TRANSLATION

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Figures of Mediation: Late Gothic Chapel Vaults Between Primordial Stone and Medieval Theology

Figures of Mediation focuses on the vaults of Late Gothic German chapels from the 15th and 16th centuries, with particular reference to the way that decisions regarding their layout emerged from a dialogue between sophisticated theology and modest stonemasonry praxis, exercised in an elaborate chain of communication. The medieval sources present difficulties regarding our ability to trace the ontological descent from theology down to the praxes of stonemasonry since the sources in theological Latin and those in the local dialect of a mason reflect two different constituencies, priorities and involvements in reality. However, various architectural, literary, and visual sources associated with the vaults confirm genuine continuity between primitive embodying conditions and the precision of geometry and language.

Two sets of late medieval primary sources mediate and translate nearly identical content into different mediums, providing insight into the shared content of different articulative phenomena. Folios of drawings known collectively as *Baumeisterbücher* comprise idealized plans and elevations of chapels, and masonic texts known as the *Werkmeisterbücher* codify in writing the knowledge that was previously orally transferred, and remain minimally removed from that tradition. They address the setting-out of the ground plan of a chapel, which commenced with the inscription of a governing figure made through sequential elemental geometrical operations that reflect the paradigmatic tension between circle (symbolic of the divine) and square (symbolic of humanity). The ground plan provided a resolute background for the diverse range of sophisticated figured vaulting that brought a new and far less predictable geometry into play. Faithful three-dimensional computer models that were constructed for this study disclose which aspects of the architecture come into focus, which become peripheral, and which remain spatially ambiguous. They reveal that while there is stability at the extremes of the periphery and centre – and, by analogy, earth and light, human and divine – everything in between is in a state of movement or metamorphosis.

"Figures of Mediation" focuses on the vaults of Late Gothic German chapels from the 15th and 16th centuries, with particular reference to the way that decisions regarding their layout emerged from a dialogue between sophisticated theology and modest stonemasonry praxis, exercised in an elaborate chain of communication. Vaulting possessed a singular status in the Late Gothic architecture, manifesting in an extremely diverse range of configurations, including stellar, net, flying-rib, fan, and tracery vaults. The examples at the more elaborate end of the register are highly sophisticated spatially and technically. The representational depth of these architectural configurations encompasses mute stones, practical geometry, fine craft skills, and the symbolism of a paradisial garden.

The medieval sources present difficulties regarding our ability to trace the ontological descent from theology down to the praxes of stonemasonry,[1] if only because the sources in theological Latin and those in the local dialect of a mason reflect two different constituencies, priorities and involvements in reality. However, the various architectural, literary, and visual sources associated with the vaults confirm genuine continuity between more primitive embodying phenomena, such as gesture and spatial orientation, and more articulative phenomena, such as speech and geometry.

The method adopted for this inquiry is a mode of interpretation following the procedure of phenomenological hermeneutics as developed principally by Edmund Husserl, Martin Heidegger, Hans Georg Gadamer, and Paul Ricoeur.[2] Phenomenological hermeneutics acknowledges that all meaning is in relation to our particular concrete historical situation, which includes our fore-understandings of the world and the tools-to-hand with and through which we register, manipulate, and articulate it. Phenomenology teaches the degree to which events and things are embedded in their context, to which hermeneutics adds the practice of explication.[3] It avoids the issue of instrumentalizing ethical judgements the way that theory strives to discover generalisations that can be expressed like the 'laws' of science, to which actions can be linked with the expectation of measurable results. Instead, the practical philosophy of phenomenological hermeneutics preserves the reciprocity between what can be understood universally and the full richness, depth, openness, and vulnerability of particular concrete situations in history. It seeks to invoke the broad contexts of its topic and is accustomed to crossing classes and disciplines, moving up and down the levels of representation— for example, from primordial aspects of stone or spatiality to theological argument.

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1   The inventory of skills and knowledge required of medieval masons encompassed the cutting of stone blocks and the finishing of surfaces, corners, and profiles, as well as engraving, sculpting, setting floor and wall surfaces, and reading and producing sketches and fabrication plans. The tools they used included the square, compass, mallets, chisels, plumb, cords, and yardsticks.

