

Introducing the Japanese sword

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Why, in an age of high-tech weaponry, does a fascination with the Japanese sword remain? The answer is simple: it is an unmatched weapon of elegance and strength, a technological and artistic marvel (fig. 1). Many scholars consider it the finest sword ever constructed. Traditionally crafted Japanese swords continue to be manufactured by an elite group of artisans. Masterworks of today are sold and collected alongside 700 year-old blades, as art objects. Often, newly-made blades are valued at levels approaching the masterworks of yesteryear. This article will offer a very brief introduction to the sword, its nomenclature, distinguishing features, and manufacture.¹

A Japanese sword (*nihontō*) traditionally consists of the blade, the handle (*tsuka*) and a scabbard (*saya*). The handle consists of a two-part wooden base that is carved with great precision, to snugly fit the unpolished end of the blade (the tang or *nakago*). The two parts of the handle are covered with rayskin (*same*) and then bound together with high quality cotton or silk cord, the so-called *tsukamaki*. Between the *tsukamaki* and the *same* one can see the sword ornaments (*menuki*). The end of the handle is covered with an end cap (*kashira*) whereas the base carries the *fuchi* (the hilt collar, which slides over the blade). To assemble the

sword, one first slides the *habaki* (iron collar or sleeve) onto the blade, followed by a spacer (*seppa*), the hand guard (*tsuba*), another spacer, and finally, the handle. The handle is then firmly locked in place by a peg (*mekugi*) which is hammered through pre-drilled holes in both the handle and the blade. The scabbard is usually made of lacquered wood with a cord (*sageo*) at the top that can be used to tie the scabbard to the belt. The end of the scabbard is also fitted with an end cap (*kojiri*). On the scabbard you may find a *kozuka*, a decorative handle fitting for a small utility knife (*kogatana*) (figs 1a and 2).

