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## Swedish mapping in the Baltic Countries

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*Summary:* This paper is based on information from Professor Ulla Ehrensvärd's book *Nordiska Kartans Historia. From myths to reality*. Also the supporting works in Latvia, during the 1990s, on aerial photography for the production of orthographic maps is recalled. The Nordic map produced by Andreas Bureus, published in 1621 and the land survey mapping that Bureus was in charge are as well briefly displayed.

### Carta Marina, 1539

Olaus Magnus (1490-1557) and his brother Johannes worked for the Swedish king, Gustav Vasa. They were both interested in the history of Sweden; Olaus more on the land and the people, and Johannes more on the ancient history of the Nordic countries. Johannes was sent to Rome for a contact with the Pope and when he came back to Sweden in 1523 he very soon became Archbishop of the Swedish Catholic Church. In that position he was sent on a visit trip in 1526 to the North of Sweden, but when he came back he understood that Gustav Vasa wanted to confiscate the wealth of the church and convert the Protestant Church. In October 1526 the king Gustav Vasa sent him to Poland as a Swedish delegate. He brought with him valuable documents, stayed in Danzig and never returned back to Sweden.

Olaus Magnus also intended to make a career in the Catholic Church. First he studied other countries in Oslo for seven years and got in 1513 his academic degree in Rostock, Germany. He then got a position in the Catholic Church of Sweden and made in 1518 a trip to Northern Sweden for collecting letter of indulgence to be used for building the St Peter's Church in Rome. He travelled along the Swedish and Norwegian coasts and collected information that later was used for his Nordic map. In 1523 Gustav Vasa sent him to Rome for meeting the Pope in order to get confirmation for four new Swedish bishops. On his way back home he was asked to stop for negotiations in Lübeck and Amsterdam on the rights for ships to visit Swedish ports. On his trip to Holland he probably came in contact with the World Map prepared by Waldseemüller. That map was prepared on information collected by Portuguese sailors in an outlay that has been used by sailors since the antique. Waldseemüller wanted to improve the map by collecting more information around the Norwegian coast. However, he died in 1518 and that convinced Olaus Magnus to fulfil his idea of a Nordic map.

Olaus Magnus wrote the report to Gustav Vasa and joined his brother Johannes in Danzig. After the Reformation of Sweden in 1537 the Swedish community in Danzig grew. The communities interest in mapping brought them soon in contact with Polish cartographers e.g. Copernicus and his friend Bernard Wapowski, who worked on a map over Scandinavia, Livonia and the Muscovite country.

In 1537 Olaus and Johannes Magnus finally left Danzig and travelled to Venice for a Church meeting that was finally cancelled, but the brothers got an offer to stay in a house and a guarantee

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to publish the map *Carta Gothica*, later called *Carta Marina*. The map was rather big and was printed in 9 sheets; the map was sold in a shop close to the Rialto Bridge. After some 10 years Olaus could pay back his loan to the landlord.



Figure 1. Carta Marina by Olaus Petri as printed 1539. Sweden is shown in the mid column. Finland and the Baltic countries are shown in the right line. Photo: Stig Göran Mårtensson, University of Gävle, Sweden.

*Carta Marina* disappeared for some 300 years until 1886 when a copy was found in a library in Munich, and later an even better copy was discovered and bought by the University Library of Uppsala, Sweden. That copy has been reprinted at full scale several times (see Figures 1 and 2).

*Carta Marina* became very popular among travellers. However, its format was a problem. Antonio Lafreri's initiative to make a copy in a smaller format, printed in 1572 in colour, became very popular (Fig. 3).

### The map productions by Andreas Bureus

In 1603 Andreas Bureus got the second task from the King of Sweden Gustavus Adolfus to produce a map of the Nordic countries. He published his map, *Orbis Arctoi nova et accurate delineation*, in 1626 (Figure 4). Now the "mysterious things" in *Carta Marina* have disappeared and *Orbis Arctoi* displays very well the geometry of the Nordic region. However, the longitudinal dimensions, the West-East lengths, were difficult to calculate resulting Sweden represented wider on the map than it is in reality. To make an accurate calculation it is needed accurate determination of time in all positions. In South-East of Sweden there is an island that has a peculiar form; the observer in charge for time measurements in its middle seems to have used a one-hour differ-

ent time compared with his partners in the country's North and the South. That error resulted in a curved representation of the island that can be seen in many maps that have been copied then (see e.g. maps by Blaeu and Homann).<sup>1</sup>