2   For preliminary orientation in the work of these philosophers see Edmund Husserl, *Die Krisis der europäischen Wissenschaften und die transzendentale Phänomenologie* (The Crisis of European Sciences and Transcendental Phenomenology) (1936); Martin Heidegger, *Sein und Zeit* (Being and Time) (1927); and Hans Georg Gadamer, *Wahrheit und Methode* (Truth and Method) (1960).

3   Paul Ricoeur wrote on the topic of the mutual belonging of phenomenology and hermeneutics, stating that "phenomenology remains the unsurpassable presupposition of hermeneutics; and on the other hand, phenomenology cannot carry out its programme of constitution without constituting itself in the interpretation of experience." Ricoeur, "Phenomenology and Hermeneutics" in *Hermeneutics and the Human Sciences* (Cambridge: Press Syndicate of the University of Cambridge, 1981), 114.

Fig. 1. Gunzo's dream (detail), Paris,
Bibliothèque Nationale, MS lat. 17716,
fol. 43 (artwork in the public domain).

A telling example of discourse between religious narratives and building praxis is that of Gunzo's dream. As recounted in a medieval manuscript of unknown authorship that has come to be known as Anonymous II, Saints Peter and Paul appear to the paralysed monk Gunzo as he sleeps in Cluny's infirmary. They commission him to convey to Abbot Hugh their plan for the building of a new church, Cluny III. An illustration alongside the text depicts the saints in the process of instructing Gunzo to memorise the plan's dimensions and proportions as they lay them out with ropes in a rotated cross pattern (fig. 1).[4]
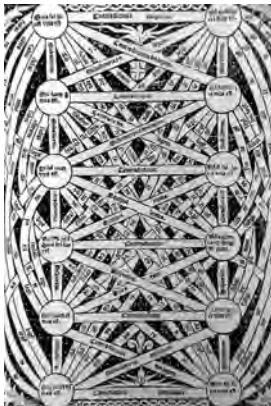

Fig. 2. The Geometry of the Mind, in
Juan de Celeya, Expositio … in primum
tractatum Summularum Magistri Petri Hispani …
(Paris, 1525), Paris, Bibliothèque Nationale
(artwork in the public domain).

The Late Gothic master mason Matthäus Roriczer provides a second highly illuminating concrete example of this collective orientation that crosses classes and disciplines. He dedicated his Büchlein

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4   For a study on Cluny III that focuses on Gunzo's oracular dream, see Carolyn M. Carty, "The Role of Gunzo's Dream in the Building of Cluny III," Gesta 27, no. 1/2 (1988): 113–23. On the active architectural role of ecclesiastical patronage in the Early and High Middle Ages, see Binding, *Der Früh- und hochmittelalterliche Bauherr als Sapiens Architectus* (The Building Patron in the Early and High Middle Ages as *Sapiens Architectus*) (Cologne: Abt. Architekturgeschichte des Kunsthistorischen Instituts der Univ. Köln, 1996).

von der Fialen Gerechtigkeit (Booklet Concerning Pinnacle Correctitude) to the Bishop of Eichstatt, Wilhelm von Reichenau, noting that the Bishop was a lover and patron of the "free art of geometry", and that "they had discussed the subject together many times."[5] Lon R. Shelby wrote that "it is just this kind of rapport between the ecclesiastical patron and his master mason that must have provided the input of a great deal of 'clerical' learning into the craft traditions of the Middle Ages."[6]

A diagram from a Late Gothic manuscripts, entitled "The Geometry of the Mind" (1525), further illustrates the nuanced relationship among architecture, symbolic diagrams, and language (fig. 2). There is an obvious visual similarity between the diagrams and the plans of late medieval vaults, pointing to a common latent background. The highly wrought arrangement of the diagram reveals an agonic moment in which truth appears within conflict, arising from an effort to reconcile the *trivium* with the *quadrivium*. As will be seen below the vaults similarly wrestle with the nature of relationships between centre and periphery, human and divine.