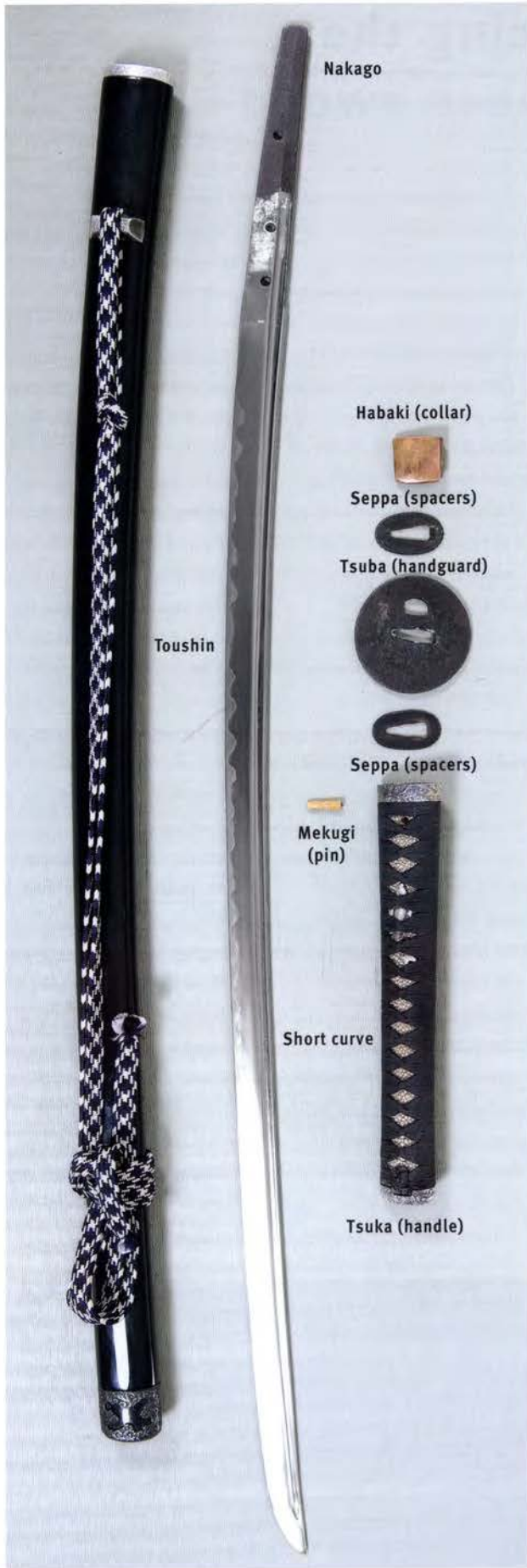
Creating a Japanese sword

Producing a finished sword is not the work of the sword smith alone. The manufacturing process requires the collaboration of several independent and highly specialised artisans. Each undergoes a lengthy apprenticeship. Sword smiths apprentice for five to seven years before receiving licensure. The sword polisher's apprenticeship can last up to ten years, depending on the school and teacher, while the *habaki* maker trains for up to eight years before being able to stand on his own. Consequently, all involved are celebrated traditional artisans; their work highly honoured, scrutinised

■ Fig. 1. A sword by Nanki Shigekuni, Kiasaki.

Abe Kazunori





■ Fig. 1a. Disassembled *katana*.

■ Fig. 2. Fittings for the *tachi* are often ornamental, as many were ceremonial and given as gifts among high-ranking samurai.

and sought-after. Each of these craftsmen strives to produce work with a technical perfection where visual composition, subtlety, and infinite attention to details leave the viewer in awe. While collectors often concentrate on the various sword accessories, here, we'll focus on the sword itself. The manufacture of the sword can be broken down into six general processes (although some scholars would delineate many more). Please note that this represents only a glimpse into the sword making process.

alloys. Carefully controlling the carbon content, homogeneity, crystallinity, and other factors allows the raw steel to achieve the quality needed for sword steel.

Some sword smiths still operate a forge (*tatara*) within the confines of their smithies to produce their own steel. Producing *tamahagane* on such a small scale is, however, quite difficult and has become rare.



■ Fig. 3. Mr. Kawachi Kunihira, a 15th generation sword maker, at work.

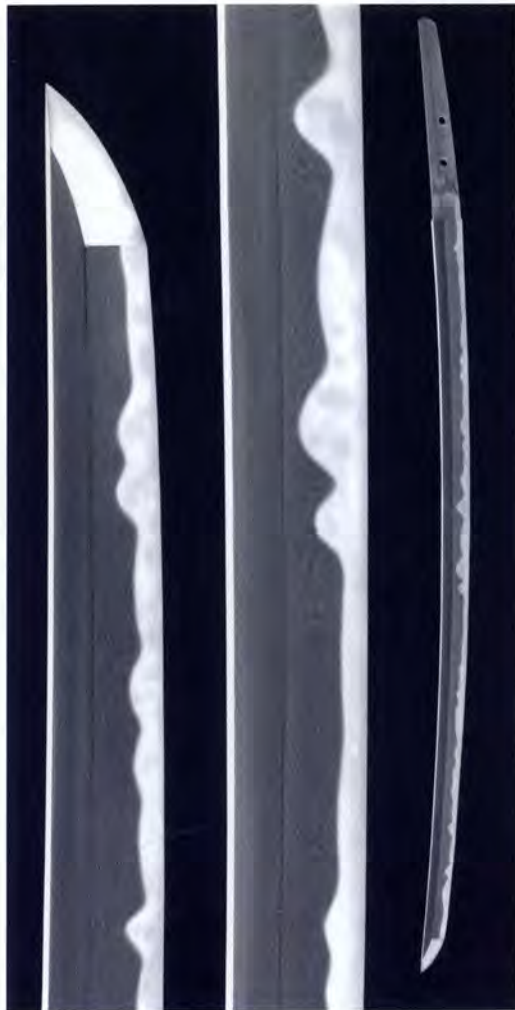
1. Producing traditional steel

Today, the sword-steel (*tamahagane*) is jointly produced almost exclusively by a partnership involving Hitachi Metals, the Japanese government, and the NBTHK (the Nihon Bijutsu Tōken Hozon Kyokai or Society for the Preservation of Japanese Art Swords) in Yokota, a small town in Shimane prefecture. In this process, iron ore contained within dark brown or black sand is smelted in a clay furnace, using charcoal as fuel as well as reducing agent. The liberated iron then combines with more carbon to form steel

2. Forge-folding the steel

After the raw steel is hammered out and sorted, the smith refines the steel by forge-folding (*tanren*), a process similar to kneading dough (fig. 3). It is a common misconception that Japanese swords are folded thousands of times. In reality, the jacket steel is folded ten to fifteen times. This results in multiple layers being doubled with each fold. The grain (*jihada*) displayed by the surface steel may therefore consist of thousands of layers – not folds. In most blades, these layers can be seen by the naked eye when a blade has been well

■ Fig. 4. This *mumei* blade in typical Shizu-style shows a *hamon* of the Koto Era (swords made during the Heian period [794-1185] through the late Muromachi Era [1573-99] are called Koto).



polished. The slight variances within the carbon-content of the jacket steel make the folds visible. The *jihada* layers appear as fascinating and intricate patterns.

