

German Architectural Models in the Renaissance (1500 – 1620)

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The present essay seeks to give an overview of three-dimensional scale models of buildings and cities, preserved into the 20th century, which came into being in the area of present-day Germany during the Renaissance period¹. This is probably the first such overview on the topic published in English. We still lack a history of this media genre also encompassing the non-preserved models from the German Renaissance period. This cannot be provided by the present essay. The key aim here is to attempt to present at least some picture of the original functional context of the respective models.

Despite their actually quite robust character as sculptures in wood, architectural models constitute a precarious genre in terms of the technical transmission of heritage. Unlike architectural representations in the form of drawings or prints, they are in three-dimensional space and thus often encounter problems to be preserved over extended periods within the archiving system developed in the late Middle Ages and the Renaissance. For this reason, the survey presented here also reflects the existence of suitable repositories and institutions. Notable stocks have only been preserved either where special model chambers were established, such as in the large imperial cities of Augsburg and Regensburg, or where models were preserved within collections in the framework of the princely *Kunstkammern* created in the mid-16th century, such as those in Munich or Dresden.

For that reason, the preserved models cannot by themselves provide any information about the quantity and geographical reach of the contemporaneous use. To this end, additional written source materials would have to be evaluated, and to date there has been no preliminary research on which such investigation can build.

Consequently, it is in particular the very special heritage in the framework of the municipal administration of an imperial city, and per se a distinctive building culture, which has passed on to us in Augsburg a larger number of architectural models from the 1510s onwards. It would be necessary to check where this also allows us to grasp the beginnings of the use of three-dimensional architectural representations for purposes of building construction within the northern Renaissance culture. We cannot

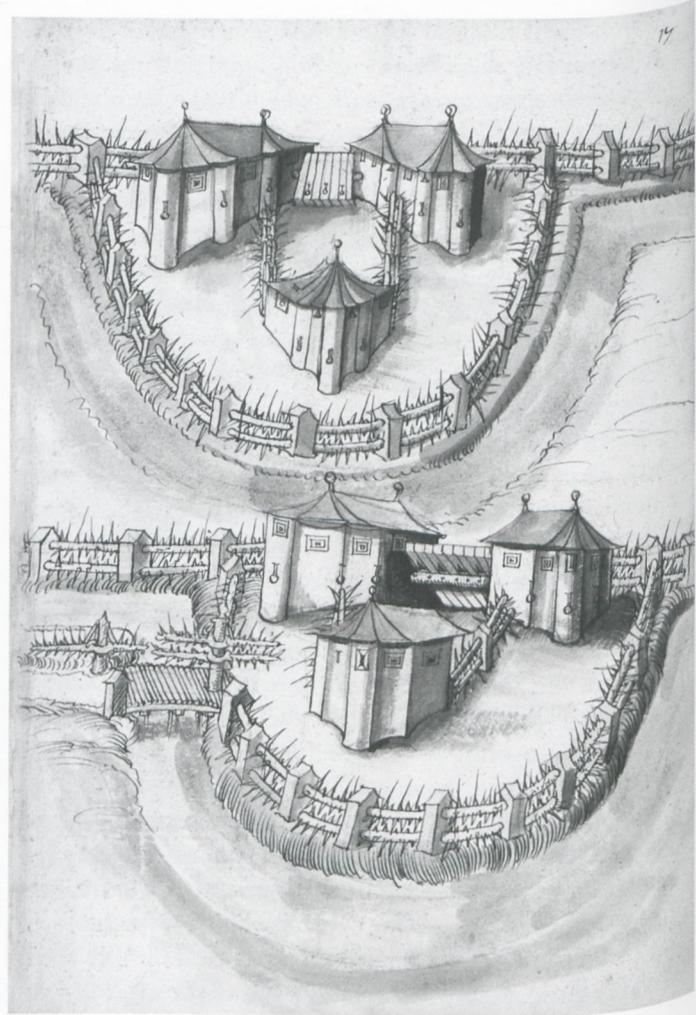
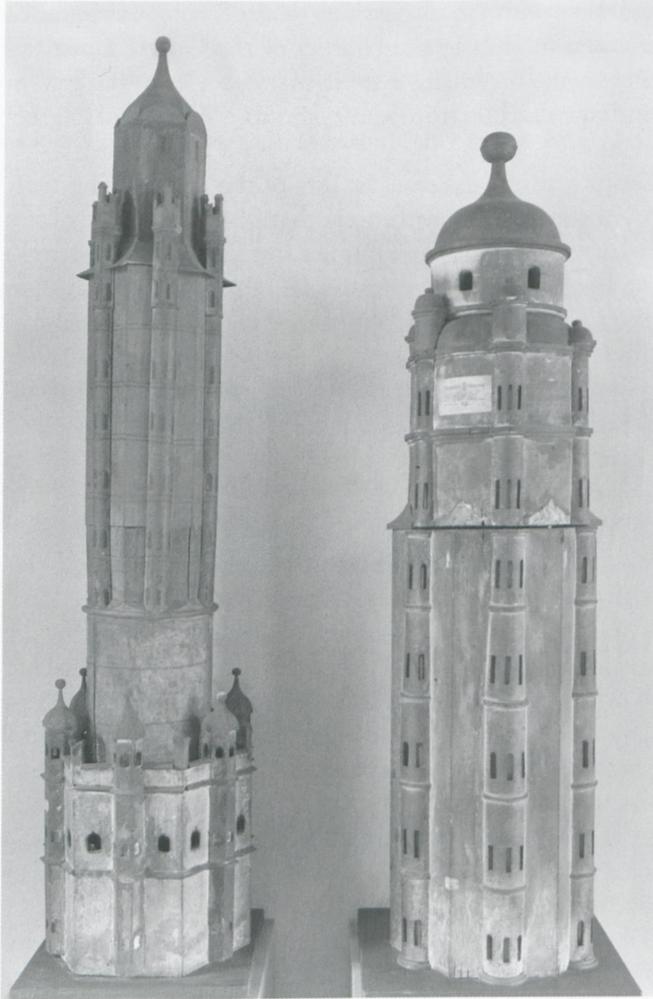
deal here with the discussions on the former existence of wooden models in the context of the Gothic construction sheds. It remains a topic that has not yet resulted in findings the literature can come to a consensual agreement on².

