Abstract: This article presents the first English translation and commentary on Sake Journal (Goshu no nikki), the earliest guide to sake brewing and one of the most important sources for understanding the history of sake making in medieval Japan (1192–1600). Sake Journal includes six recipes for sake, five of which are translated here, along with the directions for pasteurization. Besides providing insights into the technology and tools of medieval brewing, as a secret manuscript whose dissemination was strictly controlled, Sake Journal documents the professionalization of the brewing craft and the popularization of certain styles.

At first glance, the ingredients needed to make sake appear quite simple, with water and nonglutinous rice the chief components, although just mixing rice with water will not produce sake. Unlike fruit, which can ferment naturally even on the tree or vine, grains like rice need a catalyst to release the sugars in the starch to make them available for fermentation. Beer brewers turn to malt, but sake makers use the mold Aspergillus oryzae, called kōji in Japanese. Kōji produces amylase, protease, and about fifty other enzymes that saccharify the starch in the grain, mustering it for fermentation. Fermentation also requires yeast. Before the twentieth century, although they might try to capture and save yeasts by soaking a rag in a tank of brewing sake and allowing it to dry, brewers largely relied on ambient yeasts and probably placed a greater emphasis on religious faith in the hopes that the almost magical transformation of ingredients into alcohol would happen. But in the last years of the nineteenth century, Japanese scientists isolated sake yeasts, and then refined and cultivated them to make them available for purchase. Most brewers buy their yeast today and have many varieties to choose from. Besides rice, water, kōji, and yeast, sake today is usually made with two more ingredients: lactic acid and alcohol. Like yeast, lactic acid is a compound that occurs naturally, but rather than catalyzing fermentation, it is the byproduct of anaerobic fermentation when lactic acid bacteria convert carbohydrates into lactic acid. Lactic acid inhibits bacteria that might compete with the yeast and ruin a batch of sake. Premodern brewers would not have had a scientific appreciation of lactic acid, but they did develop special techniques to cultivate naturally occurring lactic acid, as described below. Nearly all brewers today bypass these laborious steps and simply add a dose of lactic acid to their yeast starter. Many modern brewers also add alcohol to their finished sake. When rice was in short supply and its use regulated during World War II, sake makers discovered they could increase the scale of their production by adding water and brewer’s alcohol to their finished sake. Although in decline in recent decades, the practice continues today. As of 2018, only 23 percent of Japanese sake was produced without added alcohol (Imada 2021: 4). Makers of low-end sake add alcohol to cut costs, but producers of premium brands use it to enhance flavors, they claim. To top off the list of ingredients, some brewers today add industrial sugar to sweeten their sake, whereas others use doses of amino acids such as monosodium glutamate to boost the umami taste (Roussille 2017: 183–184).

What is today a science was in the past a product of centuries of trial-and-error methods. One popular origin story of sake making in Japan is that it began with the custom of virginal women chewing grains and using their saliva instead of kōji to render the sugars in the starch available for fermentation. “This primitive technique survived until the beginning of the twentieth century in Okinawa. By tradition, virgins prepared this type of liquor for special religious ceremonies” (Ishige 2000: 1180). A long-held view among some scholars of Japanese folklore and anthropology is that regions far from the political center are “backward,” holding onto customs that have disappeared in the mainstream (Rath 2016: 158, 150–151; Christy 2012). Ishige, for instance, has equated modern ethnographic information with historical data to attempt to argue that sushi originated in Southeast Asia due to the
existence of similar dishes in remote areas of Thailand and Laos today (Rath 2021: 37). Consequently, Ishige’s comments could be meant to be read backward historically to conclude that Okinawa preserved customs lost on the main islands and that virgin girls chewed and spat the earliest sake in Japan. That interpretation seems to have swayed sake expert Gautier Roussille, who writes:

In Japan, kuchi-kami-sake (“chewed sake”) was produced during Shinto ceremonies and consumed quickly. Depending on the period, the place and the specific ceremony, the work of mastication was carried out either by young virgins, by the miko ([female] diviners and guardians of the sanctuary), or by the whole village. (2017: 16)