3. Assembling the component steels

Central to the Japanese sword smiths' craft is the ability to combine various densities of steel into an ingenious sword-structure. The resulting sword has durable outer layers and a tough core that is not easily broken. There are several construction methods for combining the hard jacket steel with the tough core steel. Some use two pieces, some up to five.

In the *kobuse* method, for instance, the jacket steel is hammered into a 'U' shape, which will contain the softer core steel. The core is enclosed within the folded jacket steel in the way a hot dog is placed inside its bun. The two are welded together to create the soft-core/harder-jacket combination, which is one of the features that distinguish Japanese swords from their celebrated Toledo or Damascus counterparts.

4. Creating the billet and profile

Assisted by his apprentices or, for those working alone, using a power hammer the smith hammers out the billet, which gradually becomes elongated. A steady tempo of hammer strikes creates a rhythm that helps create a smooth collaboration between the smith and his apprentices. The geometry of the billet is tapered and rectangular. At this point the metal is more or less rectangular when viewed as a cross-section, as if it were cut from a sheet of steel.

The sword smith works to shape the blade's ridgeline and edge-slope a few inches at a time. When this stage is completed, the makings of what will become the distinctly Japanese sword shape emerge. When all the lines are correct the smith is ready to proceed. It is important to note that at this stage, the blade is still straight.

5. Quench hardening

When steel is heated above a certain temperature and then quickly cooled, its carbon atoms do not have the time to travel out of the unstable molecular structure that higher temperatures allow, and are locked within, giving way to a highly stressed and hardened material. In the craft of sword making this phenomenon is used in the selective hardening of a sword edge. The difference in hardness between the edge and the body of the blade allows the creation of the hardening mark, the so-called temperline or *hamon* (fig. 4). The carbon content of the steel and the rate at which the steel cools dictate the hardness that will be attained: the higher the carbon and the faster it cools, the harder the steel. The edge steel is extremely hard, whereas the jacket sides are only moderately so; the soft core prevents the blade from becoming brittle. The forces in differential hardening stretch and compact the steel differently thereby elongating the edge and creating the sword's distinctive curve.

6. Final shaping

The smith passes the completed blade to the polisher (*togishi*), who carefully refines the surfaces and lines of the blade on various grades of abrasive stones. Once the basic geometry of the blade has been refined, the polisher sends the blade to the *habaki* maker (fig. 5). After the *habaki* has been made, the blade is transferred to a scabbard maker who will carve a scabbard to fit its exact measurements. Once the scabbard has been

■ Fig. 5. The numerous steps in creating a sword from humble iron-bearing sand.





■ Fig. 6a & 6b. The process of finish polishing (*shiage-tōgi*) by moving finger stones over the blade.



■ Fig. 7. The *ken* is a straight, double-edged sword of ancient Chinese design. It holds importance in esoteric Buddhist ritual, but also plays a role in Shinto ceremonies.

Courtesy of the Herr collection



made, the blade goes back to the polisher for the final polishing stages. The initial polish shapes and sharpens the blade. The second visit to the polisher brings out all the artistic aspects of the sword. Painstakingly, the polisher uses 'finger stones' to highlight the grain and the *hamon* (figs. 6a and 6b). Finally, the blade is fitted and polished, ready for the smith's final inspection. Only after receiving the blade back from these artisans and making a careful inspection, will the

in Japan, it remains relevant due to its symbolic significance (figs 7 and 8).

Chokutō

Originally also of Chinese design, *chokutō* were produced in Japan's ancient times and pre-dated the quintessential 'Japanese' sword. *Chokutō* were straight swords with one cutting edge. They also lack temperlines, because the steel used for these early blades is homogenous and not a combination of various densities.

