

Grand Scales / *Wielka Waga*



One of the two weigh houses on Krakow's Market Square, demolished at the end of the 19th century. Parts of the relics that were preserved under the Market Square are now accessible inside the Rynek Underground permanent exhibition.

ponderator – locally appointed weigher of goods called also pensarius, pesarius, poiser, podrearius or poynder. [1]

The Grand Scales was used to weigh heavy items – such as copper, iron, lead – in loads more heavy than one hundredweight. [2]

Municipal weigh houses were built in relation with trade activities. A town needed a special privilege to establish a weigh house. The goods sold in town had to be weighed in a weigh house and a special fee paid to the town. The Grand Scales in Krakow was the largest building of this type in the Kingdom of Poland. [3]

During the 2005–2006 archaeological excavations in Krakow's Main Square 'patches' of copper, as well as irregular, often porous solids, resulting of copper processing were found nearby the Grand Scales. Copper was probably worked on the site, since fragments of stoves were discovered inside the building. [4]

The trade of metals and of metal products was an important factor in the economic growth of Krakow. Copper was the most important metal in trade and production. Slovak copper was imported to Krakow from the Kingdom of Hungary. The first information about the journey of Slovak copper imported in Krakow dates back to the 13th century. The City of Krakow was given the right of storage of copper, an important trade privilege obtained from Władysław Łokietek in 1306, providing exclusivity to the city in this matter. From Krakow merchants transported it through Miechów, Piotrków, Łęczycza and Toruń down to Gdańsk, and then by sea to distant Flanders. In the tradition of the Hanseatic League (medieval trade organization) Krakow was called '*the home of copper*' – a load of one the ships transporting copper was extracted from the bottom of the Bay of Gdańsk. [5]

Visual measure of complexity for the *Grand Scales*. No differences in the interpretation of the data are visible on this simple and short diagram. The relics of the Grand Scales were discovered – a part of them was incorporated into another building. [I. Dudek, J.Y. Blaise, 2011]

Note 1. cf. Zubko R. E., *Dictionary of Weights and Measures for the British Isles: The Middle Ages to Twentieth Century*, American Philosophical Society, Philadelphia, 1985, [on-line] <http://books.google.fr/books?id=0l_k-XMIiQIC&printsec=frontcover&hl=fr#v=onepage&q&f=false>, accessed 27.II.2013

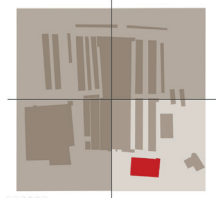
Note 2. A hundredweight (or *centum weight*) is a unit of mass. In 1764 a hundredweight (*cetnar koronny*) equalled 64,8 kg, while in 1818 only 40,55 kg. cf. *Leksykon Genealogiczny*, [on-line] <<http://www.genealogia.okiem.pl/glossary/glossary.php?definition=mira>>, accessed 02 II 2013

A hundredweight used in Krakow to weigh metals equalled 136,5 pounds (55,282 kg with 1 lb = 405 grams).

Note 3. cf. Komorowski W., *Krakowska Waga Wielka w średniowieczu*, *Rocznik Krakowski*, t. LXXII, 2006, p. 33

