adapted their native experiences to local conditions, although they were also influenced by the environment of the goldfields and by other miners.

There were two mining methods for extracting gold from alluvial soil: shallow digging and deep sinking. The first one was very simple. A single miner dug up the surface soil or gravel and silt (“pay-dirt”) from a creek bed and washed it in a pan. From the pan he picked out any gold flecks, specks and small nuggets. The second method, deep sinking, was more complicated. Miners would work together on ancient river beds buried under topsoil. They had to work in small groups. One miner would dig in an underground shaft and transport the dirt up to the surface where his mates could wash it. Sometimes the extracted material was too sticky to be washed directly. In this case, the miners would use a cradle, or puddling machine, an effective piece of equipment driven by a horse, to centrifuge the material and make it amenable to washing. The cradle was the most popular tool with Chinese diggers. It had wooden or iron rakes fixed to arms turned by hand, which stirred the dirt in a circular trough about 60 centimeters deep and a meter wide. Clean water flowed in on one side and muddy water poured out at a lower point on the other.⁴⁹

Both methods were very destructive of the environment of the goldfields. By 1854, when the first major group of Chinese descended on the Victorian goldfields, the landscape had already dramatically changed. For example, the Mount Alexander and Ballarat diggings had once been covered by dense forest and thick vegetation, but as early as 1852 the trees and plants had been systematically removed, causing severe soil erosion. Creeks became muddy. Even the clouds turned dark because of the dust in the atmosphere. Whole valleys and roads were even dirtier than the notorious Melbourne streets.⁵⁰

European miners would burrow anywhere, like moles or wom-

⁴⁹ Rolls, *Sojourners* cit., p. 91.

⁵⁰ See F. Lancelott, *Australia As It Is: Its Settlements, Farms, and Gold Fields*, Vol. 2, Colburn and Co. Publishers, London 1852, pp.134-136.

bats. They ruthlessly cut down trees, diverted water courses and dug shafts wherever they thought there might be gold.⁵¹ However, when Chinese miners arrived in the goldfields and started to dig, it was they who were accused of ruining the environment. As early as 1855, Chinese miners were reported to be organized in large groups and to be engaged in rewashing tailings on wasted claims formerly occupied by European miners.⁵² In Bendigo, a resident complained to Parliament Commission:

They would not dig holes, and take the washing-stuff alone and wash it; but they went about the gullies, and scraped up whatever they thought would pay them. In that way they were perpetually washing while other men were digging.⁵³

In later petitions to the Victorian Parliament in 1857, some Chinese miners admitted this:

We have been generally content to dig on lands which have been abandoned by other miners as unprofitable, and which can be made remunerative only (by) the co-operative system practiced by us, and that, thereby, we have obtained considerable quantities of gold which might never have been extracted from the ground.⁵⁴

By working in such a way, Chinese miners damaged the soil and water resources of the goldfields more than the European miners did. The abandoned claims contained only minimal gold, so the Chinese miners had to wash the soil repeatedly to extract gold. Consequently, they further ruined the already barren earth and consumed considerable additional water. They worked collectively in order to achieve higher outputs and this intensified the damage to the local environment. As natives of a place rich in water, these miners were ignorant about the low rainfall conditions in Australia and did not expect a shortage of

⁵¹ See N.F. Barr, J. Cary, *Greening a Brown Land: the Australian Search for Sustainable Land Use*, Macmillan Education Australia, Hong Kong 1994, p. 54.

⁵² *Argus*, April 11, 1855.

⁵³ "Evidence Presented to the Commission on the Chinese, including those of J.A. Panton and the Chinese Howqua", *VPLC* 1855, p. 237.

⁵⁴ "Influx of Chinese", *VPLC, 1856-1857*. E. No. 66., August, 21, 1857.

water on the goldfields. Because of this extensive mode of resource use, the Chinese miners appeared as a threat to other miners' work.

This idea of the role of the Chinese in the goldfields, however, has turned out to be, in part, a overgeneralizing stereotype. Based on his archeological research in main southern New South Wales goldfields, Barry McGowan has established that the Chinese often worked on first-hand claims and did not just wash tailings.⁵⁵ Even in Victoria, Chinese migrants entered many original fields and adopted regular mining methods.