Modern sake brand names that include words like “beautiful woman,” “maiden,” “daughter,” “bride,” and “beauty” could be seen to evoke a similar gendering and sexualization of sake, a fantasy of young women of yore chewing rice and spitting into containers in what could be mistaken for a sex act. Such impressions contribute to sake’s reputation in Japan today as an “old man’s drink,” despite efforts to market to other consumers. Besides the fact that ancient Japanese may not have viewed virginity as a specific life stage for women or men, the process of chewing grain to make sake as described in the oldest Japanese reference, the eighth-century Gazetteer of Ōsumi (Ōsumi no kuni fudoki), which provides information about the eastern part of modern Kagoshima prefecture, indicates that both men and women—neither of whom were called virgins—participated (Hiroyuki 2019: 19). To answer the question of whether young women might have higher amounts of amylase or yeast in their saliva efficacious for brewing, researcher Yamashita Masaru surveyed his students and concluded that there were no differences in the amount of these compounds among men and women of different ages, although there were variations among individuals and whether or not they had not brushed their teeth in the morning (1999: 41–45).

Charting the technological history of sake from ancient to modern times deserves a much longer discussion, but the translation presented here documents some important steps. Sake Journal (Gosho no nikki) presents six recipes for making sake, directions to pasteurize it, and other notes. Some indications about how to make sake can be found in the tenth-century Procedures of the Engi Era (Engi shiki). However, that source is a collection of laws and customs, not a dedicated treatise on brewing. Moreover, the Engi shiki lists only the ingredients for producing different types of sake. It cannot be used as a basis for reproducing ancient sake recipes (Yoshida 2015: 56). Sake Journal is a more extensive guide to sake making that allows us to take the measure of the brewers’ art in the medieval period (1192–1600). A copy in the collection of the University of Tokyo’s Historiographical Institute, which dates to 1566, is the oldest extant version of Sake Journal, but the work may have been composed as early as 1355 or 1489, depending on how one interprets the calligraphy for the date on the manuscript. As preface to the translation below, a few background observations about the text’s history and contents are needed to explain its significance.

A Secret Text

The anonymous author of Sake Journal presents the text as “an oral secret that must be kept completely private.” Before the chemistry of sake making was understood, the techniques to create it would have been discovered from hard-won trial-and-error methods, making technical knowledge of how to brew sake precious. But secret texts did more than simply preserve proprietary know-how in medieval Japan—they also served as a way to license professionals. An evaluation of the date of Sake Journal is beyond the scope of this article, but the cult of secrecy was much more advanced in the fifteenth century than the fourteenth. By the first decades of the 1400s, professions from cooking to the performing arts had literate practitioners who borrowed longstanding strategies from religious lineages and masters of poetry composition to create secret manuscripts (hide-nsha) with several aims in mind. First, as noted earlier, secret writings were a way for groups to preserve essential know-how and thereby distinguish themselves from their competitors. While the exact contents of any secret writing were not known at the time, literate society knew about the general existence of secret textual traditions to the point that claims to have access to a secret body of knowledge were almost required to do business in some fields. Second, within the professions that owned them, secret manuscripts could also serve as a means to designate and authorize successors through their select dissemination. Accordingly, some secret manuscripts, but not Sake Journal unfortunately, specified the names of their intended readers at the same time that they warned against showing the text to outsiders. Third, among the classifications of secret knowledge, transcriptions of oral teachings such as Sake Journal were the most revered because they alleged to record information that had hitherto been restricted to verbal instructions. Yet, instead of replacing knowledge conveyed by word of mouth, secret manuscripts reaffirmed the importance of oral truths. Sake Journal, for instance, makes reference to additional “oral secrets,” reinforcing the notion
that the most secret and important facts should never be written down. This strategy ensured that living masters were the ultimate and final arbiters of knowledge (Rath 2004: 49–52; 2010: 54–55). Such hierarchies of written and oral secrets are still maintained in schools of the performing arts in Japan, with the tea ceremony being the foremost example. The supposed existence of secret oral knowledge unlocking the deepest meanings and techniques means that tea masters or the heads of schools of flower arrangement or other schools of traditional arts can maintain their authority in an age when anyone can now read the “secret” writings composed centuries ago.

*Gastonomica* reaffirms the importance not just of oral instructions but also of bodily learning for sake brewing. As the directions below reveal, successful brewers had to be able to use their senses to judge the taste and appearance of sake, from the clarity of the water used to wash the rice to the action of the yeast in the ferment to the correct temperature for pasteurization. Consequently, *Gastonomica* provided guidance for gauging temperatures by touch alone. The master brewer also had to keep seasonality and weather in mind since environmental factors could affect the outcome of the brew.

