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RELIEF-PERSPECTIVE – CONCEPT AND APPLICATIONS

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Relief-perspectives had been used for theatrical settings and buildings especially in the Renaissance, for example "Teatro Olimpico" in Vicenza, 1585, or "Chiesa di Santa Maria presso San Satiro" in Milan, 1479-99. A systematic mathematical theory for relief-perspectives however had been only developed when perspective had been understood as a geometric-mathematical transformation and not only as a representation method. Lambert's studies in refer to his Perspectograph, the analyses of Jean Victor Poncelet in *Traité des propriétés projectives des figures*, 1822, and Jakob Steiner's thoughts in *Systematische Entwicklung der Abhängigkeit geometrischer Gestalten von einander*, 1832, lead finally to the system of projective geometry, as Karl Georg Christian von Staudt worked it out in *Geometrie der Lage*, 1847. Perspective as a projective transformation is the fundament for a full understanding of the concept of relief-perspective. Important books in relation to a relief-perspective concept had been published by Noël-Germinal Poudra, 1860 in France, Rudolf Staudigl, 1868 in Austria, and Ludwig Burmester, 1883 in Germany. Johann Adam Breysig [1] had published the probable first book on relief-perspective 1798 in Germany.
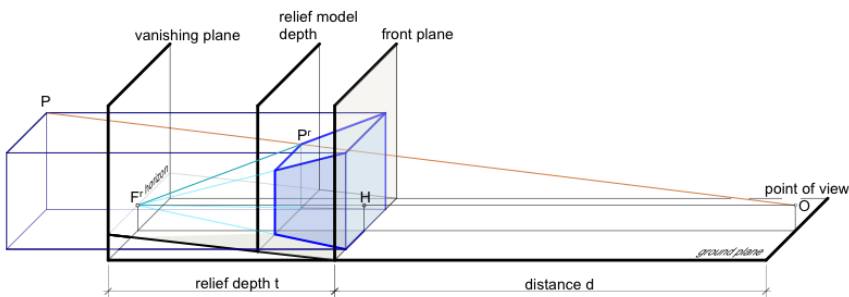

Fig. 1 Axonometric visualization of the relief-perspective parameters

The relief-perspective can be defined by the parameters: point of view, view direction, front plane, and vanishing plane. The space layer between the front plane and the vanishing plane

defines the relief depth t, which determines substantially the relief-perspective. The infinite half space is transformed to a space layer. If the relief depth is zero, we get the usual perspective. The relief-perspective can be seen as the most general method of projection, from which the orthogonal, the oblique and the perspective projection arise as special cases, as Staudigl [3] already pointed out. Spatial objects are deformed according the perspective collineation rules as defined by these parameters.

Also today relief-perspective models can be used in architecture to visualize spatial impressions of a building from a viewpoint more intensive than a perspective drawing. The purpose of a relief-perspective in applications for visualizing architecture will be shown in projects with our students [2]. The spatial model itself does not remain an independent object; it becomes related to the spatial perspective transformation.

Fig. 2 Students' relief perspective models of Stirling's Clore Gallery (photos by Bernhard Friese)

The interest and stimulus in relief-perspective can be found in art, especially in applications for stage design. But only the geometric-mathematical development of vanishing elements, projective geometry and a transformational approach, systematically worked out in the 19th century, enabled a theoretical and applicable concept of relief-perspective. The fruitful relationships between art and geometry affected the development of relief-perspective.

References:
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