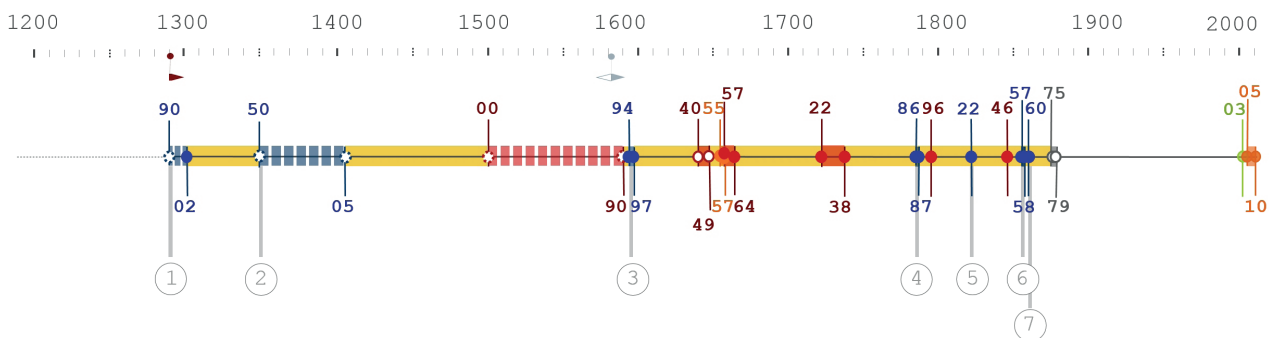
Note 4. cf. A. Garbacz-Klempka, *Miedź krótki rys historyczny i najnowsze zabytki archeologiczne*, Akademia Górniczo-Hutnicza w Krakowie, Wydział Odlewnictwa, Specjalność Odlewnictwo Artystycznej Precyzyjnej, *Informator Metale Nieżelazne* 2007, p. 238

Note 5. *Ibidem*



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<i>Waga Cetnarowa</i>	[Encyklopedia Krakowa, 2000, p. 1029]
<i>Waga Ołowiana (Ołowna)</i>	[Komorowski W., 2006, p. 33]
<i>Dom Komisji</i>	[Komorowski W., 2007, p. 287] [Follprecht K., <i>Nieruchomości...</i> , 2007, p. 23, note 24]
<i>Komisja</i>	[Kadłuczka A., 1975, p. 129]
<i>Eysenwooge</i>	[Wawel Louis J., 1890, p. 28]
<i>Pensa Maior</i>	[Sudacka A., 2006, p. 48] [Komorowski W., 2006, p. 33] [Follprecht K., <i>Źródła...</i> , 2007, p. 1]
<i>pensa argenti</i>	[Sudacka A., 2006, p. 48]
<i>Pensa plumbi</i>	[Piekosiński F., Szujski J., 1877–1878, p. 6]
<i>bliuage</i>	[Komorowski W., 2006, p. 33]
<i>Städtisches Haus</i>	[Münch H., 1959, p. 11]



1

1290 ??
1302

1302 – first mention of the building
[Komorowski W., 2006, pp. 33, 35],
[Niemiec D., 2008, p. 88], [Frančić M.,
1964, p. 25], [Tobiasz M., 1974, p. 124],
[Komorowski W., Sudacka A., 2008, p. 248]

around 1300
[Opaliński P., 2010, p. 117]

The weigh house was already in use in the
beginning of the 14th century.
[Follprecht K., *Nieruchomości...*, 2007, p. 23,
note 24]

Approximate period of construction of the Grand Scales – first
mention of the building in 1302 (*bliuage*).

[Sudacka A., 2006, p. 48], [Piekosiński F., Szujski J., 1877–1878, p. 6]

wooden building (?) – All we know is that the building existed.
[Komorowski W., 2006, p. 35], [Niemiec D., 2008, p. 88]

The Grand Scales was used to weigh copper, lead and iron.
[Komorowski W., 2006, p. 33]

Around 1300 the building could still be a vertical post log construction.
[Opaliński P., 2010, p. 117]

hypothetical reconstructions: [Krzysztofory nr 28, cz. 1, p. 116, il. 4], [XX, Cracovia 3D,
2011, p. 108]

2

1350 ??
1405 ??

turn of the 14th and 15th century
[Komorowski W., *Kraków. Nowe studia...*,
2007, p. 161], [Komorowski W., 2006,
p. 35], [Follprecht K., *Nieruchomości...*, 2007,
p. 23, note 24]

second half of the 14th century
[Niemiec D., 2008, p. 88], [Komorowski W.,
Sudacka A., 2008, p. 37], [Buško C., 2006,
p. 68], [Buško C., 2007, p. 230]

end of the 14th century
[Komorowski W., Sudacka A., 2008, p. 248]