As a manuscript that depended on secret professional expertise, oral tradition, and bodily learning to make it understandable, *Gastonomica* presents some challenges for readers today, and for the translator. I referenced three modern commentaries on the text, and often found variation in how the original was interpreted, even on such basic matters as to whether recipes required brown or polished rice. Moreover, several of the processes described in the text completely confound modern scholars. One step, called *shirotsuki* (白次), might suggest polished rice, but the purpose is unclear. Most scholars omit the passage entirely from their studies of *Gastonomica*, but Matsumoto Buichirō proposes two possibilities: one that *shirotsuki* is a recipe for making dumplings, and the other that it is a method of milling rice. In either case, the directions indicate “kneading something to a consistency similar to wheat dough and adding lime from a dye store,” an ingredient especially puzzling for sake making (Kondo 1893–1897: 33). Directions for a sake called *kikuzake* (菊次) are equally as perplexing. Not only has no one identified the meaning of this term, but the purpose of the directions, which guide the reader to prepare brown rice at a high temperature, also remain cryptic. My translation below certainly preserves that mystery. However, in other instances where the meaning is not ascertainable, I have omitted those passages. The absent sections appear at the end of the manuscript and are in some instances too blurred to read in the original. They include a shopping list of ingredients—mioga, mulberry, and cypress leaves—that might be part of a fragment for a recipe for vinegar, and an unusual recipe for chrysanthemum sake (*kikuzake*, 菊酒). In most instances, this beverage drunk on the ninth day of the ninth lunar month simply indicates a chrysanthemum flower added to a cup of sake. Chrysanthemum sake was considered to be a tonic against bad luck and a medicine to ensure longevity, following a Chinese legend in which the drink granted immortality (Ogura, Komatsuzaki, and Hatae 2003: vol. 1, 65). The recipe in *Gastonomica* suggests adding actual flowers to the brew, but the directions are unfortunately too garbled to make sense of, so I have omitted them.

**The Recipes for Sake**

While translated here as *Gastonomica*, the title of the manuscript comes from the name of the first recipe for a sake called *Goshu* (御酒).³ *Goshu* was a thick, sweet sake made with a relatively large initial ratio of *kōji* to rice, approximately 60 percent according to the directions, as compared to the 20 to 25 percent used today. The “Go” in the title is an honorific—one usually not translated—but *Goshu* was brewed for the emperor’s use for seasonal celebrations in the ancient period (eighth to twelfth centuries). However, the version in *Gastonomica* is different from that of the ancient period as described in the Procedures of the Engi Era. The ancient version used a method called *shiori* in which rice, *kōji*, and water were added to previously made and pressed sake up to three times as a way of raising the alcohol content. *Gastonomica*, by contrast, adds the ingredients to the sake while it is still brewing (Yoshida 2015: 58; Yoshida 2016: 44). By the early modern period (1600–1868), brewers added two more additions of ingredients to the starter, and that is the way sake is still made today. Thus, *Gastonomica* documents the transition from the ancient method of *shiori* sake making to a more modern one. Modern brewers produce sake at 20 percent alcohol by volume (ABV), which they water down to about 15 percent; however, we can only guess at the strength of *Goshu* and the other medieval sake.

Two other recipes for sake purport to be in styles produced at temples. Japanese temples had been brewing sake since as early as the eighth century and were at the forefront of sake brewing by the sixteenth century (Katō 1689: 19). Amano-style (あまの) sake refers to the brand made at Amanosan Kongōji, a temple in Kawachi province (modern
that begins with pressing the sake by placing the sake and
finishing involves separating the liquid from the solids, a task
vide any indication about how all the sakes were finished,
the ratio of koji to rice, which would have produced a stronger
appearance of Glossy Silk must have set it apart from the
modern “lightly or unfiltered cloudy sake” (inuki
cooked rice be soaked for seven days instead of three.
Bodaimoto
method produces lactic acid, which as noted ear-
lier helps to eliminate bacteria harmful to sake brewing.
Brewers continued using variations on the Bodaimoto
method until the 1920s (Kondo 1984: 44). Today, only a few
sake makers take this step, preferring instead to add lactic
acid directly, an innovation discovered in 1910. Due to
changing economic conditions in the late sixteenth century,
such as the loss of income from agricultural landholdings
and the transition to a new political order that authorized
only artisans and merchants to engage in manufacturing and
trade, temples ceased brewing sake in the early modern
period; but Shōryakūji has revived its tradition of Bodaimoto
brewing. In 1998, the temple received a license from the
Nara prefectural government to produce sake (Katō 1990:
537). Instead of opening its own brewery, the temple partners
with local sake makers who create a small batch of Bodai-
moto starter each January on the temple grounds. The
brewers then take this starter to their own breweries to finish
making the sake, and the temple sells these brands on site.3
One other element distinguishes the Bodaisen recipe from
the previous ones in Sake Journal: Bodaisen uses a lower
ratio of koji to rice, which would have produced a stronger
tasting, more acidic sake (Katō 1990: 50–51).