Despite all the external factors of the material heritage, it is probably not fortuitous that one of the two oldest preserved architectural models from the German-speaking lands is connected to the restoration and renovation of an observation tower in the Augsburg municipal fortifications. Thus, the new medium was utilized already quite early on in the sphere of plans for fortification architecture, while at the same time touching on a sensitive structure within the municipal self-staging of its cityscape³.

In Augsburg up to WW II, a total of three wooden models c. 100-130 cm in height were preserved from the holdings of the model cabinet of the imperial city in the town hall. They represented various stages in planning for the restoration of the eight-story tower called *Lueginsland* (*Lug ins Land* = "Look into the Countryside") in 1514/15. The tower located at the northeastern corner of the city originally had been constructed in 1430 and destroyed by fire in 1498⁴. Today the only such preserved model is that by the wood carver Adolf Daucher the Elder (ca. 1460 - 1523/24) housed in the Maximilianmuseum, the other two are missing since 1945 (fig. 1).

The *Lueginsland* tower functioned both as a military observation post and also as the landmark symbol of the strength and defensive readiness of the imperial city. The three models show that they were designed to assist in finding a solution primarily for the symbolic aspect. Thus they discuss only the external visible shape of the tower. The wooden construction model here appears on the scene at a time when the traditional Gothic formal language was being enriched by details reflecting classical antiquity, such as the curved roof hood. The traditional Gothic planning media on paper or parchment would probably have arranged ground plan geometries projected one over the other, as exist in numerous architectural sketches of the period for sacral construction tasks⁵. But this kind of drawing would likely have only

1. Augsburg, Lueginsland tower, 2 draft models, 1514/15 (prewar photograph, models lost) (photo Foto Marburg 82.351)
2. Jörg Kölderer, inventions of fortifications for Tyrol, c. 1508 (ÖNB Cod. Vind. 2858, fol. 17r) (photo Institut für Realienkunde – Universität Salzburg)



been highly inadequate for a precise anticipation of the special formal appearance of the tower, and thus would have been scarcely able to assist in providing a solution in this area. Those addressed by the new medium were not only the construction foremen in charge of implementation and military experts but also those circles who bore political responsibility for the self-representation of the city and were in a sense working on shaping the image and outlook of the defensive fortifications. Thus, the Augsburg construction models document a juncture in northern Alpine architectural history in

which the visual effect of fortification structures was visualized in advance during the planning process. The Augsburg scale models represent in this sense complementary media to the then likewise incipient contemporaneous upsurge in illusionistic renderings of fortification and artillery works of the time. In the German context, one can refer here to Jörg Kölderer's illusionistic drawings of Tyrolean artillery fortifications and projects⁶ for Emperor Maximilian I from about 1508 (fig. 2) or the wood carvings of circular bastions in Albrecht Dürer's tractate "Etliche Unterricht zur Befestigung der Stett,

Schloss und Flecken" of 1527⁷.

In Italy, such illusionistic visualizations of fortification construction were familiar since the drawings by Francesco di Giorgio (from c. 1480/90)⁸ and Leonardo da Vinci (from c. 1490)⁹. Consequently, such stimuli could be present here influencing the Augsburg social practice of visual anticipation of spatial aspects of architecture. However, also the numerous illusionistic drawings in the German gunner's manuals that were becoming ever more numerous at that time provide evidence that the three dimensional and illusionistic mode for machine drawings was also coming to enjoy ever greater popularity likewise beyond Italy's borders from the mid-15th century on¹⁰. Examples are the cannon and machine drawings around 1470 done by the Nuremberg master gunsmith Johannes Formschneider¹¹ or the drawings of fortifications and ordnance prepared ca. 1473/80 by the Palatinate master gunsmith Martin Merz¹².

