

Silver Jars in the South Section of the Shosoin Repository

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At the South Section of the Shosoin, there are two enormous silver jars that have been preserved for many centuries. They measure approximately 60cm in diameter of body and weigh 46kg including the round base. The inscription on the bottom that reads “fourth day of the second month of Tempyō Jingo 3” (AD 767) and “Tōdaiji” proves that the jars were oblations offered by Empress Regnant Shōtoku for her imperial visit on the inscribed date. On the body of the jars, pictorial motifs are engraved using a burin, depicting a hunting scene with horse-riding figures chasing deer and boars. Taking into consideration the elaboration of the hunting figure composition, it has been thought that the jars were produced in China (Tang Dynasty) and brought to Japan. This paper describes the results of a close observation of the silver jars, and the consequent conclusion that, given the production skills and the features of the hunting patterns, the jars are most likely to have been produced in Japan. The major grounds for this conclusion are:

1. In contrast to the usual cases of ancient Chinese gold-ware and silverware, the type of burin used and the application methods are different, and the technical aspects are relatively unsophisticated.
2. It has been suggested that there is an evidence that efforts were made to scrape off the inscription of the original Chinese workshop. However, it appears that the evidence has been misconstrued and the markings are actually a trial burin etching, hence constituting no supportive evidence of production in China.
3. There are a total of twenty-four horse-riding figures and twenty-three animals drawn on the two silver jars. However, many of these subjects are the copies from the same pattern source. Specifically, the horse riders can be identified as being derived from only seven original patterns, and the animals from five original patterns. This suggests the difficulty in adding new motifs to the original patterns, originating from restricted production environments; i.e. production in Japan.
4. On the round base of the jars, peculiar motifs such as “capture of *qilin* (*kirin*, a mythical horned animal)” and “a man holding the reins of a *shishi* lion” are incoherently arranged.

The reason for the production and dedication of the silver jars remains unknown. There is a possibility that the silver jars were produced by collecting and recasting ancient silver coins “*Taihei-Gempō*”, no physical examples of which have been found to date, despite the fact that the order to cast the coins was issued in Tempyō Hoji 4 (AD 760). The issuance of the coins was proposed by *Fujiwara no Nakamaro* 藤原仲麻呂 who was chancellor (*Daijo-daijin*) of the imperial government. Four years after this proposal, he was killed by an imperial subjugation for rebellion. Empress Regnant Shōtoku presumably wiped away his achievements; and, at the same time, produced the silver jars and dedicated them to the Great Buddha of Tōdaiji temple as a requiem for the dead.

Scientific Research on the Shosoin Treasures Using Analytical Instruments

Masakazu Naruse

Beginning in 1982, the office of the Shosoin Treasure House has installed a range of scientific instruments in order to analyze the ancient materials used in the Shosoin Treasures. The first instrument thus introduced was an X-ray diffractometer, which is generally used for specifying crystalline components of a sample, and here for identifying stone materials and inorganic pigments. An X-ray fluorescence spectrometer is used for the qualitative and quantitative analysis of inorganic elements, and has been applied here since 1983 to investigate the elemental compositions of metallic objects, as well as the supplementary use for identification of inorganic pigments. A scanning electron microscope was installed in 1989, and has been employed for observing the particle configuration of pigments and the surface morphology of fibers such as silk and animal hairs. For characterization of adhesives, lacquer and coatings applied to the treasures, Fourier transform infrared spectroscopy (FTIR) has been used. FTIR is generally used to analyze functional groups within the structure of organic compounds. By the attachment of the attenuated total reflectance to the FTIR, it is possible to carry out a nondestructive analysis of an artifact. Fluorescence spectroscopy, set up in 2003, is used to investigate the fluorescence characteristics of organic compounds under ultraviolet and visible lights. In 2009, visible spectroscopy was incorporated to measure the optical absorption of organic colorants at different wavelengths within the visible region. With the UV/vis. spectroscopies equipped with optical fibers, the nondestructive characterization of natural dyes has been performed.

Through scientific research using the analytical instruments discussed above, the specification of more than thirty types of inorganic pigments, eight types of natural dyes, and three types of adhesives used on the treasures has been achieved. Additionally, previous analyses have led to the discovery of bronze, brass, and tin among the metal objects, and the indicated elemental compositions of some bronze mirrors suggested the place of manufacture. Currently studies seek to understand the origin of dyed materials using high performance liquid chromatography installed in 2015, in which the instrument separates each dye component contained in a minute sample taken from an object.

In addition to the material analyses on the ancient artifacts, research has also been conducted on the degree of degradation of silk fibers and dyed colors.

