

Maps of Czech Lands in the Period 1518 - 1720 from the Map Collection of Charles University in Prague

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Abstract

Preliminary results of research on old maps of Czech Lands deposited at the Map Collection of Charles University in Prague are presented. The extensive cartographic collection belongs among the most important collections in the Czech Republic. The goal of the research was to document the development of cartography during the period 1518 (Claudianus's map) to 1720 (Müller's map). More than 50 originals or facsimiles of different maps were found during inventory phase of the work. The paper concentrates on a description of most interesting maps discovered from the point of view of their content, map symbols and cartometric characteristics.

Keywords: old maps, map collection, map analysis

1 Introduction

Maps of Czech Lands, i.e. Bohemia, Moravia and Silesia, created by individuals in the period of 1518 - 1720 are part of our history and represent important cultural heritage of immense value. They give evidence about the period in which they originated. Old maps reflect the society and culture, and they become important historical sources. These sources are used especially in social sciences, namely in history of cartography, historical cartography, historical geography and historiography.

The map collections in the Czech Republic preserve a considerable number of old maps. This article presents an overview of the most significant cartographic works from the given period deposited in the Map Collection of Charles University in Prague, which is one of the most important map collections in the Czech Republic. Its objective is also to indicate various levels of the art of cartography and outline the extent to which old maps can serve as a source of knowledge of geographic areas of the past.

The research was conducted within the project "*Cartometric and semiotic analysis and visualization of the old Czech Lands maps in the period 1518 – 1720*". In relation to the project the research of the Map Collection of Charles University in Prague focused on map works of Bohemia, Moravia and Silesia created by individuals in the above mentioned period. The map research then centered on the analysis of the map content and on cartometric analysis.

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Figure 1: Bohemia Lion on the Aretin's map of Bohemia from the year

The results of the research are described in the text below using knowledge from historical and cartographic studies of the last decades.

2 Map Collection of the Charles University in Prague

The Map Collection of Charles University in Prague was founded by professor Václav Švampera in 1920 as the State Collection of Maps of the Czechoslovak Republic. The basic elements of this collection were represented by the funds from the Department of Geography of the Faculty of Science, some map sheets from the Vienna War Archives after the collapse of the Austro-Hungarian Empire, and cartographic archive materials from various libraries. After the World War II the State Collection of Maps acquired map funds from the German University in Prague. Later, the fund was enriched by cartographic archive materials from the National Museum. Since 1994 the Map Collection of the Charles University has served as a workplace of the Faculty of Science. Professor Bedřich Šalamon and Professor Karel Kuchař belong among its prominent representatives.

The collection funds contain originals and facsimiles of cartographic works from the 8th century up to now. Maps from atlases from the 16th, 17th and 18th centuries can probably be declared as the most beautiful cartographic works. They are connected to the names of cartographic giants like Mercator, Ortelius, Blaeu, Delisle, Homann, Seutter. There are also maps created by the representative of cartography in Czech Lands - Müller.

The Map Collection of the Charles University nurtures the legacy of inestimable value, provides materials for research and study, as well as for wider cultural purposes. Its cartographic fund places among the most significant in the Czech Republic. It is composed of over 2,000 atlases (since the 16th century), 60 globes, approximately 100,000 map sheets and books and magazines.



Figure 2: Complement placed in the corners map sheets of Müller's map of Moravia

3 Analysis and assessment of old maps

During the 1st half of 2008 the map fund of the Charles University was researched thoroughly, with particular emphasis on map works of Bohemia, Moravia and Silesia from the period 1518 - 1720. During the analysis and assessment of these old maps a number of questions and problems arose. The works' dating details served to determine the author, year of publication and name of publisher. In case only some data were stated on the map or they were completely absent, the map's date of origin was determined following the characteristic features for particular phases of cartographic production, for individual authors or publishers. The representation of map content, typeface, material used, reproduction technique and artistic elaboration are among such features. Authors of the maps were mostly cartographers, land surveyors, draftsmen, engravers, publishers, printers, clerks or artists. The information whether the work is an original, facsimile, copy or derivative was also important. In our selection Comenius's map of Moravia is a facsimile. Other maps are originals.