As has previously been suggested, one of the main virtues of modern hermeneutics is that it enables us to see and understand the richness of articulative phenomena in other areas of culture.[7] This depends upon an ontology of language persisting through the strata of various types of representation to convey the reality of an original historical situation.
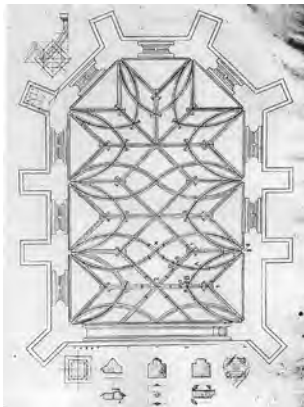

Fig. 3. Composite plan for a late medieval chapel, Stromersches Baumeisterbuch 1, 16th century, fol. 235. Stromersche Kulturgutstiftung Grünsberg / Germanisches Nationalmuseum, Nuremberg (artwork in the public domain).

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5   Matthäus Roriczer, *Das Büchlein von der Fialen Gerechtigkeit* (Booklet Concerning Pinnacle Correctitude) (1486); facsimile edition, ed. Ferdinand Geldner (Wiesbaden: Pressler, 1965), 45–46.

6   Lonnie Royce Shelby, "The Geometrical Knowledge of Medieval Master Masons", *Speculum* 47: no. 3 (1972), 413.

7   Dalibor Vesely discusses the relationship between verbal language and the totality of linguistic phenomena in terms of 'communicative movement' as a reciprocity of articulation and embodiment. "The preliminary articulation of the world that precedes the acquisition of verbal language provides vital background to the life and meaning of language. Verbal language represents another order but only in that it offers a higher level of clarity, greater transparency of meaning, and a more explicit mode of articulation. As we have already seen, the life and meaning of verbal language depend on the presence of a 'total language'." Vesely, *Architecture in the Age of Divided Representation: The Question of Creativity in the Shadow of Production* (Cambridge, Mass.: MIT Press, 2004), 70.

Help in arriving at a present-day interpretation that does justice to the original Late Gothic situation is provided by Dalibor Vesely's observations on the task of reconstructing the "space of communication". According to Vesely, who borrows the German term *Sprachlichkeit* (linguality) for this purpose, the task relies on re-contextualising evidence and understanding how meaning is shared and mediated by several disciplines and strata of culture: "The key to the phenomena of mediation is language, not in its ordinary sense but as a medium in which culture on all its different levels is articulated."8

Within the limits of the current discussion, two sets of primary sources produced and used by late medieval masons themselves (one comprising drawings, and the other texts) are optimal vehicles for developing an interpretation of the meaning of the Late Gothic chapel: they mediate and translate nearly identical content into different mediums, engendering a 'space of communication' in the sense described above. They both have their roots in an oral tradition in which rhymes were used to help memorise fundamental geometric operations.9

Several extant folios of drawings from fifteenth- and sixteenth-century southern Germany, known collectively as *Baumeisterbücher* pertain to the education of masons, and contain idealized plans and elevations of chapels. Throughout the Late Gothic period and up until the end of the nineteenth century, stonemasons were required to execute *Meisterstücke* (masterpieces), which included drawings and models for the choir of a church. One such folio is by the Nürnberger Ratsbaumeister Wolf Jacob Stromer (1561–1614), and is now known as the *Stromersches Baumeisterbuch*. A drawing from this set (fig. 3) provides the foundation for the interpretation of the set-out and vaulting of the Late Gothic chapel below.

Complementing these folios of drawings are three comprehensive *Werkmeisterbücher* (Master Masons' Books) from around the same time and area which are concerned almost exclusively with the same subject matter.10 The *Werkmeisterbüche*r are concerned with the correct planning and execution of church buildings, from determining the disposition and dimensions of the building

8   Vesely, *Divided Representation*, 68–69.

9   Joseph Rykwert, "On the Oral Transmission of Architectural Theory," *AA Files*, no. 6 (Spring 1984): 15–27. On this point, note that the medieval masons used rhymes to help memorise fundamental geometric operations as in the following example:
"What is to be seen in the art of stonemasonry
Such that there is no mistake nor diversion
rather straight as a cord a ruler,
Everything is drawn through the compass,
so you will find three standing in four,
and thus go to the centre through one"
Cited in Carl Alexander Heideloff, Die Bauhütte des Mittelalters in Deutschland (Nuremberg: Johann Adam Stein, 1844), 15. For a modern study on stonemason hymns, see Karl Maertin, Des Steinmetzen Hymnen (Munich: Georg Müller, 1928).