Rebuilding – the wooden building is replaced by a stone and brick
built edifice, probably a two-storey building with a steep roof and an
interior subdivision into two parts. The eastern part with an entrance
from the St. Adalbert church side is twice bigger than the western
part, that housed gold and silver smelting workshops, as well as stalls
used to sell various metal products.
[Komorowski W., Sudacka A., 2008, p. 248]

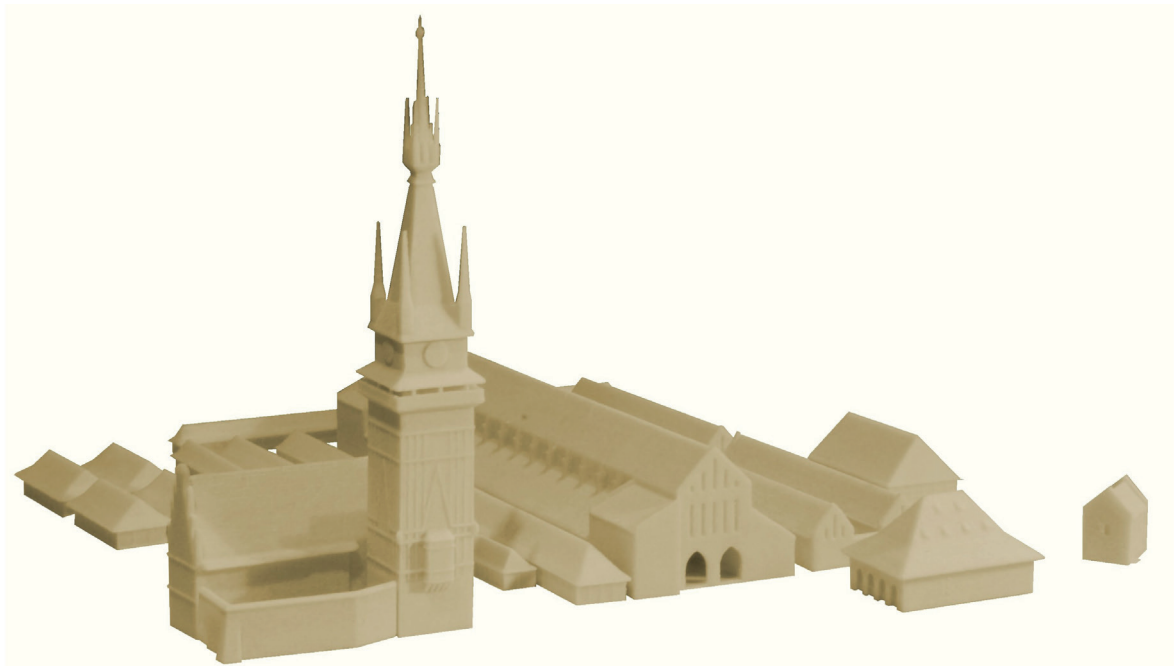
stonework with the addition of bricks, dimensions in plan: 18,75 x 16 m, thickness of
walls: 1,2 m, lime stone without course (continuous horizontal layers), probably two-
storey building covered with a steep roof.
[Komorowski W., 2006, p. 35]

The building housed gold and silver smelting workshops, as well as stalls used to sell
various metal products.
[Komorowski W., 2006, p. 42]

