The Visualisation of Unseen Planning States

The Planning and Building States of Early Bern Minster in Visual Comparison

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Abstract: Unseen planning states are a valuable field for the method of the "visualisation of uncertainty" as introduced by the authors in 2009, Lengyel Toulouse (2011). Here, the uncertainty is not merely the result of lost architecture, but fundamental since these planning states have never been realised. Nevertheless, it must be assumed that a clear design intention had been the basis of any begun construction. The difference to lost but originally realised buildings is therefore not relevant for the way they are represented, and all the principles that concern the visualisation of uncertainty in general are also valid here. In this respect, unseen planning states serve much more as confirmation of the relevance of this method in the scientific visualisation of non-visible architecture, and the common feature of both cases, i. e. being the result of architectural planning, reinforces the goal not to simulate built architecture, but to visualise the design on which it is based. After all, designs have always been, above all, a declaration of intent.

Keywords: *Visualisation—Hypotheses—Uncertainty—Invisibility—Contradiction*

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Introduction – What are planning states

Mere planning states, as this term is used in this project, have never been realised, in contrast to building states that have been realised. Nevertheless, it must be assumed that a clear design intention had been the basis of any begun construction. As often in the scientific world of archaeology and building history, the verbal description of research results is the primary medium of communication. The set of illustrations that have been developed in this project intended to cover planned and realised building states. Thereby it is to be considered that both, not realised plans and states of the building that might have existed, are unseen and therefore hypothetical as they have never existed, even if of different degree of uncertainty. This is called "uncertain knowledge" and consequently its translation from text into image is referred to as the "visualisation of uncertainty".

Planning phases serve as a continuation of this method, since the assertion that there are pure planning phases as opposed to realised construction phases extrapolates the degree of uncertainty into the fundamental. It is no longer only a matter of reconstructing knowledge that existed before, in the hope that someday documents or drawings might turn up documenting the lost buildings or parts of buildings whose appearance is being attempted to be reconstructed. No, mere planning phases are per se indeterminate because they have never been realised. They constitute architecture that has not passed beyond the design planning stage, except for the few but sufficiently explicit

indications that lead to the assumption of their existence. As a result, the modelling of the unseen as well as the visualisations are primarily abstract, just as declared in the visualisation of uncertainty, but just alike, all available methods of traditional architectural photography have been taken care of in order to make the church still as vivid as possible.

A suitable appearance

Creating visualisations for a contribution to historical building research first of all raises the question of a suitable appearance. The Bern Cathedral (Fig. 1) is a building that is not only marked by changes in plans but also by replacements. In addition, a largely unknown predecessor building stood in about the same place.