10   Ulrich Coenen published the three comprehensive *Werkmeisterbücher* in the original medieval German. They are faithfully reproduced with original pagination, and it is to this work that reference will be made. All translations are by the author unless otherwise noted. See Coenen, *Die Spätgotischen Werkmeisterbücher in Deutschland als Beitrag zur mittelalterlichen Architekturtheorie* (The Late Gothic Master Masons' Books in Germany as a Contribution to Medieval Architecture Theory) (Aachen: G. Mainz, 1989).

as a whole to deciding on the proportion of details and marking out the building on site, including recommendations for the choir, nave, bay, vault, roof, wall dimensions, buttresses, windows, cornices, pinnacles, and capitals. They also address such practical building processes as the making of foundations or the mixing of mortar. These books codify in writing the knowledge that was previously orally transferred, and remain minimally removed from their oral tradition, providing insights into how medieval masons spoke about their work.[11]

The layout of the typical floor plan of a chapel on the building site as disclosed in one of the *Werkmeisterbücher*, Lorenz Lechler's in *Unterweisungen* (Instructions) (1516), provides a sound vehicle through which to discuss the origins and meaning of geometry and its symbolic import both as it pertains to the present study and in its universal dimension. By such means, the layout of a chapel can be understood as a special case of a more general representational structure or process of configuration, which in turn implies a stratification of symbolic embodiment. Vesely has declared that geometry is the paradigm of symbolic representation and noted that the "earliest paradigms are derived from the annual movements of the sun and the moon, the division of time into seasons, and the separation of the world into four zones", and that they exhibit "a clear sense of centre and periphery, a notion of horizontal and vertical axes, the origins of geometry and its creative application."[12]

When actually setting out the configuration of a chapel on the ground in preparation for building, the inscription of the governing figure was made through two sequential elemental geometrical operations: the derivation of an orientation and the inscription in the ground of a boundary figure. Great significance was attached to these operations in the masons' writings, exposing a concern for origins beyond pragmatic circumstance. The concern for origins is always both a return to essences and a recovery of time in the temporal sense. It is the establishment of a just measure, which has traditionally been symbolized by the measuring rod and chord and is most clearly evident in the symbolism of foundations.[13] This disclosure of order corresponds to the recovery of an orientation with respect to the whole (*kosmos*). According to the *Werkmeisterbücher*, the orientation of a

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11   The terms of reference at this time are still not very abstract, remaining close to the act of making. Texts such as the *Werkmeisterbücher* are thus quite different from Renaissance treatises written at about the same time in Italy, lacking the cultivation of argument present in properly theoretical works. Although they employed sophisticated geometric systems and demonstrated fine craftsmanship, the medieval masons operated with a pre-theoretical understanding – that is, their orientation was always to perform well the task at hand, without recourse to the kind of theoretical justification that emerged in the Renaissance, when it was discovered that it was possible to see oneself objectively.

12   Vesely, *Divided Representation*, 378.

13   In the Book of Revelation, the angel of the Heavenly Jerusalem "had a measuring rod of gold to measure the city, its gates and its walls". Revelation 21:15 (New International Version). It is the foundation that attracts the symbolism of the world order as a temple in God's response to Job, as described in Job 38 (NIV):

4   "Where were you when I laid the earth's foundation?
     Tell me, if you understand.