		<p>A weigh house and a smelting workshop for non-ferrous metals. The west part of the building was divided into four rooms by wooden walls – most likely stalls used to sell various metal products. External walls made of limestone – dimensions in plan: 18 x 14 m. The eastern part was paved and twice bigger than the western part, with a large entrance (3,1 m).</p> <p>[Buško C., 2006, p. 68], [Buško C., 2007, p. 231]</p> <p>hypothetical reconstructions: [Krzysztofory nr 28, cz. 1, p. 124, il. 18], [Krzysztofory nr 28, cz. 1, 1450], [Krzysztofory nr 28, cz. 1, il. 17], [MHmK, <i>Wielka Waga</i>, XV]</p>
	<p>07 December <u>1358</u> [ADmK, <i>Katalog...</i>, 1907, p. 11]</p> <p>1358 [<i>Kraków. Nowe studia...</i>, 2007], [Wikipedia, <i>Kalendarium historii Krakowa</i>], [Encyklopedia Krakowa, 2000, p. 861], [Frančić M., 1964]</p> <p>1358 – mention of two weigh houses – <i>duas pensas</i> [Komorowski W., 2006, p. 35]</p>	<p>Casimir III the Great confers on the city the right to own two weigh houses. [Komorowski W., Sudacka A., 2008, p. 32]</p> <p>Casimir III the Great broadens rights and belongings of Krakow's municipality. The king expresses a wish that '<i>the town will not be disfigured with chaotic buildings</i>.' [Komorowski W., <i>Kraków. Nowe studia...</i>, 2007], [Wikipedia, <i>Kalendarium historii Krakowa</i>]</p>
	<p>[Komorowski W., Sudacka A., 2008, p. 250] [Komorowski W., 2006, p. 35] [Sudacka A., 2006, p. 48]</p>	<p>Tasks, as well as prices of services, are fixed for both weigh houses – <i>pensa Maiori</i> and <i>pensa Minori</i>. [Sudacka A., 2006, p. 48], [Komorowski W., 2006, p. 35]</p>
	<p>1500 ?? <u>16th century</u> 1590 ?? [Buško C., 2007, p. 231]</p>	<p>Wooden partition walls situated in the western part of the building are replaced by stonework supporting brick vaults. [Buško C., 2007, p. 231]</p>
3	<p><u>1594–1597</u> [Komorowski W., 2006, p. 35]</p> <p>1594 <u>1594–1596</u> [Komorowski W., Sudacka A., 2008, pp. 68, 248] 1597 [Komorowski W., Follprecht K., 2007, p. 209] [Follprecht K., <i>Źródła...