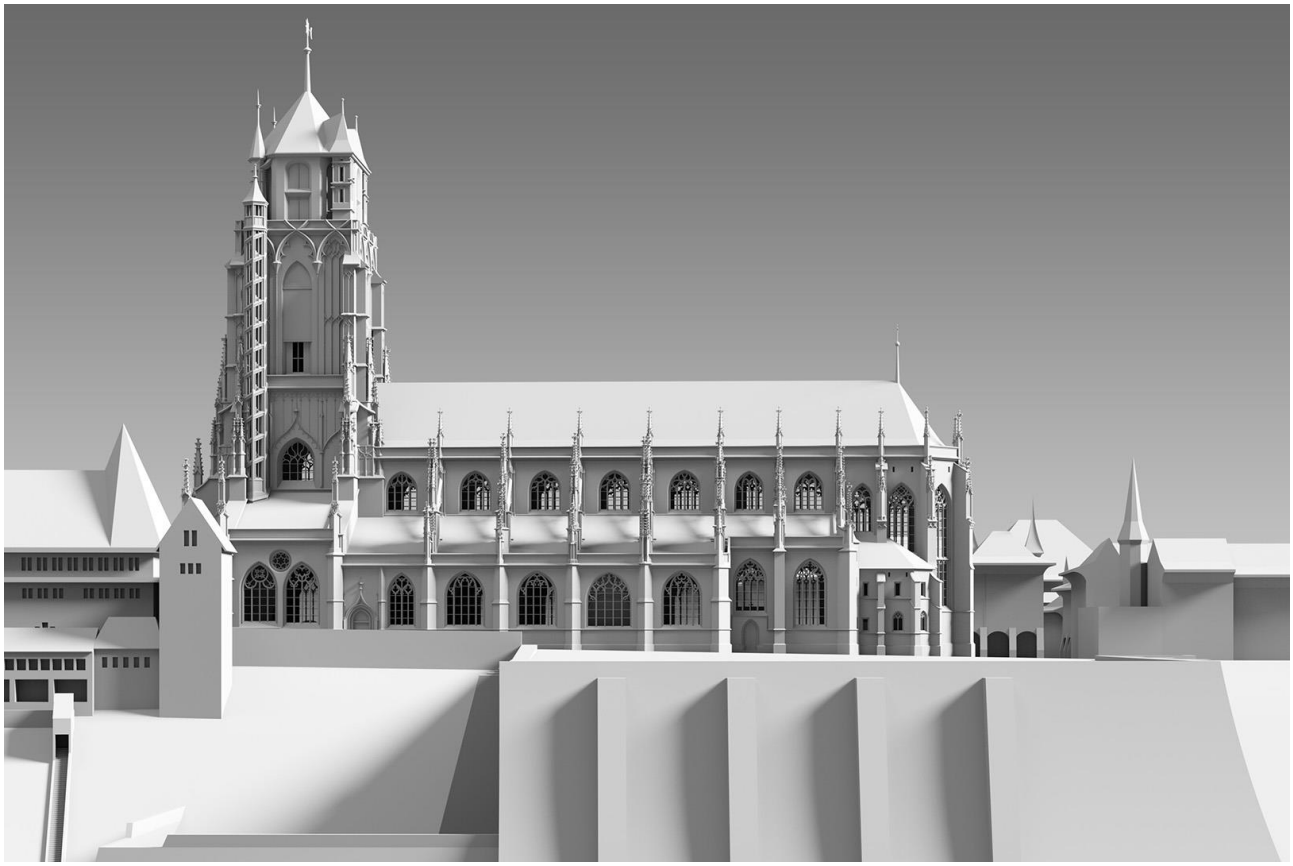

Fig. 1. Bern Minster platform around 1529, view from the opposite bank of the Aare (© Lengyel Toulouse).

The visualisation project was realised within the framework of a multidisciplinary, four-year research project at the University of Bern and the Bern Minster Foundation with archaeologists, art historians, building researchers, the cathedral architect, and stonemasons. The visualisations published by Lengyel and Toulouse (2019) were an integrated part of the research and thus contributed to the gain in knowledge.

The changes in planning took place during the construction process. There are only a few findings from the predecessor building, and changes in the planning of the cathedral are indicated by structural elements, but without revealing all the details of the rejected plans. In many cases, therefore, there are clear indications of circumstances which cannot be definitively clarified on the basis of the present state of knowledge, as published by Druzynski v. Boetticher (2019). This is then called uncertain knowledge. For example, it is undisputed that there was a predecessor building (Fig. 2).

