Special Exhibition

The Introduction of Guns in Japanese History

– From Tanegashima to the Boshin War –

Oct.3 (Tue) to Nov. 26 (Sun), 2006
National Museum of Japanese History

Outline of Exhibition

The history of guns in Early Modern Japan begins with their arrival in 1543 and ends with the *Boshin* War in 1868. This exhibition looks at the influence that guns had on Japanese politics, society, military and technology over this period of three centuries, as well the unique development of this foreign culture and the process of change that took place while Japan was obtaining military techniques from Europe and the United States at the time of transition from the shogunate to a modern nation state. An enormous number of materials, approximately 300, including new discoveries, form this exhibition arranged in three parts.

Since the National Museum of Japanese History first opened its doors, the Museum has conducted research on the history of guns and acquired more materials, mainly due to the efforts of Professor *UDAGAWA Takehisa*, the Museum's curator responsible for this exhibition. As a result of acquiring the three most renowned gun collections in Japan -- the *YOSHIOKA Shin'ichi* Gun Collection, *ANZAI Minoru* Gunnery Materials and part of the *TOKORO Sokichi* Gun Collection -- our collection of guns, related items and documents is the finest in Japan in terms of both quality and quantity. This exhibition is the culmination of many years spent acquiring guns and the findings of research conducted over that time.

* “S.N.“ (Serial Numbers) in this explanatory pamphlet show the numbers written at the upper-left of white plates for each article on display.

Part 1

The Acceptance and Establishment of Guns
(From their arrival through to the beginning of *Edo* period)

Around the middle of the 16th century, a large number of guns had been introduced to western Japan, which includes *Tanegashima*-island. The construction of extant examples of these old guns tells us that they came from Southeast Asia and not the Europe, and the *wakô* who were armed foreign-trade merchant groups and active around the seas of Southeast Asia at that time were responsible for their introduction.

Guns, newly arrived goods from overseas, were initially used as gifts or for hunting. Not long after their introduction, gunnery-masters who taught how to make gunpowder and how to fire a gun appeared in various parts of the country. These gunnery-masters spread gun technology throughout Japan in the course of their travels around the provinces where they plied their trade. Guns did not become a major weapon in wars until more than a decade after their arrival when *Sengoku* feudal lords established their own battalions of soldiers armed with guns.

1.1. THE ARRIVAL OF GUNS

Among some theories advocated for the arrival of guns, the leading one is "arrival to *Tanegashima*" theory as follows;

"The first gun was introduced by the Portuguese drifted down to *Tanegashima*-island in 1543. Many guns were made and widespread throughout Japan by coping the form of the first arrived gun. Because it was in *Sengoku* era, the Age of Civil Wars, guns were immediately thrown in wars."

It is widely accepted and even appears in school textbooks.

HOWEVER, the articles in front of you can present our COUNTERARGUMENTS against this theory.

Teppôki **(the upper of the panel on the right of a large photograph overlooking an ocean)**

The "arrival to *Tanegashima*" almost bases on the document named *Teppôki*, which was turned out by *TANEGASHIMA hisatoki*, the load of the island, when the usage of guns was at peak all around Japan.

But it was written in 1606, about 60 years later from the purported first arrival of gun, not in the same age. Furthermore, the purpose of writing this document was for giving tribute to his grandfather who purchased the gun. So the academic value of this document is not adequately high from the standpoint of historiography.

Were guns widespread only from *Tanegashima*?

If guns had been widespread throughout Japan by copying the form of the first arrived gun, all of the gun at the initial stage should have same form. But when we compare imported guns and the copied guns there, we can find wide variety of their forms, e.g. shapes of muzzle, barrel, trigger, breech etc. (see S.N. 1 - 4) In the16th century lots of trading vessels exchange visits around East Asia including Japan, so it is

assumed that other trading merchants also deal guns along with many other trade good.

Consequently we conclude that the early guns came to multiple locations almost at the same time, and the case of *Tanegashima* was one of these arrivals.

Was the first gun introduced by the Portuguese?

The Portuguese could be on board, but the ship drifted to *Tanegashima*-island was Chinese one, a junk, because *Gohô* who was recorded to be aboard together was the name of a big boss of *wakô*, who were armed foreign-trade merchant groups and active around the seas of Southeast Asia at that time.

Comparing European matchlock gun (S.N. 12) with Japanese ones (S.N. 1 – 5 and 9), you can see the difference of their shapes especially at breech. In the case of Japanese gun the breech was held at the shooter's cheek, in contrast, the breech of European gun was held at the shoulder. In addition, European gun has the matchholder moving from front to back and it is different from Japanese ones where the matchholders move from back to front. On the contrary when you observe guns of Southeast Asia (S.N. 10, 11), you would find they have similar shapes with Japanese ones.