</i>, 2007]</p>	<p>Renaissance rebuilding of the Grand Scales (mason August Litwinek) – introduction of a butterfly roof and of a parapet, as well as living quarters on the upper floors, removal of the smelting workshops. [Komorowski W., Sudacka A., 2008, p. 248]</p> <p>A stone and brick building with a butterfly roof hidden behind a Renaissance parapet (mason August Litwinek). During the transformations the smelting workshops, as well as the lead depot were removed from the Grand Scales. Living quarters for the <i>ponderator</i> were introduced on the upper floors. The Grand Scales was still flanked by stalls and workshops of various craftsmen (<i>i.e. workshops of goldsmith and grinder, hardware stalls</i>). [Komorowski W., Sudacka A., 2008, pp. 68, 248], [Komorowski W., Follprecht K., 2007, p. 209]</p> <p>hypothetical reconstructions: [Opaliński P., 2007, w <i>Rynek Główny</i>, p. 93], [Civitas..., 2007], [Gottwald, <i>Kraków 1650</i>, 2007], [Gottwald, <i>Rynek XVIII w.</i>, 2008], [Krzysztofory nr 28, cz. 1, p. 189], [Krzysztofory nr 28, cz. 1, p. 271]</p> <p>maps and plans: [plan 1667 JG], [plan 2003–2007], [Mamica M., 2005–2006], [plan 2004, w Kłuj 2006, il. 2], [XX., 2005–2006, WK 19/2006, il. 13], [plan 2009]</p>
	<p>1640 ? [Komorowski W., Follprecht K., 2007, p. 247] 1649 ?</p>	<p>Renovation</p> <p>1643 – Living quarters inside the Grand Scales are mentioned (Mikołaj Szwarc – goldsmith, Jakub Samsonowic). [Follprecht K., <i>Źródła...</i>, 2007, p. 73]</p>
	<p>from 25th September to 17th October <u>1655</u> – siege of Krakow, victory of the Swedish army; Stefan Czarniecki, deprived of hope of relief, surrenders Krakow to the enemy on 17th October. 1655 [Wikipedia, <i>Potop szwedzki</i>] 1657 August <u>1657</u> – siege of Krakow, Polish-German victory [Wikipedia, <i>Potop szwedzki</i>]</p>	<p>Destructions resulting from a time of war and from the stationing of the Swedish troops in Krakow. [Komorowski W., Follprecht K., 2007], [Komorowski W., Sudacka A., 2008, p. 248]</p>
	<p>1657 [Komorowski W., Follprecht K., 2007], 1664 [Komorowski W., Sudacka A., 2008, p. 248]</p>	<p>Repairs of the destructions caused by the Swedish invasion. [Komorowski W., Follprecht K., 2007], [Komorowski W., Sudacka A., 2008, p. 248]</p> <p>1667 – Grand Scales is indicated as a municipal property. [plan 1667 JG]</p>