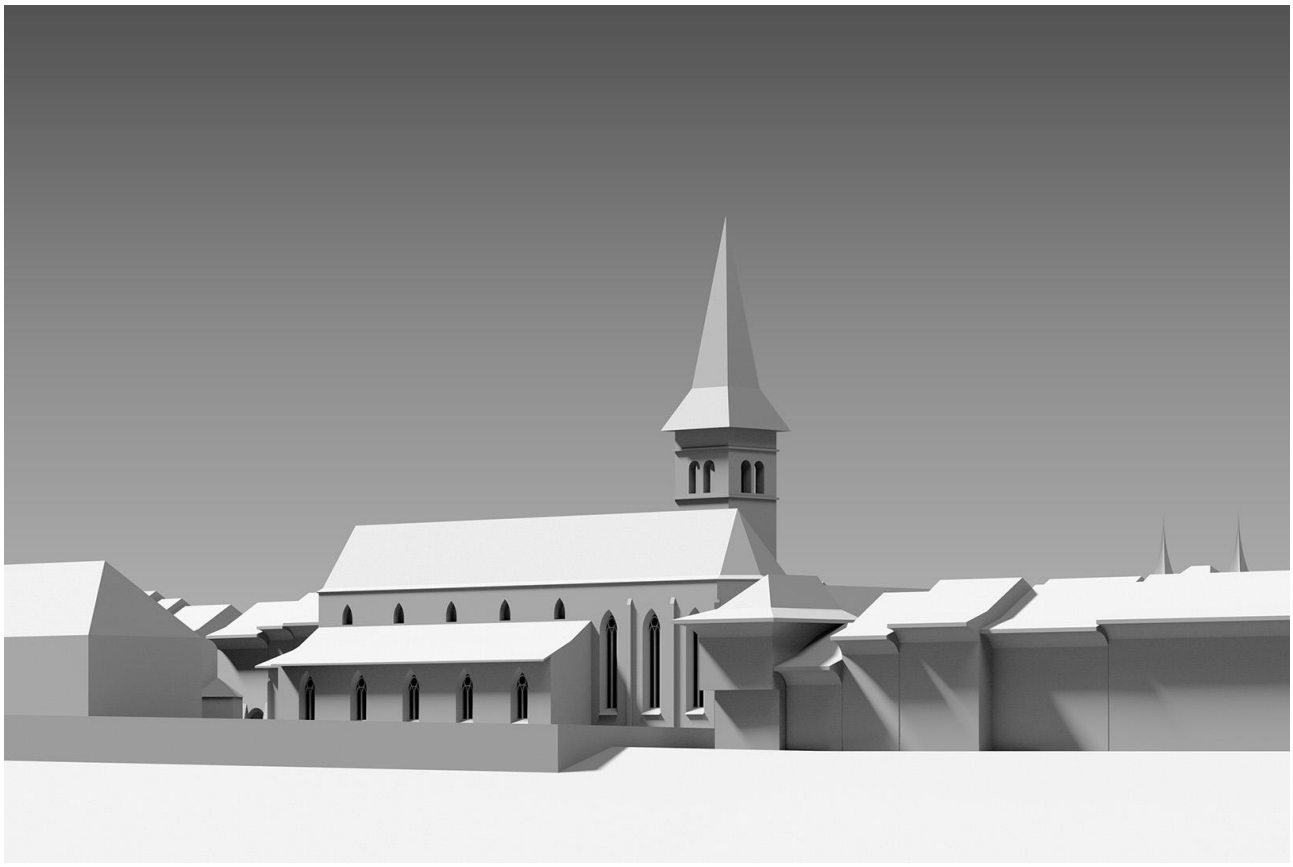

Fig. 2. Predecessor building from the opposite bank of the Aare, 1310–1334 (© Lengyel Toulouse).

However, the few foundation remains allow for several equally plausible building forms. The same applies to changes in planning. The indications of such changes are much more subtle than the remains of the previous foundation. They include, for example, begun vaulting beginners, whose form and orientation appear strange in the realized building, while they would fit for an alternative completion that does not correspond to the present one. The finding thus suggests a change in planning during the progress of the construction, but above all it raises the question of the form that was originally intended. A fundamental distinction is therefore made between planning and implementation stages. As in the case of the predecessor building, it is obvious that the cathedral is completed or compared with other buildings, which allows hypotheses to be made about the rejected planning.