Figure 3: Scale on the Comenius's map from the year 1627

The analysis of map content can provide us with answers to other relevant questions related to analysis and assessment of maps. Similarly to modern maps, old maps also include some map elements which were becoming more and more precise with the development of cartography and geodesy. However, some map elements were absent, like date or name of the author. For example, Mercator's copy of Criginger's map of Bohemia is not dated. In some cases the maps were made without a map frame or a scale. The scale of old maps was indicated by words comparing length in the map to real length, or graphically as a line segment, rectangle or trapezium segmented into smaller parts which represented the ratio of distance on the map and real distance. The basic elements of map content are: settlements, paths and roads, granges, castles, monasteries, baths, vineyards, waters and various natural-history curiosities. Political and territorial self-

governing divisions of depicted areas are represented by various types of boundary lines and surfaces of different colours.



Figure 4: Legend and scale on the Aretin's map from the year 1632

Geographic name is a changing map element. Various language versions of maps of Czech Lands were predominantly Czech, Latin and German.

Another assessed element of map content is the relief. Till the end of the 18th century relief used to be represented by a stylised drawing of elevations using pictures of hills and mountains, so called hill method (in Czech *kopečková* or *pahorková metoda*). "Hills" and their ranges informed the user about the character of the represented landscape. This method was used in all the maps we assessed.

The position of the legend is also important. The legend contains a group of symbols for elements used in the maps, together with verbal explanation of their meaning. Usually they are arranged according to a determined hierarchy. Old cartographic works often contained decoration in the area of title, scale or legend, or a so called paregon, i.e. a graphical complement placed in the corners of map sheets. And also a cartouche, i.e. decorative or ornamental framing of the map's title.

4 Analysis of the content of selected maps

Maps from the period 1518 - 1720 representing the area of Bohemia, Moravia and Silesia were chosen from the Map Collection of Charles University in Prague. After assessment of the extent of damage and degree of legibility their suitability for further processing was decided. Selected maps were scanned by large-format scanner Contex Crystal XL 42 Plus with the resolution of 200 dpi and in the format .tif. After scanning them the paper originals were no longer used and all further analyses were performed using the scans in electronic format. Analyses of map content as described in Chapter 3 were performed. Cartometric analyses are currently completed only for Vogt's map. Other maps are in progress.

After completing the analyses the following maps were chosen: Criginger's map by Gerhard de Jode, Mercator and Kaerius, Aretin's map of Bohemia, Vogt's map of Bohemia, map of Moravia by Abraham Ortelius based on Pavel Fabricius, Comenius's map of Moravia and Müller's map of Moravia.

4.1 Chorographia insignis regni Bohemiae, autore Ioanne Crigingero

Author: Johann Criginger

Year of publication: 1584

Author of engravings: copies by Gerhard de Jode

Approx. scale: 1 : 683 500

Johann Criginger (1521 – 1571) created a map of Bohemia oriented to north - *Bohemiae regni nova chorographica descriptio*. The map is historically the second map image of Bohemia. The map of Bohemia was adopted from many Dutch atlases - Ortelius (1570), Mercator (1585). The precious copy by Gerhard de Jode is less known. Its reprint was found in the Map Collection of Charles University in Prague.



Figure 5: Surroundings of the Prague City on the Criginger's map of Bohemia, copies by Gerhard de Jode

The map's title is "*Chorographia insignis regni Bohemiae, autore Ioanne Crigingero*". Its content does not depart from the original Criginger's map. However, it does not contain the original depiction of four rulers of the Czech Crown countries in the map's corners. It contains a very good representation of Czech mountains and waters. There are altogether 292 settlements in the map represented by four symbols. The map contains a detailed network of water streams and mountain ranges represented by hummocks and groups of trees.

Mercator's and Kaerius's copy of Criginger's map

A well-known copy is that by Mercator (1585). It is not dated and its title is "Bohemia". It was supplemented with topography of South Bohemia. The description is done by Latin italics, minuter but also unequivocally much more legible than in the original. Among the most beautiful copies of Criginger's map of Bohemia is the 40 x 50 cm big map by a Dutch engraver, publisher and bookseller Peter Kaerius. It is decorated with vedutas of Prague and Hradčany (Prague castle). It contains a detailed topography, the relief is represented by hills and trees, the scale is provided in Czech miles.