5   Who marked off its dimensions? Surely you know!
     Who stretched a measuring line across it?

6   On what were its footings set,
     or who laid its cornerstone."

particular chapel in terms of its primary axis is found by "turning toward the direction in which the sun rises"[14] – that is, the orientation of liturgical east is founded anew.[15] The chapel is therefore defined by its stance with respect to global conditions. This orientation was translated into the domain of drawing where, due to the symbolic precedence of east, the side of the building facing in that direction is the top of the page. The second action is the founding of the internal width of the chapel, the primary dimension from which all others are derived: "The building has its exact law and rules of organization, since all components must correspond to the work, and the entire work must reciprocally correspond to the components. The choir is taken as the foundation and basic regulation of the whole building".[16] This is the first dimension marked into the ground. The moment of translation from drawing to building is of significant practical and ontological import, since it circumscribes the human-divine mediation for this particular chapel. The representation of this proximate remoteness that establishes a periphery and a centre is one way of mediating the exchange between the eternal and historical, pointing toward the universal conditions of human finitude.

In the example here, the figure is made through elemental geometric operations, which reflect the paradigmatic tension between circle and square. The operation begins with the circle (symbolic of the divine), moves to the square (symbolic of humanity), and results in the mediating figure of the octagon.[17] The figures are fixed in the earth by means of posts and cords (fig. 4).
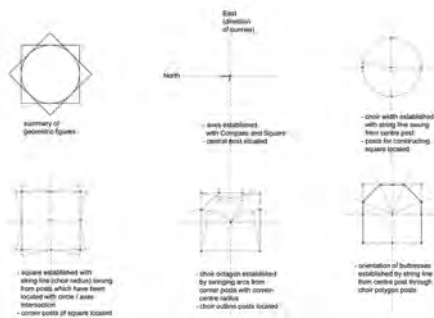

Fig. 4. Diagrams depicting the setting out of a chapel plan on the building site, derived from the written description in Lorenz Lechler, Unterweisungen, 1516. Drawing by Ross Anderson..

14   Lorenz Lechler, *Unterweisungen*, in Coenen, *Die Spätgotischen Werkmeisterbücher*, 243.

15   'East' refers to the point of the compass at which the sun rises and therefore has a parallel formation to the word 'orient', from the Latin word *oriri*, originally meaning 'rising' or 'to be born'. So the correlation is that the sun arises or is born every morning in the east. By the Middle Ages, church builders would say that their sanctuaries 'were oriented' because they faced the east.

16   Lechler, *Von des Chores Maß und Gerechtigkeit* (On the Measure and Correctitude of the Choir) (ca. 1500), in Coenen, *Die Spätgotischen Werkmeisterbücher*.

17   Sacred associations with the circle in the Western tradition are set out in Georges Poulet, *The Metamorphoses of the Circle* (Baltimore: John Hopkins Press, 1966), xi-xxvii. In Christian iconography, the number eight and the octagon are associated with resurrection – e.g., the world began eight days after Creation, the Temple was sanctified in eight days and Christ rose from the grave after eight days. See Richard Krautheimer, *Early Christian and Byzantine Architecture* (Baltimore: Penguin Books, 1965).

A square is constructed out of the primary choir radius, on the east–west axis; and from this square, an octagon is derived, whose five eastern sides form the eastern termination of the choir. Finally the position and orientation of the buttresses are fixed by stretching cords from the central choir post over the corners of the choir polygon. The deliberate and requisite sequence of the procedure from circle to square to octagon, although these shapes are ultimately spatially overlaid, fulfils an originally temporal aspect of geometry. Edmund Husserl's insights into the origin of geometry are relevant in this context. He approached the task as an inquiry back into the most original sense in which "geometry arose, was present as the tradition of millennia, is still present for us, and is still being worked on in a lively forward development."[18] The key to Husserl's argument is his apprehension of 'origin' as always-possibly-now, rather than necessarily historically distant.

Looking at the exemplary drawing from the *Stromersches Baumeisterbuch* (fig. 3), one can see that the orientation and fundamental topography of the chapel provide a preliminary understanding of the whole. What is important is that the body of the church provided a resolute background for the articulation of a more particular, more contingent and mediated relationship to the divine, observable in the ordering that proceeds from the ground up through the piers, ornamentation, and, ultimately, the figured vaulting. The figured vaulting is evidently the domain in which the Late Gothic practical imagination was at its most innovative, bringing a new and far less predictable geometry into play.