■ Fig. 8. The *ken* (see fig. 7) shows a Sanskrit character (*bonji*) and is attributed to Echizen Shimosaka, middle Edo period, probably Kyōhō 1716-36.

Courtesy of the Herr collection



sword smith sign his name to the blade.

Sword types and distinguishing features

Understanding different types of swords, their parts and nomenclature is an essential part of sword connoisseurship. Lists of blade types and distinguishing features are therefore given below.

A. Blade types

Ken (tsurugi)

The *ken* (also known as *tsurugi*) is a straight, double-edged sword of ancient Chinese design. It holds particular importance in esoteric Buddhist ritual, but also plays a role in Shinto ceremonies. Although the *ken* is one of the oldest sword types

Tachi

The *tachi* is the first functional sword of truly Japanese design. It probably evolved from different types of *chokutō*. It was designed for slashing rather than thrusting and was meant to be drawn and used with one hand (usually from horseback). It was worn edge down and tied to the outside of armour. It has a single-edged curved blade and a temperline highlighting its differentially hardened steel. Because of its innovative technology and resulting effectiveness it became a blueprint for all swords developed in later times.

Katana

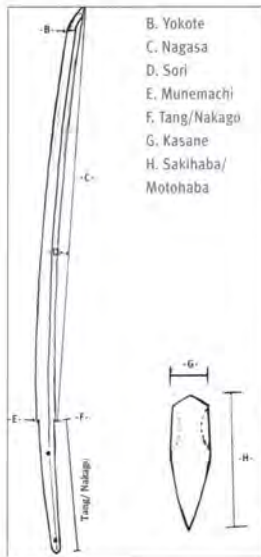
This sword, like the *tachi*, is curved and single edged. It is distinguished by a relatively shallow curve and, contrary to the *tachi*, was worn edge

■ Fig. 9. The *daishō* set of *katana* and *wakizashi* swords (below) was produced to be worn together.





■ Fig. 10. The fittings and components of a disassembled *katana*.



■ Fig. 11. The terminology for different measurements of the blade.

up, tucked into the warrior's belt. This allowed the sword to be worn comfortably (without armour) on a daily basis. The *katana* could be drawn and used immediately; the *tachi* was more cumbersome. The invention of the *katana* marked a shift from swords mainly designed to be used on horseback to those also used on foot. The *katana* could be wielded with one hand or two. Due to its ease of use and flexibility, the *katana* quickly gained popularity and soon became a standard sidearm for warriors. It eventually became an exclusive symbol, worn only by those of samurai blood.

Wakizashi

The *wakizashi* is a short sword, designed to be worn in the same fashion as the *katana*. Its handle, however, is shorter, making the use of two hands impossible. It was worn along with the *katana*, tucked into the belt, and ready for use. Because the *wakizashi* is less intrusive, it became a back-up of sorts. A warrior may have been asked to "check his sword at the door" when visiting a household or a business. In such cases, the *katana* would be left at the entrance, but the *wakizashi* would accompany him into the building (fig. 9 and 10).

Tantō

The *tantō* is a very short sword, usually serving the function of utility knife. It comes in many sizes and shapes but is generally less than 30 cm. Despite its size, however, the *tantō* shows the same craftsmanship as its larger cousins.

B. Distinguishing blade characteristics

Measurements and further attributes determine the school, smith, condition, and even the value of a sword. The terms used here are explained in fig. 11.

Length

The length (*nagasa*) of a sword is determined by measuring the distance between the *kissaki* (tip) and the *munemachi* (notch in the back of a blade).

Thickness

The thickness of a sword, as measured from its lateral sides, is called *kasane*. Swords are described as being thick or thin. Old blades that have been polished many times are referred to as 'tired', because of the large amount of metal that has been polished away. Swords that have retained their original *kasane* may be called 'robust' or 'healthy'.

Width

The width of the sword from edge to back is

measured at two places. The first measurement, called *sakihaba* (width at the tip), measures the width at the *yokote* (the ridge delineating the sword's point). The second is called *motohaba* (width at the base) and it is taken at the *habakimoto* (the area at the base of the sword covered by the collar or *habaki*). The relative difference in these measurements can mean different things to an expert appraiser. The term *funbari* is used to describe the degree of tapering between the base and the tip; blades with a lot of *funbari* are considerably narrower at the tip than at the base.

Curvature

The depth of a sword's curve is called the *sori*. It is measured between the deepest point of the back edge and the sword's length line.

