Huangjiu or Chinese Yellow Wine:
The Evolution of Traditional Huangjiu in Shaoxing

Ka Fung Gavin Hui

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Faculty of Culture and Society

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Supervisor

Dr. Lindsay Neill

Abstract

Because huangjiu is uniquely linked to Chinese history, it holds a special place in modern China. Cognisant of that, and using secondary data analysis, my dissertation explores huangjiu's traditional brewing and its contemporary practice, concentrating upon the huangjiu produced in Shaoxing, a city in China. The aim of my research was to explore how huangjiu from Shaoxing has changed over time. Key to that narrative have been Western technologies, commercialisation, and the positioning of huangjiu as the beverage most associated with China. In that way, huangjiu has a socio-political connotation that reflects the beverage's socio-temporality. Consequently, my research reflects the wider consideration that vernacular items like huangjiu are dynamically constructed. In that sense, huangjiu is a metaphor signifying how many ancient and contemporary Chinese people have come to make sense of their world. My dissertation offers a unique insight into huangjiu, because many of my secondary sources are not available in the English language. Through their translation and addition to my research, this dissertation extends what is known about huangjiu within the Western academy in deep and meaningful ways.

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Attestation of Authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

Signed:

Date: 22nd November 2023

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Glossary of Chinese Terms and their English Language Meaning

Chinese Word	English Translation
Běi shān jiǔ jīng (北山酒經)	Alcohol Bible from Beishan
Chún xiāng (醇香)	Mellow aroma
Fán tǐ zì (繁體字)	Traditional Chinese character
Gài tiān (蓋天)	Cover the sky
Huáng (黃)	Yellow
Jiǎ gǔ zì (甲骨字)	Oracle bone characters
Jiǎn tǐ zì (簡體字)	Simplified Chinese character
Jiàng xiāng (醬香)	Sauce aroma
Jīn zì (金字)	Metal character
Jiǔ (酒)	Alcohol
Jiǔ jīng (酒經)	Alcohol Bible
Jiǔ qū (酒曲)	Catalyst for brewing
Jiǔ xiān (酒仙)	Alcohol Immortal
Kǎi shū (楷書)	Regular script
Lìshū (隸書)	Clerical script
Mǐ xiāng(米香)	Rice aroma
Qí mín yào shù (齊民要術)	Essential skill for people of Qi
Qīng jiǔ (清酒)	Clear alcohol
Qū (曲)	Bent / Song
Qū xiāng(曲香)	Jiuqu aroma
Shǐ jì (史记)	Record of the Grand Historian
Shì jiǔ (事酒)	Occasional alcohol
Shī xiān (詩仙)	Poetry Immortal
Wǔ qí sān jiǔ (五齊三酒)	Five uniforms three alcohols
Xī jiǔ (昔酒)	Aged alcohol

Xiǎo zhuàn shū (小篆書)	Small seal script
Yào xiāng (藥香)	Medicinal aroma
Zhōu lǐ (周禮)	Rites of Zhou

Note. For sources, refer to in-text references.

Chapter 1: Introduction and Background Information

Food and beverage are important identities and cultural signifiers. Considering this observation, and the context of the academic discipline of gastronomy, brings to the fore Brillat-Savarin's (1825/2002) famous quote, "Tell me what you eat I will tell you what you are" (p. 22). Brillat-Savarin's open-ended statement not only links food with identity, but also subtly acknowledges the importance of food in everyday life and culture. Extending that importance are globalising forces. In that way, and as Assmann (2017) realised, globalisation has engendered a culinary homogenisation. Despite food's homogenisation, food and beverage remain potent identifiers. One example that reflects how a beverage can signify identity is huangjiu or Chinese yellow wine.

Huangjiu is one of the oldest alcoholic beverages (Sun, 2019/2022). In China, it was once the most commonly consumed alcoholic beverage (Li, 2011). However, over the last few decades its popularity has been supplanted by baijiu, Chinese white alcohol (Hé et al., 2015/2017). Notwithstanding that, consumer nostalgia for huangjiu has realised its renewed popularity, especially for young Chinese adults. However, there is a lack of research and literature on huangjiu's history, classification, manufacture, and uses within the Western academy. Consequently, my research dissertation addresses that shortfall and explores the dynamic nature of huangjiu over time, specifically in China's Shaoxing region. Guiding my research on huangjiu are the following three research questions.

My primary research question asks:

- ***In what ways has traditional Huangjiu changed over time in Shaoxing?***

Supporting my primary question are two underpinning research questions:

- ***How has Western culture influenced huangjiu?***
- ***How has technological innovation contributed to these changes?***

1.1 Research Rationale

While I was born in Hong Kong, during my time in tertiary education I lived and studied in Manchester, England. Currently I live in Auckland, Tāmaki Makaurau, Aotearoa New Zealand. Being away from my birthplace has, for me, evoked a

nostalgic homesickness. That sickness has led to my questioning of my identity and my cultural heritage. Part of that questioning was answered when I had to select a topic for my Master of Gastronomy research dissertation. To realise my traditional culture, and to help assuage my self-questioning, I selected huangjiu as my research topic. Huangjiu has a long history (Máo, 2020). Additionally, the beverage remains a key part of contemporary Chinese culture (Xiè, 2020). While huangjiu is rarely recognised outside of China, that, for me, adds to its appeal. Huangjiu's research adds to my own search for self-identity.

Studying the 'right' topic for a dissertation is important. My supervisor Dr Lindsay Neill recommended that I choose a topic that I was passionate about. That passion, he suggested, would guide my academic journey which, he also suggested, may not always be a smooth one. Consequently, as I write my dissertation, I am full of hope. That hope reflects the passion for my topic, my realisations of self, and the wider hope that the quality of my dissertation is sufficient for me to be awarded my Master of Gastronomy degree.

1.2 Overview of the Dissertation

My dissertation's exploration of huangjiu relies on secondary data as the source material (refer Chapter 4: Methodology and Method). That material merges sources from the Western academy and academic work from China that has not been released in the English language (refer Chapter 3: Literature Review). In that way, my dissertation makes a unique and timely contribution to knowledge about huangjiu, particularly for Western scholars and researchers.

Considering my topic and its secondary data research approach, Chapters 1 to 4 provide not only provide my theoretical and methodological perspectives, but also the academic information I require in order to respond to my research questions. Consequently, rather than having a Findings Chapter, Chapter 5, titled Discussion and Conclusion, contains my findings in response to my research questions and their discussion, alongside other topics usually located in a dissertation's Conclusion chapter.

Presenting my dissertation in this way has necessitated some particular considerations. For example, at the end of each chapter preceding Chapter 5, I

present a summary of chapter content and link it to the following chapter. Additionally, because I merged my findings with their discussion and the conclusion in Chapter 5, I grappled with the issue of presenting repetitive information. In particular, I wondered if my findings in Chapter 5 should simply be cross-referenced back to the preceding chapters, or whether I should re-present my findings in direct response to my research questions. Doing that might risk what some might consider unnecessary repetition. After thoughtful consideration of my dilemma, I decided that it would be better to re-present my Findings in Chapter 5. My rationale for that choice, despite repetition, was that each chapter was then 'complete-in-itself' rather than a heavily cross-referenced piece of writing. Notwithstanding these decisions, my dissertation is presented in the following way.

Chapter 1 presents an introduction to my dissertation and my topic: the huangjiu that is produced in Shaoxing. In Chapter 1, I present my overview and the background information for my topic that includes its link to gastronomy, the relevance of the Chinese language, huangjiu's definition, the relationship between huangjiu and Chinese dynasties (history), an explanation of jiuqu and, finally, a discussion of huangjiu's consumption. This information provides a base understanding of my topic for my readers. Additionally, Chapter 2 presents my understanding of the theory related to how I see the world and, within that view, how I see my research topic. My literature review constitutes Chapter 3. In my review, I present the current state of knowledge on my topic, cognisant of my research questions. Chapter 4 overviews my methodology and method. The methodology presents the theoretical positioning of my research whereas the method presents my application of that theory to my topic. As previously noted, Chapter 5 not only answers my research questions but also presents my contribution to research, my research limitations, and recommendations for future research. Considering that, Chapter 5 can be considered an amalgam of topics usually found within two chapters, namely a Findings Chapter and a Discussion and Conclusion Chapter. I conclude my dissertation with a brief reflective section that overviews my research experience.

1.3 Linking my Topic to Gastronomy

As Brillat-Savarin (1825/2002) defined it, "gastronomy is the reasoned comprehension of all that relates to the nourishment of man [sic]. Its aim is to

produce the preservation of man [sic] by means of the best possible nourishment" (p. 67). Later, Santich (2007) added that "gastronomy is not simply what people eat, although this itself is subject to the interplay of diverse influences, but also how, where, when, why, and with whom" (p. 57). Given those positions, gastronomy's 'nourishment' occurs not only within food's consumption, but also within thinking about the rituals and occasions food and beverage facilitate. My research considers those positions within its raison d'être. Not only does huangjiu or Chinese yellow wine provide literal nourishment, it also figuratively evokes thinking about huangjiu's history, evolution, future, and ritualised dimensions. In those ways, and considering my research questions, my dissertation is grounded in the discipline begun by Brillat-Savarin (1825/2002): gastronomy.

1.4 Considering the Chinese Language

My exploration of the Chinese language is important because understanding some Chinese words makes my dissertation easier to follow for people who might be unfamiliar with China and its languages. China has more than 56 ethnicities speaking more than 80 different languages and dialects (Chen, 1993). Han Chinese constitute 93% of China's total population (DeFrancis, 1984). Despite that diversity, in 1955, Putonghua (or Mandarin) was chosen to be the official vernacular language of the People Republic of China (Chen, 1993). As Chen (1993) observed, Putonghua combines the Han language within the Beijing sound system, constituting its pronunciation standard (Chen, 1993). Although I grew up in Hong Kong China which uses Cantonese as the main spoken language, I have been educated in Putonghua as well. In my research dissertation, I rely on Putonghua.

As a written language Chinese, according to Zhào and Baldauf (2008), was first noted on pottery dated to 4000 BCE. That pottery has a relationship with the oracle bone characters (Jiaguzi 甲骨字) dated to around the 13th century BCE during the Shang dynasty (1766–1122 BCE). Called jiaguzi, the characters were usually etched on oracle bones. Their characters were also more refined and were no longer considered to be pictographs. In the later Shang dynasty, contrasting jiaguzi, a more complex and condensed writing of metal characters (Jinzi 金字) was found etched on bronze vessels (Lu & Aiken, 2004). Although China only unified the nation's spoken

language recently, written Chinese was unified in the Qin dynasty around 221 BC (Lu & Aiken, 2004).

During the Warring States period (476–221 BC), there were seven states with seven different written languages. After unifying China in 221 BC, the emperor Qin Shi Huang begun to codify the written language, currency, and measurement units. Then, the small seal script (Xiaozhuanshu 小篆書) was standardised as the written language of China (Lu & Aiken, 2004). Since this important historical event, the written form of Chinese has not been divided, but rather has evolved linearly. In the Han dynasty (206–221 AD), a more simplified form of the small seal script, called the clerical script (Lishu 隸書), was developed, replacing its former characters. Lishu is a significantly important writing format as it is later transformed into the regular script (Kaishu 楷書) during the Northern and Southern dynasties (420–589 AD) (Lu & Aiken, 2004). Kaishu became known as the 'Traditional Chinese Character' (繁體字) in today's context. However, the simplification of the Chinese written characters remains dynamic.

Established in 1956, the 'Simplified Chinese Character' (簡體字) is the official written language format used in mainland China. However, its use does not extend into Hong Kong, Macau, or Taiwan (Lu & Aiken, 2004). Sometimes, the Chinese written form is also called 'Hanzi', a derivative of the Han identity (Wang, 1998). It is also important to note that although there are over 80 spoken languages and dialects in China (Chen, 1993), almost all of these languages and dialects use Traditional and Simplified Chinese characters. Meaning depends on the individual's spoken language, such that different individuals looking at the same Chinese character may pronounce it differently although the meaning is the same (Chen, 1993; Lu & Aiken, 2004).

1.5 Dynastic China and Huangjiu

China has a long-lived civilisation. The nation's dynasties reflect that longevity. The histories of huangjiu and dynastic China are linked. Those associations are noted in Table 1, below, and discussed in the following section.

Table 1: Chinese Dynasties and Huangjiu

Period	Dynasty	Contribution to Huangjiu
ca. 2070-1600 BCE	Xia Dynasty	• Discovery of alcohol by Du Kang
ca. 1600-1046 BCE	Shang Dynasty	• Huangjiu started to be enjoyed by noble class
1046-771 BCE	Western Zhou Dynasty	• Famous publication *Rites of Zhou* mentioned some huangjiu production requirements
770-476 BCE	Spring and Autumn Period	
475-221 BCE	Warring States Period	
221-207 BCE	Qin Dynasty	• Huangjiu production unified with increased efficiency • The earliest manufacturing guides on huangjiu
206 BCE-9 CE	Western Han Dynasty	• Wall painting showing the whole huangjiu brewing process
9-23 CE	Xin Dynasty	• Standardised huangjiu recipe
25-220 CE	Eastern Han Dynasty	• Discovery of feed-batch fermentation technique
220-280 CE	Three Kingdoms Period	
365-534 CE	Northern Wei Dynasty	• Important publication *Qimin Yaoshu* (齊民要術) recorded over 40 huangjiu brewing techniques
581-618 CE	Sui Dynasty	
618-907 CE	Tang Dynasty	• Shaoxing city named the 'birthplace of huangjiu'
907-960 CE	Five Dynasties Period	
960-1279	Song Dynasty	• Important publications *Beishan Jiu Jing* (北山酒經) and *Jiu Jing* (酒經) appeared and later became the standard of huangjiu brewing
1279-1368	Yuan Dynasty	• Huangjiu continued to be refined with better equipment and practices
1368-1644	Ming Dynasty	
1644-1911	Qing Dynasty	
1912-1949	Republic Period	• Increased manufacturing rate and sales rate • Standardised huangjiu styles
1949-present	People's Republic of China	• Western influences and technological innovation advanced huangjiu to today's standard

Note. ca. = circa, BCE = Before Common Era, CE = Common Era (Zucker & Harris, 2015). Sources: Guō et al. (2021); Hé et al. (2017); Heinrich (n.d.); Zhōnghuá rénmín gònghéguó zhōngyāng rénmín zhèngfǔ [The State Council, The People's Republic of China] (n.d.).

According to the *Record of the Grand Historian* (史记) by Si Ma Qian, the famous historian from the Western Han dynasty of Ancient China (206 BCE–9 CE), the grain-based alcoholic beverage now known as huangjiu was discovered around the

time of the Xia dynasty (ca. 2070 BCE) by Du Kang, a commissariat officer (Sima, ca. 86–145 BCE/1993). According to Si Ma Qian's writings, Du Kang was tasked with solving the problem of storing excess food (Sima, ca. 86–145 BCE/1993). He decided to store some of his foodstuffs, including soybean, wheat, broomcorn, foxtail millet, and rice in the hollow of a large dry tree stump. After some time, Du Kang discovered that some animals had collapsed, and were unconscious, near his food-store. Du Kang observed a liquid, with a pungent aroma that oozed from a crack in the hollow stump. He suspected that mysterious liquid was the reason for the unconscious animals. Tasting some of the liquid he felt instantly refreshed. Looking inside the tree stump he saw liquid coming from a mixture of sprouted wet grains. Later, based on his observations, Du Kang replicated the production process (Sima, ca. 86–145 BCE/1993).

Soon, he was praised as the 'God of Alcohol' (Sima, ca. 86–145 BCE/1993). Later, in the Shang dynasty (1600–1027 BCE), huangjiu consumption became popular within the noble classes and royalty (Hé et al., 2017). Reflecting that, archaeologists found traces of huangjiu alcohol on bronze containers (Hé et al., 2017). The literature on huangjiu brewing and its classifications developed during the Zhou dynasty (1027–221 BCE) (Céng et al., 2019). Reflecting that was the publication of the *Rites of Zhou* (周禮), a governing text recording theories on bureaucracy and construction during the Zhou dynasty (Lu, 2016). Within that text are limited entries on huangjiu. A chapter within *Rites of Zhou*, "Five Uniforms (五齊) and Three Alcohols (三酒)", noted a system that categorised huangjiu based on its quality and use (Liu et al., 2014). The five uniforms define the stages of huangjiu brewing, whereas the three alcohols are early classifications of huangjiu.

Notwithstanding that, one of the first manufacturing guides on huangjiu that recorded its brewing process was found in the Mawangdui archaeological site located in Changsha city, Hunan, China; the guide was from the early Qin dynasty (221–206 BCE). While "Five Uniforms (五齊) and Three Alcohols (三酒)" presented a brief for brewing standards, it omitted any detailed recipe or huangjiu formula (He et al., 2017). After the emperor Qin Shi Huang unified China in 221 BCE and started the Qin dynasty (Berit & Strandskogen, 2015), the production of huangjiu become more efficient. Reflecting that are ancient wall paintings from the Western Han dynasty

(206 BCE–9 CE) that displayed the entire brewing process. Those images were discovered in the Liangtai ruins of Shandong China (Yang, 1991). The paintings depict that the brewing process was carried out within an organised system, where contributing individuals focussed on specific tasks including cooking rice, mixing yeast with cooked rice, chopping firewood, and filtering the huangjiu (Hé et al., 2017). While the emperor Wang Mang had a short reign within the Xin dynasty (9–23 CE), during that time the recipe for huangjiu production became standardised. As Hé et al. (2017) related, the standardised recipe consisted of two Chinese stones (62kg) of rice and one Chinese stone (31kg) of jiuqu to yield 6.6 Chinese stones (204.6kg) of huangjiu in total (一釀用粗米二斛, 曲一斛, 得成酒六斛六斗).