The fourth sake, Glossy Silk (Nerinuki, ねりぬき), also
makes uses of the Bodaimoto method but directs that the
cooked rice be soaked for seven days instead of three. Ne-inuki was a type of “white sake” (shirōzake) similar to the
modern “lightly or unfiltered cloudy sake” (nigorizake) that
retains some of the lees (Roussille 2017: 191, 245). The cloudy
appearance of Glossy Silk must have set it apart from the
other sake in Sake Journal, although the text does not pro-
vide any indication about how all the sakes were finished,
which would have played a key factor in their appearance.
Finishing involves separating the liquid from the solids, a task
that begins with pressing the sake by placing the sake and
lees in a cloth bag and either hanging the bag to allow the
liquid to drip out or applying force to the bag to press it out.
After pressing, medieval brewers understood that they could
add a little charcoal to their pressed sake to separate the
liquid from the solids further, a clarification technique that
appears in written records from the fourteenth century
(Roussille 2017: 18). Unfortunately, Sake Journal sheds no
light on these pressing and fining methods.

Nerinuki was one of several different types of white sake
in premodern Japan. At the lower end were the sakes
called jokushu or dokushu in the medieval period and
renamed doburōku in the early modern era. When the
government began taxing sake in the Meiji period (1868–
1912), it considered all unfiltered sake to be homemade
and hence bootleg doburōku and prohibited it because
presumably it had been made without paying the proper
licensing fees and taxes. The ban on cloudy sake lasted
until 1964. However, white sake had special prominence
before the Meiji period. The white sake called shirōki was
used for imperial enthronement ceremonies (daijōsai),
where it was served in conjunction with black sake (kur-
oki) darkened with ash.4 A different white sake, written
with the same characters as shirōki but pronounced shir-
ozake, was made from a blend of glutinous rice and non-
glutinous rice. Hakata (in modern Fukuoka prefecture)
and Bungō (modern Ōita prefecture) were famous for it
(Matsumoto 1979: 750).

Perhaps because of the many varieties of white sake in
premodern times, the one described in Sake Journal has
a prestigious name to distinguish it. Nerinuki was the
name for a silk fabric made crisp, light, and glossy by
removing the protein sericin in the silk by submerging it
in an alkaline solution, usually ash, which also brightened
any dye colors used on the fabric. Nerinuki silks were
much in vogue in the era when Sake Journal was created.
They were used for short-sleeved kimono (kosode) and the
elaborately dyed garments worn by powerful warlords such as
Toyotomi Hideyoshi. Nerinuki sake is mentioned in
several fifteenth-century diaries.5 It seems the glossy white
appearance of the sake gave rise to the name, at least
according to the theory of the noted philosopher and bot-
anist Kaibara Ekiken (1630–1714). Writing about nerizake,
which was another name for nerinuki, in the Latter Gaz-
etteer of Chikuzen (Chikuzen zokudoki), Kaibara
observed: “We do not know when this sake originated, but
the sake’s appearance like glossed silk gave rise to the
name.” Kaibara elaborated that there were two versions
of this sake. The first was called nerizake because of the
way the liquid was separated from the solid dregs when the

Osaka prefecture). Amano sake was a famous style, one said
to have been a favorite of Toyotomi Hideyoshi (1557–1598),
the warlord who unified Japan in 1590 (Yoshida 2015: 102–
103).