These vaults are of enormous benefit for understanding the practical imagination more generally, offering insights into one of the fundamental architectural dilemmas: the difficulty of being both certain and free. Every rule carries with it the eventual prospect of reduced liberty, a tension constituted in the dialogue between conditions and possibilities. Regarding the plan configuration of the vault out of which the three-dimensional development is *ausgezogen* (drawn), it is notable that there is not a single instruction for the correct configuring of vault-rib plans in any of the *Werkmeisterbücher*. In fact, an almost infinite variety of choice is implied by the few comments that do exist on this subject – for example, in Folio 54r. of Lechler's Instructions, where it is written that "no rib-sequence is like another."[19] The properly three-dimensional development of the vault differentiates its use of geometry from the rest of the chapel.

The value of the *Stromersches Musterbuch* drawings lay in providing real dimensions for the cutting of stones. To this end, and keeping in mind that the ribs curve in three dimensions through space, it becomes clear that a conventional cross-section as would be employed today would have been of

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18 Edmund Husserl, "The Origin of Geometry" in Husserl, *The Crisis of European Sciences and Transcendental Phenomenology* (Evanston: Northwestern University Press, 1970), 354. Note that Husserl also drew attention to the contribution of the habits, terms and procedures of traditional building praxes and the use of standardized tools, materials, and dimensions in the formation of geometry.

19 Lechler, *Unterweisungen*, 216. The claim is not necessarily absolutely true – it may one day be shown that two vaults were in fact built to identical plans, but rather it is practically true. That is, as far as the medieval mason was concerned the primary arc technique enabled the infinite variation that was necessary to realise the ambition of a unique mediation between humans and their God in the concrete situation of every vault, erected above the secure foundations of the typically configured ground plan of the chapel.

little use to a mason. Their tasks would have required a real section axial to the articulated rib, not to the vault. It is necessary therefore to discard the current understanding of a section as an axial vertical slice through a building. The basis for the three-dimensional development of the vault ribs as described in the *Werkmeisterbücher* and corroborated in the *Musterbuch* drawings was indeed drawn out of the plan, although it was done so via a much more involved procedure that is quite foreign to current architectural orthodoxy, and requires explanation.
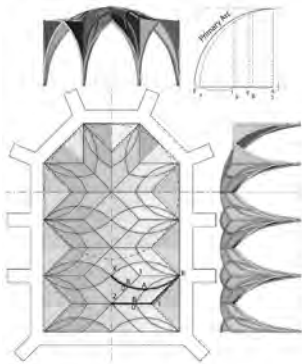

Fig. 5. Reconstructed plan, elevation and Primary Arc of the chapel vault depicted in the composite drawing fol. 235 of the Stromersches Baumeisterbuch 1 (fig. 3). Drawing by Ross Anderson.

The procedure has come to be known as the *Prinzipalbogen* (primary arc) technique.[20] Essentially, the derivation of the primary arc is achieved by sequentially adding together along a horizontal line the true plan lengths of the segments of a rib that trace the longest possible continuous path from the lowest point (the springing point) to the highest central point within a quarter bay of a vault. A quarter circle is then thrown with the radius that is the sum of the rib segments (fig. 5, above right). This generates a single constant curve that is to be used for all rib segments. The intersections of rib segments, which is where the rib changes direction in plan, is found by drawing lines vertically from the individual lengths on the horizontal line up to where they cut through the arc.

By carefully analyzing and working with the drawing selected from the *Stromersches Baumeisterbuch* (fig. 3), it is possible to extract practical and symbolic knowledge that is represented in it. A faithful three-dimensional computer model was constructed as part of this study in order to help interpret the consequences of using the primary arc technique of constant radius for the vaulting (fig. 6). It helps to reveal which aspects of the architecture come into focus, which become peripheral,

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20 The term *Prinzipalbogen* first came to be used in the mid-nineteenth century. The medieval sources speak of drawing up a curve sequence (*Ufftragen einer Bogenreihung*).

and which remain architecturally ambiguous when the plan of the vault is extrapolated spatially.[21] Although it is conjectural, this computer model is certainly plausible, as it is based on the background knowledge of the primary arc technique that has evidently been used in the original conduct of the drawings, and on built examples from around the time the drawings were produced.