Adding to the ancient literature on huangjiu is *Qimin Yaoshu* (齊民要術). This text is one of the oldest agricultural texts in China. It was written by a Northern Wei dynasty officer named Jia Si Xie between 533 and 544 CE. Within this text, there are eight examples of jiuqu production and more than 40 examples of brewing techniques (Hé et al., 2017). The text informed brewers of the day and provided the groundwork for contemporary brewing practices in China. Although this text omitted considerations of how bacteria and micro-organisms contributed to the brewing process, it nonetheless facilitated their brewing actions by noting the importance of temperature and pH control as mechanisms enhancing the brewing process (Hé et al., 2017).

However, it was during the Tang (618–907 CE) and Song dynasties (960–1279 CE) that huangjiu development reached its zenith (Guō et al., 2021). Then, the literature of the day, including *Beishan Jiu Jing* (北山酒經) and *Jiu Jing* (酒經), became the standard text, or ‘bibles’ for huangjiu brewers (Hé et al., 2017).

During the Yuan (1279–1368 CE), Ming (1368–1644 CE), and Qing (1644–1912 CE) dynasties, the brewing of huangjiu continued and improved with enhanced production practices and equipment. However, it was not until after the Chinese People's War of Liberation had taken place (1948–1949 CE) that the new People’s Republic of China became more open to foreign cultural exchange. Over time, that exchange came to influence and inspire the huangjiu brewers in China. Reflecting that, around 1949, brewers began to use stainless steel vats, and, to take into consideration the impact within brewing of micro-organisms and bacteria (Máo, 2020). In short, modern machinery and technologies revolutionised the huangjiu

production industry. In modern China, commercialised huangjiu production is concentrated in dedicated factories where automated machinery ensures product consistency (Guō et al., 2021).

1.6 Exploring Huangjiu: Is it Wine?

The word, 'Huangjiu' (黃酒) can be divided into two separate words, 'huang' (黃) and 'jiu'(酒). 'Huang' and 'Jiu' literally and respectively mean 'yellow' and 'alcohol' in Chinese (Hàndiǎn, n.d.c, n.d.d). Consequently, huangjiu is commonly called yellow wine in English literature possibly because yellow alcohol does not sound as appetising as yellow wine. While mostly yellow, huangjiu can also be red or black. Huangjiu from Fujian uses a red jiuqu coloured by the red mold, *Monascus purpureus* (Aniya et al., 2000; Guō et al., 2021; Hé et al., 2017; Máo, 2020). Black huangjiu from Jiangxi, a south-east province of China, uses black glutinous rice (Céng et al., 2019; Hé et al., 2017). However, calling huangjiu 'wine' is erroneous. My dissertation emphasises that huangjiu is a unique classification. That classification includes huangjiu only, because huangjiu's primary ingredients are grains. Naming huangjiu 'wine' is misleading, particularly for many Westerners.

According to Amerine (2022), wine is the liquid produced from the fermentation of grapes. Yet, that definition is narrow and misleading because other fruits can produce wine. For instance, fermented peach juice can be called a peach wine (Amerine, 2022). Wine is believed to be an accidental discovery whereby a container of grapes naturally fermented, producing wine (Charters, 2006). In Iran, scientists have found traces of wine in a neolithic jars dating to 5400–5000 BCE (Varriano, 2022). According to Charters (2006), grapes are perfect for wine making because they are juicy; they contain sugars aiding fermentation, and grape skins often introduce yeasts promoting fermentation. According to the International Organisation of Vine and Wine (OIV) standard, the definition of wine is an alcoholic beverage exclusively fermented from fresh grapes. Considering that and based on the national Chinese standards for huangjiu (GB/T 13662-2018), the definition of huangjiu is an *alcoholic beverage* made from a combination of rice, millet, black rice, maize, wheat, and water, which is combined with jiuqu and then brewed.

Notwithstanding that, and considering huangjiu's ingredients and production/brewing process, huangjiu could almost be described as a variation of beer (Mosher, 2021;

Zhào, 2020). However, huangjiu is differentiated from beer because beer requires malt in order to complete its fermentation, and huangjiu does not (Máo, 2020; Mosher, 2021). For fermentation, huangjiu brewing uses traditional clay containers which are gas permeable (Zhào, 2020). Beer is brewed in an airtight vat, restricting the escape of carbon dioxide, thus carbonating the beer (Mosher, 2021). Beers, ales, and lagers can take 2–14 days (or several months for some lagers) to brew (Mosher, 2021). Huangjiu, depending on its style, requires two to three months' fermentation. Ordinary huangjiu, such as Yuan Hong can age for three to five years (Zhào, 2020), while higher quality styles including Jia Fan age for five or more years (Zhào, 2020). Consequently, beer and huangjiu are two completely different beverages.

1.7 Exploring Jiuqu

The use of jiuqu is unique for huangjiu brewing because it distinguishes it from any other grain-based alcoholic beverages (Hé et al., 2017). 'Jiu' (酒) means alcohol (Hàndiǎn, n.d.d). 'Qu' (曲) can be difficult to translate. There are different meanings for qu, depending on its 'place' in a sentence. For example, qu itself can be defined in the form of an adjective 'bent', or a noun 'song' (Hàndiǎn, n.d.g). However, when 'qu' is used after the word 'jiu' it implies the use of a catalyst[1] in huangjiu brewing, which in this case will be the yeast and the mold within jiuqu (Hàndiǎn, n.d.e; Zhào, 2020).

To understand how jiuqu works, first it is necessary to explore fungi. "Fungi are eukaryotic micro-organisms that occur as yeasts, molds, or as a combination of both forms" (McGinnis & Tyring, 1996, p. 7). In that way, and for the purposes of brewing, yeasts, molds and fungi are important because yeast promotes the fermentation process (McGinnis & Tyring, 1996); mold catalyses the saccharification[2] reaction that breaks down complex sugar into simple sugar (Aghaei et al., 2022; McGinnis & Tyring, 1996). Jiuqu contains a combination of both yeast and mold (Zhào, 2020). Consequently, jiuqu acts as a saccharification agent in the fermentation process as well as helping to convert saccharified sugar into alcohol. Combined, that reaction is called simultaneous saccharification and fermentation (SSF) (Liu et al., 2016). The SSF reaction impacts production efficacy and the quality of huangjiu (Liu et al.,

[1] Catalyst: A substance that speeds up a chemical reaction once it is added (Wang & Yu, 2023).
[2] Saccharification: Breaking down complex sugars into simple sugars (Aghaei et al., 2022).

2016). Additionally, jiuqu provides flavour and aromatic characteristics because of its abundance of natural micro-organisms (Xiè, 2020). Brewer's yeast, or distiller's yeast, acts in the same ways. Brewer's yeast contains the yeast *Saccharomyces cerevisiae*. That yeast helps to accumulate ethanol that speeds up the fermentation process (Piškur et al., 2006). However, because of the lack of mold, brewer's yeast cannot speed up the saccharification reaction like a jiuqu which contains both mold and yeast (Máo, 2020). Brewer's yeast is often used by Western brewers for beer and whisky production in order to create different flavours and aromatic profiles during the fermentation process (Saerens et al., 2010).

Brewer's yeast is also a nutritional supplement because it contains rich sources of chromium and vitamin B (Piškur et al., 2006).

Jiuqu is also often compared to Japanese Koji. Koji is made by cultivating the mold *Aspergillus oryzae* on steamed rice and allowing it to grow for five to six days (Okuda et al., 2019). Koji is widely used in Japan for sake brewing and various other fermented food product such as miso paste and soy sauce. However, koji exclusively uses the koji mold *A. oryzae* as the only mold and rice is the only medium for alcohol brewing. In contrast, the traditional Chinese jiuqu contains a combination of yeasts and molds in the environment with different type of grains as the medium, depending on the style of huangjiu. For instance, Shaoxing huangjiu uses a wheat-based jiuqu (Hé et al., 2017). A Fujian huangjiu uses a rice-based jiuqu (Zhào, 2020). A Henan huangjiu uses a black glutinous rice-based jiuqu (Máo, 2020). Metaphorically, jiuqu is considered to be the 'bones' of huangjiu, whereas the main grain used and the water are thought to be its 'flesh and blood' (Máo, 2020).

1.8 Consuming Huangjiu

Many Chinese, and other people, enjoy drinking huangjiu. In the following two sub-sections I explore the tasting and drinking considerations of huangjiu. Many of the themes noted in these two sections are similar to the considerations Western consumers apply when tasting and drinking wine.

1.8.1 Tasting Huangjiu

Like Western considerations of wine, many huangjiu drinkers, according to Hé et al. (2017), are mindful of the beverage's colour, aroma, and taste.

Huangjiu colour quality implies that a quality huangjiu should be transparent with a reddish/yellowish-brown colour. Huangjiu's colour indicates many important factors. For example, huangjiu with a high iron content will be a darker yellowish-brown (Hé et al., 2017) whereas huangjiu that has been stored in intense sunlight will be an oxidised reddish-brown colour (Hé et al., 2017).

While Hé et al (2017) suggested that aroma contributes 25% of the consumption experience, Guō et al. (2021) identified six common huangjiu aroma types. Guō et al.'s (2021) aromas included: a mellow aroma (醇香); a sauce aroma (醬香); a jiuqu aroma (曲香); a medicinal aroma (藥香); a rice aroma (米香), and a lingering aroma (留香). These aromas do not simply come from a single chemical compound – they are complex aromas produced by the combination of multiple substances in the beverage. According to Xiè (2020), ester[3] is the main compound contributing to huangjiu's aroma. A total of 149 types of ester compounds are found in huangjiu.

Complementing aroma and colour, a well-crafted huangjiu has a well-balanced taste. That taste and balance is located within the combination of sweet, sour, spicy, umami, bitter, and astringent profiles (Guō et al., 2021; Hé et al., 2017). According to Guō et al. (2021), an under-aged huangjiu tends to taste sweet, sour, and spicy. Contrasting that, a well-aged huangjiu is mellow, luscious, with a hint of citrus acidity.

Hé et al. (2017) outlined the huangjiu tasting routine. Firstly, the huangjiu should be poured into a colourless tulip-shaped glass. Under sufficient light, the first examination ascertains the clearness of the huangjiu, and its colour (Hé et al., 2017). Then, the beverage's aroma is explored by swilling the beverage around the tulip glass. Next, sipping the huangjiu and passing it over the tongue and mouth enhances aroma profiles as the beverage passes the palate. Those actions ensure that the characteristics of the huangjiu are maximised for the discerning palate (Hé et al., 2017).

1.8.2 Drinking Huangjiu

Guō (2021) described huangjiu as a mild, gentle alcoholic beverage that was best drunk slowly. In Shaoxing, huangjiu is often consumed warm. To make huangjiu

[3] Ester: A secondary product produced during the metabolism of sugar in a low oxygen environment by yeast (Peddie, 1990).

warm it is poured into a bamboo vessel that is placed in boiling water. As it heats, the huangjiu and bamboo release their pleasant aromas (Sun, 2022). The best way to drink heated huangjiu is a combination of sipping and sucking. That combination maximizes both taste and aroma as air enters the mouth with the warmed huangjiu. The warm huangjiu slowly dissipates in the mouth. Guō (2021) suggested adding sliced ginger into the warm huangjiu. Once swallowed, the gingered huangjiu can be felt passing through the body until it reaches the stomach, thus creating a warm and pleasant feeling.

Contrasting tradition, and in summer, huangjiu can be chilled and served with ice. Chilled huangjiu is an effective thirst quencher (Guō, 2021). Contemporary huangjiu brewers, like Grand Talon, also recommend huangjiu as a cocktail ingredient. Exemplifying that is the cocktail called the 'Emperor Sour'. That cocktail is an adaptation of the traditional 'Whiskey Sour' whereby huangjiu is substituted for whiskey (Grand Talon, n.d.).

1.9 Summary and Conclusions for Chapter 1

Chapter 1 sets the stage for my dissertation, by outlining the chapter contents, and by providing a broad overview of my topic and its supporting themes. Key to this chapter was the identification of my primary and supporting research questions and their link to gastronomy. My exploration of huangjiu fits within gastronomy's purview because huangjiu is linked to identity and it is a signifier of Chinese culture, history, and ritual. Not only that, but huangjiu also provides a space to imagine the future of the beverage as globalised forces impact both its production and its consumption. In that way, huangjiu important in the study of gastronomy in the same ways that a bottle of French Bordeaux is important. Like French wine, huangjiu is socio-temporal. It reveals history, tells of the now, and provides a portal to future possibility. Huangjiu has existed since ca. 2070–1600 BCE (Sima, ca. 86–145 BCE/1993) with the discovery of alcohol and within huangjiu's consumption by the noble classes in ca.1600–1027 BCE (Hé et al., 2017). That lineage is presented in Table 1: Chinese Dynasties and Huangjiu, in this chapter. While the 1912 Republic Period and the 1949 founding of The Peoples Republic of China, may not be dynastic, they are included in that table because they introduce the beverage into our contemporary understanding of modern China and its relationship with huangjiu.

In Chapter 1, I also discussed how the study of huangjiu contributed toward my deeper understanding of myself, and my identity. That inclusion also reflected the importance of the Chinese language, and the ways in which I have come to understand the world, in that language and interaction are the most common ways in which we come to know our world. My translation of Chinese texts, an integral part of my research, reflects that and continues in Chapter 2, where I explore the philosophical underpinning and theoretical base of my research and dissertation.

Chapter 2: Theoretical and Conceptual Framework

2.1 Introduction and Overview

To explore my research topic, it is important to address my understanding of the philosophical theories that underpin it. Consequently, this chapter presents my theoretical and conceptual frameworks. While my theoretical framework explores theoretical perspectives, my conceptual framework illuminates those theories within their application to my research. With that in mind, this chapter explores notions of reality and knowledge (ontology and epistemology), before presenting my wider view of the world via Berger and Luckmann's (1966) social construction of reality thesis. As I have come to understand and apply those perspectives to my work, they provide a way of thinking that situates my topic within wider considerations of reality and knowledge. That understanding took me some time to 'get my head around' because, as the following sections illuminate, the topics within their theoretical and conceptual frameworks are often taken for granted and therefore not often 'thought about,' at least in my own lived experience.

In creating this chapter, I have been reminded that reality and knowledge are both symbiotic and dynamic. Back in ancient time, Western philosophers from Ancient Greece believed the world was flat, and some even believed it was hollow (Couprie, 2018). Similarly, many early Chinese thinkers believed in the 'Gia Tian' (蓋天) model, suggesting that the earth was a square piece of land, surrounded by oceans and covered by a dome-shaped heaven (Couprie, 2018). Those realities promote the contemporary notion that knowledge and reality are dynamic, subjective, and grounded within considerations of the dynamic and socio-temporal nature of knowledge and reality. Considering that emphasises that reality and knowledge are socio-temporal constructs.

2.2 Theoretical Framework

2.2.1 Ontology

Ontology is a field of study questioning reality and existence (Jacquette, 2002). As Crotty (1998) explained, there are two main categories of ontology: realism and

relativism. A realist ontology proposes one reality which remains unchanged over time (Healy & Perry, 2000). Descartes, a French philosopher considered to be the father of modern realism, proposed that while ideas are seemingly constructed by people, that there was a higher power independently controlling notions of reality (Bilgrami, 2002). Contrasting that view, a relativist ontology proposes that reality and existence are dynamic constructs inasmuch as the world is ever-changing, and within that world multiple subjective realities exist (Proctor, 1998). My research reflects a relativist perspective.

2.2.2 Epistemology

Like ontology, epistemology also contains the suffix '-ology', hence it is a type of study, the study of knowledge (Novak-Marcincin et al., 2014). As Crotty (1998) proposed, epistemology can be divided into three categories: objectivism, subjectivism, and constructivism. Epistemological objectivism focuses on discovering the truth (Crotty, 1998). Within that position, researchers grasp reality through their senses and cognitive processes (Kelley et al., 2019; Rand 1990). Objectivists believe that reality exists independently of our perception and consciousness (Hanly & Fitzpatrick Hanly, 2001). Subjectivism opposes objectivism by encouraging researchers to interpret meaning, knowledge, and reality (Crotty, 1998). Finally, epistemological constructivism denotes the importance of interaction between the researcher and their topic within an understanding that humankind creates the(ir) world in order to understand it. Key to that realisation is Berger and Luckmann's (1966) social construction of reality thesis (refer section 2.4). Within their construct, new knowledge can be generated through the interaction of existing knowledge, past knowledge, and experience, particularly within the interactions between people who interact within a common socio-culture (Ültanir, 2012).