	<p>1722 [Komorowski W., Follprecht K., 2007, p. 277] 1738</p>	<p>Renovation – small repairs</p> <p>1760 – 12 stalls flanking the Grand Scales are mentioned. The document references some of the owners – a grinder, a snuff trader, two tailors and a tinsmith. [Follprecht K., <i>Źródła...</i>, 2007, pp. 76–77]</p> <p>Approximate length of the stalls was 40,5 meters (when translated from ells).</p>
4	<p>1786 [Komorowski W., Sudacka A., 2008, p. 248], [Follprecht K., <i>Nieruchomości...</i>, 2007, p. 23, note 24] 1787 [Rederowa D., 1958, p. 89] at the end of the 18th century [Tomkowicz S., 1907, p. 8]</p>	<p>Alteration of the Grand Scales (at the request of general J. Wodzicki) – the Renaissance parapet is removed and the stalls adjoining the building are covered by flat terrace roofs, gaining the edifice a nickname – <i>inkwell</i>. After the transformations the building houses the seat of civil-military administrative offices (<i>Komisja Porządkowa Cywilno-Wojskowa</i>), its original function (weigh house) is transferred to the Small Scales. [Komorowski W., 2006, p. 35]</p> <p>The original function of the weigh house is transferred to the Small Scales. [Sudacka A., 2006, p. 55]</p> <p>The building of the Grand Scales after the transformations is described as: <i>an important, styleless, two-storey stone and brick built edifice with numerous interior divisions, used as a guardhouse for the Austrian soldiers</i>. [Tomkowicz S., 1907, pp. 7–8]</p> <p>1787 –... <i>an old tenement housing flats and shops</i> ... [Murray E, 1787, p. 124] Describing the Grand Scales, Murray gets confused over its name – calling it the Small Scales.</p> <p>1792 – Inventory of the tenement that used to be called the Grand Scales. [Follprecht K., <i>Nieruchomości...</i>, 2007, pp. 23–27]</p> <p>iconography: [Stachowicz M., 1794, ban103], [Stachowicz M., 1794, ban111], [Smuglewicz F., 1794, 1796], [Stachowicz T.B., 1800, ban18], [Stachowicz M., 1809, ban107], [Stachowicz M., przed 1820, ban104], [XX, 1820–1822, ban51], [Kozakiewicz Ł., 1824–1827, ban5]</p> <p>hypothetical reconstructions: [Kwaśniewicz A., 2007, w <i>Rynek Główny</i>, p. 121], [Opaliński P., <i>Zabudowa Rynku przed 1801</i>, 2006], [Gottwald, <i>Rynek XVIII w.</i>, 2008]</p> <p>maps and plans: [plan 1773], [plan1700_1773], [plan 1773_Derisha], [plan kołłątajowski 1785] – dziwna przybudówka od południowego-wschodu, [plan Pucka 1787], [plan 1800], [plan senacki 1802–1808], [plan 1803–1804]</p>
	<p>1796 [Rederowa D., 1958, pp. 89–90]</p>	<p>Change of function of the edifice – offices for the Austrian authorities (in the beginning commission of bookkeeping, then the head office of the directorate of construction, and finally the building is put in lease). [Rederowa D., 1958, pp. 89–90]</p> <p>1802 – Identified as a building number 6. [senacki-przerys 1802–1808], [plan 1803–1804]</p> <p>1807–1808 – <i>Städtisches Haus</i>, building number 6 [Münch H., 1959, p. 11], [Stachowicz T.B., 1800, ban18]</p> <p>maps and plans: [plan pruski 1794], [plan 1797 z 1848], [plan senacki 1802–1808], [senacki-przerys 1802–1808], [plan 1803–1804], [plan 1813]</p>
	<p>1815</p>	<p>Between 1815 and 1846 the building of the Grand Scales is a governmental property of the <i>Free City of Krakow</i>.</p> <p>1820 – Spotted as: <i>bâtiment inutile</i> (a useless building) [plan 1820ir]</p> <p>1834 – Spotted as building number 10 and designated to be demolished. [Plan de situation, 1834]</p> <p>maps and plans: [plan1817], [plan 1820ir], [Plan de situation, 1834]</p>
5	<p>1822 [Wawel Louis J., 1890, p. 47] [Komorowski W., Sudacka A., 2008, p. 249]</p>	<p>The edifice is adapted to become a guardhouse for troops of the <i>Free City of Krakow</i> – the porch is covered by a pent roof. [Komorowski W., Sudacka A., 2008, p. 249]</p> <p>1834 – Spotted as a <i>building of the Commission and a Guardhouse</i>. [plan 1834]</p> <p>1832–1836 – Spotted as a building not to be sold. [plan 1832–1836]</p>