In both cases, the predecessor building and the unrealized plans, the uncertainty is not only that many things cannot be clarified. The uncertainty also includes several mutually exclusive, i. e. contradictory possibilities. In view of these uncertainties, the fundamental question of what should and can be shown in such a visualisation is added to the considerations of an appropriate appearance. A visualisation is most likely to serve scientific knowledge if it remains as close as possible to the hypothesis. Since historical building research moves argumentatively between construction and appearance, it is obvious that the illustration should also be based on the specific characteristics of the phenomena investigated, i.e. to visualise both the constructive principle and the resulting spatial impression in a comprehensible way. To this end, some aspects are deliberately excluded from the depiction, of which perhaps the most obvious ones will be briefly explained in the following, namely materiality, stone joints and sculptures (Fig. 3).

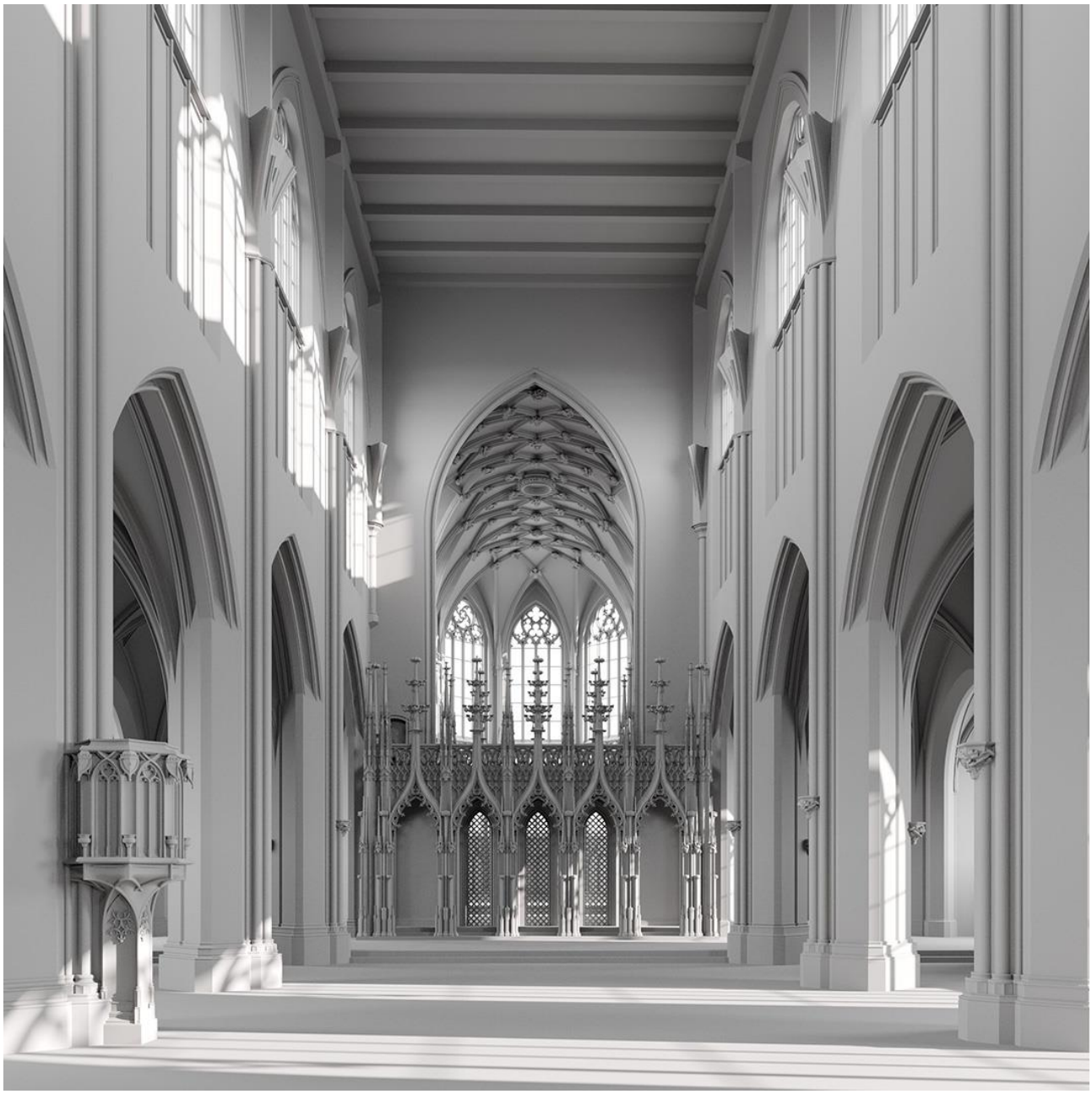

Fig. 3. View into the choir, 1517–1528 (© Lengyel Toulouse).

The reproduction of each individual stone could only include those surfaces that are still preserved, while due to the uncertainty described above, stones that are no longer preserved as well as stones that were planned but not built upon could basically only be represented fictitiously.

The situation is quite similar with the representation of materiality. Equally the representation of the actual surface condition of each individual stone would be limited to the still preserved stones. All other surfaces would have to be shown without materiality anyway. Because a fictitious, but only apparently lifelike representation would create the wrong impression of certain knowledge. Moreover, the visual effect of natural surfaces would clearly dominate the geometric statement behind them. In order to keep the proportion of purely fictitious additions to a minimum, it was therefore decided to also exclude materiality from the present illustration of the building research hypotheses.

Finally, sculptures were excluded for various reasons. Firstly, they are of secondary importance for the building research investigations and statements. Although their volumetric presence already

shapes the spatial impression, especially on the important sculptured western portal that has undergone separate research as published by Nicolai (2019), the direct comparison between construction phases with and without sculptures seemed to be dispensable to building research. On the other hand, the limitations of uncertainty are particularly applicable to the sculptures, since here too, in many phases, especially in the planning stages that were not realised, it is unclear which sculptures were erected or planned at what point in time and at what location within or on the outer facade of the cathedral.