The other temple sake in Sake Journal, Bodaisen, can be
translated as “Font of Enlightenment” (菩提泉). The name
refers to the Bodaisen River near Shōryakūji temple. Shō-
yakūji, located five kilometers south of Nara City, was
a branch of Nara’s Kōfukuji temple. Amano sake was a winter
brew using brown rice, but Bodaisen could be brewed in the
warmer months and made with polished rice using a method
called “Enlightened Starter” (bodaimoto) in which steamed
rice is placed in a cloth bag or a wicker basket and then
submerged in uncooked rice and water for several days. The
Bodaimoto method produces lactic acid, which as noted ear-
lier helps to eliminate bacteria harmful to sake brewing.
They were used for short-sleeved kimono (kosode) and
the elaborately dyed garments worn by powerful warlords such as
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observed: “We do not know when this sake originated, but
the sake’s appearance like glossed silk gave rise to the
name.” Kaibara elaborated that there were two versions
of this sake. The first was called nerizake because of the
way the liquid was separated from the solid dregs when the
sake was pressed. Presumably, some of the solids remained floating in the sake to give the sake a whitish, glossy look comparable to a modern nigorizake. The second type of nerizake he identifies, which he calls the “authentic” version, combined glutinous and nonglutinous rice, similar to the aforementioned shirozake. In fact, Kaibara seems to be equating nerizake with shirozake because he identified the beverage as a specialty of a city in his home territory, Hakata, which also produced shirozake. Kaibara bragged that brewers from neighboring lands came to Hakata to learn how to make it. Nerizake was the variety that was the warlord controlling Hakata gifted to the shogun annually in the early modern period, another sign of the sake’s fame and quality (Hioki 2005: vol. 5, 236). Today, Wakatakeya Brewery in Kurume City, Fukuoka, produces a nerizake that it advertises as a revival of the medieval sake. Packaged in a 500-millimeter container that looks similar to a milk bottle, the beverage has the appearance and consistency of a yoghurt drink, making it much thicker than a typical nigorizake, and with a much lower alcohol content (3–4% ABV).6

To Kaibara’s list we can add a third type of nerizake from a recipe in Tales of Cookery (Ryōri monogatari 1643), the first printed cookbook for a general readership. The directions read: “Add white sugar to an egg and mix it well with cold sake. Serve hot” (Issunsha 1985: 72). The egg was likely raw when added to the sake but cooked when the beverage was warmed. This recipe was one of nine directions in the cookbook for serving sake with different flavorings that sound like remedies for hangovers.

Another element that made Glossy Silk a prestigious sake was that it used polished rice where the recipe for Amano sake in Sake Journal called for brown rice. Brown rice is generally not used for commercial sake today. In fact, the extent to which the white rice is milled is mainly what legally defines various grades of sake, with the most refined versions (daiginjō) featuring rice in which at least 50 percent of the kernel has been polished away. The use of brown rice and wild yeasts would have given medieval sake a much rougher and tangier flavor profile than commercial sake today. Of course, the “white” rice mentioned in the Sake Journal recipes would have also been less polished than even modern table rice. While we do not know the exact milling rates to be used for the recipes in Sake Journal or in the medieval period, in the early modern period the scholarly consensus is that people living in cities ate rice that was 70 percent milled, meaning it retained 30 percent of the bran, compared to modern table rice in which the bran is completely polished off. City dwellers in early modern times ate 70 percent milled rice only after the advent of milling shops, which opened around 1650. These milling shops employed standing mortars (fumiusu) that greatly facilitated the speed and the extent to which the rice could be polished (Rath 2016: 72, 74). Medieval sake brewers would have had to rely on a wooden mortar and a large pestle to hand mill their rice, a much more laborious method that could not easily yield highly polished rice. In other words, the white rice used for the recipes in Sake Journal would likely have had more bran and looked browner than modern table rice.

Besides omitting information about milling rice and finishing the sake, the recipes in Sake Journal skip several other crucial steps. In describing the brewing process today, brewers often use the shorthand expression kōji, moto, tsukuri. Kōji making is the process of spreading the kōji mold on steamed rice and helping it propagate through controlling for temperature and manipulating the rice by hand, a process that takes forty to sixty hours. The recipes in Sake Journal assume readers know how to create kōji and will factor in the time required to make it. So, recipes instead focus on how to prepare the “fermentation starter mash” (moto), creating an environment rich in lactic acid and where the kōji has started saccharifying the rice. Interestingly, the recipes call this stage tsukuri, a term that today designates the stage when sake is fermenting. Further study of the historical changes in the meanings of these terms is warranted, but the shift in their meaning might reflect a greater understanding of the fermentation process requiring different terms—moto and tsukuri—to differentiate the stages when the yeast is active, consuming sugars and producing alcohol. Although the meaning of these technical terms has obviously changed over time, I have noted them in parentheses in the translation for the historical specifics they provide.