Tan Kailing introduced a regular digging system for Chinese miners that depended on the detecting of differences in topsoil color:

The digging could be very simple for us. We checked the earth around. If the color of the soil in a certain area was different from the surroundings, we immediately dug a shaft. We used two people: one dug into the soil putting the dirt into a basket, the other pulled it out and washed it in a cradle. This was a reliable way to get gold.⁵⁶

This account portrays a typical system of deep seeking, where the Chinese miners were working a fresh claim and not working as a large group. In a series of reports in 1856, William Kelly mentioned that the Chinese were increasingly using puddling machines to be more effective and consume less water.⁵⁷ Not all Chinese mining was thus environmentally damaging. Many Chinese adapted to local systems when they eventually understood that water was scarce in some seasons: "We Chinese lack water now (January 1855). [...] In the winter time you go and take plenty of water, in the summer time you cannot take a drop of water".⁵⁸

⁵⁵ B. McGowan, "The Economics and Organization of Chinese Mining in Colonial Australia", in *Australian Economic History Review*, 45, 2, 2005.

⁵⁶ "Dang shi cai jin zhi fa, ji wei jian dan. Fan fa xian nit u you yi zhi chu, ji jue jing qu sha. Zhi yong yi ren xia jin jue sha, yi ren zai jin kou jiao sha, jiang sha fang zai mu ti pan nei, yi shui chong xi, ji tao de sha jin", in Zhiming, *Records of the Development* cit., p. 10.

⁵⁷ *Argus*, July 17, 1856.

⁵⁸ "Evidence Presented to the Commission on the Chinese, including those of J.A. Panton and the Chinese Howqua", in *VPLC*, 1855, p. 336.

Figure 1. Sluicing technology used by the Chinese miners



Although their traditional experience was limited, they still tried to use Chinese techniques and tools where suitable. When they could get access to water on the goldfields, they could apply their traditional skills in water management. Fig. 1 illustrates the sluicing technology used by the Chinese miners.⁵⁹ This technology was derived from the Californian Sluicing Box or “Long Tom”, which needs plenty of water. It was thus widely applied only in the Beechworth goldfields in north-eastern Victoria. The European miners often built a box 4 meters long, 30 centimeters wide and 20 centimeters deep.⁶⁰ The Chinese miners, instead, preferred to connect

⁵⁹ F. Grosse, *Chinese Gold Miners Sluicing, near Beechworth, Victoria, 1867*, available on the web at: <http://nla.gov.au/nla.pic-an10328049> (Accessed in January 2012).

⁶⁰ C.J. Davey, “The Origins of Victorian Mining Technology, 1851-1900”, in *ARTEFACT-MELBOURNE*, 19, 1996, p. 53.

Figure 2. Chinese collected water for washing pay-dirt



a series of sluicing boxes inside a long man-made channel, a system formerly used in their homeland to convey water from the mountains. So the Chinese sluicing box was considerably longer than the European one. By delivering water from the top of a hill and sluicing the lengthened box, they could get tiny gold grains from low grade dirt. This method was not abandoned until the 1870s.

Fig. 2 shows how a group of Chinese collected water for washing pay-dirt.⁶¹ The lower claim near the small dam could be directly worked by two miners – one digging, the other washing. Two miners used a pump to raise the water to claim much higher than the water hole. A long bamboo pipe was used as a lever, with a small keg fixed to it. This was a traditional technique regularly used in the See Yap irrigation fields. By comparison, European hardly ever utilized bamboo as construction material, but the Chinese miners would use any available bamboo brought over from China.⁶² As the image shows, this method of alluvial mining was highly efficient, making sparing use of water and wood. Moreover, the Chinese were well organized and worked patiently and collaboratively, in contrast with the European miners, who were more individualistic and caused environmental damage in their quest for larger nuggets of gold. So in many cases the Chinese were actually much gentler on the local environment.

McGowan found that the piles of mullock around Chinese and European claims have left distinct archaeological traces. Among the relics of the New South Wales goldfields are elongated mounds of water-worn stone ('tailing mounds') piled up after working the face and floor of the diggings. Two principal types of tailing mounds were identified: unstructured mounds and neatly packed vertical ones. The latter type was made by Chinese and showed all the hallmarks of diligent and careful mining practice.⁶³ Considering the number of Chinese miners who were adept at building dams in very limited areas, these relics unsurprisingly bear witness to how their traditional skills were put to good use on the goldfields.

