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Keyboard instrument making in Stockholm in the second half of the 18th century¹

Musical instruments can be an interesting source when studying the musical life of a society. Music from the 18th century is still a living part of the musical repertory of our own time, and to be able to play it we need the instruments. Their musical possibilities and restrictions will tell us important things about the music and how it was played.

The making of an instrument in an 18th century workshop differs quite a lot from how it is made today. These differences in the way the models were designed and how the tools were used can be seen as typical examples illuminating general differences between their society and ours. A long tradition of instrument making gave a solid ground for an efficient production well adapted to the possibilities in a workshop with few workers using hand tools. Models could be easily changed to adapt to new demands. Far into the 18th century this workshop practice in Sweden can be seen as a part of a general North European instrument building tradition.

In the middle of the 18th century mercantile theories lead to import restrictions in 1756. Manufacturers were supported in order to increase production within the country, to reduce imports and increase exports. Science was considered a help in developing new qualities in what was produced.

A scientific approach to instrument making

The Royal Swedish Academy of Science was founded in 1739. The Academy made some efforts in trying to improve the quality of musical instruments and give the makers an alternative to just copying imported instruments.

Jacob Faggot, one of the leading men of the Academy, made calculations for instruments constructed according to these “scientific” principles. One of his ideas was that the string scale should be Pythagorean, which means that in every octave all strings for the lower note should be exactly double the length of the strings for the higher note. Another idea was that all strings should have the same thickness. Then all strings will have the same tension, and changes in temperature will affect the pitch of all the strings in a similar way and thus the instrument should never go out of tune.

Johan Broman was the maker commissioned to build such a harpsichord and this very instrument is now part of the collection of the Stockholm Music Museum. This harpsichord has a compass of five octaves, F1 – f3. The doubling of the string lengths goes down to C. In the lowest fifth, F1 – C, the string lengths are foreshortened not to make the instrument unreasonably long. Its total length is 360 centimetres, considerably longer than a modern concert grand piano. There are three 8-foot strings and one 4-foot string for each note. The 8-foot bridge is of an unusual construction. The upper surface of the bridge is flat and the strings rest on small pieces of ivory positioned perpendicular to the string direction and making all 8-foot strings in the course the same length. The 4-foot strings are half the length of the corresponding 8-foot strings, with no foreshortening for the lowest notes. The harpsichord shows a careful implementation of the scale ideas presented by the Academy. Probably the original strings were all of the same thickness, according to the original plan.

Jacob Faggot died in 1777 and an obituary held at the Academy was later published.² At the end, this experimental harpsichord is mentioned and described as a failure. The reason for this was supposed to be that some mistake had been made in scaling the instrument, and the experiment was never repeated. This shows that the real reasons for the failure never had been realized. Changes in humidity affect the tuning much more than temperature changes and it is not possible to use the same string thickness for all strings. Usually a harpsichord has about ten different string sizes, carefully chosen by the maker. All experienced keyboard instrument makers knew this, and they must have considered the theorists of the Academy as fools.

The harpsichord by Broman was restored in 1968 to playing order. It was then strung in normal way with strings of different sizes.

In the collection there is also a clavichord by Broman built after the same ideas (inv.no. X5488). If this is the only one made in this model we do not know. There is also another clavichord in the collection made by Broman in 1756

¹ Lecture given at the Kraus Conference arranged at the Stockholm Music Museum in November 2007.

² Henric Nicander, Åminnelse-tal, öfver Kongl. Vetenskaps-Academiens framledne Ledamot, Öfver-Directeuren vid Kongl. Landt-Mäteriet samt Charte- och Justerings-Verket, Herr Jacob Faggot, hållet för Kongl. Vetenskaps-Academien, Den 28. Nov. 1778, Stockholm 1779, p. 47

(inv.no. N57244), and also another harpsichord by Broman (inv.no. N149592), both with non-Pythagorean scale. Apparently most of Broman's instruments were built in the normal, traditional way.

The ideas from the Academy had no direct influence on the harpsichords and clavichords built in Sweden after the middle of the 18th century. Still, there could very well have been an indirect influence. Propagation from an official institution for the idea that instruments of good quality in new models could and should be produced in Sweden could very well have inspired the large Swedish clavichord invented in the 1770s and made for a period of about half a century.