The choir vault

An exception to this is the choir vault. The iconoclasm of 1528, which makes it difficult to locate not only the fragments recovered in the Bern sculpture find of 1986, fortunately left out the area of the choir vault. This has made it possible to visualise the individual steps of the construction technique of the vault up to the sculpturally worked keystones in an exemplary manner. Although this would also have been possible with the help of abstract placeholders, the construction method, which places the sculptural keystones on temporary wooden supports before the ribs are erected, appears all the more impressive in the contrast between the geometric form of the vault ribs and the sculptural form of the keystones. However, since this is also a schematic representation overall, and the individual sculptures are not the focus here either, only a small selection of keystones was scanned three-dimensionally. These were distributed alternately over the ribbed crosses so that the overall picture of regular vault ribs and variable keystones is preserved.

The limitation of the visualisation to space-forming surfaces and edges is also done in order to be able to compare planning and realisation statuses directly and also in an urban context. In this way, for example, the state of the cathedral during the construction of the choir walls can be directly contrasted with the then still upright remains of the predecessor building, without the differences in knowledge about both buildings impairing the overall spatial impression.

This consistency of the image, i.e. the cohesiveness of the representation, is a fundamental prerequisite for the architectural evaluation and interpretation of the hypothetical appearance of a historical condition. Closeness means that all components of the image are coordinated with each other. In addition to the restriction to space-forming surfaces and edges, this applies above all to the image detail. This is chosen in each picture in such a way that all components of the picture make a conscious statement about the depicted hypothesis (Fig. 4). Above all, however, the actual and unavoidable spatial limitation of the virtual three-dimensional model – to a certain extent the edge of the model construction table that forms the basis for the visualisations – is not recognisable in any representation.