Fig. 6. Rendering of the underside of the chapel vault depicted in the composite drawing fol. 235 of the Stromersches Baumeisterbuch 1 (fig. 3). Drawing by Ross Anderson..

An immediately apparent characteristic of the vault is that its cross-section is not continuous. The further the ribs are rotated away from being perpendicular to the nave, the steeper the vault. This produces the tendency for the vault to rise steeply from the springing point and then flatten out toward the centre of the nave. Note also that as straight and curved ribs rise out of a common springing point, they are difficult to distinguish from one another and, together, approximate a rudimentary conic section. As the plane of the arcs of the curves approach the horizontal, the more like their plans they are. This dialogue between the curved and lineal geometry in plan and the ultimately spatial order of the chapel is a moment of animation or differentiation. There is evidently stability at the extremes of the periphery and centre - and, by analogy, earth and light, human and divine - but everything in between is in a state of movement or metamorphosis.

The more sophisticated Late Gothic vault plans are correspondingly ambiguous in their representation of a structured mediation between human and divine. Benedikt Ried's looping stellar vaults are important examples of elaborate plans in which rich floral symbolism—patterns of stylized six-petal flowers—sublimate the underlying geometry that nevertheless can be seen to govern the disposition of the whole of each vault. Ried expressed in the nave vault of Saint Barbara the fact that the ribs forming the vault were not able to meet their columns tangentially by making them overreach the columns before trailing down them, and he further drew back the surface of the vault from the rib, creating a shadowy area where the vault and the column are woven together. This configuration discloses a rich field of botanical motifs as the emerging ribs are revealed to be

21 The computer models do not simply illustrate the critical analysis; indeed, they are the medium in which it was conducted. In the process of analysis there was all the time a 'to and fro' between operating with the sophisticated computer technology that is now available for carrying out drawings, and reflection on the manual drawing implements that were originally at the mason's disposal. In the language of contemporary hermeneutics, this empathy for the original production, which can be approached and progressively understood yet remains proximately distant, would be termed a 'fusion of horizons'.

bundled 'stems' from which spring the vast 'petaled' fields of the looping stellar vaulting. A similar efflorescence of botanical and figural motifs, indicative of the turn to naturalism, can be seen in ecclesiastical writings and in painting and drawing of the Late Middle Ages. Ried's vaults can also be viewed in light of the dawning naturalism of architectural motifs that are most visible in the development of Ast- und Laubwerkdekors (sculptural branch- and leaf-work ornamentation) during the second half of the 15th century.[22] In the parish church of Our Lady at Ingolstadt, about 1520, there is a tracery vault formed of arched branches that appear to 'grow away' from, and almost independent of, the primary body of the vault behind.[23]

The elaborate course traced by a stone rib in a Late Gothic vault from springing-point to apex is also an arcing movement from periphery to centre. It is a representation of the exchange between the eternal and historical as are the two geometric diagrams from the medieval manuscripts. Both the vaults and the diagrams reveal a negotiation between motifs such as the 'good' and practical circumstances. The two very different sources shared significant representational intent and paid tribute to the depth of mutual understanding between the modes of participation in reality of the mason and the theologian. The interpretation of these figures of mediation required explicit acknowledgement of what technology and aesthetics mostly take for granted – interpretation with respect to the culturally qualified common-to-all.

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22 See Karl Oettinger, "Laube, Garten und Wald," in *Festschrift für Hans Sedlmayr* (Munich: C.H. Beck, 1962), 201–28).

23 For a detailed exploration of themes of nature in the chapel vaults at Ingolstadt, see Ethan Matt Kavaler, "Nature and the Chapel Vaults at Ingolstadt", The Art Bulletin, vol. 87 (June 2005): 230–48.