

HISTORY OF CARTOGRAPHY

The oldest map monuments

- **primitive geographical sketches**

Pavlov Map – 24,000 BC

- engraving into a mammoth tusk, situational map of the camp of mammoth hunters
- found in 1962 in Pavlov in southern Moravia
- Institute of Archeology, Academy of Sciences in Brno, copy NM in Prague

Other findings:

- Switzerland (cave)
- Siberia (Jenisej)
- Lake Ladoga
- ... carvings into bones or drawings on rock walls, depicting watercourses, campsites, hunting trails



The oldest map monuments

- **maps of the oldest cultural nations**
- Babylonia, Egypt – building plans, first survey for tax and land reclamation purposes (clay tablets, later papyrus)
- Egypt – Annual flooding of the Nile – need for re-surveying of land – development of practical geometry
- building pyramids - leveling and astronomy
- Egyptian map from the 14th century BC, depicts a part of the desert with settlements, quarries and mines for gold mining – the oldest geological map; stored in a museum in Turin, Italy



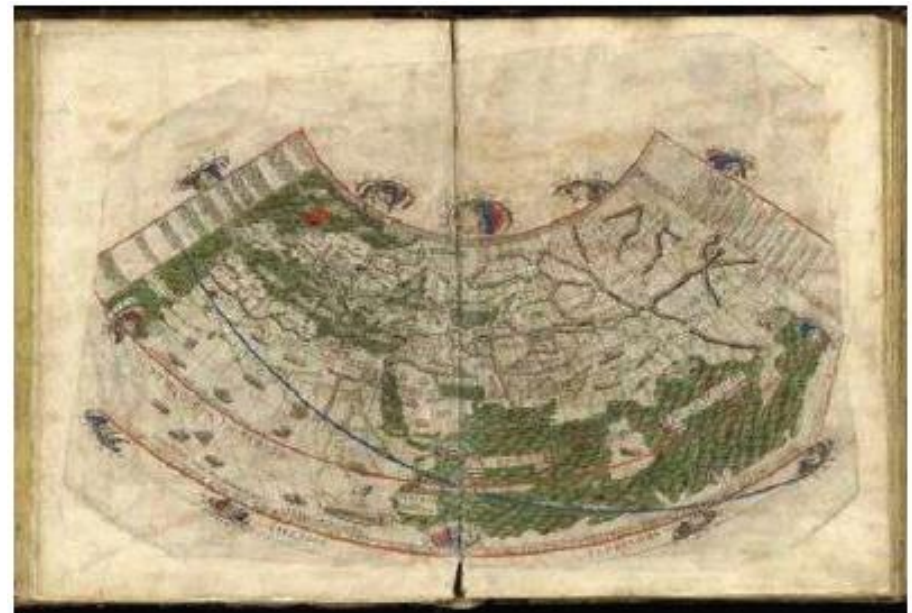
The oldest map monuments

- The Greeks – considered the Earth to be a sphere, determined its dimensions, introduced geographical coordinates and the sexagesimal division of the circle, the foundations of mathematical cartography
- Alexandria (Hellenic Egypt) – Euclid, Pythagoras, Archimedes, Eratosthenes (dimensions of the globe),
"father of cartography" Ptolemaios – concepts of geography, topography, mound method of relief drawing, the Ferrian meridian as the western border of the known world

Eratosthenes world map (3rd century BC)



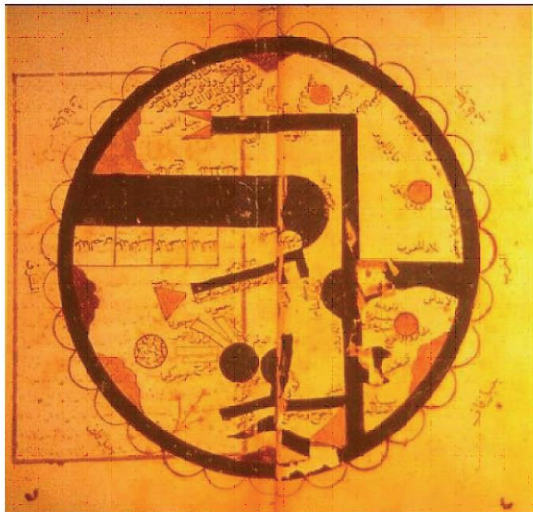
Ptolemy's world map (2nd century BC)