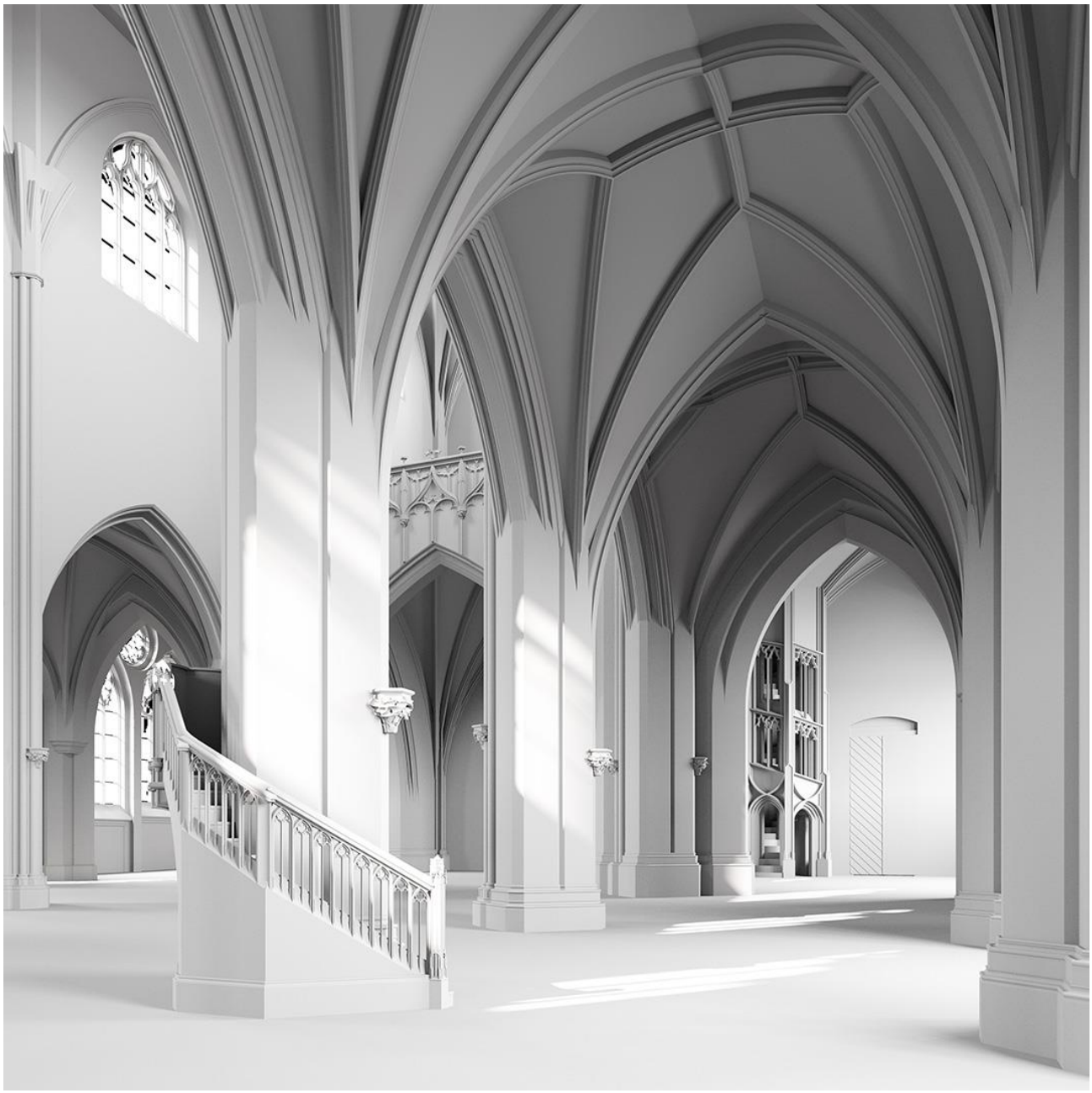

Fig. 4. Hypothetical planning state, around 1470 (© Lengyel Toulouse).