**Pasteurization**

In addition to the sake recipes, Sake Journal describes methods of pasteurization centuries before Louis Pasteur (1822–1895) experimented with heat to kill bacteria in wine in the 1860s.7 While premodern sake brewers would not have understood the science behind how heat eliminates bacteria, kills yeasts, and stops fermentation, they knew that raising the temperature of sake did extend shelf life. Lacking modern thermometers, medieval brewers relied on sensations of temperature that differed according to the
change of seasons. *Sake Journal* advises heating the sake until it is “warmed for drinking” in the late spring (about 40 °C [104 °F]) but raising the temperature until it was “hot to the touch” (around 60 °C [140 °F]) in the summer (Matsumoto 1979: 749). But the directions are even more precise, specifying the twenty-fifth day of the fourth, fifth, and sixth lunar months as the correct days for pasteurizing. These months, which correspond roughly to May through July, were the early and mid summer and so a hotter period when sake would have a greater tendency to go bad. Since brewers today even today pasteurize their sake more than once, it is logical that medieval producers set aside specific days to pasteurize their sake and to clean the containers it had been stored in.

The twenty-fifth day of the month might have had special significance for sake brewers for several reasons. Buddhists believe there are twenty-five realms of existence, and working to help humanity transcend suffering are twenty-five bodhisattvas. So, the twenty-fifth day may have simply been considered a lucky day. The twenty-fifth day of the month was also important for the deity of learning (Tenman Tenjin), the divine form of the ancient statesman and poet Sugawara no Michizane (845–903). In early modern Japan, temple schools closed their doors on the twenty-fifth day to honor Tenman Tenjin. It is tempting to imagine the predecessors of these early modern school children heading to the sake brewery on their day off to help pasteurize sake. However, the connection to the importance of the twenty-fifth day of the month and the deity of learning might have something more to do with kōji. In medieval Kyoto, guilds backed by Kitano Shrine, where Tenman Tenjin was the main deity, held a monopoly in the capital on the powdered kōji used for sake and other purposes (Gay 2001: 43). So, drawing attention to the twenty-fifth day may have been a way for medieval brewers to acknowledge the importance of kōji and, by extension, the power of Kyoto’s kōji guilds, which may have been too busy enjoying the day off or involved in ceremonies to sell kōji those days.

However, since sake brewing occurred year-round in the medieval period, it is likely that pasteurization did as well. *Sake Journal* offers another set of directions for pasteurization that could be used throughout the year. The medieval process of pasteurization would have helped to stabilize the sake, but it would have also lowered the sake’s alcohol content because heating the sake releases alcohol. To avoid this problem, brewers today pasteurize their sake in a contained environment that prevents alcohol from vaporizing, such as by submerging bottled sake in a warm water bath.

### Brewing Tools and Technology

Among the insights one can gain by reading the recipes in *Sake Journal* is a greater understanding of the tools and technology at the disposal of the medieval brewer, although the specialized terminology is not always clear. For example, some of the recipes call for using a vessel (かめ) that could be read as *koku*, indicating a large wooden bucket, or *koga*, suggesting a ceramic container. The recipe for Amano sake begins with creating a starter (called a *shabo* or *moto* today) in a wooden bucket and then combining it with more ingredients in a ceramic vessel called a *kame*. A *kame* was the main container for medieval brewers and designated a large ceramic vessel with a capacity of one *koku* (180 liters) that had to be partially buried in the ground for stability. Some brewers employed *kame* with a capacity two or three times that size, but larger vessels were expensive and even more unwieldy, so typical brewers used hundreds of separate one-*koku* *kame* in their operations (Yunoki 2005: 35). Since the recipes in *Sake Journal* call for fashioning a lid for the *kame*, the ceramic vessels apparently lacked lids, or else the brewers in some instances preferred using lids made of matting that were not airtight. If the brewers reused their mats, then the mats might have trapped yeasts from previously made batches of sake and could thereby serve as a way to introduce these yeasts to a new batch. Undoubtedly, that recipes in *Sake Journal* call for initially using eighteen liters of rice was because this amount was one tenth of the capacity of the medieval *kame*. Premodern Japan’s base ten system for capacity, which was the normative measurement for cooking and brewing recipes in premodern times, made adjusting the size of recipes relatively easy. Accordingly, the measurements in *Sake Journal* are in terms of capacity, not weight. Modern sake brewers still measure their production in volumetric terms of *koku*, and the oversized traditional sake bottles one finds in Japan with a 1.8-liter (one *shō*) capacity are yet another holdover of premodern units of measurement. Other tools mentioned in the *Sake Journal* recipes include a *zaru*, which usually designates a bamboo colander but here suggests a wicker basket that can hold cooked rice and be submerged in water. A rice caldron called a *kama*, usually intended for cooking grain or heating water in a home on top of a mud or ceramic stove (*kamado*), is also mentioned as is a “stirrer” (*neriki*) used to churn the brew. Early modern brewers stirred their sake with long wooden oars called *kai* or *kaibō*, and medieval sake makers probably used something similar. During fermentation, the grains settle at the bottom of the container, and mixing the ferment with the oars releases trapped carbon dioxide and adjusts the temperature.
Sake Journal (Goshu no nikki) Translation