2.2.3 The Nexus of Ontology and Epistemology

The connection between ontology and epistemology is crucial to understanding knowledge and its meaning. As Crotty (1998) stated, "ontology ... would sit alongside epistemology informing the theoretical perspective, for each theoretical perspective embodies a certain way of understanding what is (ontology) as well as a certain way of understanding what it means to know (epistemology)" (p. 10). If ontology is the representation of knowledge itself, epistemology is the process of investigating the

possibility and limitations of ontology (Rawnsley, 1998). As Kant (2014) realised, it is important to understand the relationship and distinction between ontology and epistemology before starting research. Failing to do so may lead to the possibility of false reasoning. Consequently, as Bates and Jenkins (2007) noted, it is crucial for researchers not to blindly 'follow the leader' but to decide their own philosophical positions. According to Marsh and Furlong (2002), "ontological and epistemological positions should not be treated like a sweater that can be 'put on' when we are addressing such philosophical issues and 'taken off' when we are doing research" (p. 21). Consequently, the nexus of ontology and epistemology is symbiotic. Considered rhetorically, how can we consider knowledge without considering reality? Conversely, how can we understand reality without knowledge of it? Those considerations lie at the heart of philosophical thinking, and simply cannot be answered adequately in my dissertation. Nonetheless, ontological and epistemological considerations permeate my work, my wider being and becoming, and most importantly, the understanding and interpretation of my work, not only by myself, but by my readers.

2.3 Conceptualising Ontology and Epistemology

I draw upon two world views in my conceptualisation of ontology and epistemology. Those world views reflect my life as a Chinese man and also as a Chinese man who has lived in Hong Kong, the United Kingdom, and now Aotearoa New Zealand. My understanding and presentation of my expressions of ontology and epistemology are therefore influenced by those lived experiences. Similarly, I write for a Western academic audience; consequently, my notions of ontology and epistemology are slanted in that direction. By viewing the world in relativist ways, I present my own and others' notions as a subjective and dynamic expression of reality and knowledge that is socio-temporally located. Complementing that are my learnings and reflections revealing how reality is, for me, a socially constructed concept (Berger & Luckmann, 1966). That reality includes notions of shared dynamic knowledge and realities.

2.4 The Social Construction of Reality Thesis

Berger and Luckmann's (1966) social construction of reality thesis suggests that people create their world in order to understand it. Exemplifying that creation and

subsequent understanding, I explore notions of colour and its understanding. Colour is a concept shared across all cultures; however, different cultures may have different perspectives about the same colour. In order to better understand colour, Green-Armytage (2006) positioned colour within seven categories, which are: "conventional colour, substance colour, formula colour, spectral profile colour, psychophysical colour, inherent colour, and perceived colour" (p. 253). According to O'Connor's (2021) review on traditional colour theory, the ontology of colour focuses on substance colour (pigment colour) only. By putting this broad topic under a narrow ontological lens, traditional colour theory become a fundamental knowledge base that is shared among different individuals, groups, and cultures. That process, aided by interactive communication, distils notions of what constitutes 'green', and within that knowledge comes the ways in which we make sense of the world around us (Berger & Luckmann, 1966).

2.5 Conceptualising the Social Construction of Reality Thesis

The social construction of reality thesis (Berger & Luckmann, 1966) is the main framework supporting my dissertation research. To make sense of huangjiu, the Chinese character 'jiu' is constructed as a way to categorise huangjiu. Likewise, the English word 'alcohol' is constructed for a similar purpose. Hence, different societies also share similar constructed realities, but often have different linguistic expressions for the same 'thing'.

Huangjiu is also a constructed term used by the Chinese to describe a fermented beverage made from grain and jiuqu. Chinese people use huangjiu to help them make sense of the world (Berger & Luckmann, 1966; Sun 2022). Reflecting that, and the hierarchal nature of Chinese socio-culture, in modern times a young person would position themselves lower than their elder when toasting with huangjiu, in order to show the elder respect (Sun, 2022). In that way, making sense of our constructed world also includes actions, rituals, and ways of being and becoming. These rituals and customs have been consolidated over many generations. According to Sun (2022), within the 56 ethnic groups in China, excepting hui zu (回族),[4] a group who do not drink alcohol (Qingyang Vocational and Technical College,

[4] Hui zu (回族): Chinese Muslims are known as 'hui zu' regardless of their race, ethnicity, and/or language (Levi, 2019).

2016), each group has their own unique drinking etiquette and rituals. The famous Chinese *Book of Rites* (禮記) noted that it is important that visitors to regions of China follow and observe the local drinking etiquette (Confucius, 2013). Given that, as a nation, China has endured multiple unifications[5] and fragmentations[6] (Baaquie & Wang, 2018), drinking rituals are but one way of creating social stability through shared interaction (Baaquie & Wang, 2018).

2.6 Summary and Conclusions for Chapter 2

My understanding of the world has been clarified by my considerations of the theory and philosophical positioning underpinning my dissertation. While ontology (Bilgrami, 2002; Crotty, 1998; Healy & Perry, 2000; Jacquette, 2002; Proctor, 1998) and epistemology (Crotty, 1998; Hanly & Fitzpatrick Hanly, 2001; Kelley et al., 2019; Rand, 1990; Ültanir, 2012) were daunting terms, I have come to understand the importance of reality and knowledge. Until I embarked on my dissertation journey, I gave these topics little thought. However, my dissertation research has shown me that, within my topic and my lived experience, constructs of knowledge and reality are interwoven within my (and our) interpretation of the world around us. In that way, huangjiu is a shared reality that is expressed in multiple ritualised and subjective ways. Those 'ways' reflect the socio-temporal development of the beverage, all the knowledge related to it, and the people who have enjoyed this unique beverage. That development, knowledge and enjoyment creates our dynamic realities. Consequently, within my research I have located my sense of self inasmuch as I now realise that as people, we construct our world and the items in it, like huangjiu, and those acts of construction create our knowledge and reality within our being and becoming who we are. As I noted in my previous chapter summary, concepts of knowledge and reality are reinforced by language and interaction. Building on that notion, in Chapter 3, I present my review of literature. That literature reflects constructs of both reality and knowledge. That corpus helps us to make sense of the world around us (Berger & Luckmann, 1966).

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[5] Unification: Homogeneous communities merge to become a larger society; for example, Emperor Qin Shi Huang unified China in 221 BCE, a unification which lasted for 440 years (Baaquie & Wang, 2018; Berit & Strandskogen, 2015; Lee & de Vries, 2018).

[6] Fragmentation: Parcelling of land or community into smaller fragments; for example, China fragmented during the final stages of the Han dynasty in 220 CE, a situation which lasted for 370 years (Baaquie & Wang, 2018; Van Dijk, 2003).

Chapter 3: Literature Review

A literature review is a research tool summarising previous research, theory, and the positioning of other academics on a specific topic. Thus, a literature review enables a researcher to 'go deeper' by exploring and contributing to research knowledge through further research. In most cases, a literature review is part of a thesis or dissertation, but it could also be an independent review (Jesson et al., 2011). According to Booth et al. (2021), a literature review can be realised in two styles: traditional and systematic literature reviews. No matter the style, a literature review serves the same purpose: it summarises, evaluates, and presents existing knowledge (Jesson et al., 2011). According to Baumeister (2013), a traditional literature review takes a personal perspective, whereby the author's interpretation of existing literature dominates their review. That perspective also includes the author's descriptive and critical evaluation (Baumeister, 2013). Contrasting that, a systematic literature review is an "explicit, and reproductible method for identifying, evaluating, and synthesizing the existing body of completed and recorded work produced by researchers, scholars, and practitioners" (Fink, 2019, p. 6). In that way a systematic approach minimises an author's personal input, thus providing a more neutral and, according to Greyson et al. (2019), a more reliable review. Compounding those positions, a literature review is often presented in thematic or chronological order. A chronologically focussed literature review explores the development of the chosen topic through a period of time (McCombes, 2022). A thematic literature review identifies and then discusses themes (Alhojailan, 2012).

My literature review takes a blended approach, incorporating and maximising traditional (Baumeister, 2013), systematic (Greyson et al., 2019), chronological (McCombes, 2022) and thematic (Alhojailan, 2012) approaches. Considering those approaches, my literature review identifies, defines, discusses, synthesises, and considers a wide range of huangjiu literature. Within that format, my literature review illuminates a topic that has not been widely explored within the Western academy. Consequently, my literature review and the exploration of my topic make a unique academic research contribution to the Western academy.

My literature review begins by introducing Shaoxing, the Chinese city renowned for its huangjiu production (Máo, 2020). Then, an historical overview of huangjiu is

presented. Following that is a contemporary overview of huangjiu, looking at traditional and contemporary production methods. Rounding out my literature review, I explore huangjiu's social-political potency and the differences between Chinese and Western drinking cultures.

While my dissertation and literature review rely on secondary research resources gathered through the AUT library, internet academic resources (Google Scholar, JSTOR, EBSCO, and CNKI), it also relies on a significant number of contemporary textbooks sourced from China. Those texts included:

- *Huángjiǔ Mǐjiǔ Shēngchǎn [Yellow Alcohol Rice Alcohol Production]* (Céng et al., 2019);
- *Huángjiǔ Gōngnéng Yīnzǐ Yǔ Yíngyǎng Bǎojiàn [Yellow Alcohol Functional Factors and Health Care]* (Guō et al., 2021);
- *Huángjiǔ: Shēngchǎn Gōngyì Yǔ Jìshù [Yellow Alcohol: Production Art and Technique]* (Hé et al., 2017);
- *Huángjiǔ Niàngzào: Guānjiàn Jìshù Yǔ Gōngchéng Yìngyòng [Yellow Alcohol Brewing: Key Technique and Engineering Application]* (Máo, 2020);
- *Guó Jiǔ [National Alcohol]* (Sun, 2022);
- *Huángjiǔ Niàngzào Jìshù [Yellow Alcohol Brewing Technique]* (Xiè, 2020); and
- *Huángjiǔ Gōngyè Shǒucè [Yellow Alcohol Industrial Handbook]* (Zhào, 2020).

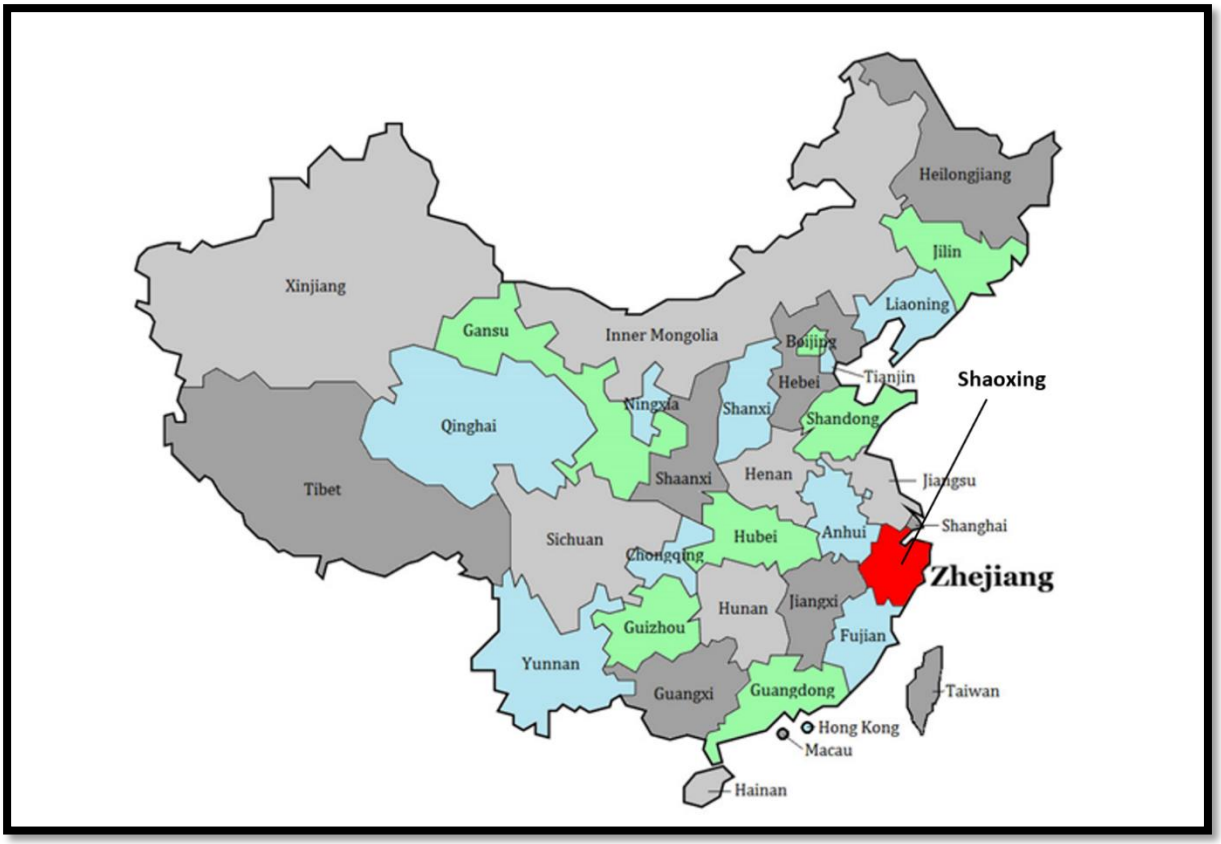
These texts are not available within Western bookshop offerings. Consequently, including them in my dissertation makes a significant and unique contribution to academic knowledge. Because these texts are not English language texts, part of my research work has been their translation.

Fortunately, these texts were written in formats including traditional and simplified Chinese characters. I studied these characters during my schooling, and they are part of my language repertoire. Consequently, I have every confidence that within my multilingual abilities (I speak Chinese, Cantonese, and English) that I can fairly and accurately move between different languages and, in doing so, bring accuracy and authenticity to my work.

3.1 Shaoxing and Shaoxingjiu

Shaoxing city is in the Zhejiang province of China. The city has a population of more than 4 million people (Song, 2021). Shaoxing city is steeped in culture and eco-tourism (Song, 2021). Reflecting the former, Shaoxing is the birthplace of numerous scholars and important figures. They include Yu the Great, a ruler who developed the first ever dynasty (the Xia dynasty) in ancient China around 2200 BC to 1760 BC (Allan, 1984). Shaoxing is also the hometown of Lu Xun, a famous author often regarded as the father of modern Chinese literature (Wang, 2010). Reflecting the city's emphasis on eco-tourism are its canals, historic sites, and proximity to the Yangtze River. That combination has given the city a peaceful and elegant ambience (Wang, 2010). Unsurprisingly, Shaoxing city is known as the 'Oriental Venice' (Song, 2021).

Figure 1: Map of China



Note. From University of Illinois Urbana-Champaign (2023).

Alongside Shanghai, Jiangsu, Fujian, Shandong, Zhejiang, Shanxi, Henan, Hubei, and Guangdong, Shaoxing city is one of the most famous huangjiu production regions in China (Máo, 2020). The huangjiu produced in Shaoxing city is specifically

named after its city of production, it is called ‘Shaoxingjiu’, where ‘Shaoxing’ is the name of the city and ‘jiu’ means alcohol (Hàndiǎn, n.d.d). Three unique ingredients make the huangjiu produced in Shaoxing special. Those ingredients have crowned the regional beverage as the king of huangjiu (Zhào, 2020). The first special ingredient is the choice of the best quality glutinous rice (Céng et al., 2019). Because glutinous rice’s starch is mainly amylopectin, a highly branched molecule, rather than amylose, a straight chain molecule (Gunaratne & Corke, 2016), it absorbs water at a faster rate, thus enhancing yield (Céng et al., 2019). The second special ingredient is a traditional wheat-based jiuqu (Céng et al., 2019). A traditional wheat-based jiuqu provides natural yeast promoting fermentation. Additionally, a traditional wheat-based jiuqu also contains an abundance of micro-organisms that create a unique aromatic and colour profile (Máo, 2020). The third special ingredient is the water, taken from Jian Lake (Máo, 2020). That water is exclusively used for Shaoxingjiu production. According to Zhào (2020), that water must meet certain standards. Those standards include that, the chromaticity (colour of the water) has to be lower than 15°; the turbidity (clarity of the water) has to be lower than 5°; the water is odourless and contains no solid matter (Zhào, 2020). Additionally, the water from Lake Jian has an average water hardness of 71.25 mg/L and a pH level of 7.2 (Hé et al., 2017). The water hardness, defined by the amount of calcium carbonate per litre of water, sits within the recommended range of 36–126 mg/L (Máo, 2020). However, if the water hardness is too low, the fermentation process is too rapid resulting in a bitter, flat beverage (Máo, 2020). For huangjiu brewing, a pH of 6.8–7.8 is ideal (Zhào, 2020). If the mixture is to acidic or alkaline, it results in a poor-quality product (Máo, 2020). Additionally, the lake’s high waterflow ensures that it is fresh and clear (Hé et al., 2017).

The four most commonly produced Shaoxingjiu styles, presented below in Table 2, conform to the national standards for huangjiu (GB/T 13662-2018) in terms of their sugar content (Chinese Standard, 2018).

Table 2: Four Common Shaoxingjiu

Style	Ingredients	Sugar Content	Alcohol Content
Yuán hóng (元紅)	Glutinous rice, wheat-based jiuqu, Jian Lake water	≤15 g/L	~17 - 20%
Jiā fàn (加飯)	Additional glutinous rice, wheat-based jiuqu, Jian Lake water	15.1 – 40 g/L	~18 - 22%
Shàn niàng (善釀)	Glutinous rice, wheat-based jiuqu, aged Yuan Eyre	40 – 100 g/L	~15%
Xiāng xuě (香雪)	Glutinous rice, wheat-based jiuqu, Zao shao	>100 g/L	>20%

Note. Compiled from Céng et al. (2019), Hé et al. (2017), Máo (2020), Sun (2020), Zhào (2020).

