

Bronze Bells in Early Japan: “Swallowed” by the Mountains? An Interpretation of Their Ritual Purpose in Early Iron Production

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Introduction

The earliest extant large-scale works of literature in Japan, dating from the late seventh through the eighth century, comprise myths, legends, poems, chronicles and gazetteers. Many of these contain passages that to the modern reader appear at first sight to be obscure, irrelevant in context, or otherwise dismissed as ‘nonsense.’ In recent decades, however, it has become increasingly clear that their comprehension depended on word play. I have argued elsewhere that these plays on words were by no means random or puerile: they were often, to the contrary, ingeniously crafted and complex sets of word plays based on relevant and selected themes, motifs or tropes.¹ Decoding of these sets of word associations reveals deeper and holistic meanings for the phrase or passage in question. This resembles a verbal cryptic crossword, the decoding of which by the listener/reader is essential to ‘getting the point’ of the reciter’s intended meaning. The text I have mainly concentrated upon is *Harima no kuni fudoki* 播磨国風土記 (hereafter *Harima fudoki*), which dates from around 714 CE.

In this text, there are two separate entries that describe the disappearance of a ‘jingle bell’ on a hillside. In this article, I shall hypothesize that these two brief passages were oral vestiges of the Yayoi Period practice of burying bronze bells. The motives for the burying of bronze bells in the Yayoi Period are still unclear, and theories abound. In connection with ‘decoding’ a deeper meaning to the two *Harima fudoki* entries, I shall review the theory that the practice of burying bronze bells was connected to the early search for iron deposits.

First I shall present the two passages in question, before moving on to a review of the literature about iron extraction and production in ancient Japan.

Harima Fudoki

Passage (1): in the entry for Paripara *Sato*, Ipibo *Kōri*:

Suzukupi-woka: The reason why it is called Suzukupi is because in the reign of the Heavenly Sovereign Pomuda, [he] was hawking on this hill; the falcon’s bell fell off and they searched but to no avail. Hence it is called Suzukupi-woka.²

¹ Palmer, 2000; 2001a; 2001b; 2007; 2008; 2009; 2010; 2011a; 2011b; 2013; 2016.

² *Suzukui-oka* 鈴喰岡 in Modern Japanese. ‘Bell-swallowing Hill,’ possibly Iwaoka in present-day Katabuki, Honda-chō, Tatsuno-shi (Kadokawa Nihon Chimei Dai Jiten Hensan Iinkai 1988, 1833); or Katabukiyama, Katabuki, Honda-chō, Tatsuno-shi (Tai 2010, 119). See Akimoto 1958, 305; Uegaki 1997, 69; Okimori et al. 2005, 26; Palmer 2016, 156. *Suzu*: ‘small jingle-bell, crotal.’ *Homuda*: putatively King Ōjin. *Taka*: ‘hawk,’ ‘falcon,’ a general term for small and middle-sized birds belonging to the Order Falconiformes. Bells were sometimes attached to the falcon’s tail (Uegaki 1990b, 76. See, for example, a *haniwa* displayed at the Asian Art Museum of San Francisco, fig. 1). There is no explanation for the ‘swallowing’ in the text. It is not clear whether it was the falcon or the hill itself that was deemed to have swallowed the bell; I take it to mean the latter.

Passage (2): in the entry for Tuma *Sato*, Taka *Kōri*:

Suzupori-yama is so called because when the Heavenly Sovereign Pomuda came [here] on a progress, his [falcon's] bell fell off on this mountain. They searched but could not find it, so they dug the ground to look for it. Hence it is called Suzupori-yama.³

In both of the above passages, the word for 'bell' is 鈴, glossed *suzu*. *Suzu* refers to a crotal bell, which is to say, a 'jingle bell'—the type of spherical bell in which a ball moves freely when shaken, without the ball falling out. Metal ones jingle, but they may also be made of clay, in which case they rattle, sounding somewhat like maracas. In both passages, the bell disappears while a king is out hunting with a falcon on a hillside, and a search for the missing bell ensues. In the first entry, the inference appears to be that the hill (Suzukui-oka) itself has 'swallowed' the bell. In the second (Suzuhori-yama), those present dig but fail to find it. Either way, the consequence is that the bell is left *in* the hillside.

