Manufacturing Methods for *Nohkan* and *Ryuteki* as Clarified by Radiography

Introduction

Noh is the first type of drama that was formed in Japan. Its prototype dates back to the early Muromachi period, to a form of drama started by Kan'ami and Zeami, a father and a son who were both actors.

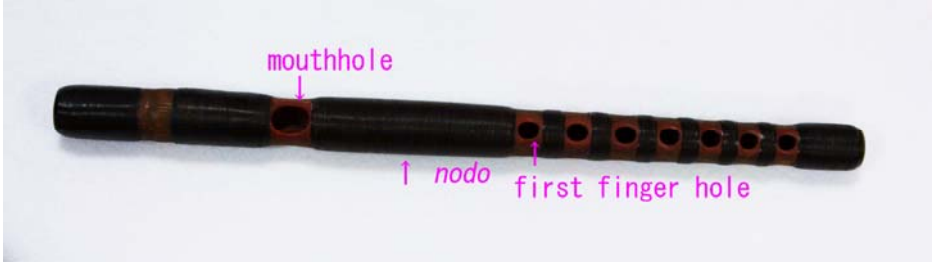
Since the progress of the plot and the sentiments of the main character are expressed mostly by means of songs and dances, the rhythm and tone of drums and flute that accompany them are very significant. The Department of Intangible Cultural Heritage has placed focus on the study of *nohkan* (a transverse flute used in *noh*) and has been investigating its manufacturing methods by radiography. As a result it was found that, in addition to what had been considered the conventional method for the manufacture of transverse flutes, there were other ways in which *nohkan*, an instrument having a special structure, was made.

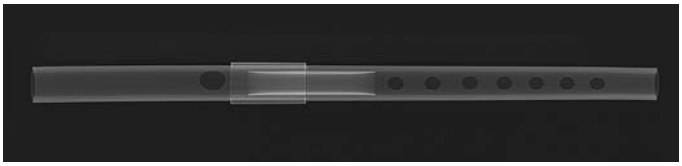
The Department has also been investigating *ryuteki* (a transverse flute used in *gagaku*). In 2008, a *ryuteki* stored inside the body of a statue of Amitabha at Ankokuji, a temple constructed in the Kamakura period, was investigated by radiography.

1. *Nohkan* and *ryuteki* – structural differences

Nohkan is 38 to 39 cm long and made of bamboo. After opening the mouth hole and seven finger holes, a thin string of the bark of a cherry tree is wound around the bamboo. Then a coating of Japanese lacquer (urushi) is applied, followed by a coating of vermilion. A small bamboo tube called *nodo* is inserted into the bamboo, between the mouth hole and the first finger hole in order to make the inner diameter of the flute smaller. This tube cannot be seen from the outside once the bamboo is wound with the string of cherry bark, but a radiograph reveals that the inner diameter of that part is smaller.

Although it is not clear why or when *nodo* began to be inserted, it inhibits stable temperament. This means that the interval between the low and high sounds of the same note produced by covering the same finger hole is smaller than an octave and is not uniform in all *nohkan*. Thus, since the temperament differs from one *nohkan* to another, it is not possible to play *nohkan* in ensemble.





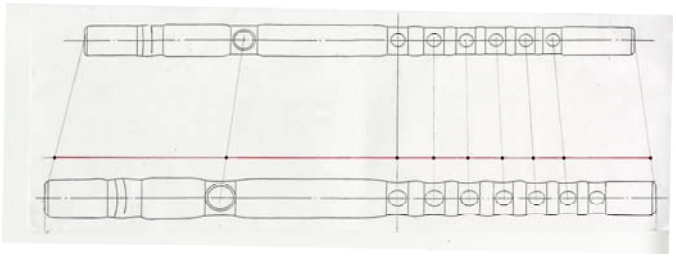
Ryuteki is approximately 40 cm long. It is also made of bamboo and has seven finger holes. Outwardly it looks very much like *nohkan*, but its inside is not made narrower, as is the case with *nohkan.* A radiograph of *ryuteki* shows that the part from the mouth hole to the first finger hole is straight. Because of this, it is possible to play a well-tempered scale like *do, re, mi* by releasing the finger holes one by one in turn. Since *gagaku* is an ensemble of melody instruments, it is indispensable that *ryuteki* is well tempered.

However, the difference between *nohkan* and *ryuteki* does not lie only in the presence or absence of *nodo*. The distance between the finger holes is also slightly different. The figure at the top is a drawing of *komabue* used in *gagaku*, while the one at the bottom is that of a standard *ryuteki*. The red line indicates a standard *nohkan*, and the points at which the vertically drawn black lines cross the red line show the positions of the six of the finger holes of *nohkan* (the seventh hole is not indicated because it does not relate to the pitch).

Komabue

Nokan

Ryuteki



Since its appearance is similar to that of *ryuteki*, *nohkan* was said to have developed from *ryuteki*. It was presumed that when *ryuteki* was broken for some reason, it was remade by inserting a separate tube to hold the broken pieces together, taking care that the damage would not be conspicuous from the outside.