Sake Journal is an oral secret that must be kept completely private.

[goshu]

Allow 18 liters (1 to) of white rice to soak overnight in water; then steam it thoroughly. Add 10.8 liters (6 shō) of kōji at body temperature. Add the water used for soaking the rice the previous evening to the ferment (tsukuri). That water should be at body temperature, and 18 liters of it should cover [the ferment]. Cover the bucket with a mat for a lid and allow it to rest for about six days. Once the fermentation is activating in the bucket, mix and stir it. Make sure to mix carefully including the ferment on the edges of the bucket. Stir it twice at midday. When the brew becomes sharp tasting, add kōji mixed with water (mizu kōji). Then steam 18 liters of rice thoroughly as before and cool it completely. Add the rice into the center of the fermenting sake. After that, stir it twice daily. If it settles, churn it with the stirrer. Cover with a lid you have made. There are [additional] oral secrets.

AMANO SAKE

Let 18 liters of brown rice soak overnight. Steam it thoroughly on the next day. Since this a sake brewed in winter, allow the rice to cool to body temperature and combine it with 10.8 liters of kōji, placing it in the ferment. Measure and add 18 liters of water, cover with a mat for a lid and allow to rest. Within about four or five days, when the grains of the rice begin to dissolve and the fermentation occurs, stir it gently. When it begins tasting fermented, take 18 liters of rice, soak it overnight, and steam it well on the following day; then cool it thoroughly on a straw mat. Combine this with 10.8 liters of kōji and add it to the sake made earlier. Add 18 liters of water and stir. When the fermentation progresses and it starts to bubble, divide it into two vessels (kame). Then add 5.6 liters (3 shō) of steamed rice to each vessel. The kōji [added] is 10.8 liters, as before. Because this is a transcript of an oral instruction, it must remain secret.

FONT OF ENLIGHTENMENT (BODAISEN)

Wash 18 liters of polished rice until the water is clear. Remove 1.8 liters of rice from that and cook it. In the summertime, be sure to allow the rice to cool thoroughly. Put that cooked rice in a bamboo basket and soak it in water, positioning it in the middle of the [remaining] uncooked rice. Seal the container for a day and let stand overnight. On the third day, place a bucket (oke) off to the side and remove any clear water at the top of the vessel. Then remove the cooked rice from the center and place it in the bucket off to the side. Next, remove the uncooked rice and thoroughly steam it. In the summer, be sure to allow that rice to cool completely. [From that rice prepare] 9 liters (5 shō) of kōji and set aside 1.8 liters (1 shō) of it. Combine that 1.8 liters kōji with the 1.8 liters of cooked rice [that had been soaking in the basket in the water] and place half of it flat on the bottom of a bucket. Combine the remaining [4 shō] kōji with
the rice, mixing these together and placing them in the fermentation (*tsukuri*). Measure off 1.8 liters of the [clear] water removed earlier and add that on top. Then spread the [other half of the] cooked rice [and kōji] from earlier on top of that. Cover the opening with a straw mat; let it rest for seven days. The sake is usually done in seven days, but if you do not need it yet, wait up to ten days.

**Kikaki**

Soak 18 liters of brown rice overnight. While the rice is still hot, place it into a vessel [either a large bucket (*koga*) or a ceramic vessel (*koka*)]. Measure out 1.8 liters of hot water and pour it on top. Stir it using a mixing stick. Remove the rice and allow to cool overnight. Prepare the usual 10.8 liters of kōji. Combine that with the rice and place it in a container. Stir it twice a day. If the ferment quietens, mix it with the stirrer. Cover the container. The sake is ready in twenty days.