If a connection is to be made between these *suzu* bells and the buried bronze bells of the Yayoi Period (Old Japanese *sanaki* 鐸, nowadays called *dōtaku* 銅鐸), it might at first sight be argued that bronze being an alloy of copper (*akagane* 銅) and tin (*suzu* 錫), a mental association could easily have been made between tin (*suzu*) and crotal bells (*suzu*). There may indeed be some such connection: metallurgist Kamei Kiyoshi 亀井清 found that the tin content of Japanese bronze was greatest in the earliest Yayoi bronze bells, at around 20 per cent, there being less later on in the Kinki region.⁴ However, there appears to be much more involved in this puzzle.

Bronze Bells (*dōtaku*)

Almost half a century ago Tanaka Tatsumi 田中巽 noted that there were already more than a hundred theories regarding the usage, distribution, etc., of Chinese-style bronze bells (*dōtaku*).⁵ Even now, the mystery remains unsolved with any degree of certainty; and obviously, an appraisal of all such theories is beyond the scope of this article.



Figure 1. Falcon-shaped *haniwa* with bell attached to its tail. (Author's photograph reproduced by kind permission of the Asian Art Museum, San Francisco, California.)

³ *Suzuhori-yama* 鈴掘山 in Modern Japanese. 'Bell Digging Mountain.' See Akimoto 1958, 337; Uegaki 1997, 105; Okimori et al. 2005, 40; Palmer 2016, 213. *Hori*: 'dig.' Local folklore has it that the bell can still be heard tinkling on rainy days (Inoue 1931, 427). Possibly present-day Susōji-yama, Hori-chō, Nishiwaki-shi (Akimoto, 1958, 336, n. 1; Kadokawa Nihon Chimei Dai Jiten Hensan Iinkai, 1988, 1385).

⁴ Kamei, in Mori 1983, 314.

⁵ Tanaka 1970, 1.

In brief, *dōtaku* appeared in Japan during the Yayoi Period (approximately 1000BCE–200CE).⁶ Around five hundred have been unearthed to date.⁷ Geographically, they tend to be concentrated in western Japan, especially in the Kinai region. Other bronze artefacts such as mirrors, weapons and agricultural implements dating from the Yayoi Period are frequently found as grave goods—often together with other items and sometimes in large quantities. However, this is not the case with bronze bells, which are typically found by accident, singly or in small numbers, separate from obvious dwelling or burial sites.⁸ Unlike other ritual objects, they are not found in burial mounds. Instead, they turn up in hills or valley sides, and appear to have been deliberately buried. Curiously, their use ceased rather abruptly around 300 CE, at the beginning of the Kofun Period.

Early bronze bells were small and functional, with thick rounded suspension loops on top and a clapper hung from the inside. Freshly cast, they shone in an awesome way. In time, suspension loops flattened such that the bells could no longer have been suspended. Clappers disappeared, meaning that they were no longer intended for ringing. In size, they became bigger, the largest to around 1.35m, arguably too big to be practical as suspended bells. In short, their purpose changed from “bells for listening to” to “decorative ritual objects for looking at”. Similarly, contemporaneous bronze weapons evolved from instruments of killing to symbols of authority.⁹

Yet once bronze bells had become ‘ritual’ objects, for what rituals were they used, and why? Why would they, rather than any other kind of object, have been ceremonially buried on hillsides? Many are decorated with scenes depicting deer, hunting and threshing scenes, grain stores, dragonflies, lizards, turtles, cranes, etc. Faute de mieux, this has led to what is perhaps the most widely accepted interpretation: that these depict agricultural scenes, and that the bells’ use was therefore presumably to invoke bountiful harvests.¹⁰ But given that Imori Tokuo 井守徳男 notes that deer are by far the most common creature portrayed also on fifth century decorated pots and *haniwa*—and even on an octopus pot—, which are not particularly linked to agriculture, it is hard to see a plausible specific direct connection between *dōtaku* and *agricultural* rites.¹¹

The most widely accepted of the many theories about *dōtaku* include the following (in no particular order): they were for propitiating a bountiful harvest; they were precious communally owned ritual objects, dug up only for ceremonies and festivals, like ceremonial bronze drums in Vietnam that were normally buried; they were discarded in the ground when no longer needed; they were buried when small village states confederated into districts (*kuni*); they were tutelary deities of village boundaries; they were concealed in the ground as treasures; they were distributed by central Yamato authorities to local tribute lords; they were apotropaic *yorishiro* (依り代 / 憑代) for warding off earthquakes, etc., as in ancient southern China.¹²

⁶ In 2003, AMS carbon dating placed the start of the Yayoi Period at around 1000 BCE. (Morioka Hideto 森岡秀人 in Harimagaku Kenkyūsho 2010, 90.)

⁷ <https://ja.wikipedia.org/wiki/銅鐸>. Accessed 7 June 2016.