4.2 Regni Bohemiae nova et exacta descriptio – Aretin's map of Bohemia

Author: Petr Aretin of Ehrenfeld

Year of publication: 1623 (second publication - first published in 1619)

Author of engravings: Paulus Bayard sculpsit Prague

Frame size: 766mm x 574mm

Approx. scale: 1 : 504 000

The map titled *Regni Bohemia nova et exacta descriptio* (New and exact description of the Bohemian kingdom) was created by Petr Aretin of Ehrenfeld (1570-1640) as the historically third map image of Bohemia. The map was first published in 1619. In our collection we found the second and third publication of the map. The second revised and supplemented publication is dated 1632 and was used as a military map during the Thirty Years War. On the right and left edge of the map there are six figures in period garments. Six female figures on the right edge and six male figures on the left edge. In the upper right corner the Czech lion is represented and in the upper left corner there is the imperial eagle.



Figure 6: Surroundings of the Prague City on the Aretin's map of Bohemia from the year 1632

The map contains 1157 settlements, including an alphabetical index of names and coordinates in Czech miles in the upper left corner of the map. A mile scale is drawn on the map's frame and a network of coordinates (width 42 Czech miles, height 35 Czech miles). On the left edge the scale is printed; it was to serve for subtracting coordinates after a wooden lineal was pasted. At the end of the index important cartometric information is given stating the circumference, surface area of Bohemia, and the west-east and north-south distance.

The map is described both in Czech (capital letters) and German (small letters). Aretin's map represents first political division of Bohemia into fifteen regions. On the map we can find sixteen determined symbols representing for example free Royal towns, aristocratic residences, monasteries, mines, warms springs and glassworks. Moreover, the map also contains notes on the discovery of most beautiful pearls and gems.

The map contains hydrography which is changed in comparison to the first publication. The following rivers are described: Labe, Úpa, Metuje, Orlice, Chrudimka, Jizera, Cidlina, Ploučnice, Ohře, Vltava (its spring is covered by a drawing of an angel), Malše, Lužnice (with the pond Jordán u Tábora), Blanice, Mže (its tributaries are depicted but not named). Many other water streams, including foreign ones, are depicted but not named.

Orography is relatively accurate but its description is missing. Road network is not represented.

The third publication in 1665 was done by the copperplate engraver Daniel Vusín (1626 - 1691). In the Map Collection of Charles University in Prague another, undated and changed publication was found. This copy was done by his son, the copperplate engraver and bookseller Kašpar Vusín (1664 - 1747, Prague).

4.3 Vogt's map of Bohemia

Author: Johann Georg Vogt

Year of publication: 1712

Frame size: 853mm x 656mm

Approx. scale: 1 : 396 800

Vogt's map is an important cartographic work dated in the first quarter of the 18th century. Its author is Johann Georg Vogt, the abbot of the Plasy Monastery. The format of the map is 853 x 656 mm. The scale along the central meridian is 1 : 396 800. The map is not created following a particular cartographic representation. The map is inserted in a frame which is divided by a two-second scale.



*Figure 7: Surroundings of the Prague City
on the Vogt's map of Bohemia from the year 1712*

The legend includes 24 determined symbols. Vogt's map represents altogether 3110 elements. It differentiates walled towns, small towns, villages, churches, castles, ruins, mills. Gold, silver and cupriferous ore mines are also represented in the map, as well as pearl oyster sites, thermal baths, glassworks, vineyards, ironworks and custom stations. In addition to these symbols Vogt also used perspective miniatures, e.g. the castle of Bezděz. Discontinuous representation of mountains leads to the fact that the main characteristics of Bohemia fade down. The water network is dense, e.g. in Prague the characteristic meander of the river Vltava is depicted correctly. Vogt dedicated close attention to the shapes and locations of water surfaces, especially the pond system in the region of Třeboň a Přelouč are outstanding, nevertheless, the surface areas are overdrawn. The map contains nomenclature in two languages but it conforms to German custom. The map is coloured and richly illustrated.

Vogt's map is the last private work of the early period of Czech cartography created by one cartographer.

The original Vogt's map was used at the Department of Applied Geoinformatics and Cartography for the first cartometric analysis. This analysis found out that the value of the medium scale along the central meridian is approximately by 6% bigger than the currently stated value of 1:396800.

4.4 Map of Moravia by Abraham Ortelius base don Pavel Fabricius

Author: Pavel Fabricius (1519 – 1589)

Author of copy: Abraham Ortelius

Year of publication of Ortelius' copy: 1573

Frame size: 469 x 345 mm
 Approx. scale: 1 : 455 000

Fabricius's map from 1569 is the first autonomous map of Moravia. Moravian aristocrats later wrote their comments to the map which were used to publish a corrected map in 1572. Fabricius represented not only Moravia, but also a considerable part of North Austria. The original map is printed on six copperplates and its overall format is 946 x 846 mm; the engraver's name is unknown. The scale is approximately 1 : 288 000. The map's frame is divided by 5' in the direction of meridians and parallels.