⁶¹ The original image is kept in the Chinese Cultural Center, Beechworth. Quoted from G. Cunxiao, *Illustrations of (cultural) Relics Passed Down by Overseas Chinese and Chinese Migrants in Australia*(*Ao Zhou Hua Ren Hua Qiao Yi Cun Tu Jian*), Hei Long Jiang People Press, Ha'er bin 2008, p. 32.

⁶² It is still not clear whether they also planted bamboo on the goldfields. Local newspaper reported that Chinese usually carried their luggage on bamboo poles. *Argus*, April 16, 1856; June 19, 1856.

⁶³ McGowan, *The Economics and Organization* cit., p. 126.

Chinese environmental experiences in agricultural activities in the gold rushes

Gold rushes stimulated many other natural resource extraction industries in support of mining. For example, in Victoria “the presence of agricultural, pastoral and timber resources helped to keep down mining costs, just as mining provided hinterland settlers with ready markets.”⁶⁴ Correspondingly, the environmental impact of the gold rushes was not just from digging and washing. Skillful agricultural workers that they were, many Chinese on the goldfields also changed local ecosystems through farming.

Migrants from See Yap found opportunities to do agricultural work as soon as they arrived in Australia. The Parliament Commission asked Howqua if they “would be able to grow wheat and vegetables.” He replied: “yes, all Chinamen like farming”.⁶⁵

Among all Chinese agricultural activities, market gardening was the most significant contribution to Australian goldfield societies.⁶⁶ Its evolution went hand in hand with that of mining activities. When shallow digging was popular in Victoria in early 1850s, miners had to shift claims frequently, so they could seldom stay in one place long enough to establish a vegetable garden or market system. By the early 1860s, with the rise of quartz mining on large Victorian goldfields such as Bendigo, the more settled miners provided a stable market for vegetables. Many Chinese migrants found it difficult to gain opportunities in the quartz mining gangs, so they turned to agricultural work around the goldfields if they wanted to remain.⁶⁷ Northeastern Victoria experienced a very similar process. In the 1860s, vegetables from the Chinese gardens quickly came to dominate the Beechworth market.⁶⁸ In

⁶⁴ W. Bate, *Victorian Gold Rushes*, McPhee Gribble, Fitzroy, Victoria 1988, p. 5.

⁶⁵ “Evidence Presented to the Commission on the Chinese, including those of J.A. Panton and the Chinese Howqua”, in *VPIC*, p. 336.

⁶⁶ Y. Ching Fatt, *The New Gold Mountain: the Chinese in Australia, 1901-1921*, Raphael Arts, Richmond 1977. The Chinese edition was published in 1988, pp. 49-54.

⁶⁷ Z. Stanin, “From Li Chun to Yong Kit: A Market Garden on the Loddon, 1851-1912”, in *Journal of Australian Colonial History*, 6, 2004, p. 23.

⁶⁸ Frost, *Migrants and Technological Transfer* cit., pp. 116-117.

Queensland and New South Wales, although Chinese market gardening was not always developed by miners, the planting skills were similar to those deployed in Victoria mainly because the gardeners came from similar backgrounds.

The locations of vegetable gardens were varied, but cultivators generally preferred fertile soil and flat fields. For example, in the Loddon River district in Castlemaine, a planting site usually required “a rich alluvial soil, a nearby water source and a reasonably flat aspect.”⁶⁹ Chinese could also grow vegetables more successfully on poor soils than European market gardeners. In Bendigo, an “editor particularly admired the facility with which the Chinese could take infertile land situated in the midst of old gold workings, all ‘stiff clay’ and ‘quartz pebbles’, and make it fertile.”⁷⁰ It is notable that many of the Chinese market gardens were scattered on abandoned alluvial diggings, showing that Chinese migrants did not merely destroy mining land, but sometimes were able to make it fruitful.