⁸ There are some exceptions, most notably at the Kōjindani site in Shimane Prefecture, where six were found near 358 bronze swords. Kōjindani Hakubutsukan, 2006; Shimane-ken Hikawa-chō, undated.

⁹ Ōsaka Furitsu Yayoi Bunka Hakubutsukan 1991, 48.

¹⁰ See for example, Piggot 1989, 47: “Bronze bells are believed to have been used in springtime to awaken the spirits of the earth prior to planting.”

¹¹ Imori 2010, 235 and 251–252.

¹² Ōsaka Furitsu Yayoi Bunka Hakubutsukan 1991, 49.

As the Wikipedia website points out, all of the above attract refutations.¹³ It is not the purpose of this article to evaluate these theories, which I also regard as largely unconvincing, but to consider the plausibility of a lesser known theory: that the ritual usage of bronze bells was related to the search for *iron* deposits.

The Beginnings of Iron Use in Early Japan

Broadly speaking, metal smithing appeared in Japan in the Yayoi Period, along with a more complex continental cultural suite that included wet rice agriculture, sericulture, and the production of stoneware pottery. A chronological demarcation between a 'bronze age' and an 'iron age' is much less clear in Japan than in many other parts of the world. Arguably, metal smithing originally arose from experience of pottery making, since both involve the construction of a furnace, the control of fire at high temperatures, and the transformation of mineral matter by fire.¹⁴ Debate remains about the commencement of bronze and iron making in Japan, including the extent to which it depended on importation of raw materials and scrap metal from the continent. Again, there is insufficient space here to discuss the discourse on this subject; but iron objects began to appear in Japan from around the fourth or fifth century BCE.¹⁵

Suffice it to understand that copper melts at a temperature of around 1100°C, whereas the melting point of iron is around 1528°C. These are the temperatures required for *casting* the metal into the desired shape, by pouring the hot molten metal into a mould. Needing hotter temperatures, it took the development of more sophisticated furnaces to be able to cast iron than bronze. Nevertheless, at 700–800°C iron becomes sufficiently malleable that it can be tempered and forged as wrought iron.¹⁶

Iron deposits appear in several forms. It is generally thought that iron working commenced in the region of Anatolia (Turkey), and that the most readily accessible sources were of magnetite, Fe₃O₄, which is to say, iron contained in fallen meteors. It is often claimed that there is no evidence of iron production in Japan in the Yayoi Period, but use of iron objects and their manufacture started in the first century BCE. For Japan's earliest efforts at iron working, evidence in Northern Kyūshū indicates that the source was imported pig iron or scrap iron from China or the Korean Peninsula.¹⁷ For example, iron bars (*tettei* or *kanateko* 鉄挺) imported from China and the Korean Peninsula have been found as grave goods in mid-Kofun Period graves. But there is increasing evidence of small ironworks dating from the mid-Yayoi Period onwards.¹⁸

¹³ Wikipedia Japanese edition, <https://ja.wikipedia.org/wiki/銅鑄>. Accessed 7 June 2016.

¹⁴ Mayumi 2012, 39. Mayumi observes that in the *Nihon shoki* entry for Sūjin 7, the agent for enshrining the deity Ōmononushi at Mt. Miwa was called Ōtataneko from the *sue* pottery base village of Suemura. He posits that the agent's name Ōtataneko indicates that he was skilled in the use of *tatara* (furnace, iron bloomery). See also Aston, 1896 152–154.

¹⁵ Senda 2002, 180.

¹⁶ See for example, Ōsaka Furitsu Yayoi Bunka Hakubutsukan 1991, 21; Mayumi 1993, 13; Asai 2008, 31; Mayumi, 2012, 16.

¹⁷ Asai 2008, 109; Morioka, in Harimagaku Kenkyūsho 2010, 89.

¹⁸ Asai 2008, 92–110.

However, warfare, both on the continent and within the Japanese archipelago, seems to have blocked the route through the Inland Sea in the late second century, such that the main points of entry were via the Japan Sea and the districts of Izumo, Hōki, Inaba, Tajima and Tango. Indeed, some scholars posit that this period of warfare in Eastern Asia, including the so-called second century Wakoku Tairan 倭国大乱 strife in Japan, was primarily a power struggle for the control of sources of iron.¹⁹ Once peace resumed, the Inland Sea again dominated, including the Harima coast, and from then on the Kinki hegemony started to control the production and shipment of iron.²⁰ Pertinent to the present study is that the province of Harima was from early times an important source of iron.²¹