The most common Shaoxingjiu style is Yuán hóng (元紅). This huangjiu style does not require aging. It takes two months to produce. The second style is called Jiā fàn (加飯), which translates to 'add rice.' Jiā fàn has a longer brewing period of more than three months. It is also famous for its aging potential, hence its notation: 'the older it gets the better' (越陈越香) (Zhào, 2020). This results in a full-bodied huangjiu with enhanced aromatic notes when compared to Yuán hóng. The third style of Shaoxingjiu is called Shàn niàng (善釀), or 'good brew.' Its name evolved because of its popularity (Guō et al., 2021). By using an aged Yuán hóng rather than a basic Yuán hóng, this product has the taste profile of an aged huangjiu, even though it has a shorter production time (Zhào, 2020). However, during the brewing process, adding alcohol to the brew causes the yeast growth to slow down. That slowing leads to an incomplete fermentation process resulting in a higher residual sugar level (Zhào, 2020). Finally, the fourth Shaoxingjiu style is called Xiāng xuě (香雪). Its naming reflects its pale white brewing residue that resembles snowflakes, or 'fragrant snow' (Guō et al., 2021). However, Xiāng xuě is a fortified alcohol. It uses a spirit called Zao shao (糟燒). Zao shao is made by distilling the huangjiu residue. This spirit is used to replace the Jian Lake water. The brewing process for Xiāng xuě takes four to five months to complete. During this time its nauseous smell slowly dissipates. A completed Xiāng xuě has a golden colour, a luscious taste, and mellow aroma devoid of any 'heated' alcohol taste (Céng et al., 2019).

3.2 Huangjiu Classifications in Ancient China

Table 3: Three Types of Huangjiu

Type	Description	Usage
Occasional alcohol (事酒)	• Has not been aged • Cloudy • Brewed in winter and bottled in spring	• Brewed for specific occasions such as funerals and weddings
Aged alcohol (昔酒)	• Has been aged • Less cloudy • Brewed in winter and bottled in spring	• For everyday consumption
Clear alcohol (清酒)	• Has been aged longer than aged alcohol • Transparent • Brewed in winter and bottled in summer	• For royal and noble classes • Brewed for worship

Note. Adapted from Hé et al. (2017) and Liu et al. (2014).

Occasional alcohol was used when brewed, without aging. Aged alcohol was brewed for later consumption. Lastly, clear alcohol was considered to be a high-quality product because it had been filtered and clarified during its final stages of production. However, during the Zhou dynasty (1027–221 BCE), huangjiu was commonly consumed unfiltered, its residue providing satiety (Hé et al., 2017). Consequently, huangjiu production has been a dynamic process that has evolved and been refined over time.

3.3 Contemporary Huangjiu (1990–2023)

Contemporary technologies have positively impacted huangjiu production. Consequently, both production and consumption levels are anticipated to rise (Céng et al., 2019). Despite those anticipated increases, during 1949 huangjiu production had shrunk to 25,000 tons per year (Zhào, 2020). Then, during the 1990s, the Chinese Government promoted huangjiu as the nation's national wine (Máo, 2020). Additionally, the Chinese Government reduced huangjiu-related taxes in order to stimulate production (Zhào, 2020). In 2005, the China Huangjiu Museum was opened in Shaoxing city (Zhōngguó huángjiǔ bówùguǎn, 2015). The museum building has an area of approximately 10,000 square metres. To present the culture of huangjiu to museum visitors, the history, production, and traditions of huangjiu are

displayed in different sections of the building. Additionally, the methods of storage and 'uncorking' of huangjiu are demonstrated by an on-site specialist. Following that is a huangjiu tasting (Zhōngguó huángjiǔ bówùguǎn, 2015). As a consequence of governmental recognition of the beverage, and its highlighting within a dedicated museum during the early years of the new millennium, huangjiu production reached 3.1 million tons per year (Zhào, 2020). That popularity has, in reflection of earlier times, encouraged the production of regional versions of huangjiu (Sun, 2022). The French word 'terroir'[7] is applicable to huangjiu. Famous huangjiu terroirs are recognised within a short motto: 'South Shao North Dai' (南紹北代). That motto indicates that in Southern China, Shaoxing City (of the Zhejiang province) produces the best huangjiu; while, in China's North, the Dai prefecture (now known as the Dai County of the Shanxi province) is equally renowned for its huangjiu (Sun, 2022). Notwithstanding those locations, other Chinese provinces producing huangjiu do so but with different grains. Brewers in Yan'An city, in Shaanxi province, use common rice (*Oryza sativa*) as the main ingredient; the resulting huangjiu is red in colour, aromatic and easy to drink (Hé et al., 2017). Black glutinous rice is used in the Jiangxi province of China to produce a huangjiu that is reddish-brown in colour and has a pleasant sweet/sourness (Hé et al., 2017). Another famous huangjiu developed during the Song dynasty (960–1279 CE) in the Shandong province uses millet as its main grain ingredient. Millet produces a brown-coloured huangjiu with a hint of bitterness, and a lasting aroma (Sun, 2022). Given changing tastes and technologies, huangjiu made from maize and sweet potato are becoming common (Hé et al., 2017).

Although not directly related to my topic it is interesting to note that those locations are also famous for vinegar production. As Chinese legend has it, Di Zhu (帝杼), son of Du Kang (杜康), discovered vinegar by accidently over-fermenting huangjiu (Sima, ca. 86–145 BCE/1993). Soon after that, vinegar quickly became an everyday Chinese condiment. Then, during the 10th century, Song Ci (or Sung Tz'u), a Chinese forensic scientist, promoted vinegar's use, with sulphur, as a hand sanitiser for use in autopsies (Chan et al., 1994).

[7] Terroir: The environmental conditions that will affect the characteristics of the resulting wine which includes climate, soil, and the vine (Clingeleffer, 2014).

3.4 Traditional and Modern Huangjiu Technologies

The huangjiu brewing process consists of seven fundamental steps, namely: soaking, steaming, jiuqu making, fermenting, pressing, sealing, and storing (Zhào, 2020).

3.4.1 Soaking the Rice

Soaking, as the first step in huangjiu production, softens the grain by submerging it in cold water between 3 to 12°C for at least 40 hours (Máo, 2020). This allows the grain to fully absorb water and to expand. This makes steaming and maceration easier (Céng et al., 2019). Traditionally, as shown in Figure 2, the rice is soaked in a large ceramic pot (Zhào, 2020). After soaking, it is drained manually. In modern huangjiu production (see Figure 3), rice is tube-fed into large stainless-steel tanks filled with water. Then, automated drainage separates the soaked rice from the water (Hé et al., 2017). Unlike the traditional method, the stainless-steel tanks are temperature controlled to ensure consistent soaking (Xiè, 2020).

Figure 2: Traditional Rice Soaking

Figure 3: Modern Rice Soaking

Note. From Zhào (2020).

3.4.2 Steaming the Rice

After soaking comes steaming. According to Céng et al. (2019), steaming (1) eliminates any unwanted bacterial growth in the grain; (2) promotes a partial breakdown of the grain, facilitating fermentation; and (3) removes unpleasant odours from the grain while promoting more pleasant aromas. Figure 4 shows rice being steamed in the traditional manner using wooden buckets of rice suspended over woks of boiling water. This method is labour intensive (Céng et al., 2019; Zhào, 2020). Contrasting that, Figure 5 shows the use of an automatic horizontal rice steamer. The horizontal steamer allows the rice to move along a conveyor belt while being simultaneously steamed (Céng et al., 2019). By the time the steamed rice

reaches the end of the line, it has been both steamed and cooled (Zhào, 2020). Now, it is ready for fermentation.

Figure 4: Traditional Rice Steaming

Figure 5: Modern Rice Steaming

Note. From Zhào (2020).

With sustainability in mind, traditional huangjiu brewing requires large amounts of water in order to completely rinse and soak the rice. Additionally, the amount of energy required to steam the rice is also high. A recent cutting-edge solution, reflecting a more sustainable production style which, in particular, uses less water and energy includes the liquified brewing method (Zhào, 2020). In that method, the raw ingredients are pulverised, then covered with an enzyme powder that liquifies the ingredients (Zhào, 2020). The liquified ingredients are then processed in the conventional manner. That revision not only reduces water use, but also increases transport efficiency because the pulverised matter is more easily moved (Zhào, 2020).

3.4.3 Jiuqu Making (Saccharification)

Jiuqu makes huangjiu unique compared to other alcoholic beverages. Like all steps in huangjiu production, the art of jiuqu making has evolved over time and has been enhanced by technology. Figure 6 shows two workers stepping on grain inside a mold. The choice of grain depends on the style of huangjiu the brewer is making. Jiuqu made from different grains creates different flavour profiles distinguishing the final product (Máo, 2020). Notwithstanding that, the grain has been previously rolled and soaked in water (Zhào, 2020). Stepping on the grain continues until a firm stable shape is created (Hé et al., 2017). Then, the shaped grain, an early form of jiuqu, is transferred into a dedicated room so it can mature. There the temperature and humidity are controlled by adjusting an open window (Zhào, 2020). Modern technology has streamlined this process. Figure 7 shows an automated jiuqu making

machine at the Kuaijishan Shaoxing Rice Wine Company. This machine automates the sieving, mixing, sprinkling, portioning, cultivating, drying, and storing processes. This machine can produce 4,000 tons of jiuqu per year (Zhào, 2020).

Figure 6: Traditional Jiuqu Making

Figure 7: Modern Jiuqu Making

Note. From Zhào, (2020).

3.4.4 Fermentation Process

The purpose of fermentation is to convert sugar into alcohol. Consequently, fermentation is one of the most crucial steps in huangjiu production. Traditionally, all the huangjiu ingredients are poured into a large clay pot and continuously stirred using large paddles (see Figure 8) (Xiè, 2020). However, in recent years, this labour-intensive process has been replaced by automation (Zhào, 2020). Temperature controlled in-ground stainless steel vats with industrial mixers (see Figure 9) are now commonly used at large huangjiu production sites. Those technologies provide a stable and controlled environment promoting fermentation (Zhào, 2020).

Figure 8: Traditional Fermenting

Figure 9: Modern Fermenting

Note. From Zhào (2020).

3.4.5 Pressing the Huangjiu Mash

In huangjiu brewing, 'pressing' is a remarkably similar process to the 'pressing' process in Western wine production. However, in wine making, the 'pressing' process occurs before fermentation. This contrasts huangjiu brewing where 'pressing' is completed post-fermentation (Clarke & Rand, 2015; Xiè, 2020). Traditionally, as Figure 10 illustrates, pressing uses heavy weights to maximise gravitational force. That force exudes the liquid from the huangjiu mash (Céng et al., 2019). The liquid is then filtered and clarified. As Zhào (2020) asserted, the traditional pressing method is much less efficient than contemporary methods. Contemporary pressing requires a plate and frame filter press (Figure 11) that uses a hydraulic cylinder to force the huangjiu mash through layers of filter paper in order obtain a filtered huangjiu (Kriegel, 1938). Brewers then transfer the filtered huangjiu into a stainless-steel tank and allow the huangjiu to 'rest.' This allows any residue to sink to the bottom of the container, leaving the clear huangjiu on the top (Zhào, 2020). Brewers will often collect the residue and pass it through the presser once again in order to obtain a completely clear huangjiu. A freshly pressed huangjiu is now ready to be sealed in the next production step.

Figure 10: Traditional Pressing

Figure 11: Modern Pressing

Note. From Zhào (2020).

A contemporary adaptation to traditional huangjiu is raw huangjiu. Raw huangjiu has not been heated in order to kill its bacteria. Consequently, raw huangjiu is the closest

in taste and production to the huangjiu of ancient China (Zhào, 2020). Raw huangjiu, because it is not heat pasteurised[8], has a fresh taste (Zhào, 2020). Generally, the production of raw huangjiu is completed right after its pressing (as noted above). However, to produce a raw huangjiu that is safe to consume based on today's hygiene standards, two additional steps are undertaken. First, the equipment is meticulously sanitised in order to prevent any unwanted bacteria contaminating the huangjiu (Zhào, 2020). Second, the beverage is filtered in order to remove any unwanted bacteria and yeast from the raw huangjiu (Zhào, 2020). Consequent to those processes, a raw huangjiu has the same shelf life as a traditional huangjiu. Its difference is detected in its refreshing and pungent aroma (Zhào, 2020).

3.4.6 Sealing the Huangjiu

After pasteurising the filtered huangjiu, it is then sealed in an urn while still hot (Céng et al., 2019). Traditionally, brewers poured the huangjiu into an urn that had been cleaned and sanitised. Then, various items including lotus leaf, glossy paper, bamboo shell, bamboo rope, or clay were used to seal the urn (see Figure 12) (Xiè, 2020). Again, the traditional sealing process was tedious and slow (Zhào, 2020). Nowadays, this process is automated inasmuch as an all-in-one huangjiu sealing machine completes most of the labour-intensive processes including cleaning, sanitising, and filling (see Figure 13).

Figure 12: Traditional Huangjiu Sealing

Figure 13: Modern Huangjiu Sealing

Note. From Zhào (2020).

[8] Pasteurisation: A treatment of applying heat below 100°C to a food product to minimise bacteria and extend the product's shelf-life (Fellows, 2009).

However, sealing the urn is still completed by the brewer as the sealing process is far too complicated for modern machinery to replicate[9] (Xiè, 2020). Overall, according to Zhào (2020), a huangjiu sealing machine reduces labour costs by 20%, and saves up to 50% of water use, compared to traditional methods.

3.4.7 Storing the Huangjiu

Like wine, various huangjiu styles benefit from aging. Reflecting that, a typical huangjiu produced in Shaoxing requires three years' aging (Céng et al., 2019). During storing/aging, it is important to ensure that no contamination or mishandling occurs. Currently, there are two main storage/aging methods for huangjiu. The first, reflecting tradition uses a sealed urn (see Figure 14). The second method uses a modern stainless-steel vat (see Figure 15) (Zhào, 2020). Commonly, and within traditional storage/aging, a standard ceramic urn holds approximately 25L of huangjiu. The porous nature of the ceramic promotes its aging (Clarke & Rand, 2015; Zhào, 2020).

Figure 14**: Traditional Huangjiu Storing**

Figure 15**: Modern Huangjiu Storing**

Note. From Zhào (2020).

However, using ceramic vats that only hold 25l creates space and storage issues. (Céng et al., 2019). That issue has prompted the use of modern stainless-steel vats. Those vats can store/age 50 tons of huangjiu each (Céng et al., 2019). Consequently, maintaining these enormous vats requires large scale-cleaning and sanitising processes before storing a new batch of huangjiu. Any contamination may

[9] Machine sealing: Modern machinery is inefficient in sealing the urn because materials not commonly used in machine-based processes, like lotus leaf, glossy paper, bamboo shell, bamboo rope, or clay, are difficult for a machine to handle (Zhào, 2020).

affect the huangjiu's quality (Máo, 2020). Moreover, when comparing the two materials, ceramics and stainless steel, ceramics promote oxidation whereas a stainless-steel vat does not (Zhào, 2020). According to Zhào (2020), the oxidation technology inherent in using stainless steel, compared to ceramics, is an area of ongoing scientific development.

However, a contemporary step has been added to huangjiu production. Like many Western alcoholic beverages, including wine, brandy, whisky, sherry, and port, that are aged in oak barrels, huangjiu producer 'Grand Talon' in Guangdong has begun to age its huangjiu in French and American oak barrels (Grand Talon, n.d.). By creating a blended product consisting of traditionally made huangjiu and barrel-aged huangjiu, western flavour notes of muscat, poached plum, and toasted chestnut along with flavours of fruit cake, and crisp apple can now be found in contemporary huangjiu (Grand Talon, n.d.).

3.5 Huangjiu's Social-political Potency

Over its history, huangjiu has been used as an occasional beverage served during festivals and celebration. It has transformed into a symbolic icon for hospitality and socialisation. In the Eastern Han dynasty (25–220 CE), General Cao Cao had discovered a unique huangjiu brewing technique that imparted a luscious and aromatic flavour (Hé et al., 2017). Cao Cao dedicated this technique to the Eastern Han Emperor, Xiandi, in order to gain his trust and favour. In that way, huangjiu has been used as a political tool, a gesture of friendliness, and a marker of power relations.

In Shaoxing, the most renowned area for huangjiu production (Máo, 2020), most families tend to brew huangjiu as a traditional practice (Máo, 2020). Consequently, huangjiu holds high social and symbolic meaning. Reflecting those considerations is the popular but ancient myth of the tailor and his wife. On discovering his wife was pregnant, the tailor began to brew pots of huangjiu so he could celebrate the birth of his expected son. However, his wife gave birth to a baby girl. In ancient China a baby girl was the less preferred option (Sun, 2022). Disappointed at the birth of a girl, the tailor buried the pots of huangjiu in his garden. Time passed. Then, 18 years later, the tailor's daughter had grown into a beautiful and intelligent woman. The tailor married his daughter to his best apprentice. On their wedding day, the tailor

remembered the buried huangjiu and hurriedly dug it up. On consumption the aged huangjiu was surprisingly good. Since then, it became a tradition for families to brew and bury huangjiu whenever they have a baby. Later, the huangjiu will be dug up and consumed when the daughter is married, or the son has become a scholar (Sun, 2022). The quality of the aged huangjiu not only represents the family, but also represents a symbolic gesture of appreciation for the guests' attendance. The time and effort taken to brew and age the huangjiu represent the parents' hope and blessings for their offspring (Sun, 2022).