The people from See Yap used two methods to fertilize poor land. The first way was using so-called “green fertilizer” (*Lu Fei*) or herbaceous fertilizer. See Yap people had a long tradition of reaping fresh wild grass and burying it into the fields to prepare them for growing crops. When the grass was decayed, it became an “essential fertilizer” (*Ji Fei*) that improved fields.⁷¹ The second method was to bury fermented manure, especially urine (mixed with water), in a field after planting. Although there was no direct evidence that “green fertilizer” was used on the Australian goldfields, the latter method was well known to locals. For example, Angus Mackay, an instructor of Agriculture for the board of Technical Education in New South Wales, openly criticized the Chinese gardens for being smelly because of the “ammonia” in the manure.⁷² In fact, See Yap people only piled up night soil and organic rubbish in specific sites, to be later used as fertilizer elsewhere.⁷³

⁶⁹ Stanin, *From Li Chun to Yong Kit* cit., p. 14.

⁷⁰ *Bendigo Advertiser*, July 22, 1862.

⁷¹ Jianyun, *Local Chronicles of Tai Shan County* cit., p. 254.

⁷² *Bendigo Advertiser*, May 4, 1887.

⁷³ Cronin, *Colonial Casualties* cit., p. 92.

Traditional irrigation and planting skills were also used to improve fields. Before the Chinese gardens were equipped with tap water, the water needed for planting was shouldered to gardens by laborers. Considering the low rainfall of the Australian goldfields, this work could be considerable, especially in the hot dry summers. Chinese usually watered their fields before sunrise in order to keep out of the burning sunshine and avoid undue evaporation. A Chinese agricultural worker remembered that he and his fellows had to carry hundreds of barrels of water early every morning.⁷⁴ In a typical Chinese garden, all the crops were planted in straight, parallel rows and furrows extending to the very edge of the property. The fields thus displayed very meticulous farming methods.

Although the Chinese successfully developed market gardening by transferring traditional experiences into the Australian environment, at times they also adapted to local conditions and borrowed European traditions. Chinese miners grew their favorite vegetables and fruits for their own use.⁷⁵ However, when market gardening boomed, they grew European products for the expanding market. Potato was not an important food in the Cantonese diet, but it was widely planted on the goldfields, substituting for sweet potato. Lettuce and cabbage from Chinese gardens were very popular among Europeans, although they were not traditional Chinese vegetables. In the Bendigo area, Chinese started the tomato industry that flourished in the nineteenth century before it moved north to better irrigated districts.⁷⁶ Moreover, Chinese learned from Europeans to inter-plant other crops between rows of maize because they were protected by the faster growing maize.⁷⁷ All this evidence shows that Chinese could quickly learn to grow plants not familiar to them before their arrival in Australia.

Although market gardening was the most influential farming activity of Chinese migrants in the gold rushes, it was just one di-

⁷⁴ Oral interview of Zheng Ri, recorded by Zheng Jiarui, "The Way to the (New) Gold Mountain", in *The Local Historical Studies of Zhong Shan City*, p. 75.

⁷⁵ R. Moore, J. Tully (eds), *A Difficult Case: An Autobiography of a Chinese Miner on the Central Victorian Goldfields*, Jim Crow Press, Daylesford, Victoria 2000.

⁷⁶ Lovejoy, *Depending Upon Diligence* cit., p. 31.

⁷⁷ Frost, *Migrants and Technological Transfer* cit., p. 122.

mension of their broader participation in Australian agriculture. European farmers employed Chinese migrants in a variety of jobs. William Young's report on Chinese miners shows that they were also employed as seasonal workers for harvesting.⁷⁸ Many of Chinese miners were also active in vineyards, tobacco plantations, and were even precursors to the hop industry in Victoria.⁷⁹ As early as 1855, *Argus* praised the Chinese for their orchard skills:

Chinese gardeners are not unskillful in this branch of gardening, as they often wrench or cut a strip of the bark off for some time previous to their detaching the cutting, in order to get it into a proper state for emitting roots when put into the soil.⁸⁰

Some of their activities had an aesthetic aim. A noticeable case was that Chinese miners widely transplanted plum trees into Victorian diggings in order to beautify the local landscape, since there was no other flower blooming during the Spring Festival in the local goldfields.⁸¹

Many Chinese went back and forth between mining to agriculture. Farming was a convenient way for Chinese migrants to settle down as new Australians. A typical case was Tan Shipai: he and his father worked as gold diggers, bar servants and market gardeners. When his father passed away, Tan turned to digging again and then later to woodcutting and clearing farmland. In Queensland, many Chinese became tropical fruit growers after the fading of the gold rushes. They also found farming work attractive because it offered them more opportunities to practice their traditional crafts. Although Chinese agricultural practices were sometimes considered complementary to their mining careers, Chinese contact with other communities and their interaction with the Australian environment continued through their farming work after the gold rushes ended.