It used to be believed that the first kind of ore to be domestically exploited was obtained from iron sands (*satetsu* 砂鉄, containing magnetite washed out of granite and andesite rocks) in river sediments and coastal beaches. If necessary, cliffs were mined, and the tailings of broken rock were washed downstream (*kanna-nagashi* 鉄穴流し). The heavier particles of iron sank to the bottom and could be collected in fibrous matting. Simple outdoor furnaces (*ro* 炉 “bloomeries”) were built of clay and fired with wood or charcoal. In order to raise the temperature within the furnace sufficiently, the continuous introduction of oxygen was essential. Consequently, bloomeries tended to be built on hillsides where they could catch the wind, and were likely fired on fine days when a stiff breeze blew.²² In addition, they used bellows (*fuigo* 吹子) made of deerskin leather to increase the draught through the furnace. The process was called *tatarafuki* (踏鞴吹き) or simply *tatara*.²³ This smelted out the iron sand from the rest of the rock to produce a spongy “bloom” of iron and slag (*kerā* 鋤), which sank to the bottom of the furnace; the furnace was smashed to allow the molten mixture to flow out. The iron bloom was further refined by repeated heating and hammering to make wrought iron suitable for agricultural implements and weaponry. It is well known that such *tatara* bloomeries became relatively common during the latter part of the Kofun Period (late sixth to eighth centuries), but it is unlikely that high enough temperatures could be reached early on in the Yayoi Period for casting. Nevertheless, iron was much more practical than softer bronze, for making both agricultural implements and weaponry.

Bog Iron and “*Suzu*”

However, it has become increasingly evident that even in the Yayoi Period, Japanese in western and central Japan were aware of another domestic source of iron—ironstone in the form of limonite or “bog iron.” Streams bring down dissolved iron, and particles containing iron are trapped among the roots of aquatic plants in wetlands with sluggish water flow, such as upland bogs, lakesides, riversides, watermeadows, marshes and swamps. (See fig. 2.)

¹⁹ Senda 1998, 133ff; Senda 2002, 177; Morioka, in Harimagaku Kenkyūsho 2010, 108; Nagano 2015, 60–116.

²⁰ Asai 2008, 48–92; Morioka, in Harimagaku Kenkyūsho 2010, 94.

²¹ See for example, Kometani 1967; Chikusa-chō Tatara Hakkutsu Chōsandan 1968; Oda 1981; Toba 1997a, 6–71; Tosa, in Mori 1999.

²² Kubota 2003, 30.

²³ The etymology of this word in Japanese is said to be derived from the same source as “Tartar,” since iron production is thought to have arisen first around present-day Turkey and was transmitted across Asia by Tartars.

In brief, the actions of the water and the bacteria around the roots cause the iron both to oxydize and hydrate into a lumpy mass (nodule) of reddish-brown hydrous ferric oxides ($\text{Fe}_2\text{O}_3 \cdot n\text{H}_2\text{O}$). In due course the plants die. The outer clayey surface of the nodule dries and hardens to a crust, while the heavier iron-containing matter within also dries, precipitates onto the inner side of the crust, and shrinks but at a differential rate. Sandy particles eventually break away from the outer crust, so that the nodule rattles when shaken—just like a crotal bell or maracas.²⁴ In Japan, this is known variously as *kattekkō* (褐鉄鉱) or *koshōtetsu* (湖沼鉄 “bog iron”), *nariwa* or *nariiwa* (鳴石 “sounding stone”), *tsuboishi* (壺石 “pot stone”, since the crusts could be used as containers), or *Takashi Kozō* (高師小僧 “Little Boy Takashi”)—and, not unsurprisingly—*suzuishi* (鈴石 “crotal bell stone”).²⁵ (See fig. 3.)

In size, nodules of limonite vary from 5 mm to a few metres in diameter.²⁶ A noteworthy example was discovered at the Karako-Kagi Site (Tawaramoto-chō, Nara Prefecture) in 2000. Its dimensions were 14.5 cm x 13.2 cm x 6.9 cm. That it had been used as a precious ritual object was obvious from the fact that it had been broken open, the limonite extracted and substituted with two jade comma-shaped beads (*magatama*), then the crust receptacle “jewel box” capped with a clay lid.²⁷ It dated from the mid-Yayoi Period.



Figure 2. Conditions for limonite concretion.
(Maerewhenua River near Danseys Pass, New Zealand)



Figure 3. Example of limonite, “rattling rock”.
(Author’s photograph reproduced by kind permission of The Vanished World Society Inc., Duntroon, New Zealand.)