Sword tip (kissaki) design

The tips of swords show different types of construction in various schools and in various historical periods. Although each offers slight differences in performance, the selection of a certain type of *kissaki* is usually the result of a sword maker's instructional lineage and personal preferences.

Temperline (hamon) patterns

The *hamon* is the delineation between hard steel along the edge and the softer steel towards the back of the blade. The examples of *hamon* patterns shown in fig. 12 have been drawn by sword polisher Abe Kazunori. This type of drawing is an art form in itself.

Grain patterns (hada)

The way in which the smith folds the steel in relation to how he elongates it to create the blade produces a grain pattern. Some blades have only one kind of grain but frequently a blade contains a mixture of more than one type (fig. 13).

Quality and value

Experts determine a sword's quality and value using agreed-upon industry standards, but anyone can appreciate a sword. Swords are like wine to some extent: if you like it, it's good. If you don't, it's not for you. Distinguishing the subtle notes within a fine wine is for connoisseurs. The rest of us can drink the same wine and appreciate it too – we just don't use the same fancy words to describe the flavours. Nevertheless, aside from personal taste, there are some standard criteria for swords.

Of primary importance is the sword smith.

■ Fig. 12. Temperline patterns
(*hamon*).

Images courtesy of Abe Kazunori



■ Fig. 12a. Straight waves
(*sūgūha*).



■ Fig. 12b. Irregular waves
(*midareba*).



■ Fig. 12c. Bamboo curtain
(*sudareba*).



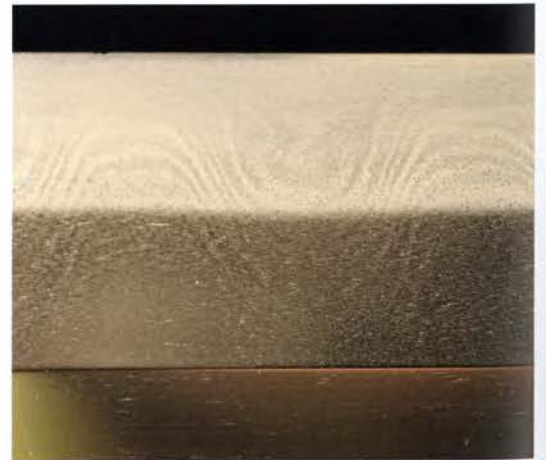
■ Fig. 12d. Mottled
(*hitatsura*).



■ Fig. 12e. Clove flowers
(*choji*).

■ Fig. 13a and b. In addition to the *hamon* (temperline) each sword features a grain pattern in steel. Grain patterns (*hada*) are one of the key points in determining a sword's quality and origin.

Al Herr collection



The second consideration is the quality and condition of the blade. Worthy of consideration in determining the value of a sword is its historical importance. Was the smith a student of someone famous? Did he distinguish himself or his work in some way? Did he make blades exclusively for a famous warlord? Did he inspire many famous students? Was the sword held in a famous collection? All these things factor into determining a sword's value.

Swords can have many different types of negative attributes. Some flaws (*kizu*, literally 'wounds') are referred to as 'fatal' and virtually destroy the value of a sword. Other flaws can be overlooked. Generally the flaws that can be removed by a polisher are considered acceptable, while those that cannot be fixed render the sword valueless to collectors. Nevertheless, swords with *kizu* may hold some value as study pieces.

Cracks and chips in sword's edges can sometimes be seen. Those that run completely through the *hamon* are generally considered fatal. Some blades were polished too many times and, as a result, their *hamon* runs off the edge of the blade. This is also a fatal flaw.

When the tip of the sword is broken off and the temperline has been interrupted, the polisher cannot fix the damage. In such cases the flaw is considered fatal. On the other hand, if the tip is broken in such a way that the *hamon* remains, the polisher might reshape the *kissaki* so that the sword retains a functional hardened cutting edge. This flaw, then, is not considered fatal.

There are many types of non-fatal flaws. When the sword is folded, the smith takes care to create a seamless weld. However, when inserting the core-steel, small air or carbon pockets may be created. They generally do not show up until the sword has been polished many times.

Sometimes swords are polished so many times that they lose their *machi*, or notches, denoting the beginning of the *nakago*. While this can be an indicator that a blade is tired, it is not necessarily a fatal flaw.