		<p>iconography: [Kozakiewicz Ł., 1824–1827, ban5], [Richter W., 1830, ban110], [Piątkowski T., 1837, ban106], [Piątkowski T., 1837, ban53], [XX, 1840, ban61], [XX., przed 1857, MHmK 1560/VIII]</p> <p>maps and plans: [plan 1834], [plan 1832–1836]</p>
	1846	<p>[Komorowski W., Sudacka A., 2008, p. 249]</p> <p>Austrian troops enter Krakow – creation of a post for the Austrian troops in the Grand Scales.</p> <p>[Komorowski W., Sudacka A., 2008, p. 249]</p> <p>maps and plans: [plan 1836], [plan 1850]</p>
6	1857 ? 1858	<p>Before 1858 the butterfly roof of the Grand Scales was replaced by a hip roof.</p> <p>[Komorowski W., Sudacka A., 2008, pp. 156, 249]</p> <p><u>fifties of the 19th century</u></p> <p>[Komorowski W., 2006, p. 35]</p> <p>Transformation of the butterfly roof into a hip roof and replacement of the west porch by a wooden portico.</p> <p>iconography: [Stroobant F., 1858, ban52], [Gozdarowski E., około 1858], [Sosiński J., około 1858, T.I. 1868], [Walter H., 1858–1859, ban62], [Beyer K., 1858, ban85], [XX., około 1860, ban218]</p>
7	1860	<p>1860 – Introduction of 'arcades' with iron columns.</p> <p>[Komorowski W., Sudacka A., 2008, p. 249]</p> <p>The wooden portico is replaced by a metal structure covered by a pent roof.</p> <p>iconography: [XX., po 1860, ban19], [XX., po 1860, ban19], [Gryglewski A., około 1865, ban242], [Maliszewski W., około 1865, ban20], [Maliszewski W., około 1865, ban63], [Rzewuski W., około 1865, ban90], [Gryglewski A., przed 1868, ban243], [XX, przed 1868, ban67], [Kozarski A., około 1868], [Rzewuski W., 1868, ban222], [Rzewuski W., 1868, ban226], [Rzewuski W., po 1868, ban245], [Krieger I., 1869–1871, ban21], [Krieger I., po 1870, ban64], [Krieger I., po 1870, ban65], [Krieger I., po 1870, ban66], [Krieger I., po 1870, ban92], [Krieger I., po 1870, ban91], [Krieger I., 1872–1875, ban237], [Krieger I., 1874–75, ban246], [Krieger I., 1875, ban238]</p> <p>maps and plans: [plan niwelacyjny 1878]</p>
R	1875 ? 1879 ?	<p>1879 – [Komorowski W., 2006, p. 35]</p> <p>1875 – [Kadłuczka A., 1975, p. 130]</p> <p>[Komorowski W., Sudacka A., 2008, p. 249]</p> <p>[Follprecht K., <i>Nieruchomości...</i>, 2007, p. 23, note 24]</p> <p>around 1877 –...removed more or less 30 years ago... [Tomkowicz S., 1907, p.8]</p> <p>Austrian troops leave the building of the Grand Scales – dismantlement of the edifice.</p> <p>[Komorowski W., 2006, p. 35]</p>
	2003	<p>2003</p> <p>[Firllet E., 2010, p. 14]</p> <p>Archaeological exploratory works (E. Zaitz).</p> <p>[Firllet E., 2010, p. 14]</p>
S	2005 2010	<p>Archaeological excavations (Buško C.) during a change of paving on the Market Square and the construction of the <i>Rynek Underground permanent exhibition</i> (Kadłuczka A.).</p> <p>[Buško C., 2007, p. 225], [Hajok D, Gazeta Wyborcza, 11 XI 2010]</p> <p>95 % of the foundations of the Grand Scales have been revealed during the archaeological works [Buško C., 2007, p. 230]</p> <p>Conservation and adaptation of the underground relics of the Grand Scales in the context of the museum exhibition. [TVP Kraków, 12 VII 2010]</p> <p>Works planned in the context of the exposition of the relics of the Grand Scales: clearing the relics of the rubble to its original ground level, four western chambers (with barrel vaults) dating from the 15th and the 16th centuries, as well as the eastern entry hall with the original entrance and the remains of a wooden roof construction (?) protecting the initial inner courtyard (?) are supposed to be adapted and exposed to the public. Access to the newly adapted chambers will be possible through secondary installation punctures in the north wall of the Grand Scales. A portion of the archaeological relics were left intact.</p> <p>[Kadłuczka A., 2006, p. 64]</p> <p>Adapted fragments of the Grand Scales are now embedded inside the newly built <i>Rynek Underground permanent exhibition</i>.</p> <p>iconography: [Kalarus T., 2005, w <i>Rynek Główny</i>, p. 37] [XX., <i>Wykopaliska...</i>, 2005], [Kalarus T., 2005-a], [XX., 2005–2006, WK 19/2006, p. 65, il. 8]</p> <p>maps and plans: [Mamica M., 2005–2006], [plan 2003–2007], [XX., 2005–2006, WK 19/2006, il. 13], [plan 2009]</p> <p>Investigations started in August 2005. They lasted until the autumn 2006.</p> <p>[Komorowski W., 2006, p. 33]</p> <p>[Buško C., 2007, p. 225]</p> <p>2005–2010 – archaeological works and change of paving</p> <p>[TVP Kraków, 12 VII 2010]</p>