²⁴ Solvent action of ground water on the iron content of the rock causes the redistribution of the iron compounds from colloidal solutions within the rock. The bed of the rock then separates from the joints, breaking up into blocks which may then become rounded due to weathering, erosion or being rumbled down the river. Thus they are irregular in shape, but tend to be smooth, ellipsoid or bar-shaped. When the concretions are broken open, they usually consist of an outer shell, or concentrically arranged shells, of a hard ironstone with a centre of sand, the iron having been completely removed from the centre and deposited in the inner of the outer shell, decreasing in content as it nears the outermost casing. Occasionally an entire separate nodule of ironstone is found inside the centre of the concretion like the kernel of a nut (adapted from display information, Vanished World, Duntroon, New Zealand).

²⁵ Mayumi 1993, 11; Mayumi 2012, 58–60. The author notes that bog iron nodules may also be found in New Zealand along the Maerewhenua River in the Waitaki Valley from Danseys Pass to Duntroon, where they are known as “rattling rocks” or “rattle rocks”. See Andrew Robert Wilson, “Fascinating Fossils and Rattling Rocks in Waitaki,” *100% Pure New Zealand*, <http://www.newzealand.com/in/article/fascinating-fossils-and-rattling-rocks-in-waitaki/> and The Vanished World Society, Inc., Duntroon, North Otago, New Zealand, <http://www.vanishedworld.co.nz/index.php/home>.

²⁶ Mayumi 1993, 11; Karako-Kagi Kōkōgaku Museum, Collection Data No.2, undated.

²⁷ Karako-Kagi Kōkōgaku Museum, Collection Data No.2, undated; Karako-Kagi Kōkōgaku Museum 2004, 45.

Moreover, the inclusion of 6% ferrous phosphate (*kurotsuchi* 黒土 $\text{Fe}_3[\text{PO}_4]_2$) as a catalyst in the furnace lowers the temperature for making wrought iron (e.g., magnetite from 1130°C to 950°C), and since limonite naturally contains ferrous phosphate from decomposed organic matter, it produces malleable iron at temperatures even lower than the normal range of 700–800°C.²⁸ Experiments were conducted in 1991 at Namiai-mura in Nagano Prefecture to verify the feasibility of whether local bog iron could have been refined using only Yayoi Period technology, and the results were successful.²⁹

Mayumi (1993 and 2012) argues that limonite (bog iron) was the raw material for iron working in Yayoi Japan. He suggests that nodules would have been regarded as mysterious and awesome, because of their deposition within a crusty case and because they rattled.³⁰ Moreover, once harvested, they might potentially regrow within a matter of three or four years—almost as though they were themselves alive.³¹

Mayumi hypothesizes that through the use of sympathetic or homeopathic magic, similar, but less valuable, bronze bells, were buried in places near where nodules were likely to form: on hillsides, overlooking boggy ground and streams. He believes that the religious act of shaking bells was to propagate the formation of limonites, and that small bronze bells were at first used for such purposes: he suggests that this ceremony developed into the ritual *kagura* dance performed by the deity Ame no Uzume to entice the Sun Goddess Amaterasu Ōmikami out from the Rock Cave of Heaven. Notably, Ame no Uzume shakes a spear which is wrapped in cogon grass (*chi* 茅) (*Nihon shoki*: 720 CE)³² or has jingle bells attached (*Kogo Shūi*: 807 CE).³³ In due course, as the search for usable iron sources became ever more urgent, the bronze bells for offering to the gods in return for bog iron nodules were enlarged.³⁴ The abrupt disappearance of bronze bells around the beginning of the fourth century is explained by improvements in furnaces and firing techniques to higher temperatures, facilitating the use of more widespread and accessible iron sands as ore from then on.

Mayumi marshals a good deal of indirect evidence to support his theory. As I have demonstrated repeatedly elsewhere, plays on words were considered to have apotropaic effects in ancient Japan; and often they were employed in multiples. It is no surprise, then, that *suzu* (tin) is homonymous with *suzu* (crotal), as noted above. Moreover, Mayumi points out that a generic word for aquatic plants was *suzu* (簍), (which is more commonly glossed in Modern Japanese as *komo*),³⁵ and included grasses, sedges, reeds and bamboos. Hence, the expression *suzu ga naru* 鈴が鳴る (the bell rattles) could call to mind *suzu ga naru* 簍が生る (waterside grasses grow). Both phrases were evocative of *suzuishi* 鈴石 or *nariishi* 鳴石: nodules of bog iron. In ancient times, then, nodules may well have been called *suzu* 鈴 too, since they in turn evoked *suzu ga naru* 鈴が生る (bog iron forms).³⁶

²⁸ Asai 2008, 33, 103–108. In their pure states, the melting point of wüstite ferrous oxide FeO is 1377°C; magnetite ferrous-ferric oxide Fe_3O_4 , 1538°C; haematite ferric oxide Fe_2O_3 , 1550°C. However, ores contain mixtures and impurities, which in practice alters the order of their melting points: limonite the lowest, followed by haematite, then magnetite.

