



Samurai and Viking Art and Science of Steelmaking and Sword making

Similarities and differences in time and space

The coming of the Iron Age is an important landmark for a number of civilizations. According to historians the Iron Age came earlier to Europe than to Japan. On the other hand, according to many modern day historians, the knowledge of iron was brought to Japan from China and the knowledge of iron making from Korea took its roots in the *Kyushu province* and spread across Japan.

In Scandinavia, solid iron, “*Lupe*”, was made by reducing iron ore with charcoal. In later days, the process temperature was increased by air blasts. Today’s blast furnace is a reactor for making pig iron that has evolved over a long period of time and it is still improving. In Japan, the Tataro process, a system for producing pig iron, was evolved approximately on similar grounds but at a later stage. The process is not in use today. Recent research efforts by Professor Kazuhiro Nagata and co-workers in Japan have, however, shown that the process had some unique features that could even be utilized in modern iron- and steelmaking context.

The properties of the steel produced by archaic methods are unique in many respects. It is well-known that the steel produced by reduction with charcoal and repeated forging resulted in steel that withstood atmospheric corrosion for nearly 2000 years in India. The repeated hot forging of the steel in the sword making process might cause multiple deformations of steel at intermediate heat-treatment temperatures leading to steel structures with properties comparable to some of the most modern steel varieties.

The processing techniques developed during this time in Scandinavia, and Japan improved the tool making as well as the iron culture in the world. The hot forging of the sword material and quenching it to hold the martensite structure were a technique adopted. It is said that the Vikings quenched the forged swords in beer and even read the fortunes of the lines that were formed. In both parts of the world, the sword was not just an instrument of war. It represented national as well as an individual pride, protection of the nearest, honour, and above all it was a symbol of heroism. Just like the cherry blossom flowers, the Samurai sword was and is a symbol of honour and integrity, albeit, the former was only short-lived. It is a deeply rooted prejudice that the Viking swords were thick and heavy and needed a strong arm to wield them. The Samurai, on the other hand, needed the sword to be quick and effective. The Samurai swords were thin as well as light, fine-grained, extremely sharp and had an interesting and beautiful pattern. Wielding them required samurai training.

Today, both Japan and Sweden are leading steel producers in the world. A comparison of the art and science of steel and sword making in the era of the glorious Vikings and Samurais is of great interest.

The present event aims at a mutual understanding of the iron culture between Japan and Europe by means of technical as well as popular lectures, demonstrations and themes exposing the salient features of Japanese culture to the European public.

Welcome to a Weekend with Samurais and Vikings

9 – 11 September 2005, Stockholm, Sweden

Royal Institute of Technology (KTH),
National Museum of Science and Technology and National Museum of Ethnography

Symposium

This exciting event starts on Friday the 9th of September with a symposium on the technical and scientific aspects of steelmaking and sword making at KTH. The speakers are experts from Japan as well as the North European countries. The symposium is expected to cover the archaic technology from these geographically separated parts of the world, both with long traditions in steel.

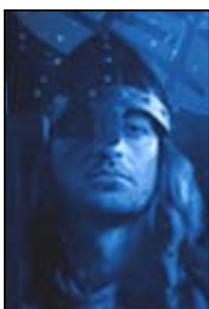
The highlights of the events are presented on Saturday the 10th and Sunday the 11th of September at the National Museum of Science and Technology. The cultural and technical aspects of sword making from the Viking days as well as the Samurai era are presented. The art and science of the archaic steelmaking and sword making from the two ancient cultures are presented to the public in the form of popular lectures. These will include demonstrations of steelmaking by the Japanese Tataru process as well as the Nordic bloomery furnace technology. A Japanese and a Swedish sword master will demonstrate the art of sword making from the two ancient traditions.

Demonstrations of Samurai and Viking steelmaking and sword making

On the grounds in front of the National Museum of Science and Technology, authentic copies of the ancient Japanese Tataru furnace and the Nordic bloomery furnace will be raised and the fire will be kept alive day and night. At announced times during the two day event iron will be tapped from the furnaces according to the ancient traditions. Next to the furnaces, the Japanese and Swedish sword masters will be working in their specially designed workshops exclusively producing (step-by-step) copies of elegant Samurai and Viking swords. Demonstrations of Japanese martial arts, i.e. Kyodo (Japanese archery) and Jiu-jitsu, will also take place on the grounds.