3.6 Western and Chinese Drinking Cultures

Western and Chinese cultures consider the consumption of alcoholic beverages in different ways. With that observation in mind, this section presents my discussion of those differences by exploring the material and spiritual aspects of both cultures within considerations of drinking alcoholic beverages. The discussion of these domains is important because, while differences exist, both Western and Chinese cultures 'use' alcoholic beverages in ways in which their understanding of their world is realised, reinforced, and renewed. Consequently, beverage consumption, no matter the culture, reflects Berger and Luckmann's (1966) idea that humans create their world, and its materiality and invented rituals, including alcohol, in order to aid their understanding of their culture and its uniqueness. Given the vastness of my topic, in the following section I explore Chinese and Western drinking cultures and the drinking vessels each culture commonly uses.

3.6.1 Chinese Perspectives on Alcohol Consumption

Given China's geographic position and the nation's enduring emphasis on grain production, it is understandable that many Chinese alcoholic beverages are derived from grains (Wang et al., 2010). However, alcoholic beverage consumption in China can be traced back to the neolithic period (5400–5000 BCE) when a fermented malt-based liquid was consumed (Céng et al., 2019; Hé et al., 2017). However, the development and popular consumption of jiuqu through the Xia and Qin dynasties (2070–207 BCE) meant that huangjiu and baijiu became popular vernacular alcoholic beverages (Xiè, 2020) at events that included weddings and birthdays. Those occasions added ritual to consumption. Reflecting that are the seating arrangements on special occasions. In traditional Chinese seating, there is a specific

seating plan that, while unwritten, is acknowledged by most people. According to Sun (2022), at a dining table the seating plan is based on the status of the individuals. Their status reflects considerations of age and their relationship to the host. On common occasions, seated at a round table, the host will usually face the entrance. Then, the most important guest will be seated on their right-hand side, followed by the second most important guest (Sun, 2022).

Another material aspect of Chinese drinking culture is its drinkware. According to Ráo (2010), the different shapes of Chinese drinkware change the contact point of the beverage on the consumer's tongue. Consequently, taste experiences are enhanced by a drinking vessels shape. Throughout Chinese history, the materials used for making drinkware have evolved from ceramic ware during the neolithic period (5400–5000 BCE) to copperware during the Shang dynasty (ca. 1600–1046 BCE) (Sun, 2020). Using copper aided the heating of alcoholic beverages (Ráo, 2010). Lacquerware was popular during the Qin dynasty period (221–207 BCE).

Drinkware also reflected social hierarchies. Exemplifying that, vessels made of gold and rare jades were reserved for the royal and upper classes (Sun, 2022). During the Zhao dynasty, in 7 BCE, in order to prevent war, a small nation from the west gifted the emperor Zhou Mu Wang a delicately hand-crafted cup. It was well known that Zhou Mu Wang enjoyed drinking (Wáng & Yú, 2009). The cup was named the 'luminous cup' because of its natural transparency in moonlight (Wáng & Yú, 2009).

Compounding that, Chinese drinking culture is considered to be excessive inasmuch as drinkers actively encourage others to drink more (Ráo, 2010). Encouraging others to drink more is considered an integral part of Chinese hospitality. That excess reflects the notion, within Chinese culture, of the importance of keeping guests well fed and 'watered' in acts displaying guest care (Sun, 2022). While encouraged, alcohol consumption denoted hospitality; but as M. Jiang (2022) realised, some people have taken advantage of this tradition to harass or test someone's devotion via their consumption capacity.

On the other hand, within Chinese drinking culture, there are courtesies and etiquette designed to recognise the status of older people (Sun, 2022). According to L. Jiang (2011), in order to show respect to the elder, a younger drinker should take the initiative to propose the toast and finish their drink first.

Chinese drinking culture is also influenced by Chinese scholars. Reflecting that, famous Chinese poet Li Bai (李白) is honoured with titles including 'Poetry Immortal' (詩仙) and 'Alcohol Immortal' (酒仙) for works that reflected his appreciation of alcohol and its influence on his writing. As legend has it, Li Bai once wrote one hundred poems with just a glass of huangjiu in his hand (Gong, 1993). One of his most famous poems, '*Bring in the Wine* (將進酒)', actively encouraged Chinese people to consume alcohol. Li Bai expressed his love of alcohol, realising it as a blessing rather than a sin, as reflected in the poetic line, "Sages in ancient times will always stay lonely, only those who drink will be remembered" (古來聖賢皆寂寞, 惟有飲者留其名) (Sun, 2006, p. 116). That line, in the spirit of carpe diem, reflects the influence of literature and authors on Chinese drinking culture.

3.6.2 Western Perspectives on Alcohol Consumption

Because the climate in many Western nation's best suits fruit production, wine and fruit-based alcoholic beverages have become poplar (Ráo, 2010). Phillips (2000) has traced early grapevine production and wine consumption back some 8,000 years. Colby (2013) proposed that grape-based wines became popular in Western cultures because the grape has a balance of sugar, acid, and tannin. Those components, Colby (2013) suggested, not only promoted fermentation, but also the wine's longevity and resultant taste. Additionally, grape production is perennial. This means that grapevines will continue to produce fruit every year, and live through winter climes (Hatfield & Walthall, 2014). As the art of winemaking begin to mature, various style of wine such as red wine, white wine, and sparkling wine developed. After the invention of distillation around 800 CE (Fairley, 1905), the distillation of wine created brandy. Both wine and brandy are commonplace on a Western dining table during celebrations and festivals (Ráo, 2010).

Like the Chinese, Western cultures started using ceramic drinking vessels during the Bronze Age (2000–700 BCE) (VinoLover, 2022). The Egyptians began using glass drinking vessels around 1400 BCE (Lilyquist, 1993). Since then, the use of glass as a drinking vessel has evolved.

Western culture discovered that the shape and size of a glass drinking vessel enhanced the beverage's aroma and drinking experience. Nowadays, there are

specific wine glasses to match grape varietals. Exemplifying that, a 'Bordeaux' glass has a larger bowl and tall wall to increase the distance between the drinker and the wine. This is a consideration because Bordeaux wines are pungent. The larger bowl allows oxygen to soften the high tannins and hence lower the total intensity experienced in consuming the wine (Delwiche & Pelchat, 2002).

In Western cultures, consuming alcohol often reflects religious belief, acts of hospitality, and, like the thirst-quenching nature of huangjiu, the need for a refreshing drink. In Christianity, particularly during communion and mass, red wine is the symbolic representation of the blood of Christ[10] (*The Holy Bible*, 1752/2011, Matthew. 26:28). Yet, the acceptance of food and wine at communion during mass also signify hospitality (bread as the symbolic acceptance of the body of Christ, and wine as his blood).

Hospitality's use of wine and other alcohols, like in Chinese culture, signify meaning and the ways in which, through drink-related rituals, many Westerners come to make sense of their world (Berger & Luckmann, 1966). Reflecting that are aperitifs and digestifs (L. Jiang, 2011). An aperitif is a light alcoholic beverage served before a meal to stimulate a diner's appetite. A digestif is often a strong or sweet alcoholic beverage served at the end of a meal in order to aid digestion (Rush, 2008). Today, many Westerners merge the etiquette of drinking into their everyday lives, an act reflecting their love and appreciation of alcohol.

3.7 Summary and Conclusions for Chapter 3

My thematic and chronologically blended approach to my literature review has realised, within the introduction of translated Chinese texts, new knowledge about huangjiu for the Western academy. In that way, my research makes a unique and timely academic contribution. However, within my literature review the tale of the tailor and huangjiu also connotes the ways in which myth serves to give people guidance and a sense of security in knowledge, even in contemporary times. In that way, huangjiu is transcendent over time, despite the contemporary refinements that have enhanced its standardisation through technology and science. While I have introduced the notion of terroir (Clarke & Rand, 2015; Clingeleffer, 2014; Sun, 2022),

[10] In Catholic belief, the notion of transubstantiation holds that the wine and bread have physically become the actual blood and body of the Christ (Karr, 2022).

that is not new to huangjiu production. Various regions of China have produced huangjiu over many millennia. However, the constant, albeit refined, themes are huangjiu's seven steps of production, the similarities between Chinese and Western drinking cultures, and the religious connotations of alcohol. Considering those themes demonstrates that, despite the passage of time, the diversity of the past is also reflected within contemporary huangjiu. Today, four common styles dominate huangjiu production (refer Table 2). Yet, in a nod to the past in the re-creation of an authentic huangjiu, raw huangjiu has become popular (Zhào, 2020). As I consider that, and my own search for identity, huangjiu and I have both come full circle.

While the information in my literature review is interesting, I have, in Chapter 4, realised the ways in which I can use this information to respond to my research questions. Consequently, Chapter 4, the next chapter, explores qualitative and quantitative research methodologies (Antwi & Hamza, 2015; Fryer et al., 2018; Garcia & Quek, 1997; Hignett & McDermott, 2015; Kalu, 2019; Sandelowski, 2000), thematic analysis (Alhojailan, 2012; Braun & Clarke, 2006; Nowell et al., 2017; Riger & Sigurvinsdottir, 2016), and highlight my choice of qualitative secondary inquiry as my preferred method.

Chapter 4: Methodology and Method

4.1 Introduction

This chapter presents my methodology and method. While methodology and method are derivative, methodology describes the theoretical perspective of the procedure, defining how to generate reliable research (Rawnsley, 1998). Aligned with that, method is the actual tool for data collection and its analysis – the operationalisation of methodology (Berryman, 2019). Consequently, while methodology determines method, method adapts methodology to best suit the research inquiry. Considering that, this chapter is divided into two sections: the theoretical aspects of the methodology chosen for my research, and then its application to my research within my explication of method.

In response to my research questions, my dissertation uses a qualitative methodology (Hignett & McDermott, 2015) maximising secondary research/data collection. Secondary research (Bryman, 2008; Stewart & Kamins, 1993) differs from primary research (Driscoll, 2011) because of the different types of data collected (Hox & Boeije, 2005). Secondary research focuses on secondary information usually sourced from various studies, research articles, or reliable texts and digital sources (Stewart & Kamins, 1993). In contrast to secondary research, primary research sources data by directly contacting people, engaging in interviews, and analysing the data from those sources. Primary researchers also collect data through observations, surveys, and interviews, after addressing ethical considerations (Driscoll, 2011). Although primary research is more time consuming, secondary research contributes new information and perspectives to the topic's knowledge base (Hox & Boeije, 2005).

In refining my qualitative research approach to the analysis of secondary data sources, one suitable option was thematic analysis (Alhojailan, 2012; Braun & Clarke, 2006; Nowell et al., 2017; Riger & Sigurvinsdottir, 2016). Thematic analysis aided my distillation of research themes from my secondary data sources. One unique aspect of my research has been my use of literature that is not available in the English language or the Western academy.

In that way, in responding to my research questions via the secondary material I sourced, and the methodology selected, my research makes a significant contribution to Western knowledge and understandings of huangjiu.

Beginning this section, I explore notions of qualitative (Garcia & Quek, 1997; Hignett & McDermott, 2015; Kalu, 2019; Sandelowski, 2000) and quantitative methodologies (Antwi & Hamza, 2015; Fryer et al., 2018) with the aid of Table 4. Additionally, I explore thematic analysis (Braun & Clarke, 2006; Creswell & Poth, 2016; Gibbs, 2007; Maguire & Delahunt, 2017; Mayring, 2004) and its application to my research (refer sections 4.3 and 4.4). Finally, and before summarising and concluding this chapter, I present an overview of my translation process.

4.2 Qualitative and Quantitative Methodologies

4.2.1 Qualitative Methodologies

Hignett and McDermott (2015) described qualitative research as an effort to understanding meaning, reflecting how humans use their experiences to make sense of their world: “a researcher's subjectivity enables penetration of the fronts individuals and groups represent which, in turn, permits deeper understanding of actors' perspectives and ways of living” (Garcia & Quek, 1997, p. 455). Qualitative researchers analyse the experiences of others in interpretive and descriptive ways (Sandelowski, 2000). These inquiries provide insight into lived experiences, reality, and knowledge (Kalu, 2019), thus linking research methodology to constructs of ontology and epistemology.

Notwithstanding that, researchers employing qualitative research methodologies can choose from a wide range of methodologies to support their inquiry. Reflecting those choices and my decision to engage in secondary qualitative research, Appendix A presents an overview of the qualitative methodologies that I considered for my research but ultimately rejected.

4.2.2 Quantitative Methodology

Contrasting qualitative methodologies is quantitative inquiry. According to Fryer et al. (2018), while qualitative methodologies focus on verbal and written data, quantitative methodologies focus on numbers, statistics, and their relationships.

Quantitative methodology is often associated with objectivism, given that replication is an important quantitative consideration (Antwi & Hamza, 2015). The strengths and weaknesses of qualitative and quantitative research methodologies are outlined in Table 4, below.

Table 4: Qualitative and Quantitative Methodologies – Strengths and Weaknesses

Qualitative Methodologies		**Quantitative Methodologies**	
Strength	*Weakness*	*Strength*	*Weakness*
Collects data involving emotion/feeling	Time consuming	Efficient	Cannot express feeling/emotion other than by numbers
Explores characteristics and personality	Result may contain researcher's bias	Easily comparable to other quantitative data	Produces objective results only
Flexibility	Collected data may not be relevant	Reliability and accuracy	Requires a large amount of data

Note. From Choy (2014).

4.3 Thematic Analysis

Thematic analysis is considered to be a fundamental method researchers use in conjunction with qualitative inquiry (Braun & Clarke, 2006). Braun and Clark (2006) recommend that thematic analysis is a sequential process. That process of analysis is outlined in Table 5, below.

Table 5: Six Steps of Thematic Analysis

Step 1: Studying data	It is important to become familiar with the data resources before using any of them. Consequently, all sources used need to be revised and noted before proceeding to the next step.
Step 2: Coding	After reading and re-reading the data, coding of key texts related to the research question is undertaken. Manual coding is conducted initially by highlighting texts of interest with a highlighter. The codes may then be transferred into NVivo, which is qualitative data analysis software for better efficiency, or the codes may be manually organised and categorised for later use.
Step 3: Grouping into sub-themes	When recurrent or related codes are identified, they will be grouped together under the same sub-themes. Before sorting sub-themes into actual themes and creating theme names, review is recommended.
Step 4: Revising themes	After the initial process of grouping codes into potential themes, a theme map is drawn to create an overview of current themes to distinguish their relevance to the research.

Step 5: Defining/creating theme names	Now that the remaining data is more refined, themes can be identified and analysed. Theme names (such as history, manufacture, traditional, modern, main ingredient, water, jiuqu) may be used to categorise codes into themes.
Step 6: Findings report	This is the endpoint of the research where the established themes are presented, evaluated, and used to respond to the research questions.

Note. Adapted from Braun and Clarke (2006).

The first step of thematic analysis is to carefully read through the data, or text. This reading should be repeated until the researcher feels comfortable with the content. Then, the coding process begins. Coding occurs when the researcher identifies sentences of interest and labels them with a codename (Gibbs, 2007).

'Open coding' was used in this research because it requires the constant comparation of codes, obtained from different sources, thus generating data with depth (Gibbs, 2007). Reflecting that, my research maximised multiple huangjiu-related texts within which the repetition of themes was identified. When I recognised similar codes, I grouped them into the same category, calling them themes (Creswell & Poth, 2016).

Thematic analysis is often confused with content analysis (Zhang & Wildemuth, 2005), as both methods require 'coding'. Although content analysis and thematic analysis share some similar techniques, the end goal of thematic analysis is to use themes to create new insights, whereas the main purpose content analysis is to quantify qualitative data (Maguire & Delahunt, 2017; Mayring, 2004).

4.4 Method – Qualitative Enquiry

Refining my considerations of qualitative research inquiry (refer section 4.2.1), I used secondary research as my qualitative method. Cheong et al. (2023) proposed that secondary qualitative data, and its analysis, "can be a powerful method by which to gain insight that primary data analysis cannot offer" (p. 1). Secondary qualitative inquiry, as Hughes et al. (2022) revealed, is also known as qualitative secondary analysis. My use of qualitative secondary analysis is refined within Hughes et al.'s (2022) consideration of configurative qualitative secondary analysis. Specifically, that mode of inquiry "refers to how existing data are brought into conversation with broader sources of theory and evidence, typically in ways which exploit greater temporal distance" (p. 375). As Becker (2007) noted, configurative qualitative

secondary analysis considers the research topic within the social world within which it functions. In that way, my topic is positioned within a socio-temporal continuum aligned to the ways in which people create and make sense of their world over time (Berger & Luckmann, 1966) and the development of huangjiu over time. I evidence my approach within the inclusion of Chinese language-based texts that, within a thematic analysis approach (Alhojailan, 2012; Braun & Clarke, 2006; Nowell et al., 2017; Riger & Sigurvinsdottir, 2016), open up my topic to new considerations and wider thinking. Consequently, my amalgam of method and thematic analysis reinforce my choice of these domains as my overarching method (refer Appendix A). In that way, my contribution to knowledge though this dissertation extends beyond my topic to include findings related to method, methodology, theoretical and conceptual framework (refer Chapter 5).