The unseen urban context

The external appearance of the Bern Minster has been researched with sufficient certainty at all the periods depicted that a hypothetical representation is possible in an abstracted but nevertheless complete appearance. In order to give the viewer such a complete overview of the state of the hypotheses, several twin images show the cathedral from the southwest and from the northeast, thus giving the impression of walking around the church.

These representations, which focus on the actual church building, already show sections of the urban context in which the churches were located. For representations that focus on the urban context, on the other hand, a separate section of the picture was chosen and, together with it, a different direction of view, namely as a view from the southwest that reaches from the cathedral platform to the town hall in the north. The section chosen here shows the transformation of the city without revealing

areas that are not intended to be commented on. In addition to the cathedral platform, the content includes the cathedral forecourt in front of the west portal, the immediate surroundings including the enclosure wall, the Deutschordenshaus, the former town hall directly east of the cathedral and the new town hall in the north at the end of Kreuzgasse. The remaining buildings of the urban environment are shown schematically. Although they are based on the actual plots – although only on the present ones, which may have been different at the times depicted – they also use a uniform appearance, with a few striking exceptions, in order to limit the image statement to the pure urban texture. Their essential features are buildings with eaves, round-arched arcades and wide roof overhangs, as well as courtyards separated by walls. This appearance, however, is also based on today's existing buildings, only the height of the buildings is in accordance with the Sickinger Plan of 1607, and here, too, the deliberate abstraction is necessary in order to do justice to the uncertainty in the knowledge and not even to address the actual appearance of the façades. The deliberately chosen schematic form of these pictorial components thus corresponds to the significance of the urban texture in the context of the focus on conveying the building research hypotheses of the Minster (Fig. 5).

Perceiving the uncertain

The most obvious feature of the visualisations of the hypothetical character of the building research findings and claims is the abstraction of the virtual model. Its complementary counterpart is the realism of the virtual projection. A visualisation does not consist of the virtual model only, allowing it to be viewed in any way. Rather, as already explained above in the section on the format of the visualisation, it is not only the viewing direction that determines reception, but the full range of photographic parameters. The challenge of a scientifically substantiated and at the same time immersive visualisation is to combine two initially opposing endeavours. The first is abstraction with the aim of modelling, as far as possible, only those object edges that are explicitly part of the building research statement and are thus evident from a building research point of view or at least well-founded. The second is the reference to classical architectural photography with the aim of immersion, i. e. to allow the viewer to imagine himself completely in the depicted world.

But why only black and white? It would easily be possible to depict polychrome architecture by juxtaposing different colour variants in the sense of the uncertainty of knowledge. But polychromy dominates a visualisation in such a distinctive way that the enormous uncertainty that arises from the fact that, although in principle polychromy is beyond question, individual specific colours and assignments on surfaces are largely unknown, obscures the underlying relatively high level of certainty in knowledge about geometry. Monochromatic representations, on the other hand, are able to focus the attention of a visualisation on the geometry and thus achieve a significantly higher degree of certainty of knowledge of the image as a whole. And it is the consistency of the black-and-white photography that excludes the illustration of individual elements such as the sky in blue or the stained glass windows of the Bern Minster in colour, for both would transform the black-and-white photo into a colour photo and suddenly turn the clearly polychrome architecture white. So, an abstention would become an obvious falsification. The abstraction of colour, the black and white photo, on the contrary, abstains from the statement on polychromy and remains true to the scientific hypothesis.