Cartography in antiquity and the MA

- the influence of the church on cartography – the Bible as the only source of knowledge, the Ptolemaic idea of the world (Earth – the center of the universe, the shape of a round plate with the center in Jerusalem)
- medieval maps – from about the 8th century, mostly oriented to east (east is up)
maps in the form of a circle – **so-called O–T maps** (Orbis Terrarum)

Arabic map, ca 1000

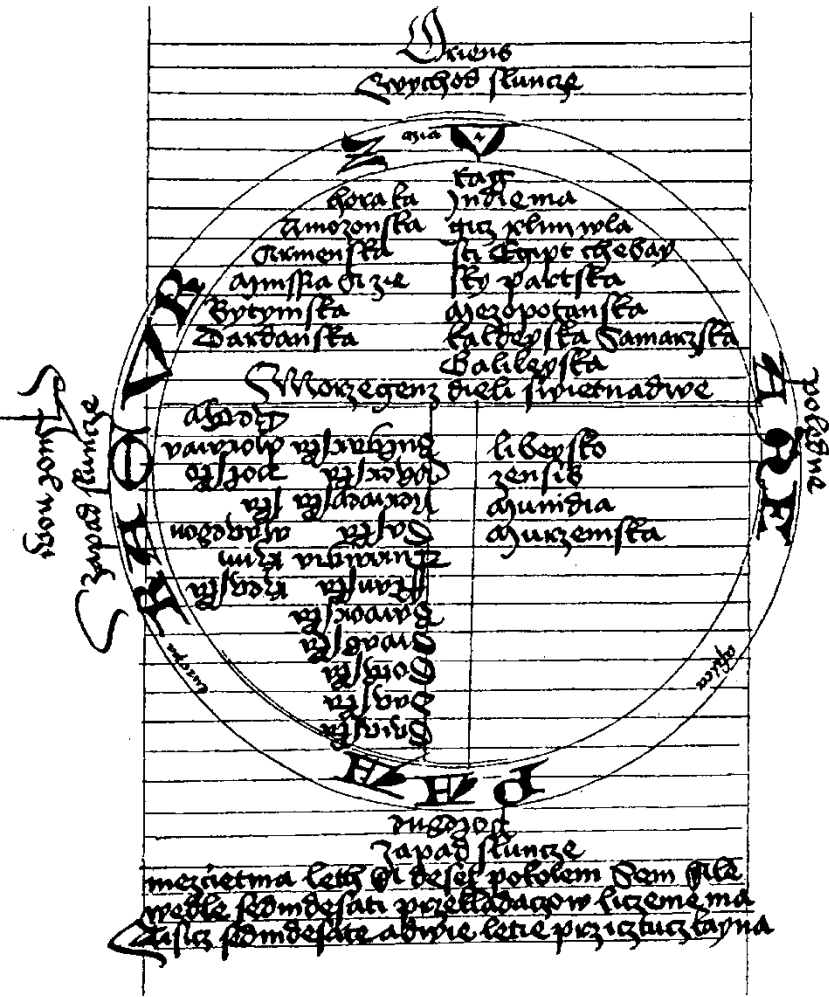


*13th century
Ebstorf map*

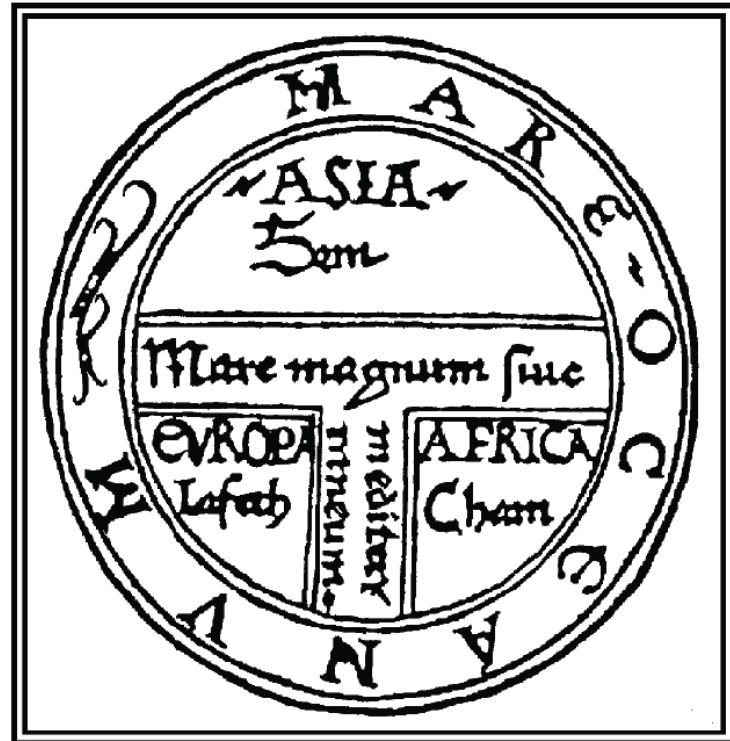


Map of Vavřinec of Březová

– our oldest map monument, the turn of the 12th and 13th centuries. included in the chronicle of Vavřinec of Březová (1370–1434)



example of OT map



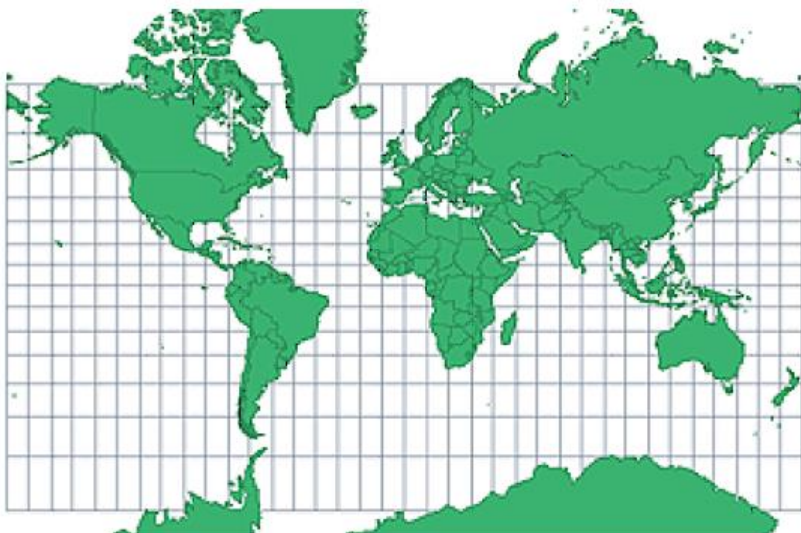
The development of cartography in the modern age

- developing commercial seafaring – 13th and 14th centuries – detailed maps of the sea coast
- **compass** (Portolan) maps – essentially navigation maps, a network of directional roses, ship navigation according to azimuth (Italians, Portuguese, Spanish, Dutch, French...)
compass maps were still used in the 18th century
- renaissance of cartography – return to the scientific basis (heliocentric system), M. Copernicus, G. Bruno, G. Galilei, **invention of printing (15th century) and copper engraving**
- **period of discovery – 15th and 16th centuries** – revival and development of cartography (Columbus and others)
- development of atlas cartography, mathematical cartography
Gerhard Mercator – Dutch cartographer, father of modern cartography (16th century)