At the National Museum of Ethnography, located next to the National Museum of Science and Technology, it will be possible to enjoy the exhibition of authentic Samurai clothing (armour) as well as of Samurai dolls.

This unique event is organized by a joint committee consisting of members from the Royal Institute of Technology (KTH), National Museum of Science and Technology, National Museum of Ethnography, Swedish Steel Producer's Association (Jernkontoret), Swedish Society of Materials Technology (SFMT), Asia-Pacific Cultural Centre for UNESCO (ACCU) and the Embassy of Japan in Stockholm.



Symposium (language English) Royal Institute of Technology (KTH)

Friday 9 September, 2005 (09:00 – 18:00)

Location: Lindstedtsvägen 3, Stockholm, room E1

- × Welcome address
Prof. Mats Hanson, Vice-Rector, Royal Institute of Technology, Sweden
- × Opening of the seminar
Prof. Anders Flodström, President, Royal Institute of Technology, Sweden
- × Inaugural address
Mats Hellström, Country Governor of Stockholm and the head of the County Administrative Board, Sweden
- × The cultural importance of the event
Director of the Asia-Pacific Cultural Centre for UNESCO (ACCU), Japan
- × Past technology in future perspective
Prof. Marie Nisser, Royal Institute of Technology, Sweden
- × Blacksmith culture in Japan
Prof. Youichiron Katsuki, Kanagawa University, Japan
- × The Viking sword – Manufacturing technique and design
Mr. Peter Johnsson, Swedish sword master, Sweden
- × Nordic process metallurgy
Associate Prof. Gert Magnusson, The National Heritage Board (Riksantikvarieämbetet), Sweden
- × Japanese process metallurgy – The Tatara process
Prof. Kazuhiro Nagata, Tokyo Institute of Technology, Japan
- × Mechanical metallurgy
Prof. Hans -J. Fecht, University of Ulm, Germany
- × The Viking sword from an archaeological view point
Prof. Eva Elisabeth Astrup, University of Oslo, Norway
- × The Samurai sword from an archaeological view point
Prof. Masahiro Kitada, Tokyo National University of Fine Arts and Music, Japan
- × Panel Discussion
Led by Dr. Orvar Nyquist, Honorary President of the event, Swedish Steel Producer's Association, Sweden

**No Registration Needed. No Symposium Fee.
No Lunch Included.**

Further information regarding the seminar can be obtained from
Margareta Bergman, Tel.: + 46 8 790 97 15, e-mail: margberg@kth.se, www.learninglab.kth.se/sword

Demonstrations National Museum of Science and Technology and National Museum of Ethnography

Saturday 10 and Sunday 11 September, 2005
All day events (10:00 – 17:00)

Location: Norra Djurgården in the museum park, Stockholm

This programme is primarily intended for the museums' regular weekend visitors, i.e. families. Information about these activities should also be communicated to people who may be interested in participating in the popular science seminars on Saturday and Sunday.

Demonstrations of Japanese and Nordic steelmaking and sword making

There will be four simultaneous events in front of the National Museum of Science and Technology. Associate Prof. Gert Magnusson from the National Heritage Board will be leading guided tours comparing the two techniques at 12:30 and 14:00.

Demonstrations of Japanese martial arts

There will be demonstrations of Japanese martial arts, i.e. Kyodo (Japanese archery) and Jiu-jitsu, on the lawn in front of the National Museum of Ethnography. Kyodo and Jiu-jitsu are sports that all samurais were expected to master. Demonstrations are held at 12:00, 13:00, 15:00 and 16:00.

Exhibits

There will be exhibits from the Samurai and Viking cultures displayed both at the National Museum of Ethnography and at the National Museum of Science and Technology.

Open Program. No Entrance Fee.

Further information regarding the event can be obtained from

Eva Ramberg, Tel.: + 46 8 450 56 58, e-mail: eva.ramberg@tekniskamuseet.se, www.tekniskamuseet.se

Ulla Edberg, Tel.: + 46 8 519 550 27, e-mail: ulla.edberg@etnografiska.se, www.etnografiska.se

Seminars (language English)

National Museum of Science and Technology

Saturday 10 September, 2005 (10:00 – 17:00)