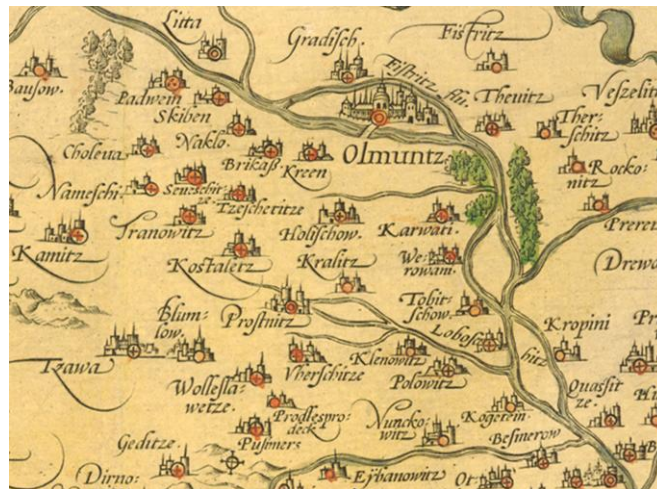


Figure 8: Surroundings of the Olomouc City
 on the Map of Moravia by Abraham Ortelius based on Pavel Fabricius from the year 1573

Several copies of the map are preserved. The most famous one was included by a prominent Dutch publisher Abraham Ortelius in his atlases. The title of Ortelius's copy is: "*Moraviae, quae olim Marcomannorum sedes, corograraphia, a D. Paulo Fabricio medico et mathematico descripta et a generositate Moraviae baronibus quibusdam correctata*". It reminds us of Marcoman history. Ortelius's copy from 1573 is printed on one copperplate in the format 469 x 345 mm. The map is scaled down and its graphic scale is 1 : 455 000.

From topographic point of view some places on Fabricius's map are overloaded with topography and others are left without description. The map contains 347 local names for Moravia and 134 for the adjoining part of Austria. The nomenclature is German. The names of some settlements cannot be identified because they had been distorted. The map represents towns, small towns, castles and monasteries. Orographic drawings (using the "hill method") in Ortelius's copy are considerably simplified, almost left out. All significant water streams are also represented. The map frame is divided into plots. The map uses fathom scale.

4.5 Comenius's map of Moravia

Author: Jan Amos Komenský - Comenius (1592 – 1670)
 Year of publication: 1627
 Frame size: 544mm x 422mm
 Approx. scale: 1 : 530 000
 Printed from Abraham Goose's second printing plate

Jan Amos Komenský (Comenius) was born in the region of Uherský Brod in 1592. In 1616 he was ordained a priest. After the battle of White Mountain in 1620 he had to emigrate; he went to the town Lešno in Poland where he worked as a teacher and from 1648 as a bishop of the Bohemian

Unity of Brethren. He wrote a number of pedagogical and theological works. After a devastating fire in Lešno Comenius left for Amsterdam, where he died in 1670.



Figure 9: Surroundings of the Olomouc City on the Comenius's map of Moravia from the year 1627

Comenius's map places among the most famous and most popular maps of Moravia. The map was being created for ten years during which a huge amount of materials was assembled. Comenius wished that the map would serve as a pilgrimage map for all people. It is possible that it was ordered by Dutch atlas publishers.

Comenius's method when processing the manual copy of the map was based on adapting Fabricius's map which he supplemented on the basis of his own travels, testimonies of his contemporaries, printed itineraries and written records of distances. When creating the map classical geodetic construction foundations were not used. Comenius's map of Moravia was published in 1624 from big Goose's plate in the Amsterdam workshop of N. J. Visscher-Piscator.

The map's title is Latin: "*Moraviae nova et post omnes priores accuratissima delineati. Auctore I. A. Comenio*". In the lower right corner there is the name of the publisher Nicolas Johann Piscator. A strip of perspectives of four cities situated on the upper edge is characteristic to the map. The four cities are Polná, Olomouc, Brno and Znojmo. In the upper left corner there is a dedication to Ladislav Velenov of Žerotín written in Latin. Here Comenius explains why he created the map and what his technique was. The map has a simple outer frame whose size is approximately 544 x 442 mm. The map's scale according to the represented geographical network is approximately 1 : 480 000 and according to the drawing of the map content approximately 1 : 530 000. The legend is situated in the lower right corner.