Such examples of spatial technical drawings can with due caution be connected in general here with the wooden scale models of the Augsburg defense tower. We can see an expansion of pictorial modes of representation of military architecture and the establishment of new discourses grounded on imagery since the late 15th century on both sides of the Alps. The planning and realization of military architecture became more and more a task for lay personnel without proper training in the construction sector.

More or less parallel with the renewal of the Augsburg observation tower was the reconfiguration of its central companion, the so-called Perlach Tower situated beside city hall in the city center. Since 1348, the Perlach Tower, stemming from the High Middle Ages, also contained the fire bell of the city and served as a central observation tower. The Municipal Art Collections of the city of Augsburg today preserve a total of four scale models of the tower from the Renaissance period. The presumably oldest exemplar is probably connected with a payment made by the Council in 1503 to the goldsmith Jörg Seld jr. and shows the tower in Gothic forms, although it is unclear whether this is a representation of its actual condition at the time or involves a project draft¹³. Not only



the function of this model is uncertain; its dating and attribution also deserve renewed examination and scrutiny. Two younger draft models from 1519 and 1522 provide competing proposals for discussion on redesigning the tower. The older model 214 cm high (1:24) stems from the architect Hans Hieber, who originally trained in Augsburg but then relocated to Regensburg. He proposed to raise the tower to 55 m and do a radical redesign of the structure, including formative elements echoing a style of classical antiquity (fig. 3)¹⁴. The later model (135 cm high, 1:24) was prepared by the Augsburg

cabinetmaker Bernhard Jäger; but the form he proposed derived from the Augsburg municipal works master craftsman Narziß Leuthner¹⁵.

In 1526, the actual addition of storeys to the Perlach Tower was carried out, in a form deviating from the models mentioned; it in turn is documented by a wooden model from 1614¹⁶, and additional storeys were added between 1612 and 1618 by Elias Holl, arriving then at today's still extant form.

Roughly simultaneous with this emerging German practice of draft models for military and security structures, the other branch of the large-scale public building projects, church construction, profited from the new medium. Once again we should recall that what we have here is a piece of special good fortune in the organized existing heritage within another imperial city.

In February 1519, the Regensburg Municipal Council, against the will of the former Emperor Maximilian now just deceased, expelled the Jewish residents from Regensburg. On the site of the demolished Romanesque synagogue, built three centuries before, a new Christian pilgrimage church *Schöne Maria* was to be constructed. In 1520/21, master builder and architect Hans Hieber, mentioned above, prepared a wooden model for this new building; this model is among the most impressive examples of this genre of the early German Renaissance (fig. 4 and 5)¹⁷. Hieber had originally been trained in the large-scale construction workshop of Burkhard Engelberg in Augsburg. Based on more recent findings, that workshop was presumably also responsible for implementing construction of the famous Fugger Chapel¹⁸. That is significant, since this chapel with its novel design had been prepared c. 1509 by an illusionistic drawing whose copy (c. 1530) is preserved in the famous sheet in the Augsburg Municipal Art Collections¹⁹. In the present context, it is not a matter of much moment whether this piece originally was a sketched draft view by Albrecht Dürer himself or more probably by another artist of the time. Important however is the observation that at the beginning of the 16th century in Augsburg, the demand for anticipating images of sacral interiors in the new antique style (paper or wood) had increased, and

4. Regensburg, Hans Hieber: draft model for the parish church of the *Schöne Maria*, 1520/21 (Municipal Art Collections Regensburg) (photo Stadt Regensburg, Peter Ferstl)

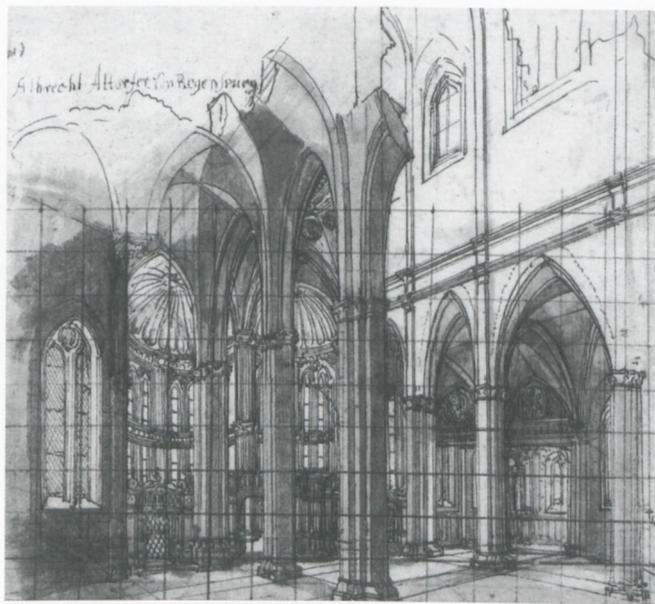
5. Regensburg, Hans Hieber: draft model for the parish church of the *Schöne Maria*, 1520/21, detail of the interior (Municipal Art Collections Regensburg) (photo Stadt Regensburg, Peter Ferstl)



some 10 years later now also stirred in Regensburg. The Regensburg wooden model is approximately 183 cm high, can be disassembled into component parts and also provides, unlike the previously discussed Augsburg tower models, insights into the chapel interior, worked out in some detail. Both in external and interior construction, the draft departs from the formal world of indigenous stonemasonry tradition, artfully integrating motifs and draft ideas drawn most especially from the northern Italian Renaissance. Its affinity with buildings by the Venetian Mauro Codussi has long been established. Yet it remains controversial in the research literature as to whether we can assume here that Hans Hieber made a trip and engaged in a personal visual inspection. As a rule, at the time there was a very active professional exchange with southern Tyrol; but there is hardly any documentation of journeys undertaken by German construction experts to Venice.