Valuations

The general Japanese term for the process of screening and evaluation is *shinsa*. The main goal of a sword *shinsa* is to determine several important

characteristics. As the judges review a sword, remarks and scores will be noted. The resulting official certificate is called *origami*.

The value of a sword is determined by the certainty that it is authentic, the quality of the craftsmanship, the condition, and the ranking of the sword smith. Other factors may also be considered, but these basic traits are of paramount importance.

There are different organizations, all of which have slightly different systems of ranking swords. For example, the *origami* from the Nihon Tōken Hozon Kai (or NTHK, the Society for the Preservation of Japanese Swords, one of the official organizations that perform *shinsa*) may include:

1. the organization that is performing the evaluation (in this case the NTHK)
2. the date of the appraisal
3. the registration number of the sword being evaluated
4. the school of craftsmanship (*den*)
5. classification (*katana*, *tantō*, and so on)
6. the historical era in which the sword was produced
7. the sword smith's signature (if present) and the experts' considerations concerning the authenticity of the blade
8. measurements
9. further remarks which may include discussion of additional information such as the province in which the sword was made. This section of the *origami* is where the rating of the sword is noted and where the signature-seals of the judges are given.

The NTHK uses the above criteria to determine a score. A blade's score determines its designation. Score and designation, then, become important factors in determining a sword's value. As noted above, there are other factors that could impact a sword's value. Nevertheless, these scores and resultant designations are critical considerations purchasing a sword. NTHK sword designations currently include:

60–69 points: genuine (*shinteishī*)

70–84 points: fine quality (*kanteishō*)

85–94 points: excellent (*yūshū saku*)

95–100 points: most excellent (*sai yūshū saku*)

Using similar judging standards, the NBTHK,



■ Fig. 14 and 15. The beauty of the exquisitely-crafted sword fittings.



mentioned above, offers the following designations: worthy of preservation (*hazon*), worthy of special preservation (*tokubetsu hazon*), important sword (*jūyō tōken*), particularly important sword (*tokubetsu jūyō tōken*).

As some readers may know, the Ministry of Education has created its own classification system for objects of great cultural value. Blades designated 'Important Cultural Property' (*jūyō bunkazai*) or 'National Treasure' (*kokuhō*) are of particular historical importance or made by a very famous smith. Blades with this distinction are not allowed to leave Japan. High class blades of this kind may be admired at the Japanese Sword Museum in Yoyogi, Shibuya-ku, Tokyo.

Availability of antique and modern swords

The dissolution of the samurai class, carried out between 1873 and 1876, meant a new era for the Japanese sword; the era of the sword as an art object. With the samurai class falling, the demand for swords diminished. The old arts were devalued as the nation raced to compete with modern Western industry; the swords and knives produced for the massive imperial military were of much lesser quality.

As a result of the new trade with outside countries, Japanese swords presented an opportunity in trade as a commodity. The first Japanese swords were traded, primarily to Europeans, in the 1860s. Such trade continued after the Meiji Revolution of 1868 and swords flowed out of Japan and into Europe. Some swords came to the United States with Japanese families that emigrated there. As exotic stories of samurai warriors spread throughout the globe, so too did interest in their unequaled weapons.

During World War II some swords were taken in battle, while others were presented to conquering allied leaders post-battle. After the war in 1945, allied servicemen were ordered to confiscate all Japanese weapons, including swords. Countless swords were taken as troops moved from door to door, demanding that the residents relinquish any weapons they might possess. Most were factory-made military blades, but there were also priceless masterworks and family heirlooms.

The swords were stockpiled in warehouses such as Tokyo's Akabane Arsenal. Any occupying allied serviceman could obtain a sword simply by asking for it. As the blades went home with the men as mementos, thousands of swords left Japan. Even though this period is considered a dark chapter in the history of the Japanese sword, some scholars assert that the servicemen's interest in Japanese swords may have actually saved many important blades.

Sword artisans were forced to stop practicing their craft. With the Japanese economy depressed after the war, and the prohibition of arms manufacture, the techniques and skills needed to produce a sword were nearly lost. In 1950, however, the Japanese government issued a proclamation requiring that all guns and swords be registered. Many people whose swords had not been taken, or who had come into the possession of a sword during the post-war mayhem, had the blades registered as theirs. Once owning a sword was made legal, many wanted to know what their blade or collection was worth. The same year saw the creation of the NBTHK; this combination of official registration and the revival of expert appraisal breathed new life into the appreciation of Japanese swords.