²⁹ Mayumi 1993, 10–11.

³⁰ Mayumi 1993, 13.

³¹ Asai 2008, 101.

³² See Aston 1896, 44.

³³ Katō and Hoshino 1926. <http://sacred-texts.com/shi/kgsh/index.htm>.

³⁴ Mayumi 1993, 13–15; 2012, 54, 57.

³⁵ Mayumi 1993, 18.

³⁶ Mayumi 2010, 60, 64.

It is attested that place names in Okayama Prefecture that include elements such as *suga* and *suge* 菅, *ashi* 芦 and *kusa* 草,—all species of waterside plants—are indicative of places connected with early iron production and they have been presumed to be connected with iron sand.³⁷ However, it is more likely that, as noted above, the connection is with bog iron rather than with iron sand.

If bronze bells were offered to relevant deities, either to pray for the finding of good nodules of bog iron, or to thank the same deity or deities once they had been discovered, it stands to reason that such rituals would have been conducted near the search site: on hillsides near bogs and streams where limonite nodules form. If this were the specific purpose of burying bronze bells, it persuasively explains why they turn up in small numbers in such locations but not elsewhere as, for example, grave goods or in contemporaneous dwelling areas.

Senda (2002) notes a close association in what he calls ‘taboos concerning iron’ (*tekki shinkō* 鉄忌信仰) between water/rivers and iron/swords. Pertinent to the discussion at this point is his observation that in continental Daoist thought associated with the Five Elements (*gogyō sōshō* 五行相生): “When metal is buried in the earth, it works to promote the cycle of regeneration, since Earth begets Metal, and Metal begets Water.”³⁸ He adds parenthetically that the burial of bronze bells may have been for “pacifying *something* [my emphasis].” In addition to reasons such as those above, I suggest that the burial of bronze bells on hillsides was to induce the production of bog iron nodules in stream beds ‘alchemically’ or through Daoist prayer.

Mayumi further observes that the *makura kotoba* 枕詞 (so-called “pillow word,” kenning or epithet) representing the ancient province of Shinano (信濃・科野) is *misuzukaru* (水簀刈る・三簀刈る), comprising the honorific *mi* (御)—indicating here sacredness—followed by “reaping [wetland] grasses”. To be sure, the nodules of bog iron might more easily be revealed by cutting the wetland plants to find them among the roots; but I suspect that an alternative mental association with *karu* 刈る (to cut, reap) could have been *karu* 狩る (to search/hunt on the mountains to collect [grasses/bog iron]). Such wetland plants still grow in abundance around Lake Suwa in Shinano Province (Nagano Prefecture). The limonite nodules could also become exposed after the wetland grass had died back—another meaning of *karu* 枯る (to wither). The multiple meanings of this *makura kotoba* therefore include 簀枯り (wetland grasses wither), in addition to 簀刈り (reaping wetland grasses), 簀狩り (hunting for wetland grasses), and 鈴狩り (hunting for bog iron).

Moreover, Lake Suwa was an early source of limonite. The prime shrine of Shinano Province was (and is) Suwa Grand Shrine 諏訪大社, where the Kanayako no kami 金屋子神, the deity of *tatara* furnaces, was worshipped. Mayumi posits that worship of this deity at Lake Suwa lasted longer than elsewhere because the lake shore produced lots of limonite, and because it was a remote (“backward”) district.³⁹ Hence, the epithetic *makura kotoba* for this district retained oblique reference to the search for limonite nodules, long after bog iron had been replaced by iron sand in importance.

Nagano (2015) notes that various iron grave goods dating from around the first century CE in Shinano Province have no correspondence elsewhere except in northern Kyushu, and posits the

³⁷ Urakami Hiroshi, “Okayamaken-nai no tatara chimei,” [http://miwa1929.mond.jp/index.php?岡山県内の製鉄\(たたら\)地名](http://miwa1929.mond.jp/index.php?岡山県内の製鉄(たたら)地名). Accessed 15 November 2016. I am indebted to Dr. Kazuhiko Seki 関和彦 of Nihon Chimei Kenkyūsho 日本地名研究所 for pointing out this reference.