There is a surprising regional root for the architectural typology of the Regensburg construction project, its formal language then unusual in Germany.

The Regensburg model of 1520/21 can be associated most definitely with a representation of the interior of a church in a drawing by the Regensburg painter Albrecht Altdorfer (fig. 6). This indeed is all the more convincing, since Friederike Hauffe has recently been able to determine that the drawing must already have come into existence around 1515/17, and thus preceded the model (and the whole building project)²⁰. In the drawing, Altdorfer envisages a sacral architecture in which a central room on a hexagonal ground plan is surrounded by five semi-circular conchae (half-domes) and a long hall. The Regensburg wooden model also embodies and displays precisely this same basic architectural idea. Decisive here is that neither Hieber's model nor Altdorfer's drawing assume that the observer has any real grasp of the orthogonal projections of ground plan and vertical plan that were actually quite customary in building construction. In these two visual media, it is not the ground plan geometry – which is indispensable for construction of a real building – that is being negotiated. Rather what we have here is the novel visual appearance of a typologi-



cally construction idea. We do not know for what specific public Altdorfer's Augsburg drawing was likely intended. But we can assume that as in the case of the envisioned Regensburg church of the *Schöne Maria*, it involved lay persons to whom a future impression of the space had to be palpably conveyed.

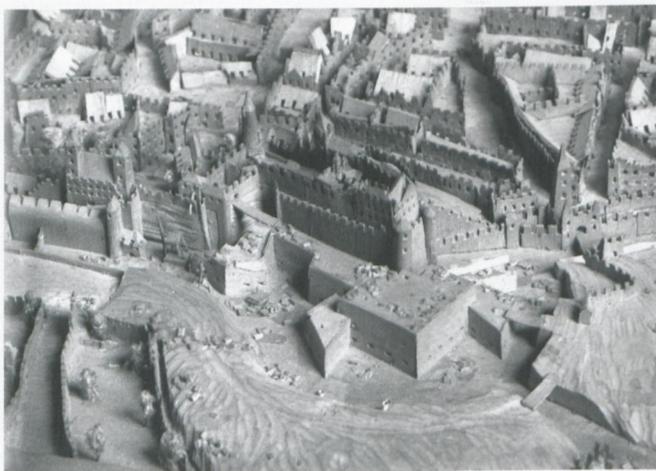
Since the 1530s, we can discern in the German-speaking lands a further domain illustrated in architectural scale models: namely already completed architecture, i.e. buildings about whose visual appearance a decision no longer had to be made prior to visualization.

Until the 1960s, a wooden model was extant in Dresden that represented the Wettin Residential Palace in the city around 1530 (fig. 7)²¹. The model could be disassembled into storeys, and the internal structure which was visible basically showed the form of the palace as remodeled from 1468. The model registered the older architectural inventory with such detailed accuracy that it even proved possible recently to utilize photographs of the model as a reference basis in investigating and reconstructing the building campaign in 1468²².

Three other architectural models stemming from the mid-16th century even aimed at presenting entire exist-

7. Dresden, model of the ducal palace (schloss) c 1530 (prewar photograph, model lost) (photo SLUB Dresden)

8. Nuremberg, Hans Baier, town model, 1540, detail of the Fazuni bastions behind the Kaiserburg (Bayerisches Nationalmuseum) (photo BNM, Neg.-Nr. 298)



ing urban bodies. At the beginning of the 16th century, after the isolated prelude venture represented by Alberti's coordinates for a plan of Rome (c. 1443/46), the first European cities were surveyed in detail, including Venice (1500), Imola (1502) and Augsburg (1521), and were drawn on scale maps or represented in bird's-eye views²³. In the 1540s, the medium of the wooden model also joined in these efforts, and in this new turn the German lands played a leading role alongside Italy²⁴.

In 1540, the Nuremberg painter and wood carver Hans Baier (Payer) – not Hans Behaim, as was long assumed – provided the City Council of his native town with a wooden model of the imperial city laid out 68 × 53 cm, which was immediately classified as top secret (fig. 8)²⁵. This city model might be related to the fortification structures by the Italian Antonio Fazuni²⁶, who was engaged from 1538 on with the construction of three angle bastions in front of the Kaiserburg Castle. The Nuremberg bastions, still preserved, rank among the very first representatives of the new system of bastions north of the Alps, previously developed in northern Italy. Unlike the older modes of circular artillery fortification, this new system was fundamentally based on geometrical principles and a highly detailed plan grounded on the surveying of the relevant terrain²⁷. Thus, as a first step, in 1538 Fazuni had surveyed the existing city wall, presenting his proposals for improvement in a plan no longer extant. A model of the proposed extensions, today lost, was prepared immediately according to this plan submitted.