Whilst the sword had become an object of cultural preservation, sword making was still illegal. Fortunately, the Japanese government and the allied forces were aware of the endangered position of the craft and in 1953 'regulations for sword manufacturing approval' were issued. Finally, sword smiths could apply to legally practice their craft again. In 1955 the first public sword makers' competition took place. The competition has been held every year since. The Japanese sword smiths of today practice their craft both as a business and as a matter of cultural preservation. The purchase and collection of Japanese swords has undergone some interesting changes in the 21st century. While internet technology has greatly improved communication and sales opportunities, it has, at the same time opened the door for reprehensible practices. Dreamy-eyed buyers are swindled into buying 'antique samurai swords', whose complex 'grain' has been acid-etched into a piece of junk steel and whose fittings are poor reproductions made to look old and dirty. Now more than ever, buyers

must arm themselves with information, verify and double check, and proceed with caution.

Collecting Japanese swords

However, the internet has also made communication with real authorities much easier. Those interested in collecting, connecting with sword experts, or just learning more about the trade can join clubs that publish newsletters and provide counsel.

comparison, innumerable experts in the art of scamming and misrepresentation. If you have sword-related questions, I recommend contacting Mr. Weissberg.⁵ For sword appraisal and polishing, I recommend Mr. Benson, who can read and translate modern and ancient Japanese sword smith signatures.⁶ Top-level Japanese polisher, Abe Kazunori, has graciously offered to assist non-Japanese with questions about sword origin, valuation, and polishing.⁷ There are other reputable



■ Fig. 16. The author cleaning the sword featured in figures 1 and 10. The blade was made in 1532 by a smith named Katsu Michi in the town of Mino (modern day Seki).

The American branch of the NBTHK can be contacted via their website.² The Northern California Japanese Sword Club hosts the largest annual sword exhibition and is also an excellent group.³ The Japanese Sword Society of the United States is another source of accurate and reliable information.⁴

A note of caution: I know of only a handful of legitimate sword experts in America and, by

experts, but I have had personal experience with these three men as being honest and trustworthy.

In conclusion

This article offered an introductory glance into sword connoisseurship. However, there is more to the Japanese sword than blade types, features, and manufacture. It is the junction where metallurgy,

culture, history, and personal significance intersect that sword enthusiasts find so inspiring (fig. 16). Studying how the sword interplayed with religious traditions, for instance, is a most fascinating approach to understanding the sword.

In the past, Japanese warriors have considered their swords as divine companions. The native Shinto gods were believed to dwell within the folds of the blade. Centuries of warfare created a need within the warrior to reconcile his duties with his soul. This deeply personal and intimate search for reconciliation gave birth to the samurai archetype. Although the swords were important as tools, they also held symbolic relevance. The sword offered salvation, both practical and spiritual. The ascent of the sword as a symbol was the result of countless influences.

Secondly, there is the aspect of preserving traditional crafts. Today people can buy Japanese-sword-shaped pieces of metal created in America, China, Thailand, and so on, for a fraction of the cost of the real thing. People all over the world are lining up to study martial arts that purport to be traditional, yet blatantly defy actual Japanese history and tradition. The hidden cost of such decisions is the slow but systematic deterioration of the traditional sword-related arts. Just like the daily actions of the craftsman, the daily practice of the swordsman, and the daily passion of the historian, the general public too can choose to act with passion for preservation. Those of us who find personal meaning within the Japanese sword can play a role in helping it to survive, and even thrive, in future generations.

Notes

1. This article was adapted from C.M. Roach, *Japanese swords. Cultural icons of a nation*, Tuttle Publishing, Tokyo, Rutland, Vermont, Singapore 2010. The publisher has kindly permitted the reproduction of images and text from the book.
2. See <http://www.nbthk-ab.org>.
3. See <http://www.ncjsc.org>.
4. See <http://www.jssus.org>.
5. For contact information, see <http://nihonto.com>.
6. See www.bushidojapaneseswords.com for more information.
7. For an introduction feel free to contact me through my website: www.mountainwinddojo.com. I may also be able to give you information about where to shop if you wish to buy a sword.