However, inserting *nodo* into a *ryuteki* does not change it to a *nohkan*. Narrowing the inner diameter may not have been the only method for making *nohkan*, that changing the distance between the finger holes may also have been employed

2 *Nohkan* in the collection of Murakami Suigun Museum

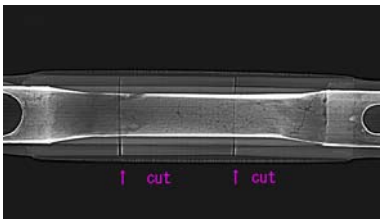
Murakami Suigun Museum in Imabari, Ehime prefecture has two *nohkan* in its collection. They have been handed down in the Murakami family, famous for its valor as pirates from the medieval to the early modern ages. Radiographs were taken of these two *nohkan*.

It was found that a typical manufacturing method was used to make *nohkan* on the left.

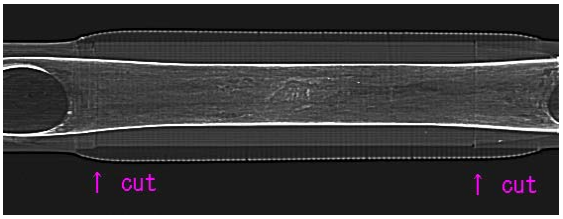
The inner diameter of the other *nohkan* is narrow, too, but *nodo* cannot be seen in the photograph. The two cuts between the mouth hole and the finger hole show that bamboo with wall of different thickness was used for this part. Thus the inner diameter of this part is smaller than that of the rest. It was not known until this investigation that bamboo with walls of different thickness could be jointed to make *nohkan* instead of inserting *nodo*.

Moreover, the distance between the finger holes of the two *nohkan* in the collection of Murakami Suigun Museum differs. The finger holes of the one with the *nodo* are positioned in a way similar to those of a standard *nohkan*. But the position of the finger holes of the one in which bamboo with walls of different thickness are used is different from that of a standard *nohkan*. This may be a transitional type to a finished *nohkan.*

Traditional method



Method using a separate piece of bamboo



3 *Nohkan* in the collections of Kikkawa Shiryokan and The Tokugawa Art Museum

Nohkan in which bamboo with walls of different thickness was used was discovered at Kikkawa Shiryokan, a historical museum in Iwakuni, Yamaguchi prefecture. This *nohkan* is said to have been in the collection of the first lord of Iwakuni, Hiroie (1561 – 1625). On the other hand, the *nohkan* of the Murakami family is said to have been used by Murakami Kagechika (1558 – 1610), master of the family during the Muromachi period, when he first went to war. Since both men are of the same generation, there is a great possibility that *nohkan* made by this method existed during the Momoyama period.

The structure of the *nohkan* in the collection of The Tokugawa Art Museum in Nagoya, Aichi prefecture is unique. A radiograph shows that *nodo* has not been inserted, but there is no trace to show that bamboo with walls of different thickness had been jointed either. What method was used to make this *nohkan* needs to be made clear, but it has been confirmed that there were several methods for making *nohkan*.

4 Conclusion

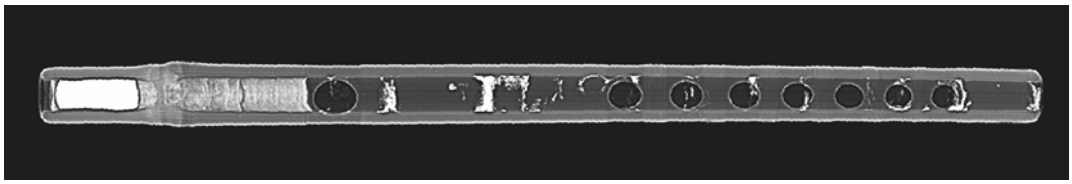
Since its appearance is similar to that of *ryuteki*, *nohkan* was said to have developed from *ryuteki*. The method of inserting *nodo* makes one think of repair work. However, the method of jointing bamboo with walls of different thickness can be thought of apart from repair. The discovery of several methods may change the hitherto held theory that *nohkan* developed from of repairing *ryuteki*.

As for the *nohkan* of Murakami Suigun that does not have a *nodo*, it has also been said to have belonged to Murakami Morokiyo, a master of the Nambokucho period. A study of a document written by Zeami shows that *nohkan* that were not well tempered were used from the early years of the Muromachi period. *Nohkan* has a uniquely sharp tone. It may be said that such a sound was not discovered by chance but was intentionally created.

The structure of a *ryuteki* manufactured in the Kamakura period

(transverse flute stored inside the body of the statue of Amitabha at Ankokuji, Fukuyama, Hiroshima prefecture)

Ankokuji in Fukuyama, Hiroshima prefecture is a Zen temple founded in 1273. A transverse flute was found inside the body of the main statue of the temple, that of Amitabha. Since the statue was made in 1274, the transverse flute would have been manufactured in the Kamakura period. Although the method used to make this flute is different from the one used today, radiography showed that its structure is very simple. It was made by opening finger holes on bamboo whose node had not been removed and winding hemp around the bamboo. *Ryuteki* in which nodes have not been removed have been confirmed only in the Shosoin Treasures and in the body of Kstigarbha Bodhisattva at Jako'in, the latter of which was also made during the Kamakura period. Thus, it has become clear that there were also several steps in the development of the method for the manufacture of *ryuteki*.



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