compass (portolan) maps



Mercator's Atlas

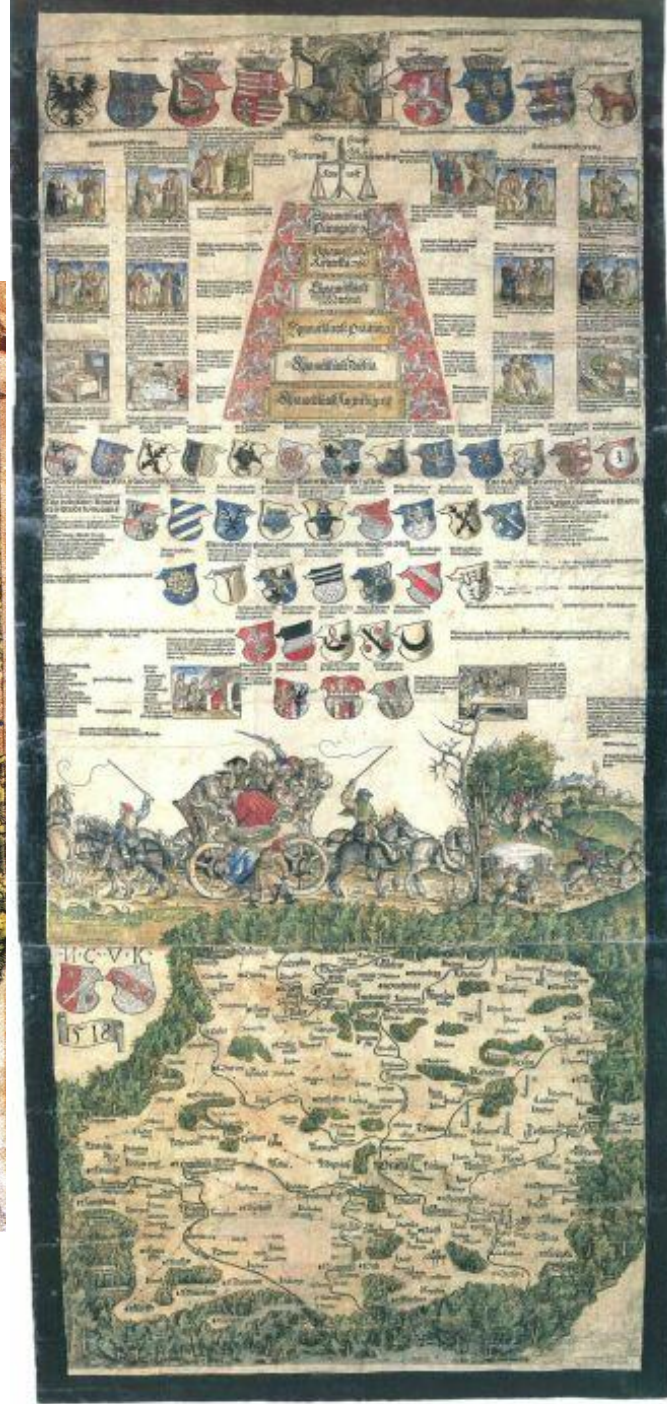
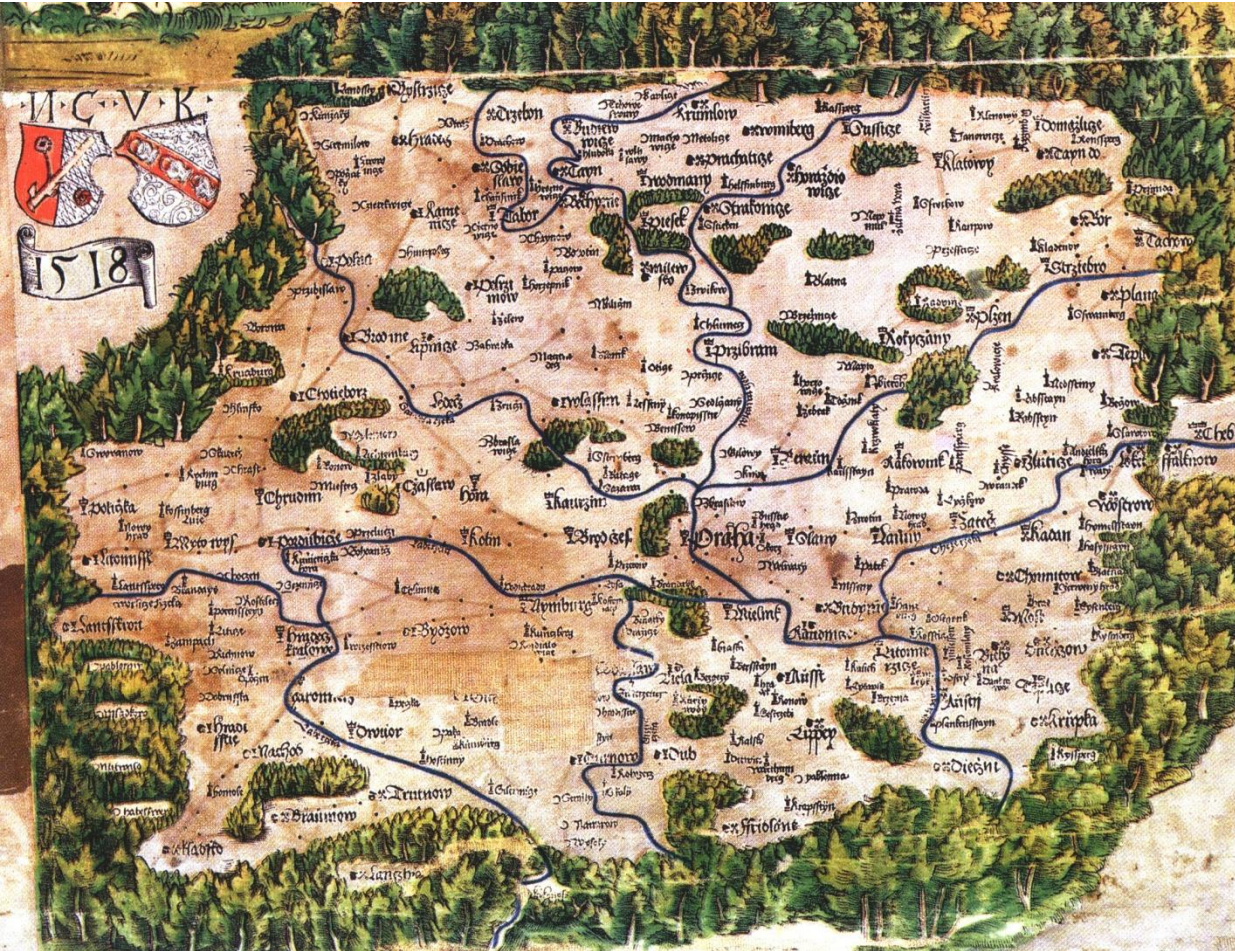