⁷⁸ See W. Young, "Report on the Condition of the Chinese Population in Victoria, 1868", reprinted in *The Chinese in Victoria: Official Reports and Documents*, I.F. McLaren (ed.), Red Rooster Press, Ascot Vale 1985.

⁷⁹ See Trevarthen, *After the Gold is Gone* cit.

⁸⁰ *Argus*, June 23, 1855.

⁸¹ Stanin, *From Li Chun to Yong Kit* cit., p. 39.

Reactions to Chinese environmental experiences in Australia and China

As an Asian migration group, Chinese experiences in the goldfields drew both positive and negative reactions from the European-Australian communities. Although Chinese miners were frequently denounced as “fossickers” on goldfields, Ann Curthoys staunchly defended them warmly, arguing that they actually maximized gold production on certain claims, when there was enough water.⁸² Chinese miners were noted for their astuteness on the Bendigo goldfields: they realized that rainfall was seasonally unbalanced, so they shifted to Owens in summer, a smaller goldfield but with a steadier water supply, and then returned to Bendigo in winter.⁸³ With their patient working style, they managed to sustain relatively high productivity, even on poor fields. A local Braidwood newspaper argued that European miners should learn from the Chinese because (European miners) “gave up easily before they had given the claim a fair trial”.⁸⁴ In the 1850s, some members of the Victorian elite argued that Chinese migrants would be particularly qualified to exploit the vast and wild lands of inner Australia. Undoubtedly, the Chinese practice of “taking of small pieces of favorable ground” and cultivating “vegetable luxuries” was an inspiration for gardening in the state.⁸⁵

On the other hand, negative attitudes to the Chinese also lent a strong voice to initiatives to expel them altogether. Chinese environmental behavior was easily utilized as a pretext by white racists, who asserted that the Chinese had stolen Australian natural resources, but did not see that the British settlers and native-born European Australians had done the same thing to the original owners of the land.⁸⁶ For these racists, natural resources should be distributed according to a

⁸² A. Curthoys, A. Markus, *Who are Our Enemies? Racism and the Australian Working Class*, Hale and Iremonger, Neutral Bay 1978, p. 38.

⁸³ *Argus*, September 22, 1856.

⁸⁴ *Braidwood Observer and Miners' Advocate*, February 6, 1861. Cited in McGowan, *The Economics and Organization* cit., p.125.

⁸⁵ Stanin, *From Li Chun to Yong Kit* cit., p. 21

⁸⁶ *Argus*, June 5, 1856.

racial or “Australian nationalist” hierarchy. The Chinese being an inferior race, they did not have the right to a share of Australia’s gold:

Through a mistaken liberality, the rich ore extracted here is conveyed to China, to become by indirect way the means of establishing a resource to oppose effectual barriers to the progress of civilization and enlightenment.⁸⁷

Chinese environmental behaviors were branded as intolerable by European standards and used to further justify the exclusion of Chinese workers from the goldfields. A most frequent accusation was that the Chinese abused water resources. It soon became such a stereotype that even when there was plenty of water Chinese miners could still be expelled from goldfields as wasteful of water. During the Lambing Flat Riot, the largest violent attack against Chinese miners in Australian history, which was launched in a year with a good water supply, ‘water abuse’ was declared to be Chinese miners’ main crime.⁸⁸ What were perceived as differences between the Chinese and Europeans in their everyday relationship with their environment also aggravated antipathy to the Chinese. A petition to the Victorian Parliament complains about:

The serious risks that the whole community run where these people are located, from the indiscriminate huddling together of their tents, so extremely small in size that their very construction prevents a free circulation of air, which is strongly impregnated all around with the effluvia arising from the various refuse scattered about, added to personal uncleanness, which should an epidemic attack the spot they have settled down upon, it is fearful to contemplate the results to the surrounding district.⁸⁹

It was thus asserted that the dense living style of See Yap migrants caused serious environmental pollution to all, although sanitation was usually poor on the goldfields among all groups. Even the choice of location for a Chinese settlement could be regarded as a threat.