Tangible models (*Tactichronie*) representing architectural objects present on the Market Square (only the objects the location of which is known are taken into consideration).

top: A view from the south-west, showing the ensemble of buildings in 1520 (*i.e.* before the introduction of the first Renaissance parapet). The form of the Grand Scales is based on the hypothetical reconstruction proposed by W. Niewalda.

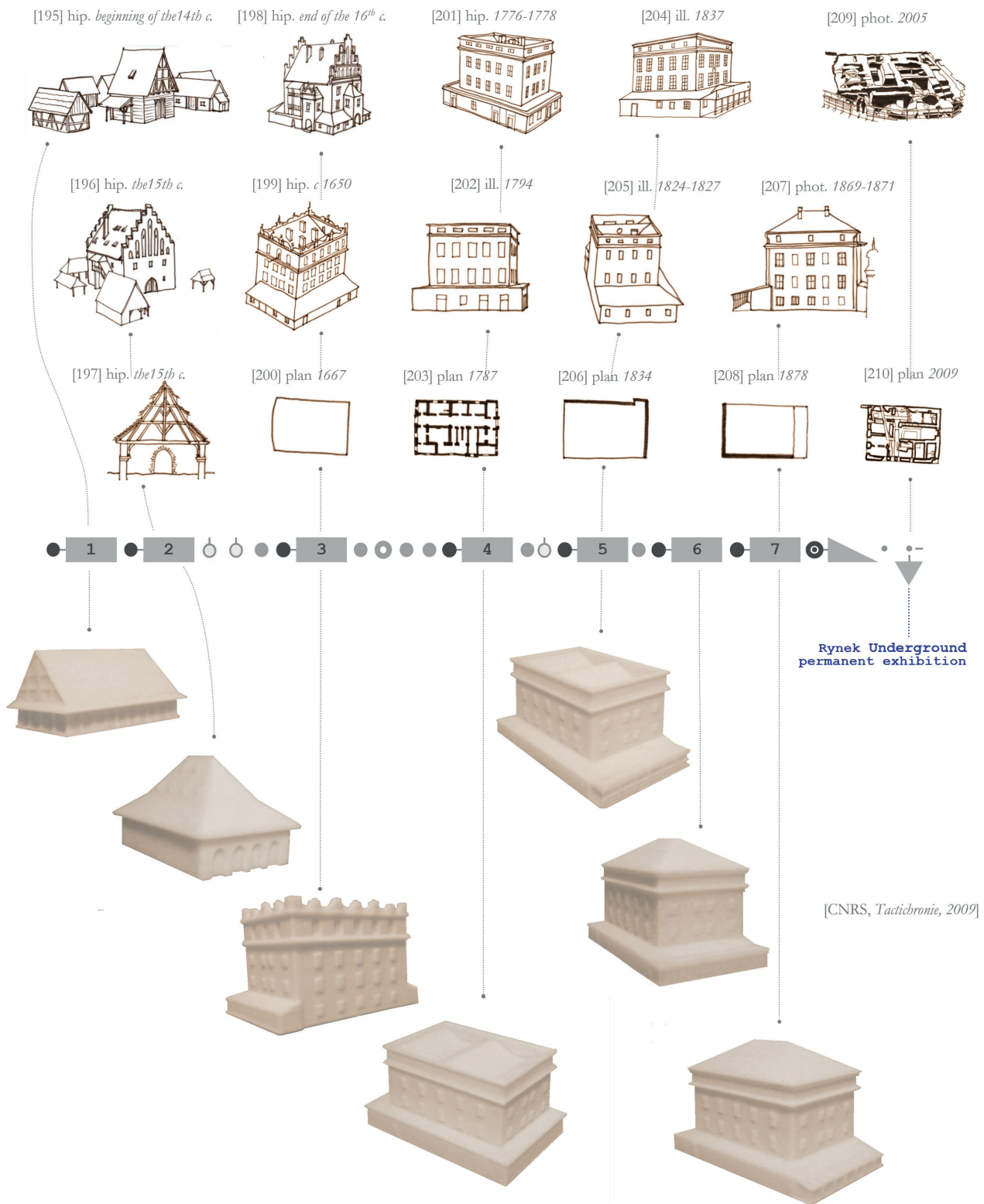
bottom: a view from the south, ensemble of buildings present in 1790 (the year during which J.W. Goethe stayed in Krakow). The form of the Grand Scales is known from iconography, textual descriptions and cartographical sources.

[I. Dudek, J.Y. Blaise, 2011]



Graph of potential interactions for the *Grand Scales* – a visualisation of the information compiled in the *chronological chart*. The linear layout of the diagram shows that, at this stage, although the edifice did change repeatedly over time, there are very little doubts concerning the nature and effects of the transformations that have been identified.

[I. Dudek, J.Y. Blaise, 2011]



Graph of potential interactions for the *Grand Scales* – with additional visual indications on the possible morphology of the artefact at different steps.

A selection of hypothetical reconstructions, as well as of cartographic and iconographic sources (redrawn fragments) are presented above the diagram – giving an idea of possible morphological transformations of the Grand Scales.

Below, the set of tangible models (*Tactichronie*) worked out using historical sources, monographs concerning the Grand Scales and analogous buildings. The level of corroboration of the presented hypotheses differs for various stages of development – it is significantly low for the two earliest evolutionary phases

[I. Dudek, J.Y. Blaise, 2011]