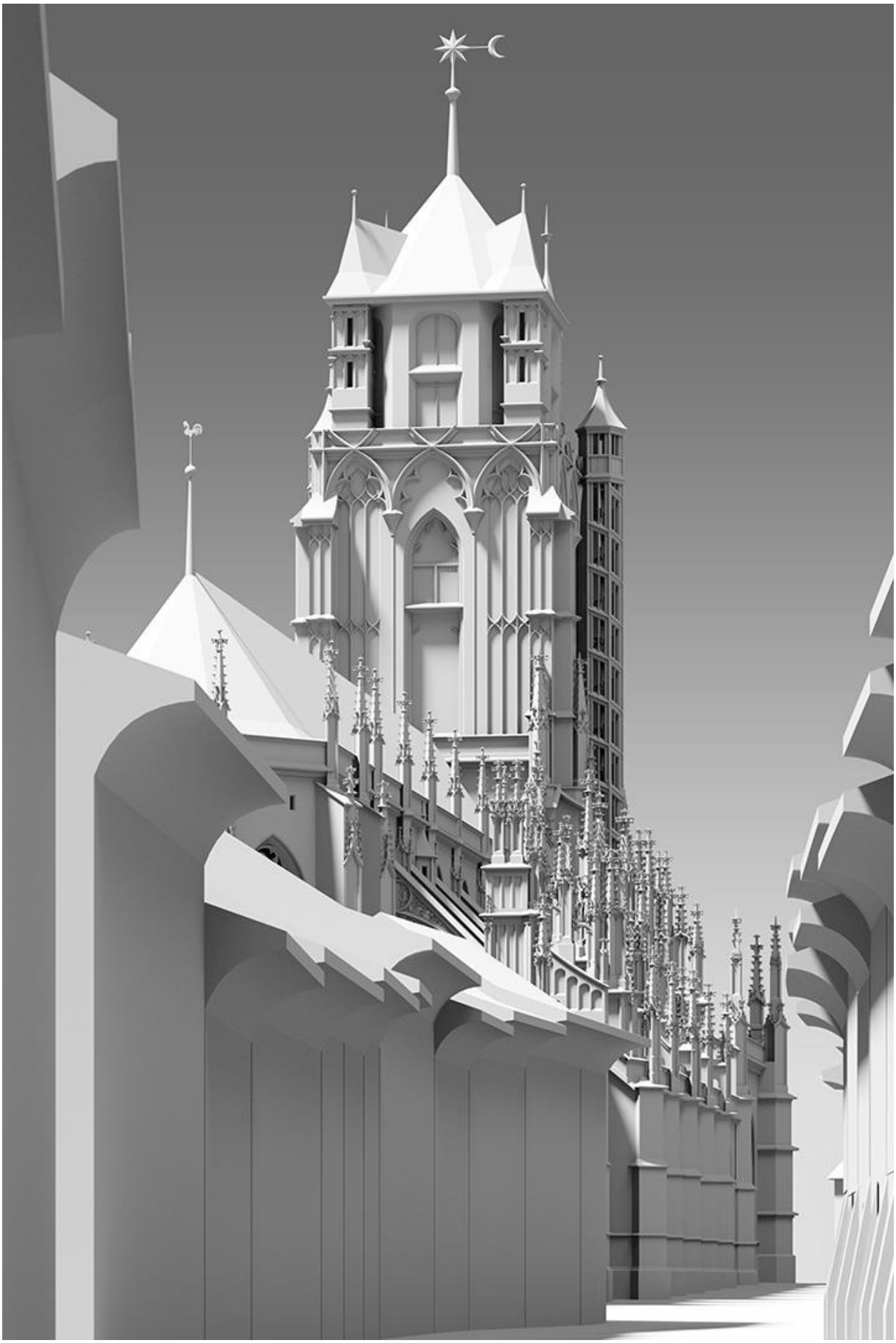

Fig. 5. The minster in its urban texture, around 1530 (© Lengyel Toulouse).

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Nicolai, B. (2019). 'Westbau und Westportal des Berner Münsters.' in Nicolai, B. and Schweizer, J. (ed.) Das Berner Münster. Das erste Jahrhundert: Von der Grundsteinlegung bis zur Chorvollendung und Reformation (1421–1517/1528). Regensburg: Schnell & Steiner, pp. 599–618.