From these points, Japanese matchlock guns were arrived from Southeast Asia by *wakô*, not from Europe.

Japanese gun (*Inatomi* school)

Gun of Southeast Asia

European gun

Were guns thrown in wars immediately after the arrival?

After arrival of guns, gunnery-masters appeared and taught manufacturing process of gunpowder, shooting techniques and so on. They organized their own schools and made books of secrets, *hôjutsu-hidensho*, which was double as text and license. In such books at the initial stage hunting methods with guns were chiefly described (S.N. 29, 31). Guns did not become a major weapon in wars until more than a decade after their arrival when *Sengoku* feudal lords established their own battalions of soldiers armed with guns.

1.2. GUNNERY SCHOOLS

Naked men only with loincloth

On the poster and leaflet a man is sitting naked except for his loincloth (*fundoshi*). He is one of pictures drawn in *Inatomi* gunnery school's book of secrets (S.N. 31). The reason why he is naked is to show the accurate configuration of foot and hands. You can access three more naked men of various pauses from QR cords on the backside of the leaflet by using a mobile phone.

Various gunnery schools

Each gunnery school used their own specified guns. You can see the differences in the case at the left wall of the first exhibition room. (S.N. 13 - 22). The points to be checked are figures of muzzle, barrel, front and rear sights, mechanism of match movement, etc.

1.3. GUNS WHICH CHANGED WARS

Once guns were thrown in wars, they significantly changed the way of wars.

Alteration of armor

In three suits of armor at the center of the first exhibition room, ones at left and center (S.N. 44, 45) had been usual to defend against sword and spear before the usage of guns for wars. After guns became key weapon in battle, a new type of armor and helmet, *tôsei gusoku*, literally "present-day armor", developed. The armor and helmet at right is *tôsei gusoku* of *TOKUGAWA Iemitsu*, the 3rd *Tokugawa Shogun* in the *Edo* period (S.N. 47). There are four bullet marks on it (two at forehead and left side of the helmet, and two at chest and back of the armor). Because he did not struggle in the battlefield, these marks are supposed to have been the result of inspection to check their defending efficiency against gun shooting.

Appearance of large guns

The length of imported and copied guns at the initial stage was around one meter, and their firing range was 100 to 150 meters. But about decade and a half after, large guns appeared to attack such military structures as castle, armed camp and warship. We exhibit four large guns, which have been fired at the *Bunroku-Keichô* wars and the *Ôsaka* wars, with length of 2 to 2.8 meters (S.N. 49). They were fired with being settled on pedestral supports such as sandbag. For longer barrel and larger bore diameter they used more gunpowder, and the firing range and destructive force increased dramatically.

Part 2

The Development of Gun Technology and Gunsmiths (Society and the Technology of Gunsmiths)

There are several kinds of firing mechanisms for matchlock guns. In the exhibition, we use disassembled examples and computer graphics to illustrate their construction and how ignition works using match cord. We also use old documents and tools used by gunsmiths -- tools from *Kunitomo* village in *Omi* which are the only such tools surviving today -- to show manufacturing techniques. *Kunitomo* village began making guns in the *Sengoku* period and once war escalated at the beginning of the Early Modern period the village was inundated with orders from all over the country. We show how a gunsmiths' guild was formed to handle this situation and how it grew to cover the whole of Japan. Here we also use exhibits to illustrate the differences in materials and manufacturing techniques between guns and swords, which have come to light through the application of natural science, and other aspects including bullet speed and force obtained from firing tests using guns made in *Edo* period.

2.1. PARTICULAR KIND OF GUN

Bôbiya* and *hiyadutu

Bôbiya is an explosive arrow (S.N.12). Wrapped gunpowder or explosive is fastened around a rod between head cap and shaft feather. Fuse powder is set into the groove at shaft feather. When *bôbiya* reaches an aim, it explodes or burns with great fury. *Hiyadutsu* is a gun to fire off a *bôbiya* (S.N. 10, 11).