4.5 Method – Thematic Analysis

Braun and Clarke (2006) created a six-step guideline (refer Table 5 in section 4.3) for researchers to use thematic analysis. My research used an adapted version of their guideline. I did consider using NVivo software. However, I felt the need to know the data myself, and consequently decided that manual coding would add depth to my research, and my own exploration as researcher. In that way, I felt a deep 'ownership' of my data that I believe added richness and depth to my understanding of my topic. My application of thematic analysis, cognisant of Braun and Clarke (2006) included the steps set out below. Each step required thought, double checking, and ongoing consideration before I felt comfortable enough to progress confidently to my next step.

1. My exploration of huangjiu-related texts.
2. Reading and highlighting, paragraphs, sentences, and chapters of interest, potentialising future coding.
3. My consideration of common themes relative to my research questions.
4. Scrutiny, double checking and locating the relevance of thematically analysed materials I had included in Chapters 1 to 3.
5. Highlighting/colour-coding similar thematic patterns (refer Appendix B).
6. Reviewing highlighted codes in order to create themes.
7. Constructing a table of key themes (refer Table 6 in section 5.1).

After my thematic analysis of the data in Chapters 1 to 3, I identified the repetitive codes and distilled 12 key themes from 170 codes.

4.6 Process of Translation

My research and dissertation used Chinese language texts that focused on the history of huangjiu, its manufacture, and use. Those texts were written in Simplified Chinese. Simplified Chinese is a simplified version of Traditional Chinese (Lu & Aiken, 2004). Throughout my studies, growing up in Hong Kong China, knowing Traditional Chinese characters allowed me to understand Simplified Chinese as well. As an adult, today I am multi-lingual. However, I take pride in maintaining my use and connection with Traditional Chinese texts and Chinese spoken languages including Putonghua and Cantonese (Chen, 1993).

Yet, my familiarity with Simplified Chinese is not absolutely perfect because sometimes I find Chinese characters that I do not know. When that happens, like most people, I consult a dictionary. I use two dictionary sources, Google Translate (Google, n.d.) and the online Chinese dictionary Hàndiǎn (Hàndiǎn, n.d.b). Hàndiǎn contains 93,898 Chinese words and 361,998 vocabularies and is considered to be a reliable and reputable online dictionary (Hàndiǎn, n.d.b; Zhào, 2016).

As a free online dictionary, Hàndiǎn contains Simplified Chinese, Traditional Chinese, and English language translations (Hàndiǎn, n.d.b). Hàndiǎn aims is to disseminate Chinese culture, history, and knowledge to those interested in learning the Chinese language (Hàndiǎn, n.d.b).

While I relied on Hàndiǎn, occasionally there were some words that were difficult to give an English translation/meaning. The sentences from Li Bai's poem 'Bring in the Wine': "古來聖賢皆寂寞, 惟有飲者留其名" (Sun, 2006, p. 116), provides an example of this. The poem would not make English reading 'sense' should I translate it word by word. Similarly, Chinese words like 'qu (曲)' have seven different meanings: 1. Bent, 2. False, 3. Twisty area, 4. Remote area, 5. Catalyst in brewing, 6. Lyrics, and 7. Melody (Hàndiǎn, n.d.g). This makes translation an exercise in context relevance. Additionally, combining this word with another creates a completely different meaning. For instant, adding 'jiu (酒)' in front of qu will make it jiuqu, the catalyst for huangjiu (Hàndiǎn, n.d.e). Adding bù (部) in front of qu making it buqu, referencing a

military unit (Hàndiǎn, n.d.a). And adding ‘shì (士)’ after qu creates the word qushi, which describes rural peasants (Hàndiǎn, n.d.f).

Within my translation process, I began by looking through the table of content pages in each text. Then, I noted the page numbers that were related to my research. After that I read through those sections of text. On reading, I would take English language notations and use the dictionary when necessary. Often, I re-read various sections to ensure my understandings were correct. That process also sharpened my familiarity with my topic, despite the language differences. Within that process, I read many texts multiple times. As I read, I made English language notes. This is the point where translation occurred. Within my notes and reading, I would go back over passages to ensure my translation and understandings were correct. In that way, I was an intuitive translator who considered the context of my topic. Consequently, I believe that my translations are accurate and reflect the correct context within their translation.

4.7 Factors Impacting my Work on my Dissertation

Completing my dissertation has been negatively impacted by both personal and global events. In November 2022 my cousin, who I am very close to, was admitted to the Intensive Care Unit of the Royal Melbourne Hospital in Australia. She studies and lives alone in Melbourne while her parents work in Singapore. Being both geographically and emotionally close to her, I went to Melbourne and remained with her until her health condition stabilised and she was transferred to regular recovery ward. That time was difficult. I spent each day looking after my cousin. My dissertation progress stopped. My mind was absorbed in her recovery, which was a slow and emotionally draining experience for her and me.

Then, when I returned to Aotearoa New Zealand in January 2023, I contracted COVID-19. Possibly because I was a little run down after caring for my cousin, my recovery was slow. It took me two weeks, to ‘come right.’ During that time, I was plagued by a sore throat, headache, and a fever that made it difficult to focus. Consequently, my COVID-19 experience delayed my progress on my dissertation.

I returned to my cousin in April 2023. At that time, she was moved to the normal ward. I was required to travel to Australia again to assist my cousin to move into the

Acquired Brain Injury Rehabilitation Centre, as she was having difficulty walking and travelling. Once again, with the lack of internet and stable work environment, my efficiency in my research work had been lowered.

Recently, June 14, 2023, I was once again required to travel to Australia to escort my cousin out of the rehabilitation centre. My cousin became very emotional and sensitive, which made it impossible for me to leave her alone under these circumstances. I stayed in Melbourne, continuing my research while taking care of my cousin's needs, until my uncle returned on July 4, 2023.

4.8 Summary and Conclusion for Chapter 4

Choosing the right methodology is an important consideration for any researcher. Until I undertook this research, my research methodological knowledge was limited to what I had read in the academic papers I studied that were related to my wider study at AUT. I had no reason to question those methodologies or enquire into their robustness. They were published articles in peer reviewed journals. Consequently, like my study of ontology (Bilgrami, 2002; Crotty, 1998; Healy & Perry, 2000; Jacquette, 2002; Proctor, 1998) and epistemology (Crotty, 1998; Hanly & Fitzpatrick Hanly, 2001; Kelley et al., 2019; Rand, 1990; Ültanir, 2012), choosing the right methodology required thought. Helping in that process, my supervisor suggested that I explore multiple methodologies. Consequently, I developed Appendix A. That was sound advice. Soon, I came to know multiple methodologies. As I came to know them, I could include them in or exclude them from my research considerations. Over time and with thought, I narrowed my quest and finally decided upon Sindin's (2017) secondary qualitative data collection, and the analysis of that data via thematic analysis (Braun & Clarke, 2006; Creswell & Poth, 2016; Gibbs, 2007; Maguire & Delahunt, 2017; Mayring, 2004). Those choices, as I came to realise, added a depth of understanding to my topic that other methodologies would not have provided. I actioned the theory of methodology within my method, which streamlined and adapted theory to best suit my need. Reflecting the idea that I had made the right choice was my ease in conducting my thematic analysis and the value of the data I gleaned from that exercise.

Because my dissertation used multiple Chinese language texts, my translation of those texts was an important consideration. In my translation I was aware of context

and accuracy, and the importance of getting it right, given that I am introducing new information into the Western academy.

Chapter 5: Discussion and Conclusion

Beginning this chapter, I am mindful of my earlier remarks (refer section 1.2) that this chapter, while titled my "Discussion and Conclusion", starts by directly responding to my research questions (refer to Chapter 1). Considering that, and the parameters of a traditional dissertation discussion and conclusion chapter, my "Discussion and Conclusion" Chapter includes my findings and the discussion of those findings. This chapter also includes my reflections on my theoretical and conceptual frameworks, and my methodology and method. A table of key themes (refer Table 6 in section 5.1) compiled from my application of thematic analysis (Braun & Clarke, 2006; Creswell & Poth, 2016; Gibbs, 2007; Maguire & Delahunt, 2017; Mayring, 2004), provides the base from which I respond to my research questions.

After responding to my research questions, this chapter explores the implications and limitations of my research, then my recommendations for future research related to my topic. Finally, this chapter concludes with my reflection on my dissertation journey.

5.1 Responding to my Research Questions

To begin this section, I remind my readers of my research questions. My primary research question asked:

- ***In what ways has traditional Huangjiu changed over time in Shaoxing?***

My underpinning questions asked:

- ***How has Western culture influenced huangjiu?***
- ***How has technological innovation contributed to these changes?***

In the following sub-sections, I use my research questions as sub-headings and respond to them using an amalgam of information gleaned from Chapters 1 to 3. That information, and its frequency, is summarised in Table 6, below. In this way, my response to my research questions, not only constitutes their 'answer' but also their discussion.

Table 6: Key Themes Identified in Chapters 1 to 3

Theme	Frequency
Traditional Huangjiu Classification	6
Contemporary Huangjiu Classification	5
Traditional Huangjiu Ingredients	9
Contemporary Huangjiu Ingredients	10
Traditional Huangjiu Consumption	12
Contemporary Huangjiu Consumption	13
Chinese Drinking Culture	8
Western Drinking Culture	27
Chinese Drinkware	7
Western Drinkware	8
Traditional Huangjiu Technology	30
Contemporary Huangjiu Technology	35

Note. Refer also to Appendix B: Thematic Coding.

In responding to my primary question and the two supporting research questions below, I am mindful of their synergy. A reflection of that synergy is the overlap of themes that are suitable responses for more than one research question. Exemplifying that, the theme 'contemporary huangjiu consumption' has been used in all three research question responses. Additionally, 'contemporary huangjiu classification' has been used within research question responses one and three. These overlaps suggests that my topic is not only multifaceted but also that, within my research, a depth of findings has emerged that reflects the complex and interwoven nature of my topic and my research. Considering those 'overlays' of knowledge, my analysis and discussion provides a depth of understanding of my topic.

5.1.1 Responding to: In What Ways Has Traditional Huangjiu Changed Over Time in Shaoxing?

Encapsulating the ways in which traditional huangjiu has changed over time in Shaoxing, my exploration of the literature has concentrated upon themes within traditional and contemporary huangjiu's history and production. Within that

exploration, and cognisant of my thematic analysis (Braun & Clarke, 2006; Creswell & Poth, 2016; Gibbs, 2007; Maguire & Delahunt, 2017; Mayring, 2004) of the relevant literature as distilled in Table 6, the first six themes in the table are directly related to my response to my primary research question. Those themes are:

- traditional huangjiu classifications;
- contemporary huangjiu classifications;
- traditional huangjiu ingredients;
- contemporary huangjiu ingredients;
- traditional huangjiu consumption; and
- contemporary huangjiu consumption.

Considering those themes realises the socio-cultural and political importance of huangjiu over time in China. Consequently, my responses to my primary research question are socio-temporally located, reflecting huangjiu's history, commercialisation, and interconnection between my research questions. Considering the genesis of huangjiu, when Du Kang left grains that fermented in a hollow tree (Sima, ca. 86–145 BCE/1993), huangjiu has evolved into a beverage synonymous with Chinese identity and has been aligned in contemporary consumption to the well-known whiskey sour (Grand Talon, n.d.)

Reflecting huangjiu's early history, its classification denoted three styles as noted in the famous text, the *Rite of Zhou*. Those style classifications included occasional alcohol, aged alcohol, and clear alcohol (Liu et al., 2014). The three classifications are a reminder that, in earlier times huangjiu, was used for specific occasions, everyday consumption, and for worship (Hé et al., 2017; Liu et al., 2014). In that way, ancient classifications of huangjiu were limited.

Written in Northern Wei Dynasty (365–534 CE), the agricultural text *Qimin Yaoshu* recorded more than 40 examples of huangjiu brewing techniques as well as eight examples of huangjiu production (Hé et al., 2017). While this text does not directly classify huangjiu, it contributed significantly toward an understand of the beverage. During the Tang (618–907 CE) and Song (960–1279 CE) dynasties, the golden age of huangjiu development, two other huangjiu texts emerged: *Beishan Jiu Jing* and *Jiu Jing* (Hé et al., 2017). These texts became the 'official textbooks' for most huangjiu brewers of the day (Hé et al., 2017).

Notwithstanding that, huangjiu's biggest change, in both production and classification, occurred in 1949 with the establishment of People's Republic of China. At that time, as Hé et al. (2017) recounted, the classification of huangjiu began to change. That change, and the contemporary huangjiu classification system, resulted after the publication of the *National Standard of Huangjiu* (GB/T 13662-2018): (Chinese Standard, 2018). That classification system was based on huangjiu's sugar content (Chinese Standard, 2018). Sugar classification divided contemporary huangjiu into four styles in Shaoxing. Those styles are: Yuan hung, with 15g of sugar per litre; Jia fan, with 15–40g of sugar per litre; Shan niang, with 40–100g of sugar per litre; and Xiang xue, with more than 100g of sugar per litre (refer Chapter 3.1) (Céng et al., 2019; Hé et al., 2017; Máo, 2020; Sun, 2020; Zhào, 2020).

Another contemporary change impacting traditional huangjiu is its modern recipe. According to one of the earliest written huangjiu recipes, created by Emperor Wang Mang (9–23 CE; Xin Dynasty), huangjiu's ingredients included the mixing of rice, jiuqu, and water together (refer section 1.5) (Hé et al., 2017). Contrasting that recipe, contemporary huangjiu includes the brewing of rice, millet, black rice, maize, and/or wheat combined with jiuqu and water (Chinese Standard, 2018). Adding to that, huangjiu from Shaoxing also uses glutinous rice, wheat-based jiuqu, and water from Jian Lake (Céng et al., 2019; Máo, 2020). Considering the wider use of different grains in modern huangjiu production, contemporary huangjiu producers choose their grains based on the grain production common to their region. Exemplifying that, brewers in Shaanxi's Yan'An city use rice (*O. sativa*) as their main ingredients for a red huangjiu that is light and aromatic (Hé et al., 2017). In Jiangxi province, a black glutinous rice produces a darker huangjiu that is balanced in acidity and sweetness. In Shandong, millet use produces a brown huangjiu with good aroma and a hint of bitterness (Hé et al., 2017). In adaptive 'twists', huangjiu producers are also using sweet potato or corn as the beverage's main ingredients (Hé et al., 2017).

The drinking temperature of huangjiu is another contemporary point of difference. Traditionally, huangjiu was consumed as a warming winter beverage (Guō et al., 2021). However, reflecting huangjiu as a relaxing and refreshing beverage, contemporary huangjiu can be drunk chilled with ice during hot summer days to quench thirst (Guō et al., 2021). Huangjiu as a refreshing beverage contrasts its warming benefits in winter and reflects the ways in which China's emergent middle

class have adapted traditional beverages like huangjiu to reflect a leisure-based lifestyle, a lifestyle starkly contrasting many of their antecedents (Guō et al., 2021; Sun, 2022). Similarly, contemporary huangjiu manufacturers recognising this market have adapted the beverage as a cocktail (Grand Talon, n.d.). Yet, alongside those refinements, there has been a 'return to basics' as evidenced by raw huangjiu. Raw huangjiu is brewed without heated pasteurisation (Zhào, 2020). Today's taste for raw huangjiu takes the beverage back to its earliest days when it was commonly brewed in almost every household (Sun, 2022), and consumed without pasteurisation. Like the huangjiu of ancient China, contemporary raw huangjiu maintains its freshness of taste (Zhào, 2020). While raw huangjiu lacks pasteurisation, its drinking safety is insured by sanitising all the equipment and putting the raw huangjiu through a special filtration system that filters out any unwanted bacteria (Zhào, 2020).

Over time, reflecting both change and the impact of contemporary technologies, the commercial production of huangjiu has been enhanced. Once, huangjiu was a home brew item. That was best exemplified by the well-known story about the Shaoxing tailor and his daughter. Then, according to Máo (2020), almost all households in Shaoxing brewed their own huangjiu as a traditional practice. The tailor's family was not the exception. When the tailor found out that his wife was pregnant, he bought some high-quality ingredients and brewed a few pots of huangjiu to celebrate the newborn. While the tailor always wanted a son, his wife gave birth to a daughter. Consequently, in disappointment at having a daughter, the tailor buried the huangjiu in his backyard. After 18 years, on the wedding day of his daughter, who he was now very fond of, he dug up his brew and shared it with the wedding guests. The guests all commented on the huangjiu's quality. From that point, aging huangjiu became common in Shaoxing (Sun, 2022).

Today, commercial production has surpassed home-brew quantities and, arguably, quality. Exemplifying that, the average huangjiu production in 1949 was 25,000 tons (Zhào, 2020). Today, production exceeds 3.1 million tons (Zhào, 2020).

5.1.2 Responding to: How Has Western Culture Influenced Huangjiu?

Western culture has impacted huangjiu's production and commercial focus in multiple ways. Considering Table 6, the themes most relevant in response to this research question are:

- traditional huangjiu consumption;
- contemporary huangjiu consumption;
- Chinese drinking culture;
- Western drinking culture;
- Chinese drinkware;
- Western drinkware; and
- contemporary huangjiu technology.

Contemporary huangjiu consumption and enjoyment has been influenced by Western wine-tasting culture (Hé et al., 2017). While aging huangjiu has been a traditional part of its production, other Western influences permeate contemporary huangjiu production. As previously noted, the promotion of huangjiu as a Western-style cocktail (Grand Talon, n.d.) exemplifies the Western influence. Similarly, notions of 'terroir' (Clarke & Rand, 2015; Clingeleffer, 2014; Sun, 2022) influence huangjiu's regional appeal in much the same ways that the terroirs of France impact that nation's wine varietals and their enjoyment.