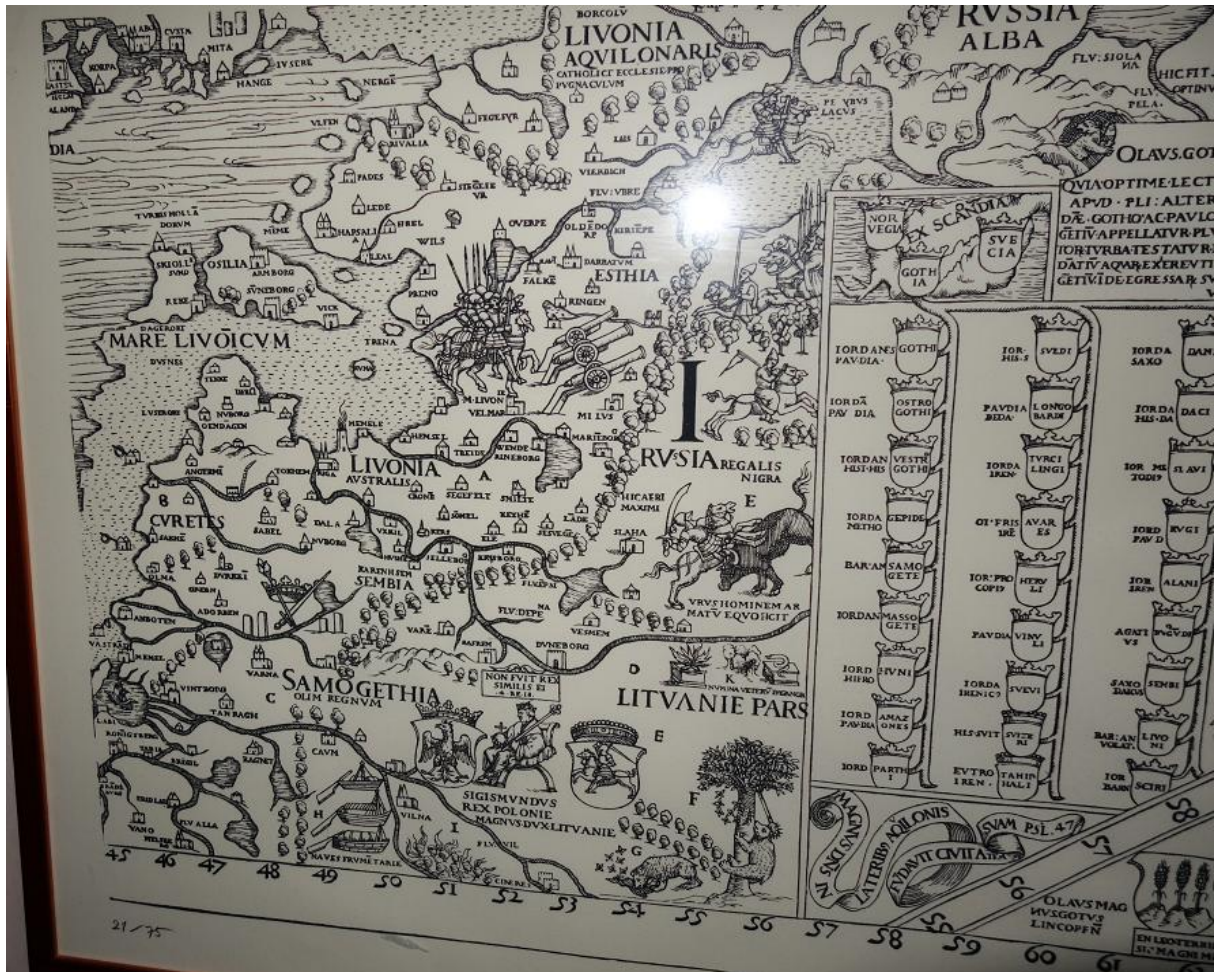


Figure 2. Shows a part of Carta Marina with Latvia. At that time borders between countries were not normally marked, but some symbols could identify differences between countries. Photo: Stig Göran Mårtensson, University of Gävle, Sweden.

The Swedish king was very impressed about the map showing the importance of Sweden in Northern Europe; he wanted to offer this map to important people in Europe, e.g. to the German-Roman Kaiser in Vienna. The map was engraved on copper plates, but they were damaged due to a fire in 1802; only one quarter of a plate is saved in an archive in Stockholm.