Bôbiya and *hiyadutu* (upper)

2.2. GUN AND ACCESSORIES

Accessories of gun

To fire a gun, various kinds of accessories were needed as follows;

Hinawa, match cord, made with cotton or bamboo
(H-673-4-35: * the number at lower-right of the plate),

Ken'nawa, rope to measure distance between shooter and aim,

Tama-bukuro, bag of bullets,

Tama-gusuri-ire, bottle of gunpowder (H-673-4-20-9, 17, 20),

Kuchi-gusuri-ire, bottle of fuse powder (H-673-4-20-8, 9, 11),

Hayagô, small container to pack a bullet and gunpowder for a single shot, to load them quickly
(H-673-4-22-1),

Dôran, bag to put *hayagô* in (H-673-4-21-3, 4),

Tama-igata, casting mold for bullet (H-673-4-23-1 - 5). *Generally shooters melted lead and cast round-shaped bullets by themselves using such *tama-igata*. *Inabe* (on the left of *tama-igata*) was used to melt lead on charcoal fire.

***TOKUGAWA Ieyasu*'s gun and accessories (*important cultural assets)**

TOKUGAWA Ieyasu, the 1st *Shogun* of *Tokugawa* feudal government, was thoroughly accomplished at gun shooting.

"S.N. 42" is a set of his gun and the accessories;

A *doran*, a *tama-gusuri-ire* (the largest bottle) and two *kuchi-gusuri-ire* (left) ;

Two rolls of *hinawa* and one roll of *ken'nawa* (center);

Five *tama-bukuro* and bullets (right).

2.3. TECHNOLOGY OF GUNSMITH

Workshop and tools of *Kunitomo* gunsmith

Kunitomo village was famous for the manufacturing of guns, and *Tokugawa* shogunate and many feudal clans ordered their guns there. *Kunitomo* made guns in accordance with order notes (S.N. 43, 44, 48). Most tools (S.N. 55) were almost the same as usual blacksmith, and as unique tools for gunsmith *makishino*, core rods to make barrel tube (right), *momishino*, grinding tool for inside of barrel (left) and taps to shave female screw at the end of barrel.

Ikkanme-ôdutsu (Seki school*)*

Ikkanme-ôdutsu (S.N. 46) is a big gun to fire round lead bullets of *ikkannme*, i.e. 3.75kg. This gun was recorded to been fired in the early Edo period at *Kazusa* (*Chiba*-prefecture). This is the biggest gun being rest among those fired with being held by hands (ref. S.N.47).

S.N. 47, *hôjutsu-ema*, shows how to fire such big gun.

Manufacturing technique of matchlock gun

Only two documents are remaining about manufacturing technique of gun, *Nakajima-ryu hôjutsu kankiroku* (S.N. 53) and *Daishô onteppô seisakukata-no-hô* (S.N. 54). Two manufacturing methods of

barrel were recorded there. One was the method called the "*udon-bari* (literally "noodle-forging")", longitudinal-forging. It was the way to roll a long and narrow iron plate vertically around a rod, and welded the joint with forging. Many cheap and made-up guns were manufactured in this way. Another was the "*maki-bari* (literally "wind-forging")" or "*kazura-maki* (literally "ivy vine wind")", swirly-forging. Long and narrow iron plates were wined around slantwise over the cylinder made with "*udon-bari*". It was done to make the barrel thick and tough (S.N. 52).

Other craftsmen made gunstock (S.N. 58, 59) and matchlock respectively, and all the part was assorted (S.N. 61 – 63).

2.4. VELOCITY AND FORCE OF BULLETS

Live-firing experiments

Live-firing test was done with three different sized guns, which used round lead bullet weight of 1.9 *monme*, 3 *monme* and 10 *monme* for each (**monme* is an old unit of weight; 1 *monme* = 3.75 g).

Muzzle velocity was measured with a chronograph. And bullet force of 10 *monme* was examined by shooting at 12.5m from aims: wooden board of 3cm thick; *tôsei-gusoku*, old armor made by iron plate; bunchy bamboo of 30cm thick; iron plate of 1mm thick. All of the bullets passed through them.

To stop 10 *monme* bullet, wooden board of 9cm thick and iron plate of 3mm thick were needed. The muzzle velocity of 10 *monme* bullet shot with 10g black powder was about 320m/s, that was almost the same as acoustic velocity.

2.5. NEW DEVELOPMENT

Development of specific technology

Early 19th century with the advance southward of Russia, Japanese had a consciousness of naval defenses. Under this situation some gunnery masters and technical workers developed their specific technology.

Kihô, invented by *KUNITOMO Tôbee* (S.N. 76), and *fûhô*, by *KUME Eizaemon* (S.N. 80), were kinds of air guns. *KUME Eizaemon* also made a wheel lock gun, *rinsuihai-jû* (S.N. 79), through use of spiral spring, and a percussion lock gun, *chô-jû* (S.N. 81).