⁸⁷ “Influx of the Chinese, August 7, 1857”, *VPLC*. Vol. 3, E. No. 61, 1856-57.

⁸⁸ A. Curthoys, A. Markus, *Who are Our Enemies? Racism and the Australian Working Class*, Hale and Iremonger, Sidney 1978, p. 39.

For example, the existence of a Chinese village at Vaughan on the Loddon River, an area defined as rugged and unyielding, with steep gullies and inaccessible river banks and cliffs, was cited as a reason for discrimination because the village could hide lawless persons.⁹⁰

Racist ideology and real contradictions within Chinese environmental experiences were mutually reinforcing. Environmental factors provided just another justification for white racist behavior. At the same time, discriminative legislation and public opinion further marginalized the environmental experiences of Chinese workers in the Australian gold rushes: on many occasions, Chinese worked on abandoned claims because the new ones could easily be “jumped” by European miners. From 1855, the *Chinese Immigration Act (Vic.)* required large Chinese groups to move into fixed camp sites and forbade them from traveling freely without the permission of their Protectors, even though this rule was not strictly enforced.⁹¹

One frequently overlooked aspect of this story is that Chinese experiences in the Australian gold rushes had repercussions on environmental ideas in China itself. One influence was the notion that European migrants were fitter to settle in temperate zones, whereas the Chinese could settle down in wider areas. In 1879, the School of Combined Learning in Beijing (*Jing Shi Tong Wen Guan*) reported to the central government that, while Europeans in temperate zones resisted Chinese migration, Europeans found it difficult to work in tropical areas, so Chinese were welcomed there.⁹² Xue Fucheng, an intellectual and diplomat to Europe, specifically collected information on Chinese toiling in the Australian gold rushes. In 1890, he recorded his worries about the depletion of non-renewable mining resources:

⁸⁹ “Influx of the Chinese, August 7, 1857”, *VPLC*. Vol. 3, E. No. 61, 1856-57.

⁹⁰ Reeves, Mountford, *Court Records and Cultural Landscapes* cit., p. 9.

⁹¹ See M.M. Ngai, “Chinese Miners, Headmen, and Protectors on the Victorian Goldfields, 1853-1863”, in *Australian Historical Studies*, 42, 1, 2011, pp. 10-24.

⁹² See in *Documents of the Ministry of Foreign Affairs (Zong Shu Qing Dang)*, March 21, 1879, p. 1521. Reprinted in Hansheng, *The Compiled Materials on Oversea Chinese Laborers* cit., p. 19.

However, we still do not use machines for deeper mining, which could reveal more resources than in other countries More and more people have been lured by our mines, so mining may soon be booming as it was in foreign countries. ... Thousands of years from now, the mines of China will be exhausted, but the mines in other countries might very well become exhausted earlier than ours. It would be terrible if there was no resource in China or other countries. That is why I have to worry about *the future of our globe*, although this is to some extent mere speculation.⁹³

Conclusion

Chinese environmental experiences in gold rushes were defined both by environmental conditions and by local society. Whether in China or in Australia, Chinese immigrants tried to adapt to the changing ecosystem and fit into the environment. They brought traditional experiences to Australia, where they established themselves. Their life experiences in Australia were sometimes successful, sometimes not. The Australian gold rushes are a case of how environmental factors can exacerbate conflicts between different immigrant groups. Despite some positive interactions, the divergent conceptions of Chinese and European Australians about the environment eventually fuelled a strong racist drive to expel the Chinese. Whether accepted or rejected, Chinese experience transformed the environment of the goldfields environment from the 1850s onwards, and many Chinese traditions have become more or less integrated into the broader environmental practices in the southern land. In the future, it would be interesting to examine Chinese experiences in the Australian gold rushes more closely in a comparative international environmental exchange perspective. Such an examination could also take a significant place in environmental history studies in Australia, a country that was shaped by its immigrants.

⁹³ My emphasis. See in X. Fucheng, *Diaries during the Visit to Britain, France, Italy and Belgium (Chu Shi Si Guo Ri Ji)*, reprinted, Social Science Material Press, Bei Jing 2007, p. 120.