Shujitsu and *Hashitsugi*: Formation of the Shosoin Documents

Yu Sasada

The Shosoin Documents are management ledgers of a *shakyōjo* 写経所 (sūtra scriptorium) established under the Tōdaiji Construction Bureau in the eighth century. A large number of *shakyō-sei* 写経生 (professions engaged in sūtra copying, including scribe, proofreader and scroll mounter) were assembled there in order to transcribe the massive number of sūtra scrolls. Compared with writing sūtras for which highquality dyed papers were used, the management ledgers for the scriptorium reused scrap papers, such as the back of used papers of official documents created at central government ministries. Due to this reuse, however, the Shosoin Documents have become valuable historical materials that convey to the present detailed aspects of ancient government offices.

This paper discusses how the Shosoin Documents were formed, targeting a series of *shujitsu* 手実 (progress reports prepared at the scriptorium) that account for a significant portion of the Shosoin Documents. Generally, the existing research on the Shosoin Documents has tried to deepen understanding of the contents by interpreting the relative relationship of the front-and-back of a document as well as the sequence of the documents that has been confused due to compilation work undertaken in the Early Modern and Modern Periods. In contrast to these, this paper focuses on how the papers were used as a material, while mainly concentrating on morphological observation. In other words, this paper features consideration about the work: (i) done prior to used papers becoming documents; or, (ii) the details of which do not become clear only through documents (but, needless to say, are deeply related to the processes of sūtra transcription).

In making detailed observations of the documents, it has been found that a significant percentage of papers from the *shujitsu* progress report contain evidence that they had been initially used as *hashitsugi* 端継 paper. More specifically, this *hashitsugi* is a plain sheet of paper temporarily attached to the head and end of sūtra writing paper to facilitate sūtra transcription work. The *hashitsugi* paper was necessary for winding a scroll, while serving as a margin to write in the estimated position of ruled lines and or notes. This study found that among the *hashitsugi* papers, those on the end side of a scroll were peeled off after transcribing the sūtra, and reused for the *shujitsu* progress reports. Meanwhile, the *hashitsugi* papers on the head side of the scroll may have been finally removed at the bibliopegy stage after transcription and proofreading, and reused by *anzu* 案主 (administrator) for the management ledger.

In this manner, a document was created from the margin of the sūtra scrolls. Many of the Shosoin Documents are composed of scraps of paper produced through working procedures. It may be said that the ancient administration based on documents was underpinned by a paper reutilization structure indivisible from the procedures of the work described above.

Formation and Succession of the “*Inaba* Province Household Register”

Akihiro Watanabe

The “*Inaba* Province Household Register 因幡国戸籍” is an official document of the eighth century, compiled in the Shosoin Documents *Seishū* 正倉院文書正集, No. 29, front side of the fifteenth to eighteenth sheets. It follows, from the fact that the document contains additional notes about change in social status, that it is more likely to be a taxation register 計帳歴名 (created every year, describing the details of family members per household) rather than a household register (created every six years). To create a taxation register, officers in ancient times would have prepared a document in which they increased the ages of family members recorded on the taxation register of the previous year, and wrote in any additional changes that became apparent in the social status of each family member during the intervening year. Consequently, this document may be considered to have been the working ledger based on which the taxation register of the year was created.

This paper reports the results of detailed observations of the *Inaba* Province Household Register including a document created by using the blank space available on the back thereof. The back of the *Inaba* Province Household Register was reused at the sūtra scriptorium 写経所 in Tōdaiji temple, and turned into a document, called *Karakuni-no-Katami-no-Ge* 韓国形見解 (lit. a report written by *Karakuni-no-Katami* 韓国形見 who was in charge of managing sutra transcription projects). Through detailed observation, it has been found that the eighteenth sheet which is the beginning of this document was added later. This fact has important implications for understanding the *Inaba* Province Household Register written on the front of the paper as well. Furthermore, the examination found five folded lines in the vertical direction which are different from any ruled lines of the documents on either side of the paper, leading to the conclusion that the *Karakuni-no-Katami-no-Ge* was folded in six for storage.

In addition, due to the fact that the *Inaba* Province Household Register has ink transfer of text in the form of mirrored script in places, it was found that, in the creation process in *Inaba* Province, there was a certain period of time during which the document had been folded inwards at the fifth line of the seventeenth sheet. Since such a form of storage is inappropriate for an official document that is to be submitted to the central government, the document is obviously the working ledger upon which the creation of the taxation register was based. Furthermore, by analyzing the ink transfer, the researcher has estimated the contents of the missing part that was supposed to be joined to the seventeenth sheet. This research also categorizes the recorded changes in social status into four groups; (i) neonate, (ii) transfer of from one age category to another, (iii) station (in case of a soldier), and, (iv) confirmation as to whether any person has been registered on a household register. Through this discussion, this paper highlights the management of the people through creation of the ledgers. The outcome of this study also verifies the conclusion reached by Eiichi Matsuzaki (1975) that the document was created in Tempyō Hoji 2 (AD 762).