Part 3

Upheaval at the End of the Shogunate and Reforms to Military Technology (Acquisition of western military techniques during the period of transition from the shogunate to nation state)

Japanese studied military techniques from the West first as a means of naval defense and later as a means of assuring victory in civil wars. However, it was an enormous struggle to overcome the huge gap between traditional fighting techniques and these foreign techniques. For example, it was very difficult to make a single rifling groove in the bore. It was as a result of surmounting this gap that the "warriors" of the Early Modern period disbanded and the "soldiers" of the modern nation state came into being. This is illustrated using many manuals on military techniques and guns that were imported from the West during this period of transition.

3.1. INTRODUCTION OF WESTERN GUNNERY

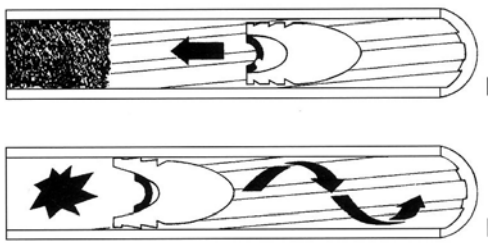
TAKASHIMA School

The Shogunate was shocked by defeat of China at the Opium War, 1840 to 1842, and decided to introduce the Western gunnery. They ordered *TAKASHIMA Shûhan* to undertake maneuvers (S.N. 1 - 2) according to the Western way operating infantry, cavalry and artillery. But the tactics and gunnery of *TAKASHIMA* School was originated from ones having prevailed at the West in the previous century, e.g. muzzle-loading flintlock guns (S.N. 3 -5), not the latest.

Impact of the Perry fleet and innovation of military system

After the arrival of M. Perry's fleet from the United States in 1853 and opening the country to the world in 1854, the Shogunate and feudal clans entered a full-fledged reform stage of military system. Geweer guns, muzzle loading percussion lock guns, were imported, and produced domestically after that (S.N. 25, 27 - 30), a large number of tactic textbooks (S.N. 40 - 43) were published, and reverberatory furnaces were constructed in various locations for the casting of cannons (S.N. 46 – 51). At this time Japan rapidly caught up to the Western military technology at early 19th century.

Appearance of rifle gun



After C.E. Minie, a French, developed a new expanding bullet (ref. illustration above S.N. 54, 55), muzzle-loading rifle guns came into wide use. Their firing range was 500 to 1000 m in contrast with that of the previous smooth-bore guns, 100 to 150 m.

The Shogunate tried to produce rifle guns domestically with copying a gun donated from the United States in 1860. "S.N. 60" is a rifling machine, which carves rifle inside of bore. Both "S.N. 58" Springfield rifle and "S.N. 61" revolver rifle are domestic products, which have been made with the Japanese indigenous technology.

With finishing the Civil War in the United States in 1865 and the Franco-Prussian War in 1871, lots of disused guns were imported to Japan. Various types of guns from Europe and the U.S. (S.N. 71 - 85) were used at the *Boshin* War, which was a civil war between the new government and *Tokugawa* Shogunate in 1868,

Development of handgun

The invention of mercury fulminate, $Hg(OCN)_2$, induced the development of various handguns in the West. At the end of *Edo* period they were imported to Japan, and besides, their copies were also produced (S.N. 89 – 102). Though most exhibited guns in the three cases are percussion lock and pinfire, two rimfire guns are set out. One is the Remington derringer that *OKUBO Toshimichi*, a VIP of the *Meiji* Government, has possessed (S.N. 101) and the other is the Smith & Wesson model No.2 army, which is the same type as the gun owned by *SAKAMOTO Ryôma* (S.N. 102), a key person to overthrow the *Tokugawa* Shogunate.

Remington derringer (S.N. 101)

S&W model No.2 army (S.N. 102)

***Shi-kin Sampô* (Four kilograms mountain artillery)**

At the middle of the 19th century, many 4 kilograms mountain artilleries (S.N. 105) were reproduced in Japan being modeled after those imported from France. Because they could be took apart and convey on horsebacks, they were adapted to undulating Japanese landscape.

Three kinds of bombshell, high explosive shell, shrapnel and canister, can be fired with the artillery and the maximum firing range is 2600 m. At the *Boshin* War they were used as primo ammunition.

A bombshell fired in the *Boshin* War

An unexploded bombshell stuck into a cedar trunk at the *Ueno* campaign in the *Boshin* War. It was incised on the shell when the tree was sawn off.

It is the first time for this material to be opened to the public. (S.N. 106)