Mercator loxodromic map

Our oldest maps

- **Klaudyán's map of Bohemia 1518** – Mikuláš Klaudyán, book printer from Mladá Boleslav. measure approx. 1 : 637,000, 126×64 cm, wood engraving, hand-colored print glued to canvas (Litoměřice). In the upper part of the coat of arms of countries, important families and cities, two allegories.
In the lower part, the map itself – orientation to the south, 280 signs and place names (cities, castles, monasteries), a chronograph with a repeated symbolic sign of leafy vegetation, country roads marked with dots.
- **Fabricius's map of Moravia 1569** – Pavel Fabricius, mathematician and personal physician of Emperor Rudolf II, m. 1:288,000, 95×85 cm, Moravia and part of Lower Austria.
- **Helwig's map of Silesia 1561** – Martin Helwig, rector of the church school in Wroclaw. measure 1:550,000, approx. 82×67 cm, south orientation, 242 residences, monasteries, castles, disproportionate drawing of the horoscope, colored map.

Klaudyán's map of Bohemia



History of cartography

Fabricius' map of Moravia – cut-out



Helwig's map of Silesia – cut-out



Historical topographical mapping of the Czech lands

18th–19th cent. – industrial revolution, development of scientific fields, measuring devices and tools, military – artillery, requirements for accurate and detailed maps

- **Müller mapping (1708–1720)**
- **I. military mapping (Josephian, 1763–1787)**
- **II. military mapping (Franziscane, 1807–1869)**
- **III. military mapping (1870–1883)**
- Provisional Military Mapping (1923–1933)
- Definitive Military Mapping (1934–1938)

Müller mapping

Jan Kryštof Müller (1673–1721) – military imperial engineer, professional astronomer, topographer and cartographer
– first map of Hungary 1:550,000 (published 1709)
map of Moravia 1 : 166,000 (1716)

Müller's map of Bohemia – his most important life work, was made on the basis of his own measurements between 1712 and 1720. Lengths measured by the number of revolutions of the carriage wheels, directions by compass, position of selected places determined astronomically.