³⁸ Senda 2002, 171 (my translation).

³⁹ Mayumi 1993, 17.

possibility that they are traces of where an early wave of refugees from the Korean Peninsula settled via the Japan Sea coast. Further, he argues that these people established small-scale ironworks.⁴⁰

An observation by Asai (2008) is also suggestive. With reference to early bog iron extraction in Scandinavia, he notes that when wetlands began to freeze over towards the end of autumn, searchers would probe through the thin ice with long poles and ascertain the location of nodules of limonite by feel and sound. They would insert marker posts, both to stake their prior claim to the find and so that they could locate it in future. Now, we do not know quite how bog iron was recovered in Japan some two thousand years ago, but it is eminently plausible that marker posts (杭 *kui*) would have been driven into the wetland close to the find for similar reasons. If so, Suzukui-oka 鈴喰岡 (Bell-swallowing Hill) is homophonous with Suzukui-oka 鈴杭岡 “Bog iron nodule stake”.⁴¹ Perhaps we see here a case of the original meaning being lost once the activity ceased, then the place name origin myth arising as a result of punning, followed by scribes of the early eighth century recording the myth with *kanji* applicable to their interpretation of the tale.

The Falcon Motif

As I have stressed in my previous analyses of *Fudoki* tales—influenced by Lévi-Strauss—all elements must be carefully considered as potentially being of significance. In the entry for Suzukui-oka, the bell is specified as belonging to a *taka* 鷹, meaning a smallish bird of prey such as a hawk or falcon. In the Suzuhori-yama tale, the meaning is perhaps implied.

One of the words for a bloomery is 高殿, which may be glossed as either *tatara* or *takadono*. In other words, the expression *taka no suzu* could be heard as 鷹の鈴 “the falcon’s bell” or, through punning thought-association, as 高(殿)の鈴 “the bog iron in the furnace”, and could be taken to mean either. It is unclear from when exactly *tatara* furnaces were referred to as *taka(dono)*; but Asai cites an instructive tale related to the founding of the first and ancient Usa Hachiman Shrine, in present-day Usa-shi, Ōita Prefecture, allegedly enshrining Hachiman Ōkami: none other than Homuda/Ōjin, the king named in both of our *Fudoki* entries. Once upon a time, an elderly iron worker lived here beside a diamond-shaped pond. One day he turned into a golden hawk. In his anger he killed three out of five, and five out of ten passers-by. A shaman called Ōkami (or Ōgami) no Higi 大神比義 and a shamaness called Karashima no Suguri-otome 辛島勝乙目 made offerings of the “five cereals” (*gokoku* 五穀) for three years, and succeeded in appeasing him. The shaman asked the deity his identity, upon which he turned into a three-year-old boy and replied that he was “King Ōjin.”⁴²

Firstly, it is noteworthy that the old ironsmith lived beside a pond, where presumably waterside plants grew. Secondly, he turned into a “golden hawk (*taka*).” Of course, when the bloomery (*taka*) is stoked and fired, the spyhole glows gold. Thirdly, I previously analyzed a number of myths in the various *Fudoki* pertaining to deities that are said to kill a proportion of the passers-by, and who are eventually appeased (= enshrined) by ‘immigrant’ families.⁴³ I argued that these were female deities of rivers or water courses. The wrathful deity of the furnace in this tale is unnamed, but we know

⁴⁰ Nagano 2015, 86–92.

⁴¹ Asai 2008, 101.

⁴² Asai 2008, 136.

⁴³ Palmer 2001a.

that the deity of the furnace, who was often called Kanayago, was deemed to be a jealous goddess, and was worshipped by *toraisha* (Korean immigrant) iron workers.⁴⁴ The name Karashima, including as it does *kara*, a designation for the Korean Peninsula, suggests immigrant intervention. Moreover, washed out slag and tailings from ironworks were inevitably a source of despoliation of waterways: through weakening of cliffs along the banks, causing landslides into the river; through causing silting downstream, making the river more flood-prone; and through contamination from washed out minerals. Such environmental hazards would indeed have put nearby residents at risk until the immigrant iron workers got their operations under proper control.