Even if the once extant planning drawings of the bastion works for Nuremberg no longer exist, the necessary prerequisite of a surveying campaign for the preserved model by Baier could nonetheless at the same time have been conceived for a further end: namely as an additional basis for a new fortification of the city grounded on geometrical principles. In comparison with other later city models, the model of 1540 also includes the surroundings of the city in a striking manner in its composition, i.e. integrating specifically that town apron area into which the defense works would have extended in conjunction with the further construction of the bastion

girdle. With impressive fidelity to detail and reliability, the model documents a temporary architectural condition of the castle bastions, which the following year (1541) was supplemented by addition of the western bastion at the *Tiergärtner*tor. A not yet completely clarified causal connection between the planned new fortification system of the city and the unusually early scale model of a whole town could place in a fresh light the marked exceptionality of these two projects.

Once again, the court in Dresden can be identified as another driving force in this field of urban surveys in conjunction with fortification projects. The wooden Renaissance model of the city of Dresden unfortunately is missing since 1945; it is, like the Palace model, only extant in a number of prewar photographs. According to older notations, the Dresden model also contained "partial sections of the fortification works of the 16th century"²⁸. These fortifications were probably sections of the bastion ring constructed around the old city center, begun in 1545/46²⁹. It is thus likely that the Dresden model was connected with the use of the modern, "mathematical" conception of fortification. It is most likely then to date the model to about 1545/46.

In the mid-16th century, a city model was also created in Augsburg. The draftsman, copperplate engraver, publisher and teacher Hans Rogel the Elder (c. 1520–1592/93) prepared a multi-colored wooden model from 1560 to 1563, now on exhibit in the Maximilianmuseum. He is believed to have used his own survey plan as well as earlier documents for designing this scale model. In 1563, Rogel also published a plan overview of the city of Augsburg on the scale 1:4,200, in the form of a wood carving. A bit later in the neighboring Duchy of Bavaria, the Straubing master woodturner Jakob Sandtner began to prepare his now renowned wooden models of Bavarian ducal towns. Sandtner appears to have created the first model on his own initiative in 1568, a likeness of his hometown Straubing on the approximate scale 1:1077, carved on a foundation surface area 81 x 64 cm. Only later was he then commissioned by Duke Albrecht V of Bavaria to prepare the models for the remaining principal towns of Munich (1570, scale 1:616), Landshut (1570,

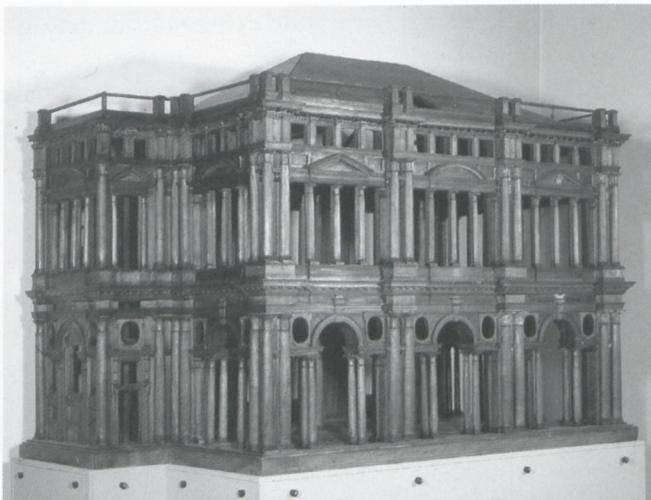
scale 1:750), Ingolstadt (1572, scale 1:685) and Burghausen (1574, scale 1:662)³⁰.

Toward the end of the 16th century, the Bavarian models were preserved in the Ducal Kunstkammer in Munich above the horse stables (today Alte Münze), for which purpose they presumably were all intended right from the outset, except for the earlier model of Straubing³¹. To date they have been researched primarily in connection with questions of urban history. Only in the case of the Straubing exemplar do we have recent detailed measurements and comparisons with the actual material body of the town³². Although the Bavarian models illustrate the fortification works of the cities down to the last contemporaneous expansions, along with the structure of buildings in the interior of these towns, it is impossible here at the moment to reconstruct an original nexus with questions of fortification. We may assume with a high degree of certainty that they did not serve for planning construction measures. However, there is documented evidence that Duke William V. arranged for the small model of Ingolstadt to be brought to his chambers in 1590 in connection with questions of the fortification of this city³³.