**Glossy Silk (nerinuki)**

Do not produce this sake in the eleventh lunar month (December); instead, make it after the New Year. Measure out 18 liters of polished rice and wash it until the water is clear. Set aside 1.8 liters of rice from that and cook it, allowing it to cool completely. Put the cooked rice in a bamboo basket and soak it in water, placing it in the middle of the uncooked rice. Seal the container and let it stand for seven days. On the seventh day, remove all the mold (*kabi*) from the top of the water, then scoop out the water and fill up a rice caldron (*kama*) with it, boiling it until it is reduced in volume to 80 percent.

[Take the remaining 16.2 liters of rice], steam it, and while it is still hot place it in a separate large vessel (*koka* or *koga*). Measure out 1.8 liters of the hot water and pour it on top. Let it stand for an hour, and then agitate it with the stirrer. Mix with the stirrer and allow it to cool overnight.

Combine 10.8 liters (6 *shō*) [more] rice with the same amount of kōji and place them in the fermentation. Stir this twice a day. Stir when it stops bubbling. Cover with a mat and allow it to rest for seven days.

Combine the 1.8 liters of rice prepared the first day with kōji and add them to the existing fermentation. [Wait] twenty days.

**Pasteurizing “Glossy Silk” (nerinuki) and Kikaki.**

On the twenty-fifth day of the fourth month, heat the sake to the temperature warmed for drinking (*nomikan*); on the twenty-fifth day of the fifth month, the sake should be hot to the touch (*tehikikan*); carefully remove all the foam at the top. Likewise, on the twenty-fifth of the sixth month, the sake should be warmed until drinking temperature, then covered so it is airtight for approximately seven days.

A second method of pasteurizing for these two types of sake is to heat the sake so that it is hot to the touch regardless of the time of year, and carefully remove any foam that rises to the top when it is being heated. This will enable the sake to last up to a year. This is a transcription of an oral secret, and it should be kept secret.

**Postscript: Sake Brewing after Sake Journal**

The recipes in *Sake Journal* reflect an age when brewing occurred year-round, used both brown and polished rice, and faced other technical limitations such as the size of the brewing container. All these aspects of medieval brewing changed in the early modern period, when the forefront of commercial sake production shifted from temples in the Nara area to the cities of Itami, Ikeda, and Nada in modern Hyōgo and Osaka prefectures, areas today that produce approximately a third of all sake made in Japan. Commercial brewers of the early modern age transitioned to brewing only in the wintertime, allowing them to lengthen the fermentation period and better control bacteria that proliferated in warmer weather that might damage the sake. Early modern brewers also used polished rice at all stages of the production process and could rely on rice milled to a much higher level and speed thanks to waterwheels, innovations that would have produced a smoother tasting sake. And they perfected methods to maintain a healthy fermentation and boost production by adding their ingredients of rice, kōji, and water in stages of ever-increasing amounts into wooden barrels with much larger capacities than medieval ceramic vessels. The recipe for sake today owes a deep debt to the developments of the brewers’ art in the early modern period, but early modern brewers were likewise indebted to their medieval predecessors, as *Sake Journal* shows.

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after brewing the sake. Yoshida (2015) and move it to the end since pasteurization occurs
14. This section comes after the recipe for Amano sake, but I follow
sat for two additional days.
13. Presumably, the covering was removed later, and the container
cooking methods, see Rath (2016: 76–83).
12. For a further description of
kama
and kamado, see Rath (2016: 78–81).
11. Katō (1989: 46) interprets this as white rice, but Matsumoto
(1979: 748) and Yoshida (2016: 105) contend it is brown rice. To me,
the original “good rice with the chaff removed” ([w]are mo naki no
umai
) can also be read as
brown rice. The directions to “steam it thoroughly” ([h]i gohan
w h i c h
) are also consistent with other passages that indicate brown rice.
10. Mixing the koji with water helps to diffuse the enzymes in the
water in preparation for fermentation, an important step before
adding the other ingredients.
9. For a further description of
umai
, see Rath (2016: 78–81).
8. The same characters for
goshu
and
sake
) can also be read as
miki
, which usually refers to sake used as an offering to a deity in a religious ritual.
4. The temple describes these activities on its website. https://shoryakuji.jp/event/event2.html

REFERENCES