Considering huangjiu, terroir is realised in the grains that are used to produce the beverage. For instance, glutinous rice is commonly used in Shaoxing, black glutinous rice in Jiangxi, millet in Shandon, and common white rice in Yan'An (Hé et al., 2017; Sun, 2022). In those ways, huangjiu terroir is like Western wine production that uses different grape varieties in different regions (Clarke & Rand, 2015). Additionally, some contemporary huangjiu brews are aged in oak barrels (Grand Talon, n.d.). After the huangjiu is fermented and matured in a traditional clay vessel, the liquid is then transferred into a French/American oak barrel for further aging and maturation (Grand Talon, n.d.). However, that transfer and its resultant change in taste profile signifies a significant change in huangjiu production, aligning its taste and aroma profiles to that of aged Western wines, brandies, and sherries. Consequently, Western taste and aroma profiles have come to influence contemporary huangjiu production.

Similarly, considerations of drinkware are important in understanding the ways in which huangjiu has changed over time, and particularly how Western-style drinkware has influenced traditional huangjiu consumption. Traditional Chinese drinking vessels were often made of materials that could be heated. Consequently, bamboo

and copper vessels were ideal for traditional consumption of warm huangjiu. However, wine consumption has impacted the consumption of huangjiu (Guō et al., 2021; Sun, 2022). That, alongside the barrel aging of huangjiu, has necessitated the use of wine style glasses for huangjiu consumption. Using a French-style wine glass has facilitated aroma enjoyment and the examination of clarity and colour of the huangjiu (Hé et al., 2017; Sun, 2022). Such practice aligns with my previous observation that, in modern China, huangjiu is now enjoyed as a chilled beverage in much the same way that a cold beer is enjoyed in the West (Sun, 2022).

Yet, there is a similarity that exists between Chinese and Western notions of alcoholic beverage consumption. From the ancient text, the *Rite of Zhou*, the three alcohol styles described there were used for special occasions and ancestor worship within Chinese drinking and religious cultural rituals (Liu et al., 2014; Sun, 2022). Those occasions parallel Westerners' drinking and religious culture inasmuch as wine and other alcoholic beverages are used to enjoy special occasions; and, within Christianity, wine signifies a communion with God inasmuch as the wine represents the saviour's blood (*The Holy Bible*, 1752/2011, Matthew 26:28).

Notwithstanding those domains, with the establishment of The People's Republic of China in 1949, China slowly began to explore Western technologies and practices that greatly influenced huangjiu production (Máo, 2020). Those technologies included: mass production using stainless steel vats (Máo, 2020); refined wine-style drinking vessels to enjoy huangjiu in similar ways to European wine (Hé et al., 2017); the recognition of the science of bacteria, yeasts and fungi; the adoption of advanced production technologies that saved energy and labour (Zhào, 2020); and sanitisation standards recognised in the West (Máo, 2020). Refer also to section 5.1.3.

5.1.3 Responding to: How has Technological Innovation Contributed to These Changes?

Considering my third research question, six themes in Table 6 directly support my responses to this research question. Those themes are:

- traditional huangjiu classification;
- contemporary huangjiu classification;
- traditional huangjiu consumption;

- contemporary huangjiu consumption;
- traditional huangjiu technology; and
- contemporary huangjiu technology.

Contemporary and traditional classifications of huangjiu are paralleled within the text's contemporary to their production. In ancient China, texts including *Rites of Zhou*, *Qimin Yaoshu*, *Beishan Jiu Jing*, and *Jiu Jing* contributed to the classification of huangjiu (Guō et al., 2021; Hé et al., 2017). Now, in contemporary China, the technology of printing has made many texts on huangjiu commonplace. However, while a comparative profusion of literature exists on huangjiu, much of it is not available in the English language. Contemporary texts used in my dissertation included:

- *Huángjiǔ Mǐjiǔ Shēngchǎn [Yellow Alcohol Rice Alcohol Production]* (Céng et al., 2019);
- *Huángjiǔ Gōngnéng Yīnzǐ Yǔ Yíngyǎng Bǎojiàn [Yellow Alcohol Functional Factors and Health Care]* (Guō et al., 2021);
- *Huángjiǔ: Shēngchǎn Gōngyì Yǔ Jìshù [Yellow Alcohol: Production Art and Technique]* (Hé et al., 2017);
- *Huángjiǔ Niàngzào: Guānjiàn Jìshù Yǔ Gōngchéng Yìngyòng [Yellow Alcohol Brewing: Key Technique and Engineering Application]* (Máo, 2020);
- *Guó Jiǔ [National Alcohol]* (Sun, 2022);
- *Huángjiǔ Niàngzào Jìshù [Yellow Alcohol Brewing Technique]* (Xiè, 2020); and
- *Huángjiǔ Gōngyè Shǒucè [Yellow Alcohol Industrial Handbook]* (Zhào, 2020).

My translation of parts of these texts has illuminated my topic for an English reading audience who, unless they were able to read traditional or simplified Chinese characters, would not be able to directly access this knowledge.

Additionally, the technology of sensory perception, within the transfer and application of wine-based sensualities, has come to configure contemporary huangjiu enjoyment for many Chinese. While subjectively experienced, the 'nose' 'colour' and clarity appreciation of huangjiu are grounded in Western sensibilities and established wine-based profiling. Countering that phenomenon is the emergence of raw huangjiu, a

move back to huangjiu's origins. Yet with that renaissance come the technologies of standardisation and beverage safety.

While those themes are important to our understanding of the ways in which technology impacts change in huangjiu classification and consumption, a deeper understand of technologies influence is evidenced within an exploration of the seven fundamental steps in huangjiu production. These were outlined in sections 3.4.1 to 3.4.7.

In traditional huangjiu technology, rice was manually soaked in a ceramic pot for 40 hours or more (Máo, 2020; Zhào, 2020). After water absorption, the rice was then steamed in wooden buckets (Zhào, 2020). These processes were labour intensive requiring large amounts of water and energy (Céng et al., 2019). The jiuqu for the huangjiu was produced by workers repeatedly stepping on the rolled and soaked grain that sat inside an open mold (Hé et al., 2017). Then, the shaped jiuqu was transferred into a room with controlled temperature and humidity, albeit via an opened window (Zhào, 2020). There, it matured (Zhào, 2020). Then, all the huangjiu ingredients (traditionally, glutinous rice, jiuqu, and water) were mixed inside a large clay pot. To encourage fermentation the mix was manually stirred with a large paddle (Xie, 2020). After that, the fermented huangjiu was pressed from the jiuqu using heavy weights in a manual process lacking efficiency (Céng et al., 2019). Finally, the huangjiu was transferred into a 25l urn that was manually sealed by the brewers using lotus leaves, glossy paper, bamboo shells, bamboo rope, and clay (Xie, 2020). The porous nature of the urn aided maturation, aging, and final taste (Zhào, 2020).

Contemporary technologies have enhanced production and streamlined the entire process. Today, the soaking and steaming of rice is carried out using automated machinery (Hé et al., 2017). Enhancing that, the liquified brewing method saves on both water and energy (Zhào, 2020). The liquified brewing method requires that the grains be pulverised and then mixed with an enzyme powder. That process liquifies the ingredients (Zhào, 2020). Then, the liquified ingredients can be directly fermented, bypassing soaking and steaming, thus speeding production, and reducing water consumption and energy use (Zhào, 2020). Consequently, contemporary technologies have enhanced huangjiu production and product standardisation.

Jiuqu making has also become automated. That automation starkly contrasts the traditional jiuqu-making method. Traditionally, making jiuqu required workers to manually step on the jiuqu ingredients in a formed space until a block was created (Zhào, 2020). Now, jiuqu ingredients are automatically refined and crafted into blocks of jiuqu which are then matured in a temperature-controlled room (Zhào, 2020). The labour-intensive nature of jiuqu making has been replaced by advanced technology that, in turn, has significantly increased production (Zhou, 2020).

Now, contemporarily, fermentation occurs in an in-ground stainless steel vat with industrial mixers and temperature control (Zhào, 2020). Contemporary huangjiu pressing uses a plate and frame filter press. The jiuqu is pressed twice to ensure a clear huangjiu and maximum extraction (Kriegel, 1938; Zhào, 2020). The process of cleaning, sanitising, and filling the urn is carried out by an all-in-one huangjiu sealing machine. That machine saves labour and water, even though the final sealing of the brew is still carried out manually (Zhào, 2020). Finally, the huangjiu is stored in 50-ton stainless steel vats. Unfortunately, the vats do not promote aging in the same ways that traditional brewing does (Zhào, 2020).

Adding to those technologies is science. Today, yeasts and molds are readily identifiable (Hé et al., 2017; Liu et al., 2016). Terms like saccharification encapsulate a process that is internationally understood (Aghaei et al., 2022; McGinnis & Tyring, 1996). Additionally, scientific advancement analyses the base elements of production, like the water from Jian Lake, ensuring consistency through quantification (Hé et al., 2017; Máo, 2020; Zhào, 2020).

The embrace of technology and standardized production has also impacted huangjiu production in regions outside of Shaoxing. As previously noted, Yan'An city in the Shaanxi province produced a red huangjiu (Hé et al., 2017); other production includes the reddish-brown huangjiu of Jiangxi province (Hé et al., 2017), and the millet-based huangjiu of the Shandong province. All these have all benefitted from the embrace of technology (Sun, 2022).

5.1.4 Concluding Responses to my Research Questions

Huangjiu has evolved significantly since its accidental fermentation as stored food in a tree trunk (Sima, ca. 86–145 BCE/1993). Key to huangjiu's evolution has been time. Considering that, huangjiu can be 'read' as a barometer of taste, knowledge

and reality that extends over time from ancient China until today. In this way, huangjiu is socio-temporally located, and a materiality through which some people come to make sense of their world. Maybe the best evidence of the socio-political importance of huangjiu has arisen since the formation of The Peoples Republic of China in 1949 as, with the aid of technology, standardisation, and constructs of terroir (Clingeleffer, 2014; Hé et al., 2017; Máo, 2020; Sun, 2022; Zhou, 2020), huangjiu has become transcendent. Huangjiu's transcendence incorporates the 'new and old' China, albeit configured within Western concepts of alcoholic beverages. Yet, within what could be perceived as an act of resistance, raw huangjiu takes standardisation and commercialisation full circle. In that way, as a symbol of Chinese identity, raw huangjiu 'tips its hat' to the past within a dynamically placed contemporary China.

Within those considerations are wider implications and ways to 'read' how huangjiu's history and contemporaneity reflect ideas about China. Through huangjiu's commercialisation and standardisation has come a new dynastic era, which I suggest could be named: 'The Commercial Dynastic Period'. Within China's contemporary capitalist expansion and Westernisation, items like huangjiu are commercial realities devoid of the myth and cultural history denoted within the tailor's home brew of huangjiu (Sun, 2022), and offset by Western ideals associated with exotic cocktails, of which huangjiu is now part. Indeed, Western ideals are literally infused into huangjiu through oak barrel aging, considerations of 'nose', aroma, clarity and colour. While my research has explored huangjiu's change over time, huangjiu could also be explored as a barometer of China's place in the world, and within the ways in which Western culture impacts notions of taste and consumerism in China. Such exploration would contrast those Western cultural impacts with the very early writings on huangjiu, particularly the huangjiu-inspired poetry (Sun, 2006), and in doing so provide a unique insight. However, those topics await another researcher and reader!

5.2 Reflections on my Theoretical and Conceptual Framework

In completing my dissertation, I have become aware of my own ontology and epistemology. As I realised my own ontology and epistemology as relativist (Crotty, 1998), I have also gained, through my secondary research sources, an awareness of

the ontologies and epistemologies of the authors of those sources. That amalgam has created the knowledge and reality of my dissertation. Within that blend is my own realisation, and that of others, of the importance of Berger and Luckmann's (1966) social construction of reality thesis. Consequently, although huangjiu is socio-temporally placed within history, multiple histories of huangjiu exist. That multiplicity reflects the subjective experiences of many people, over time. From considering that more broadly comes my realisation that Western and Chinese ways of being and becoming, through material items like wine and huangjiu, hold much in common. Both cultures have, over time, constructed materialities and the language to describe those materialities. Ultimately, those constructions fashion people's understanding of the world around them. In that way huangjiu, like knowledge and reality, is a dynamic product and concept.

5.3 Reflections on my Methodology and Method

On reflection, my choice of a qualitative research methodology (Garcia & Quek, 1997; Hignett & McDermott, 2015; Kalu, 2019; Sandelowski, 2000) maximising secondary research materials (Bryman, 2008; Stewart & Kamins, 1993) was a wise one. My dissertation, through its use of secondary research material, has brought new knowledge to the Western academy, gleaned from Chinese language texts, unpublished in the English language. Within that contribution came a personal challenge. I needed to translate Chinese text into the English language. While I had confidence in my ability to do that, I was also acutely aware that my translation skills needed to be precise. Consequently, I spent a great deal of time ensuring accuracy. I believe that was time well spent, because my dissertation makes a unique contribution to existing huangjiu knowledge.

Furthermore, within my research approach, my use of thematic analysis (Alhojailan, 2012; Braun & Clarke, 2006; Nowell et al., 2017; Riger & Sigurvinsdottir, 2016), cognisant of my research questions, became an important ingredient in my methodology/method 'recipe.' Thematic analysis sharpened my research approach through coding, and theming. Thematic analysis encouraged my thinking about the themes of common threads, and realised themes that sat outside my lines of inquiry. In those ways, my research is simultaneously thematic and chronologically ordered,

and realises the importance of a researcher's considerations of methodology, as I have outlined in Appendix A.

5.4 Research Implications

Huangjiu is under-researched within the Western academy. My dissertation, in a small way, has addressed that research gap. My work, I hope, will create a heightened awareness of this historic and meaningful beverage. In that way, my choice of topic has been a 'lucky one' because of the lack of Western research on huangjiu. I hope other researchers will be stimulated to 'know more' about huangjiu and other material items within Chinese culture because of my work. As my own research has shown, the research not only reveals differences between Chinese and Western cultures, but also their similarities. In gaining a wider understanding and appreciation of 'other' cultures and their materiality comes a greater understanding of one's self. I hope that my work makes that contribution for my readers as it has done for me.

In undertaking this topic, given that I have lived in many countries, I have realised an enhanced sense of myself, and my identity. Huangjiu is a part of Gavin Hui. Huangjiu has provided me with the opportunity to explore myself, particularly the role of the beverage in my own family life, especially growing up in China. While those narratives are not included here, their recall and nostalgic moments have led me to a better understanding of myself. In those ways, the implications of my research lie not only within its academic contribution but also within its personal reflection and affirmation.

5.5 Research Limitations

There are a number of research limitations that I note below:

- Due to a limited authorship on this topic, some authors are 'overused'.
- Due to time constraints, I was limited to using secondary research. More time would have facilitated primary research in China.
- My emphasis on production limited the socio-cultural content of my dissertation.
- More time and a mixed methods approach may have provided more informational depth.

- Personal circumstance, including contracting COVID-19, impacted my research productivity.
- My narrative often introduces a Western 'comparison.' While this adds context, it may for some readers subtly indicate a hierarchy. That was not my intent.

5.6 Recommendations for Future Research

While my dissertation has responded to my research questions, it has also highlighted areas that I recommend for future research. I outline those areas in Table 7, below.

Table 7: Recommendations for Future Research

1.	The history and use of huangjiu in Chinese cuisine
2.	A quantitative analysis of regional differences in huangjiu
3.	The ways in which beer production might impact huangjiu production
4.	How huangjiu might be presented within Western hospitality environments
5.	Autoethnographic research into huangjiu within family settings
6.	Brewers' perspectives on commercial huangjiu production
7.	Secrets of home-brew huangjiu
8.	A chronology of commercial huangjiu pricing (by year)
9.	Young Chinese people's huangjiu preferences
10.	The nostalgic value, within family settings, of huangjiu in China
11.	Exploring early literature on Huangjiu from Ancient China

As Table 7 reveals, there are many topics that can be explored and expanded to increase huangjiu knowledge. Those inquiries could be maximised through qualitative, quantitative, or blended research approaches.

5.7 Concluding Reflective Statement

In concluding my dissertation, I have come to reflect upon it as a journey. A journey is defined as "the act of traveling from one place to another" (Oxford Learner's Dictionaries, 2023). My journey was metaphorical. My geographic location remained the same. What 'moved' from one place to another was my thinking, my analytical skills, and my ability to think in critical ways. I propose that my journey moved from a 'place' where I lacked knowledge, to a 'place' where I gained enhanced knowledge,

insight and understanding. Exemplifying that has been my appreciation of theory, particularly ontology (Bilgrami, 2002; Crotty, 1998; Healy & Perry, 2000; Jacquette, 2002; Proctor, 1998), epistemology (Crotty, 1998; Hanly & Fitzpatrick Hanly, 2001; Kelley et al., 2019; Rand, 1990; Ültanir, 2012), and the social construction of reality thesis (Berger & Luckmann, 1966). As my academic and research journey progressed, I realised that constructs of knowledge and reality, and making sense of the world around me, were tools that I used in everyday life. Consequently, my journey revealed the importance of theory in everyday life, something which I had simply taken for granted.

Compounding that was other people. My cousin's stay in intensive care, my visits to Australia to be with her, and the impact of her situation on my life, not only reflected my humanity, but also tested my ability to complete my dissertation while coping with very stressful situations.