Fourthly, it is surely beyond sheer coincidence that the “king” (Pomuda/Homuda, aka Ōjin) specified in the *Harima fudoki* entries above is the very same as that identified by the shaman in the case of the Usa Hachiman myth. Homuda is thought to have been an early fifth century ruler, and is the ‘heavenly sovereign’ most frequently referred to in *Harima fudoki*. He is purported to be the king buried in the Konda Gobyōyama Kofun in Habikino-shi, Ōsaka Prefecture, which is the second largest keyhole-shaped tumulus in Japan, and it dates from the early fifth century. In other words, Homuda/Ōjin has some particular, albeit obscure, connection with the early search for deposits of iron. Nagano (2015) claims that Homuda was descendant of a powerful family (*gōzoku* 豪族) based at Tsuruga 敦賀 on the Japan Sea coast that had risen to power by the third century CE through engaging in iron trade with a trading network on the Korean Peninsula.⁴⁵ This hypothesis merits further investigation; Senda (2002) observes that iron was the equivalent of currency on the Korean Peninsula in the third century, and was likely so in parts of Japan too at that time.⁴⁶ This is perhaps indicative of the importance of acquiring iron by any means available. It also accounts for the association of Homuda with iron in the collective memory even in the early eighth century when extant records commence.

Depiction of Deer

It was noted above that bronze bell decorations frequently depict bucolic scenes including deer, and that these depictions have spawned the view that bronze bells were perhaps utilized in agricultural rites of supplication for bountiful harvests. However, as I argue above, it is more plausible that they were used in seeking for deposits of limonite. The two passages in question about disappearing bells in *Harima fudoki* make no allusion to deer, but deer are mentioned in several other entries in the same document. What then is the connection between bronze bells and deer? If indeed bronze bells were votive offerings in the search for bog iron, where do deer plausibly fit into the overall picture?

The answer appears to lie in the fact that bellows for heating the furnace were made from deerskin.⁴⁷ In the well-known myth of the Sun Goddess Amaterasu’s retreat into the Rock Cave of Heaven, the blacksmith deity Ishikoridome is commanded to make bellows using the whole hide of a deer.⁴⁸ Deer, often considered as a deity or familiar of the spirit of the mountain in Japanese myths,

⁴⁴ Toba 1997a, 10; Senda 2002, 177.

⁴⁵ Nagano 2015, 121ff.

⁴⁶ Senda 2002, 182.

⁴⁷ Toba 1997a, 3; Nagafuji 2006, 180–81, 207.

⁴⁸ Aston 1896, 47.

likely have nothing to do with agriculture in their depiction on bronze bells, but more plausibly represent the spirit of the mountain and its earth that may yield valuable deposits of iron.⁴⁹ They are central to the smelting process in a practical sense too, insofar as they provide suitable leather for the bellows that are so essential for success in controlling the temperature of the furnace.

Conclusion

The above analysis of two passages in *Harima fudoki* referring to the disappearance of crotal bells into mountains reveals an interrelated suite of cryptic word play. This suite of puns includes at least *suzu* (tin, bell, wetland grasses), *taka* (falcon, bloomery), *kui* (swallowing, stake), *naru* (ring, form, grow), and *karu* (wither, reap, hunt). Decoded holistically, they support the theory that increasingly impractical bronze bells in the Yayoi Period were used as votive items in rituals associated with the search for nodules of limonite (bog iron), either in prayer to the deities for their future discovery or in gratitude for having provided finds. Since bog iron nodules are formed among the roots of wetland plants (*suzu*), it stands to reason that the votive bells would have been deposited where finds had occurred or were likely to occur: primarily where springs arose or streams passed through poorly drained boggy uplands. These nodules of limonite rattled like clay crotal bells (*suzu*), and thought association and concepts of sympathetic magic called for the substitution of the valuable nodule of iron with a similar but less valuable bell—a bronze bell—which necessarily contained a different kind of *suzu*, tin.

The above words—and perhaps others as yet unidentified—were associated through punning with the metal smelting process to produce a complex trope. *Naru* meant “to ring, sound, rattle” [of bells] or “to grow” [of wetland grasses], or “to form, become, grow” [of both]. *Taka*, “bloomery, furnace,” called to mind *taka*, meaning a hawk or falcon. Hence, the passages in *Harima fudoki* that refer to the disappearance of the *suzu* bell of a *taka* falcon on a hillside may be regarded as cryptic references to the search for and discovery of nodules of bog iron.

This ritual practice presumably began at a time prior to the development of techniques for building furnaces sufficiently hot for smelting and casting iron sand. Once such advances became widespread in the late Yayoi to early Kofun periods around 300 CE, the need to search for bog iron would have been superseded by this new technology that could employ abundant and more easily extracted iron sand, so that the ritual burial of bronze bells abruptly drew to a close.

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⁴⁹ Nagafuji 2006, 180.

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