Also stemming from Augsburg is one of the most extensive, locally and thematically cohesive extant bodies of German architectural models of the later Renaissance. Here too there are intertwined construction projects that were launched in connection with the public self-representation of the city. Since about 1607, the City Council of the imperial city had been dealing with the question of redesigning and remodeling various public buildings on the Perlachplatz, the central square in the city's center (now Rathausplatz). This included a more recent renovation of the Perlach Tower itself, mentioned above, as well as the new buildings for a festive hall and the town hall. Here too the models have been safely preserved in public ownership and thus have been maintained down to the present day. This project in town planning in Augsburg shortly before the outbreak of the Thirty Years' War is thoroughly researched and has been recently described and systematically analyzed by Julian Jachmann³⁴.

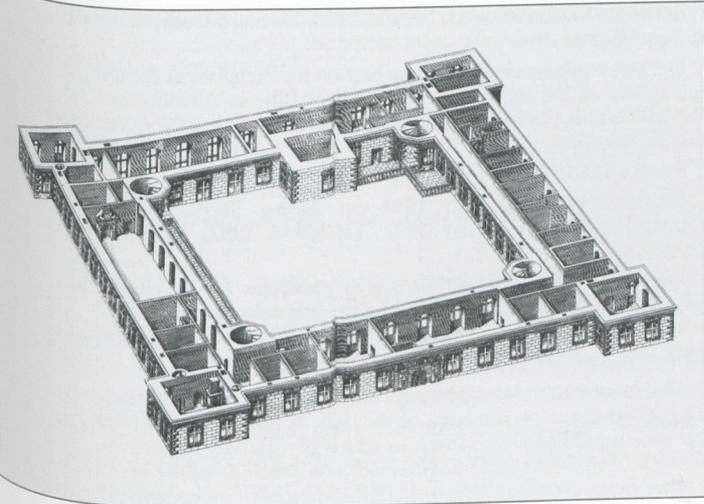
9. Augsburg, draft model for the loggia on Perlach Square (later *Neuer Bau*), probably prepared according to specifications by Joseph Heintz 1609 in Prague (Maximilianmuseum Augsburg) (photo Maximilianmuseum)

10. Augsburg, town Hall, draft model, "Zweites Dachkreuzmodell" based on draft drawings by Elias Holl 1614/15 (Maximilianmuseum Augsburg) (photo Maximilianmuseum)



Initially the plan was to modify and renovate the old town hall. As a result of the relocation of the slaughterhouse in 1609, a building site became available on the northern side of the Perlachplatz, where a new two-story building was to be constructed. It was to have an open loggia below where citizens could mingle and communicate and a hall on the second floor for sessions of the City Council. The project was visually anticipated by preparing two wooden models. The older model (162 cm x 81 cm floor area, approx. 1:20) was probably created in 1607 according to specifications provided by the Augsburg municipal painter Matthias Kager and the municipal works master craftsman Elias Holl, and the newer model (156 cm x 91 cm floor area, approx. 1:20) was crafted in 1609 in Prague according to a draft design by the Imperial Court painter Joseph Heintz (fig. 9)³⁵. In both projects, the magnificent rows of columns in the façade were to play a major role, reflecting the dignity and stature of the Council of the imperial city of Augsburg. Already several years earlier, the city, with a series of bronze fountains, had quite consciously and demonstratively adopted the standards of princely art patronage³⁶. But the loggia project was put aside in favor of a new building for the town hall, and later on this site the so-called *Neuer Bau* was constructed, following a different set of functional and design specifications. Yet it is significant that the two loggia models not only reproduced the external appearance of the architecture, but in 1607 already also introduced details of the roof construction. These stemmed from the municipal works master craftsman Elias Holl, who several years earlier had journeyed through Italy and in Venice had become acquainted with the unusual combination of wooden timberwork and iron connecting elements³⁷. With the aid of the model, the Augsburg City Council assured itself that the planned building when completed would be in accordance with the most progressive and prestigious international paradigms both externally and in its interior design. The advanced modern construction technology had thus become a medium for self-presentation in the imperial city in harmony with the demonstrative display of the elaborate facilities for water supply in city, for

11. Virtual architectural model of the castle in Aschaffenburg from Georg Ridinger, *Palatium Johannis Suicardi Principis*, 1611 (photo LMU)



which Elias Holl was also responsible. The new construction of a building for the town hall was then decided on in Augsburg in 1614. A number of individuals were responsible for its design, including in particular the City Council, the municipal works master craftsman Elias Holl and the municipal painter Matthias Kager. Here too, planning stages were represented by means of wooden scale models still extant today in the Maximilianmuseum in the city (fig. 10)³⁸. Julian Jachmann has shown how the visual elements of municipal representation extend to all the spheres of the new town hall. Not only does the façade express the princely stature of the city through the austere grandeur of its style. The visual messages intensify in the interior rooms to be passed through walking from below on upward. Spacious arched halls, broad straight stairs, and a hall with unusually high ceilings and illumination from several sides reflect a constructional outlay comparable in the further geographical surrounding area only to the ducal residence in Munich that was then being constructed. In this connection, the four preserved models for the Augsburg Town Hall show not only the distribution of the construction mass and the ornamentation of the façades, but also the spatial interior design on all storeys and details such as the vault system of the lower halls. For this purpose, the models, like the earlier one

for the Dresden palace, could be disassembled, displaying story by storey the internal structure. They thus offered views into the interior of buildings like a special contemporary type of architectural drawings that through axonometric projection simulated architectural models appearing to be cut open, as it were, horizontally³⁹. Examples of this type of architectural representation can be found in Georg Ridinger's 1611 Book *Palatium Johannis Suicardi Principis* on the newly built residential castle in Aschaffenburg (fig. 11). These cut-open, quasi dissecting virtual architectural models go back to the time of Leonardo Da Vinci and had served since then, like the real wooden models, to make certain aspects of architecture more clear to a lay public. They thus sprang from the same root and from almost the same period around 1500.