My supervisor told me that one of the most important words in the qualification I seek (a Master of Gastronomy), was the word 'master'. His advice was that I needed not only to master my topic, but also master the theoretical perspectives that I used to illuminate my work. It is not for me to claim mastery. Rather, it is for my examiners to confer. Considering that, I close my work, thanking my examiners, my other readers, and my supervisor.

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Appendices

Appendix A: Rejected Qualitative Methodologies

Methods	Focus	Data Collection	Reason for Rejection
Action Research	Involves both researcher and participant to act together for certain activities (Avison et al., 1999).	Primary: Interaction between researcher and participant	My research only uses secondary data, no participants are involved in my research.
Biography	Explore an individual's life, a form of narrative study (Creswell & Poth, 2016)	*Primary*: Interviews	My research only uses secondary data, and it does not focus on an individual.
Case Study	Analyse a single or multiple cases extensively (Creswell, 1998)	*Primary*: Observations Interviews *Secondary*: Documents Archival records	Case study requires investigation on a case or an event, however, my research is focused on literature related to huangjiu's classifications, manufacture, and history.
Content Analysis	Main purpose is to quantify qualitative data (Mayring, 2004)	*Secondary: Coding*	This method requires large volume of data. My data is limited (Maying, 2004).
Phenomenology	Gaining experiences from a phenomenon (Creswell & Poth, 2016)	*Primary*: Interviews Focus group	My research only uses secondary data and does not focus on an individual's experience.
Grounded Theory	Create or discover a theory from data (Creswell & Poth, 2016)	*Primary*: Interviews	My research only uses secondary data and is not about creating new theory.
Ethnography	Narrate a cultural/social group (Hignett & McDermott, 2015)	*Primary*: Observations Interviews	My research only uses secondary data, hence observation of a group of people is not suitable.

Note. From Avison et al. (1999); Creswell (1998); Creswell & Poth (2016); Hignett & McDermott (2015); Mayring (2004).

Appendix B: Thematic Coding

These are the texts coded from Chapter 1 to 4, different themes are represented in different combinations of colour and highlighter for distinguishment.

Themes Highlighted in Corresponding Colours
Traditional Huangjiu Classification
Traditional Huangjiu Ingredient
Traditional Huangjiu Technology
Traditional Huangjiu Consumption
Contemporary Huangjiu Classification
Contemporary Huangjiu Ingredient
Contemporary Huangjiu Technology
Contemporary Huangjiu Consumption
Chinese Drinking Culture
Chinese Drinkware
Western Drinking Culture
Western Drinkware

1. In China, it was once the most commonly consumed alcoholic beverage
2. However, over the last few decades its popularity has been supplanted by baijiu,
3. He decided to store some of his foodstuffs, including soybean, wheat, broomcorn, foxtail millet, and rice in the hollow of a large dry tree stump.
4. Five uniforms (五齊) and three alcohols (三酒) noted a system that categorised huangjiu based on its quality and use
5. The five uniforms define the stages of huangjiu brewing
6. whereas the three alcohols are huangjiu early classifications.
7. one of the first manufacturing guides on huangjiu that recorded its brewing process was found in the Mawangdui archaeological site
8. related that standardised recipe consisted of 2 Chinese stones (62kg) of rice and 1 Chinese stone (31kg) of yeast to yield 6.6 Chinese stones (204.6kg) of huangjiu in total
9. there are 8 examples of jiuqu production and more than 40 examples of brewing techniques

10. it nonetheless facilitated their brewing actions by noting the importance of temperature and pH control as mechanisms enhancing the brewing process
11. It was not until after the Chinese People's War of Liberation had taken place (1948 – 1949 AD) that the new People's Republic of China become open to foreign cultural exchange.
12. Over time that exchange came to influence and inspire the huangjiu brewers in China.
13. brewers began to use stainless steel vats, and, to take into consideration the impact within brewing of micro-organisms and bacteria
14. modern machinery and technologies revolutionised the huangjiu production industry.
15. commercialised huangjiu production is concentrated in dedicated factories where automated machinery ensures product consistency
16. Huangjiu from Fujian uses a red jiuqu coloured by the red mold, 'Monascus purpureus'
17. Black huangjiu from Jiangxi, a south-east province of China, uses black glutinous rice
18. the definition of huangjiu is an alcoholic beverage made from a combination of these ingredients: rice, millet, black rice, maze, wheat, water, combined with jiuqu and then brewed.
19. the traditional Chinese jiuqu contains a combination of yeasts and molds in the environment with different type of grains as medium depending on the huangjiu's style
20. Shaoxing huangjiu uses a wheat based jiuqu
21. Like Western considerations of wine, many huangjiu drinkers, according to He et al. (2017), are mindful of the beverages colour, aroma, and taste
22. Many of the themes noted in these two sections are similar to the considerations Western consumers undertake when tasting and drinking wine.
23. He et al. (2017) outlined huangjiu's tasting routine
24. the huangjiu should be poured into a colourless tulip-shaped glass
25. Then the beverages aroma is explored by swilling the beverage around the tulip glass.
26. Next, sipping the huangjiu and passing it over the tongue and mouth enhances aroma profiles as the beverage passes the palate.

27. gentle alcoholic beverage that was best drunk slowly.
28. In Shaoxing, huangjiu is often consumed warm
29. To make huangjiu warm it is poured into a bamboo vessel that is placed in boiling water.
30. As it heats the huangjiu and bamboo release their pleasant aroma's (Sun, 2022).
31. The best way to drink heated huangjiu is a combination of sipping and sucking
32. Guo (2021) suggested to add a slice of ginger into the warm huangjiu
33. Contrasting tradition, and in summer, huangjiu can be chilled and served with ice.
34. Contemporary huangjiu brewers, like Grand Talon, recommend huangjiu as a cocktail ingredient.
35. which adapts the traditional 'Whisky Sour' by simply substituting the whisky for huangjiu
36. The first special ingredient is the choice of the best quality glutinous rice
37. The second special ingredient is a traditional wheat based jiuqu
38. The third special ingredient is the water, taken from Jian Lake
39. the national standards of huangjiu (GB/T 13662-2018)
40. Yuan hong (元紅),
41. Glutinous Rice, Wheat based Jiuqu, Jian Lake Water
42. Jiā fàn (加飯),
43. Additional Glutinous Rice, Wheat based Jiuqu, Jian Lake Water
44. Shàn niàng (善釀),
45. Glutinous Rice, Wheat based Jiuqu, Aged Yuan hong
46. and Xiāng xuě (香雪)
47. Glutinous Rice, Wheat based Jiuqu, Zao shao
48. occasional alcohol (事酒),
49. aged alcohol (昔酒),
50. and clear alcohol (清酒)
51. clear alcohol was considered to be a high-quality product because it had been filtered and clarified during its final stages of production,
52. which during the Zhou dynasty (1027 – 221 BC) huangjiu was commonly consumed directly without filtering as the residue could provide satiety

53. Contemporary technologies have positively impacted huangjiu production.
54. both production and consumption levels are anticipated to rise
55. during 1949 huangjiu production had shrunk to 25000 tons per year
56. early millennium, huangjiu production reached 3.1 million tons per year
57. Famous huangjiu terroirs are recognised within a short motto: 'South Shao North Dai' (南紹北代)
58. other Chinese provinces produce huangjiu that often uses different grains other than glutinous rice as the main ingredient.
59. In Yan'An city of the Shaanxi province, huangjiu uses common rice (Oryza sativa) as the main ingredient.
60. Black glutinous rice is used in the Jiangxi province of China to produce a huangjiu that is reddish brown in colour followed by a pleasant sourness and sweetness
61. Another famous huangjiu developed during the Song dynasty (960 – 1279 CE) in the Shandong province uses millet as the main grains resulting a huangjiu in brown colour with a hint of bitterness finishes with a long-lasting aroma
62. Given the contemporary technological circumstances, huangjiu made from maze and sweet potato have also been created and enjoyed by today's public (He et al., 2017).
63. Traditionally, as shown in (Figure 1), the rice is soaked in a large ceramic pot (Zhao, 2020).
64. After soaking it is drained manually.
65. In modern huangjiu production, rice is tube fed into large stainless-steel tanks filled with water.
66. Then automated drainage separates the soaked rice from the water
67. Unlike the traditional method, the stainless-steel tanks are temperature controlled to ensure consistent soaking
68. rice being steamed in the traditional manner using wooden buckets of rice suspended over woks of boiling water.
69. This method is labour intensive
70. use of an automatic horizontal rice steamer.

71. The horizontal form allows the rice to move along a conveyor belt while being simultaneously steamed
72. the traditional huangjiu brewing method requires ample amount of water in order to completely rinse and soak the rice.
73. In addition, the energy required to steam the rice is also particularly high
74. The recent cutting-edge solution to this matter is called ‘Liquified brewing method',
75. where the raw ingredients are first pulverized,
76. then covered with enzyme powder which can liquified the ingredients
77. The liquified ingredients can then resume to the normal huangjiu brewing process which is adding the jiuqu and yeast allowing it to begin fermentation
78. This liquified brewing method not only reduce water wastage
79. it also increases the efficiency of transportation as liquid is highly mobile
80. two workers stepping on grain inside a mold.
81. The grain has been previously rolled and soaked in water (Zhao, 2020).
82. Stepping on the grain continues until a firm stable shape is created (He et al., 2017).
83. Then, the shaped grain, an early form of jiuqu, is transferred into a dedicated room so it can mature.
84. There the temperature and humidity are controlled by adjusting an open window
85. Modern technology has streamlined this process.
86. Figure 6 shows an automated jiuqu making machine at the Kuaijishan Shaoxing Rice Wine Company Limited.
87. This machine automates the sieving, mixing, sprinkling, portioning, cultivating, drying, and storing processes.
88. This machine can produce 4000 tons of jiuqu per year
89. Traditionally, all the huangjiu ingredients are poured into a large clay pot and continuously stirred using large paddles
90. this labour-intensive process has been replaced by automation (Zhao, 2020) (refer Figure 8).
91. Temperature controlled in-ground stainless steel vats (See Figure 8) with industrial mixers are now commonly used in large huangjiu production sites.
92. pressing uses heavy weights to maximise gravitational force.

93. That force exudes the liquid from the huangjiu mash (Ceng et al., 2019).
94. The liquid is then filtered and clarified.
95. As Zhao (2020) asserted, the traditional pressing method is much less efficient than contemporary methods.
96. Contemporary pressing requires a plate and frame filter press (Figure 10), that uses a hydraulic cylinder to force the huangjiu mash through layers of filter paper in order obtain a filtered huangjiu
97. Brewers will transfer the filtered huangjiu into a stainless-steel tank and allow the huangjiu to remain idle, this allows any residue to sink at the bottom part of the container and leaving clear huangjiu on the top (Zhao, 2020).
98. Brewers will collect the residue and pass it through the contemporary presser once again in order to obtain a completely clear huangjiu.
99. A contemporary adaption to traditional huangjiu is raw huangjiu.
100. Raw huangjiu has not been heated in order to kill its bacteria.
101. raw huangjiu is the closest in taste and production to the huangjiu's of ancient China
102. because it is not heat pasteurised
103. has a fresh taste
104. the production of raw huangjiu is completed right after its pressing
105. to produce a raw huangjiu that is safe to consume based on todays' hygiene standards
106. is the meticulous sanitisation of equipment in order to prevent any unwanted bacteria contaminating the huangjiu
107. is the filtration of the beverage in order to remove any unwanted bacteria and yeast from the raw huangjiu
108. a raw huangjiu has the same shelf life as a traditional huangjiu
109. Its difference is detected in its refreshing and pungent aroma
110. Traditionally, brewers poured the huangjiu into an urn that had been cleaned and sanitised.
111. Then, various items including lotus leaf, glossy paper, bamboo shell, bamboo rope, or clay were used to seal the urn
112. Nowadays, (refer Figure 12) this process is automated inasmuch as an all-in-one huangjiu sealing machine completes most of the labour-intensive processes including cleaning, sanitising, and filling.

113. However, sealing the urn is still completed by the brewer as the sealing process is far too complicated for modern machinery to replicate [11](Xie, 2020).

114. According to Zhao (2020), a huangjiu sealing machine reduces labour costs (by 20%), and saves up to 50% of water use, compared to traditional methods.

115. One is the traditional method is using a sealed urn

116. The other method is the use of a modern stainless-steel vat

117. Commonly, and within traditional storage/aging, a standard ceramic urn holds approximately 25L of huangjiu.

118. The porous nature of the ceramic promotes its aging (Clarke & Rand, 2015; Zhao, 2020).

119. That issue has prompted the use of modern stainless-steel vats (Figure 14).

120. Those vats can store/age 50 tons of huangjiu each

121. According to Zhao (2020), the oxidation technology inherent to using stainless steel, compared to ceramics, is an area of ongoing scientific development.

122. Many Western alcoholic beverages including wine, brandy, whisky, sherry, and port are traditionally aged in oak barrel as their last production step

123. this is certainly an exotic procedure in the Chinese brewing culture.

124. using French and American oak barrel to age their huangjiu

125. By using the finest rice in China,

126. all the brewing processes are carried out manually by master craftsman

127. The huangjiu is first fermented and matured in the traditional ceramic pot

128. then its aging campaign continues by separately aging in both French and American oak barrels

129. huangjiu has been used as an occasional beverage served during festivals and celebration.

130. It has transformed into a symbolic icon for hospitality and socialisation.

131. huangjiu holds high social and symbolic meaning

132. On discovering his wife was pregnant, the tailor began to brew pots of huangjiu so he could celebrate the birth of his expected son.

133. Since then, it became a tradition for families to brew and bury huangjiu whenever they have a baby.

134. the materials used for making drinkware have been evolved from ceramic ware during the neolithic period (5400 – 5000 BCE)

135. to copperware during the Shang dynasty (ca. 1600 – 1046 BCE) (Sun, 2020).

136. Using copper aided the heating of alcoholic beverages (Rao, 2010).

137. Lacquerware was popular during the Qin dynasty period (221 – 207 BCE).

138. Drinkware also reflected social hierarchies.

139. Exemplifying that, vessels made of gold and rare jades were reserved for royal and upper-class households

140. Chinese drinking culture is considered to be excessive inasmuch as drinkers actively encourage others to drink more (Rao, 2010).

141. Encouraging others to drink more is considered an integral part of Chinese hospitality.

142. That excess reflects the notion that, within Chinese culture, keeping guests well fed and 'watered' displays guest care

143. Reflecting that in nowadays Chinese society, the thin line between encouragement and enforcement on drinking alcohol can be easily confused due to the higher availability of alcoholic beverage in modern era

144. the encouragement of drinking was started out as a gesture of hospitality and humbleness, yet some selfish drinkers have taken advantage of this tradition to harass or test someone's devotion.

145. Phillips (2000) has traced early grapevine production and wine consumption back some 8000 years.

146. Colby (2015) proposed that grape based wines became popular in Western cultures because the grape has a balance of sugar, acid, and tannin.

147. As the art of winemaking begin to mature, various style of wine such as red wine, white wine, and sparkling wine are developed.

148. Bottles of wine and brandy are often found on the Western's dining table during celebrations and festivals (Rao, 2010).

149. the Westerner also started from using ceramic ware during the Bronze age (2000 – 700 BC)

150. Armchair Sommelier (2023) stated the Egyptians first invented glass wine vessels around 1500BC; however, it is highly impractical not until the technique of glass blowing become available near 3 CE.

151. The Westerners discovered that by using various shapes and sizes of wine glasses can enhance the aromatic outcome of the drinking experience.

152. Nowadays, there are specific wine glasses to accompany almost every single grape varieties.

153. Exemplifying that, a 'Bordeaux' glass has a larger bowl and tall wall to increase the distance between the drinker and the wine as Bordeaux wine tend to be more pungent, the larger bowl allow more oxygen to soften the high tannins in the wine (Tilden III, 2023).

154. In the spiritual level, Westerner religion also uses alcohol to understand their world, for instance, wine represent Jesus's blood in Christianity.

155. On the hospitality point of view, Western host often propose the first toast to their guests as a welcoming gesture.

156. However, unlike the Chinese drinker that have countless complicated courtesies to follow,

157. Western drinker tend to be more free and relax on inviting their guest to drink

158. In Western cultures consuming alcohol reflects religious belief,

159. and like the thirst-quenching nature of huangjiu

160. red wine is the symbolic representation of the blood of Christ.

161. wine at communion and mass also signify hospitality

162. Nevertheless, there are still many opportunities for Westerner to drink before and after a meal, they are called an aperitif and digestif respectively (Jiang, 2011).

163. An aperitif is a light alcoholic beverage served before a meal to stimulate a diner's appetite and a digestif is often a strong or sweet alcoholic beverage served at the end to aid digestion (Rush, 2008)

164. The Westerner has merged the etiquette of drinking into their daily meal, which reflected their love and appreciation on alcohol.

165. The Chinese drinking culture priorities the respect on human being

166. Westerner's etiquettes have shown their respect and focuses on the wine itself

167. However, under the influence of globalisation, the Chinese and Westerners begin to exchange culture.

168. Although the effect of drinking culture exchange seems to mostly be moving in one direction, where Western's alcohol and traditions become popular amongst the Chinese society.

169. Wines and brandy started to be more commonly found in Chinese household and special occasions.

170. Western's brewing technique and glassware also have been adapted by most Chinese alcohol manufactures.