The Swedish Gustavian keyboard instruments

Stockholm was the centre of keyboard instrument making in Sweden in the second half of the 18th century. Many workshops with a large production were active for many years. Most important as makers are Pehr Lindholm and Mathias Petter Kraft, other well-known makers are Pehr Lundborg and Anders Rangström. Several workshops had many years of large production especially of clavichords and fortepianos in square model.

Stockholm must have offered the best possible market in Sweden at this time, with many inhabitants who could afford even fairly costly instruments. The usual keyboard instruments at this time were the harpsichord, the clavichord and the square piano. Kraus must have been accustomed to the use of harpsichords in ensembles, but his keyboard works make use of dynamic expressions better offered by clavichords and hammer instruments. Grand pianos seem not to have been used in Stockholm until the end of the century, and the first grand pianos made in Stockholm are from the beginning of the 19th century.³ Probably Kraus never saw a grand piano in Stockholm. Both the workshops of Lindholm and Kraft had from the start a large parallel production of both clavichords and squares, and both types were built as long as the workshops were active. This means that both instruments had their advantages and virtues and that both were needed.



Clavichord by Eric Wessberg, Stockholm 1821
The Stockholm Music Museum inv.io. N83583
Photo Olav Nyhus



Square piano by Mathias Petter Kraft, Stockholm 1788
The Stockholm Music Museum inv.io. M66
Photo HansErik Svensson

A comparison of the clavichord and the square in Gustavian Stockholm

The Gustavian clavichord is a special Swedish model, probably invented by Pehr Lindholm. The squares made in Stockholm at this time are copied from the English squares, introduced by Johann Christoph Zumpe in London, probably in 1766.

Typically the clavichord is painted, as usual in the Swedish clavichord tradition. The squares, on the other hand, usually has a veneered case and a lid of solid mahogany, sometimes with a string inlay on the main case as is typical for the English furniture tradition.

The clavichord action is very simple and very reliable. It allows you to play so quietly as to be barely audible and these late clavichords can also be quite surprisingly loud. Consequently they have a large dynamic compass. The action has very little inertia, which makes it easy to play very fast passages. To make a reliable hammer action is much more demanding, and many changes and improvements have been tried as long as hammer instruments have existed. The

³ Patrik Vretblad, *Konsertlivet i Stockholm under 1700-talet*, Stockholm 1918, p. 105, p. 110, p. 118, p. 253f.

action in the Gustavian squares is as simple as possible, making it very difficult to play soft: there is always the risk that the hammers will never meet the strings.

Even if a square can be a little louder than a clavichord, the dynamic is much more restricted. Fast repetitions can also be problematic. Apparently other qualities must have been what made the squares interesting. One of the most important was the possibility to raise the dampers away from the strings, allowing the sound to continue even after the keys were released. The dampers in these early instruments are lifted by a hand stop. Thus it was impossible to make changes while playing with both hands. Usually this stop was divided between bass and treble, making the bass and treble dampers independent of each other. Another stop was a sordine: a thin strip of wood lined with some soft material which could be lifted to touch the strings, making the sound softer and less brilliant. If the effect of the lifted dampers was too harsh it could be softened with the sordine stop. This gave many possibilities to change the sound.

As the dynamic was restricted there was usually a stop for lifting a lid flap over the soundboard. With the lid closed the sound could be made louder and brighter by gradually opening the flap. To be able to do this while playing this stop was regulated by a knee lever.

Looking at the keyboard music by Kraus it is easy to observe how well adapted it is to the possibilities of the clavichord. It is also obvious that his more demanding works would have been much more difficult to play on a square and it is not natural to colour his music with the changes offered by the stops.

Concluding comments

We often meet some misunderstandings concerning the keyboard instruments of Kraus' time.

- When the hammer instruments arrived they quickly made clavichords obsolete.

In Stockholm these two kinds existed side by side for a period of half a century.

- The clavichord is too soft

Most keyboard music was played at home, in rather small rooms. Keyboard concerts were very rare.

The squares often have a music stand on top of the lid, and the lid flap stop must be used with the lid closed. A square with closed lid is softer than a clavichord with open lid.

- Professional keyboard players used the grand piano

Grand pianos were very rare in Stockholm in the 18th century. The earliest Swedish grand pianos are from the beginning of the 19th century. At the very end of the 18th century Abbé Vogler used an English fortepiano, supposedly a grand, for concerts.

It is an interesting fact that the clavichord, which was so important in its own time, is so unknown and little used today. If we admire the music of Kraus and his contemporaries there are good reasons for us nowadays to better investigate the possibilities of the instruments that inspired them.