It is unlikely that the body of architectural models in the German Renaissance presented here, either extant or visually documented in the 20th century, will increase significantly in number in the future. The stock passed on to the 20th century appears in basic terms to be now known. But in respect to the contemporary distribution, temporal development and functional context of this stock of models, the situation in research is quite different. Since basically speaking, the architectural history of the German Renaissance has only been fragmentarily researched, employing a one-sided methodology – and in particular, since there are still numerous written source materials stored in many archives awaiting an intensified assessment and analysis – gradually here we will doubtless come to uncover extensive additional documentary evidence.

NOTES

¹ The basis here is the catalogue in REUTHER/BERCKENHAGEN 1994.

² KURMANN 2008.

³ Basic literature regarding the connection between modern era planning innovations and fortification construction: POLLAK 2010. For the German-speaking area: HOPPE 2012.

⁴ REUTHER/BERCKENHAGEN 1994, cat. 31 (Maximilianmuseum Augsburg Inv.-Nr. 3444, reported missing since 1945), cat. 32 (Maximilianmuseum Augsburg Inv.-Nr. 3445, missing since 1945), cat. 33

- (Maximilianmuseum Augsburg Inv.-Nr.3448, partly preserved). On the Augsburg model chamber in the town hall: JACHMANN 2008, p. 71f.
- ⁵ For basic literature on the topic of Gothic architectural drawing ca. 1500 in the southern German area, see: BÖKER 2005 and BISCHOFF 1999.
- ⁶ Österreichische Nationalbibliothek ÖNB Cod. Vind. 2858 (<http://data.onb.ac.at/rec/AL00167875>). SCHEICHL 1992 (copy in the ÖNB, Sep 3260).
- ⁷ MENDE 2004.
- ⁸ Francesco di Giorgio in so-called Trattato II (ca. 1490). See: di F. Giorgio Martini, *Codice Magliabechiano*, Biblioteca Nazionale Centrale di Firenze (BNCF), ms. II.I.141, 1490; DI GIORGIO MARTINI 1967.
- ⁹ MARANI 1984; FARA 1997.
- ¹⁰ LEFÈVRE 2004, *passim*.
- ¹¹ J. Formschneider, *Feuerwerks- und Büchsenmeisterbuch*, Bayerische Staatsbibliothek München Cgm 734 (urn:nbn:de:bvb:12-bsb00036875-4, http://daten.digitale-sammlungen.de/bsb00036875/image_1). LENG 2002, vol. 1, p. 239-249; LENG 2004.
- ¹² M. Merz, Bayerische Staatsbibliothek München Cgm 599; for example, see the artillery fortifications, f° 36r (urn:nbn:de:bvb:12-bsb00045460-1, <http://daten.digitale-sammlungen.de/~db/0004/bsb00045460/images/>). LENG 2002, vol. 2.
- ¹³ REUTHER/BERCKENHAGEN 1994, cat. 38 (Maximilianmuseum Augsburg Inv.-Nr. 3451). There is a contemporary drawing of the Perlach Tower in the Municipal Library Augsburg (Graphische Sammlung Inv.-Nr. 23/13); on this, see VON HAGEN 1989; BISCHOFF 1999, p. 317-320.
- ¹⁴ REUTHER/BERCKENHAGEN 1994, cat. 39 (Maximilianmuseum Augsburg Inv.-Nr. 3450; the foundation part of the model reconstructed after 1945).
- ¹⁵ REUTHER/BERCKENHAGEN 1994, cat. 40 (Maximilianmuseum Augsburg Inv.-Nr. 3449, the octagonal cap missing since 1945).
- ¹⁶ REUTHER/BERCKENHAGEN 1994, cat. 41 (Maximilianmuseum Augsburg Inv.-Nr. 3452). This model was prepared by Elias Holl in order to document his scaffolding construction for the reconfiguration.
- ¹⁷ REUTHER/BERCKENHAGEN 1994, cat. 291. BÜCHNER-SUCHLAND 1962; HITCHCOCK 1981, p. 25-30.
- ¹⁸ BISCHOFF 1999.
- ¹⁹ Augsburg Städtische Kunstsammlungen, G 11994. HANDBUCH 2002, p. 48-62; BUSHART 1994, p. 82f. BELLOT 2010. HAUFFE 2007, p. 48f.
- ²⁰ HAUFFE 2007, p. 54.
- ²¹ REUTHER/BERCKENHAGEN 1994, cat. 121; BRUCK 1915.
- ²² OELSNER 2013.
- ²³ SCAGLIA 1964. PINTO 1976. ROMANELLI 1999; BALISTRERI-TRINCANATO/ZANVERDIANI 2000; NUTI 1994.
- ²⁴ HOPPE 2014.