- meas. 1:132,000, 25 sections of format 557×473 mm (2.8 × 2.4 m)
- decorated with Reiner's engravings
- the division of Bohemia into 12 regions, a map of about 12.5 thousand settlements
- relief using the scoop method, description in German.



Müller's map of Bohemia



I. Military survey (1763–1787)

started under Maria Theresa, lost war with Prussia, completed under the reign of Joseph II. (therefore Josephian)

- **scale 1 : 28,800** (based on the fathom measure)
- sketch of the situation to the enlargement of Müller's map
- “à la vue” method (by eye, from the saddle), **without geodetic foundations**
- one map sheet (section) showed an area of 209 km²
- 5400 sections on the territory of the monarchy
- roads, brick buildings, stone bridges, meadows, pastures, forests, waterways
- elevation chart using hatches
- significant positional deformations, inaccuracies
- use: study of landscape development, revitalization
- originals in Vienna
- scanned map sheets can be viewed at www.geolab.cz

I. military survey (near Jindřichův Hradec)



II. military survey (1807–1869)

Emperor Francis II., Napoleonic Wars,
stable cadastre 1817, 1 : 2880 – basis for mapping

- **scale 1:28,800** or 1:14,400
 - coordinate systems: Gusterberg – Bohemia,
St. Stephen – Moravia and Silesia
 - simple measurement methods (graphic intersection), stepping
 - on a geodetic basis (cadastral mapping)
 - in terms of content as I. war.map., in addition altitudes (fathoms),
altitude chart with slope hatches
 - measurement took a long time (finance)
- increase in accuracy compared to I.voj.map.
– use: study of landscape development, revitalization
– originals in Vienna
– scanned map sheets can be viewed at www.geolab.cz

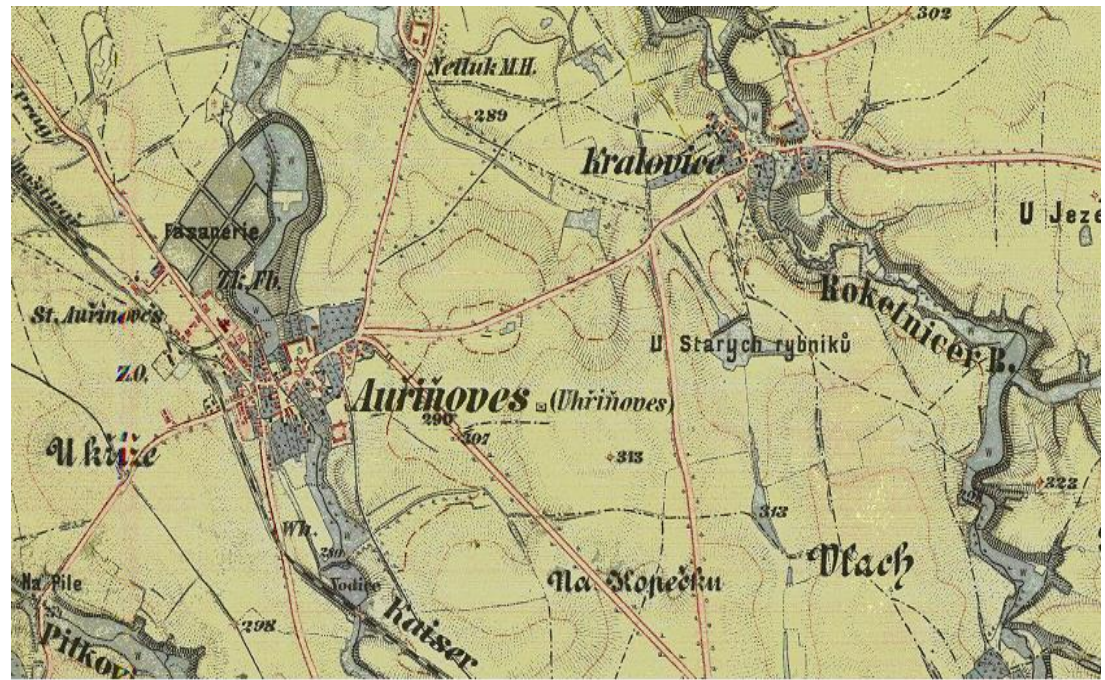
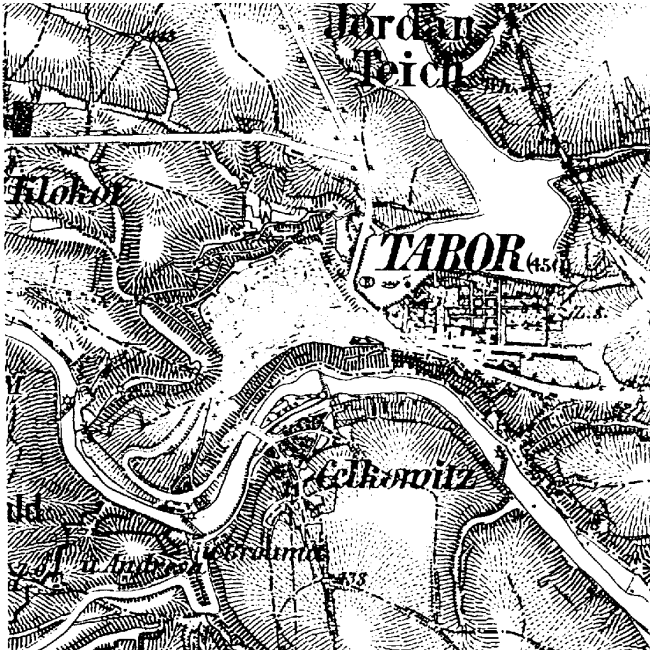
II. military survey (around Jindřichův Hradec)