The nomenclature of Comenius's map is Czech, important settlements include also their German name. In the upper left corner there is a scale in Moravian miles.

The map represents 720 geographical names, out of which 667 are settlements, 28 are rivers and ponds, 16 are orographic names, 8 are countries and 1 is vegetation. The representation of the river system is very thorough. The main river directions are expressed, the streams flow through the correct settlements and interflow as in reality. Mountains and elevations, passes, forests, bridges and river crossings are represented in the map. In addition, the map includes objects important for orientation, selected mines, glassworks, baths, healing springs and vineyards. The oldest Goose's printing plate was used as a model for a second plate called AGoos sculpist.

Facsimiles of the copy printed from Abraham Goose's second printing plate from 1627 are part of the Map Collection of the Charles University in Prague.

4.6 *Tabula generalit Marchionatus Moraviae in sex circulos divisae* – Müller's map of Moravia

Author: Jan Kryštof Müller

Year of publication: 1716

Frame size: 484 x 581 mm

Approx. scale: 1 : 630 000

The map content was engraved by the engraver Jan Kryštof Leidig from the city of Brno.

Müller's map which contains a Map of Moravia from 1716 belongs to works giving vivid evidence about the change in Czech and Moravian landscape at the beginning of the 18th century. Five decades before the first military mapping it represents in detail the landscape of the Czech Lands with a lot of information concerning geography, economy, nomenclature and culture.

In 1708 the Emperor Joseph I. issued an Imperial Patent which Jan Kryštof Müller used for the mapping of Moravia.

The mapping was done from 1708 to 1712. The map represented "*all roads and tollgates for the needs of the country and for the safety of travellers*". According to Müller's plan each of the six Moravian regions was mapped individually. These regional maps were used to compile an overall map of Moravia. The final revision was created in 1716 and the documents necessary for the engraving were handed over to the engraver Jan Kryštof Leidig from Brno.



Figure 10: Surroundings of the Olomouc City on the Müller's map of Moravia by J. B. Homann

The individual plates held the map's title "*Tabula generalis marchionatus Moraviae in sex circulos divisae quos mandato caesareo accurate emensus hac mappa delineatos exhibet Joh. Christoph Müller., S.C.M. capitaneus*". The map was engraved on four plates. When their imprints are put together their format is 1374 x 974 mm. The map's scale is in Moravian miles, after conversion this four-sheet or estate map has the scale of 1 : 180 000.

From the topographic point of view Müller's map contains all settlements, which are labelled by determined symbols. The road network is very sparse; main routes start in the city of Brno and have four directions, then they branch out further. The terrain was drawn using the hill method with

illumination coming from the west. The orography scarcely contains nomenclature, only important peaks are named.

Müller's map of Moravia became a model for the work of German, Austrian, French and Dutch cartographers and publishers. They started to publish well-arranged one-sheet maps of Moravia of medium and small scales. Their content was generalised, the format reduced, their titles and scales changed.

One of these publishers was Johann Baptista Homann from Nuremberg. His reprint of the Müller's copy is deposited in the Map Collection of the Charles University in Prague. It is a map of Moravia after 1726. In the upper left corner there is the title: "*Tabula generalis marchionatus Moraviae in sex circulos divisae quos mandato caesareo accurate emensus hac mappa delineatos exhibet Joh. Christoph Müller., S.C.M. Capitan editore Ioh. Bapt. Homanno Norimbergae*". The map is an undated (approx. 2nd quarter of the 18th century) coloured copper engraving. Its graphic scales is approx. 1 : 630 000.

5 Conclusion

This article dealt with assessment of content of old map works created by individuals in the period 1518 – 1720. Its objective was to introduce the methodology and results of basic analyses of works selected from the Map Collection of the Charles University in Prague. However, not all necessary data was available and many questions still remain unanswered. Nevertheless, the result will serve as a first stage preceding other detailed analyses of map content and cartometric analyses of these works. Currently, a detailed cartometric analysis of Vogt's map is completed. Its methodology and results are described in another article.

The Map Collection of the Charles University currently contains several other cartographic works from the period 1518 – 1720. Their content and cartometric analyses will follow.



Figure 12: Persons on the Vogt's map of Bohemia from the year 1712

6 Acknowledgments

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