- ²⁵ REUTHER/BERCKENHAGEN 1994, cat. 268a, b (with erroneous dating and attribution), Bayerisches Nationalmuseum München Inv.-Nr. Modell 7. Now on display in the museum at the Nuremberg Kaiserburg. On attribution of the model to Hans Baier, GRIEB 2007.
- ²⁶ MARTIN 1999, p. 69. On the project in detail, see NEUBAUER 1982.
- ²⁷ HALE 1965; POLLAK 1998; POLLAK 2010.
- ²⁸ REUTHER/BERCKENHAGEN 1994, cat.120. More generally on the topic, see MARTIN 1999.
- ²⁹ In 1546, work was begun on the bastion fortifications in the old Italian system of the right bank on the River Elbe in Altendresden (today's Neustadt); in 1547, work on the side of the old city commenced. See PAPKE 2007.
- ³⁰ STEGMÜLLER 1997.
- ³¹ REUTHER/BERCKENHAGEN 1994, cat. 243a-e. REITZENSTEIN 1967; GRIMMINGER 2001; HUBER 1997; LINDGREN 1992; MARTIN 1999, p. 66-72.
- ³² On the models by Sandtner, see in particular the article by Elke Nagel and Clemens Knobling in the present volume.
- ³³ See catalogue entries on the objects nos. 1960 to 1966 by Peter Diemer in SAUERLÄNDER/DIEMER 2008, vol. 2.
- ³⁴ The most extensive analysis of the scale relations is the study by Heike Messemer on the basis of the data of Matthias Stolz (2004) in her still unpublished MA thesis in art history: H. Messemer, *Ideal und Realität. Das Straubinger Stadtmodell von Jakob Sandtner von 1568. Unveröffentlichte Magisterarbeit LMU München* (supervisors: Ulrich Pfisterer/Stephan Hope), München, 2011. High resolution digital 3-dimensional surveys by Manfred Schuller of the Sandtner models of Munich and Burghausen completed in 2014 have not yet been published.
- ³⁵ See REITZENSTEIN 1967, p. 6. Reitzenstein's views on the purpose of the models articulated there are largely speculative.
- ³⁶ HITCHCOCK 1981, p. 320-325; HANDBUCH 2002, p. 48-62; BAER/KRUF/ROECK 1985; ERICHSEN 1985; DIEMER/DIEMER 1985; JACHMANN 2008, p. 141f. (there also the older literature). The PhD-Thesis completed by Eva Habersack in 2010, *Der Augsburger Stadtwerkmeister Elias Holl (1573-1646). Werkverzeichnis*, will be published in 2015, but was not yet available to the author for consultation.
- ³⁷ Stored in the Maximilianmuseum in Augsburg are the so-called "Palladio Modell" (1609) (REUTHER/BERCKENHAGEN 1994, cat. 29, Maximilianmuseum Augsburg Inv.-No. 3454) and the so-called "Zweite Italienische Modell" or "Achtachsenmodell" (1607) (REUTHER/BERCKENHAGEN 1994, cat. 30, Maximilianmuseum Augsburg Inv.-No. 3455). There is ongoing intensive discussion on their dating and attribution. In this connection, the present paper largely follows the suggestions and findings of ERICHSEN 1985; DIEMER/DIEMER 1985 and JACHMANN 2008.
- ³⁸ JACHMANN 2008, *passim*.
- ³⁹ VALERIANI 2008.
- ⁴⁰ Today there are still five models of the new building for the Augsburg town hall: one shows the predecessor building c. 1615/16 (REUTHER/BERCKENHAGEN 1994, cat. 44, Maximilianmuseum Augsburg Inv.-No. 3453); four other models represent various planning stages in the construction of the new building: the "Zweite Dachkreuzmodell" (model IV) by Elias Holl 1614/15 (REUTHER/BERCKENHAGEN 1994, cat. 45, Maximilianmuseum Augsburg Inv.-No. 3458), the "Venezianische Modell" (model I) by Elias Holl 1614 (REUTHER/BERCKENHAGEN 1994, cat. 46, Maximilianmuseum Augsburg Inv.-No. 3456), the "erste Dachkreuzmodell" (model III) by Elias Holl 1614/15 (REUTHER/BERCKENHAGEN 1994, cat. 47 (Maximilianmuseum Augsburg Inv.-No. 3457) and the "Dreiebelmodell" by Elias Holl 1614 (REUTHER/BERCKENHAGEN 1994, cat. 48, Maximilianmuseum Augsburg Inv.-No. 5326).

⁴¹ To this special type of architectural drawings and the relationship of models and drawings see the forthcoming PhD-Thesis supervised by the author: FITZNER 2013.

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