The map became very popular, improved and printed in new versions, both in single copies, in atlases and as wall map. In 1635 the map editor Henricus Hondius (1597-1651) printed a new version with improved depiction of the Danish coastal land. The Dutch cartographer Joan Blaeu (1599-1673) bought the copper plates of this map and printed a new version in 1661. The format was now 109 x 127 cm, with the text 128 x 160 cm. Even in such large format, the map was included in, at least, three atlases.

<sup>1</sup> John Harrison (1693-1776) was a clockmaker, producer of a clock that was accurate enough for a travel from England to New York and back again for giving the right time for a longitude determination during the whole travel ([https://en.wikipedia.org/wiki/John\\_Harrison](https://en.wikipedia.org/wiki/John_Harrison)).



Figure 3. Antonio Lafreri produced a smaller version of *Carta Marina* in colour, printed in 1572. Scanned by Bengt Rystedt (Ulla Ehrensävrd, 2006).



Figure 4. *Orbis Arctoi*, a map of the Nordic countries produced by Andreas Bure, published in 1626 (Ehrensvärd, 2006, pp 154-55). Photography Bengt Rystedt.

### Large Scale Mapping

On April 4, 1628 Andreas Bureus became the General Mathematician of Sweden and the head of the National Land Survey of Sweden. His instruction reads:

“Since His Majesty’s gracious desire and Intent is not only to defend his country and Kingdom from the enemy, but also that His Majesty, as the Opportunity arises and by all possible means, will improve its Capabilities And so that His Majesty may all the better be able to accomplish and execute this; His Majesty wishes to receive a synopsis, whereon His Majesty may study the position of all the Provinces and Towns, whereby His Majesty will then all the better be able to survey and consider by What Means and Where there is need for repairs and improvements. Therefore, His Majesty has graciously commissioned and ordered Andreas Bureus to take upon himself to carry out this work.”

Andreas Bureus faced an enormous task since the instruction was very demanding. Not only maps of all towns but also maps of all villages showing fields, meadows and forests were to be drawn. All lakes and rivers that were or could be deemed navigable as well as harbours were to be measured and mapped. Bureus had to start from scratch by training surveyors on purpose. He found six young men with suitable qualifications who formed his first class in surveying and mapping. A number of regulations were issued and in 1636 a memorandum with cartographic instructions was issued. Cultivated land was to be coloured grey, meadows green and mires yellow, lakes edges light blue, rivers and streams darker blue, forests green and rocky land left uncoloured; boundaries were to be marked in red and fences in black.

A distinction was made between geometric mapping and geographic mapping. The former was used for detailed surveying and the production of large-scale maps at a scale of 1:5,000. These were generalized and put together to make small-scale maps of parishes and other geographic areas at a scale of 1:50,000.

In 1688 a new Survey Instruction for both geometric and geographic surveying and mapping was issued. It was very detailed both in surveying and mapping, but also gave the cartographer freedom to find solutions to problems in a sensed way and *to allocate colours and include everything worth noting in the most suitable and pleasing manner*.

Production of geometric and geographic maps was also conducted in the Baltic Countries and in Pomerania as well. A Baltic Commission for mapping was set up in Riga with surveyors from Sweden, Finland and the Baltic Countries. In the year 1710 the Commission had mapped Latvia, Estonia, Ingeri and Karelia. The maps were produced village by village and if one farmer in a village asked for it to the county administration the surveyors also surveyed all the fields for a later amalgamation to more consistent farms that was a necessity for using more modern farming equipment. The maps had good quality and many researchers think that this mapping is one of the best tasks that the Swedish administration has made in the Baltic Countries.

According to the Peace Statutes of Nystad 1721, the maps and other deeds of Latvia, Estonia, Ingeri and Karelia should be delivered to Russia. Most of the maps can now be found in archives in Tartu and Riga.

### **Orthophoto maps in Latvia during 1990s**

After Latvia's independence in 1992, Sweden was soon engaged in the Latvian project to determine the value of agricultural land and how to compensate earlier owners. I was participating in that program trying to retrieve accurate topographical maps. However, all necessary maps were kept in Minsk and were not accessible. Furthermore, these maps had the Russian spelling of place names. The Swedish National Land Survey got a grant from the Swedish Development Agency (SIDA) to assist Latvia. I wrote up an idea to make an aerial survey and from the images produce orthophoto maps over Latvia in a scale of 1:2,000 over built up areas and at a scale of 1: 20,000 over rural areas. The idea was sent to Riga and translated to Latvian with an approval to continue. The aerial photography took place and a person from National Land Survey of Sweden brought the photos in a suitcase when flying to Riga for the orthophoto map production by the Latvian Land Survey.

### **References**

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