III. military survey (1870–1883)

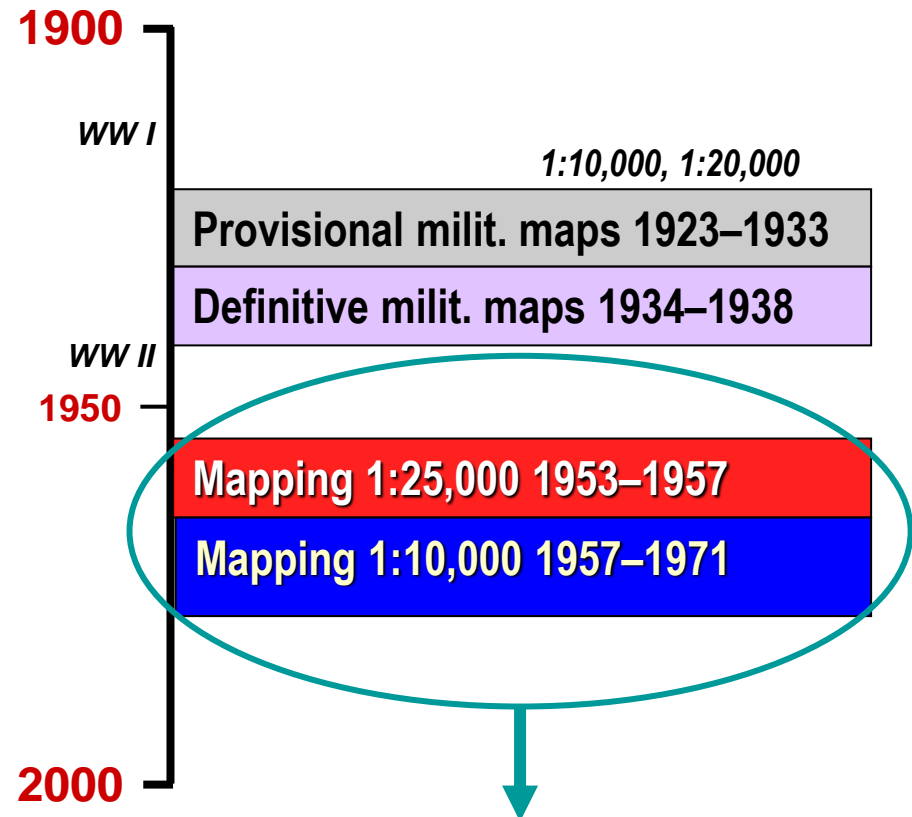
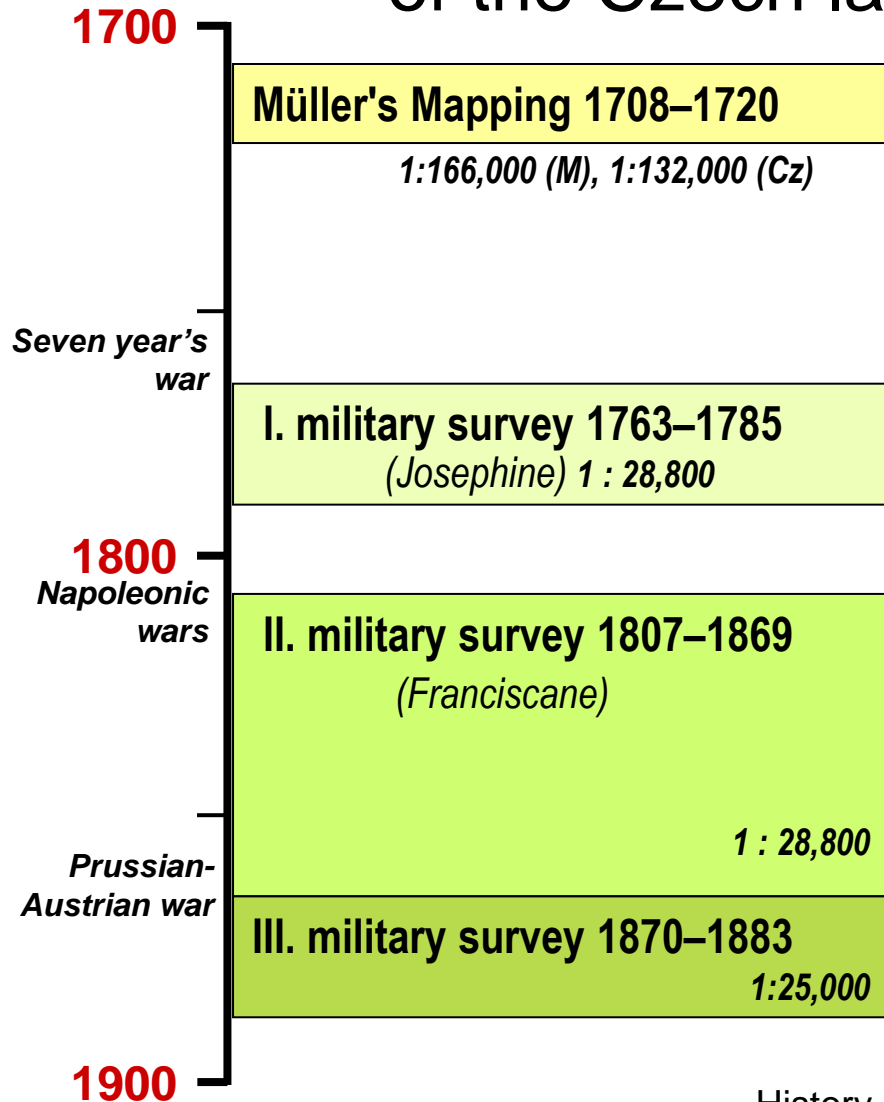
- lost Austro-Prussian War 1866, artillery requirements for accurate maps, industrialization - building roads, railways, river navigation
- **scale 1:25,000** (transition to metric scale 1871)
- coordinate systems Gusterberg – Bohemia, vol. Štěpán – Moravia and Silesia, Bessel ellipsoid, Adriatic high. system
- polyhedral display (4 sections 1 : 25,000 formed a sheet 1 : 75,000)
- derived maps
- **Special map 1 : 75,000** – the most popular historical map work of Austrian cartography, used for tourist purposes
- **General map 1 : 200,000**
- after the establishment of the Czechoslovak Republic – reambulation of maps taken from Vienna, Czech and Slovak nomenclature, four-color design, reprint of the S–JTSK network (orientational accuracy)
- www.geolab.cz

III. military survey – sample



- Provisional Military Mapping (1923–1933)
 - only 3% of the territory (1:10,000, 1:20,000)
- Definitive Military Mapping (1934–1938)
 - only 7% of the territory (1 : 20,000)

Historical topographical mapping of the Czech lands – an overview



History of cartography

the creation
of contemporary
topographical maps