Location: Museivägen 7 N. Djurgården, Stockholm

- ✗ Welcome address
Director Anne Louise Kemdal, National Museum of Science and Technology, Sweden
- ✗ Japan and Sweden – Technology and culture
His Excellency the Ambassador of Japan, Embassy of Japan, Sweden
- ✗ Can we learn from the Vikings and the Samurai
Prof. Marie Nisser, Royal Institute of Technology, Sweden
- ✗ Sharpening of swords
Master (sword sharpener) Hideo Yoshida, Japan
- ✗ Corrosion of steel
Prof. Christoffer Leygraf, Royal Institute of Technology, Sweden
- ✗ How to examine and appreciate a Japanese sword
Master (sword making) Syuji Matsuda, Japan
- ✗ Exhibition of Japanese blacksmith products
Prof. Youichiro Katsuk, Kanagawa University, Japan
- ✗ The Samurai sword – Manufacturing technique and design
Master of blacksmith Teruo Kajimura, Japan
- ✗ The Viking sword – Manufacturing technique and design
Mr. Peter Johnsson, Swedish sword master, Sweden
- ✗ Tatara operation
Prof. Kazuhiro Nagata, Tokyo Institute of Technology, Japan
- ✗ Viking steel operation
Tech. Lic. Lars Bentell, Swedish Steel Producer's Association, Sweden
- ✗ The weapons and tools of the Vikings
Prof. Arne Emil Christensen, University of Oslo, Norway
- ✗ The Samurai sword and its importance in society
Associate Prof. Fumiaki Takehiro, Hiroshima University, Japan

Museum Entrance Fee.

Adults: SEK 60; Children 6-19 years: SEK 30; Children under 6 years: Free entry; Senior citizens: SEK 40

Registration Needed for Participation in the Seminars. Free Coffee as Seminar Participant.

Please register by using the attached registration form or by contacting
Zenita Gustavsson, Tel.: +46 8 450 56 99, or Pixie Webjörn, Tel.: +46 8 450 56 29

Further information regarding the event can be obtained from
Eva Ramberg, Tel.: +46 8 450 56 58, e-mail: eva.ramberg@tekniskamuseet.se, www.tekniskamuseet.se

Seminars (language English)

National Museum of Science and Technology

Sunday 11 September, 2005 (10:00 – 17:00)

Location: Museivägen 7 N. Djurgården, Stockholm

- ✘ The weapons and tools of the Vikings
Prof. Arne Emil Christensen, University of Oslo, Norway
- ✘ Sharpening of swords
Master (sword sharpener) Hideo Yoshida, Japan
- ✘ Corrosion of steel
Prof. Christoffer Leygraf, Royal Institute of Technology, Sweden
- ✘ How to examine and appreciate a Japanese sword
Master (sword making) Syuji Matsuda, Japan
- ✘ Exhibition of Japanese blacksmith products
Prof. Youchiron Katsuki, Kanagawa University, Japan
- ✘ The Samurai sword – Manufacturing technique and design
Master of blacksmith Teruo Kajimura, Japan
- ✘ The Viking sword – Manufacturing technique and design
Mr. Peter Johnsson, Swedish sword master, Sweden
- ✘ Tatara operation
Prof. Kazubiro Nagata, Tokyo Institute of Technology, Japan
- ✘ Viking steel operation (lecture and demonstration)
Tech. Lic. Lars Bentell, Swedish Steel Producer's Association, Sweden
- ✘ History of religion – Viking sword culture and its conceptual world
Associate Prof. Ulf Drobin, University of Stockholm, Sweden

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TEKNISKA MUSEET



Registration Form

Deadline for submission of registration form is 1 September, 2005

National Museum of Science and Technology
Museivägen 7 N. Djurgården, 115 93 Stockholm, Sweden

I wish to participate in the seminars on Saturday 10th of September 2005 (09:00 – 17:00)

I wish to participate in the seminars on Sunday 11th of September 2005 (09:00 – 17:00)

Name:

Address:
.....

Phone:

E-mail:

Please note

To participate in the seminars the entrance fee to the museum must be paid (adults: SEK 60; children 6-19 years: SEK 30; children under 6 years: free entry; senior citizens: SEK 40). There is no special fee for attending the seminars.

Cancellation

Once a person has registered for the seminar he/she will be expected to attend. Notification of cancellation should be made as soon as possible so that people on the waiting list can be offered the place. Cancellation must be made in writing directly to the museum (see address below). A charge of SEK 200 will sent out if a cancellation is not requested and the participant does not show up.

Please e-mail the registration form to: info@tekniskamuseet.se or send it by postal mail to:
Zenita Gustavsson, Tekniska museet, Box 27842, 115 93 Stockholm, Sweden