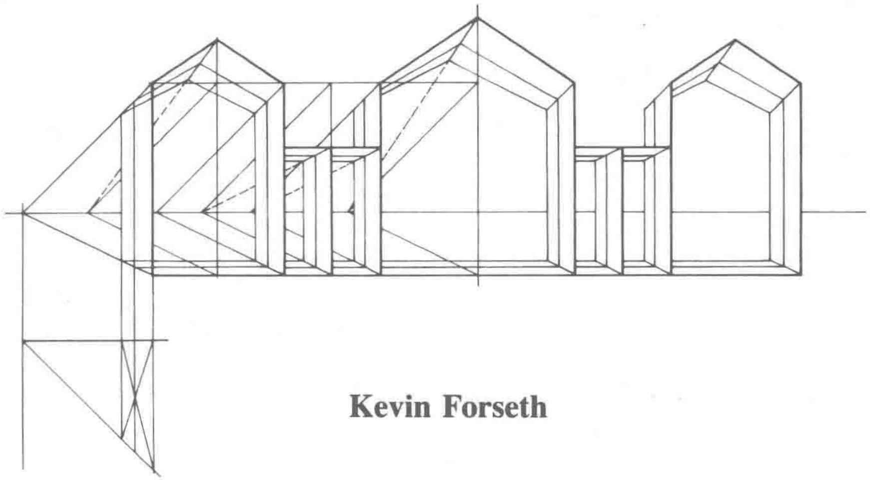
GLIDE PROJECTION

LATERAL ARCHITECTURAL DRAWING

Kevin Forseth

Glide Projection

Lateral Architectural Drawing



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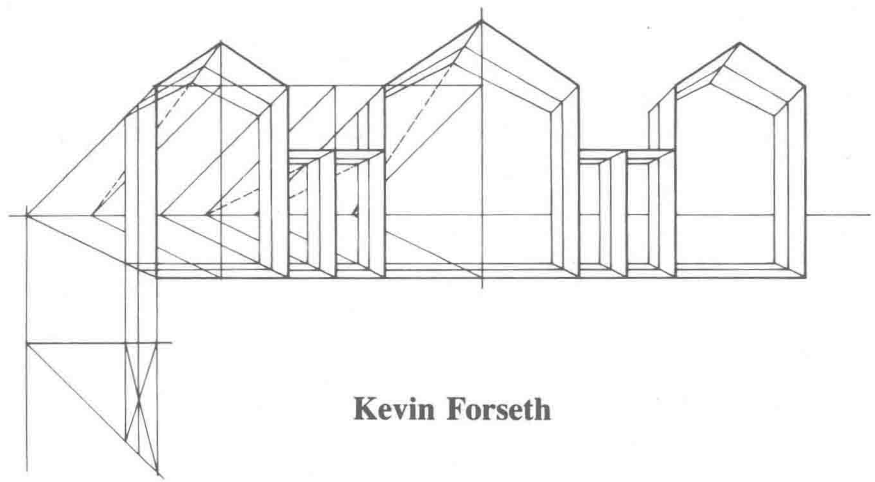

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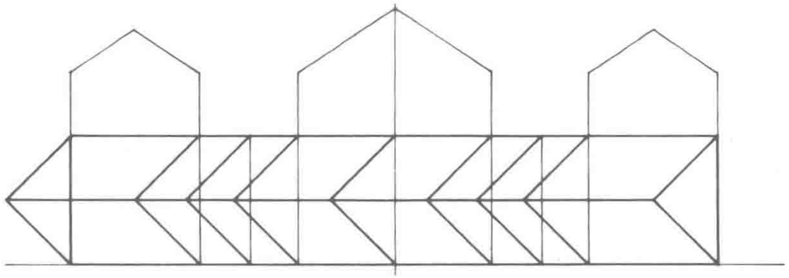
Preface

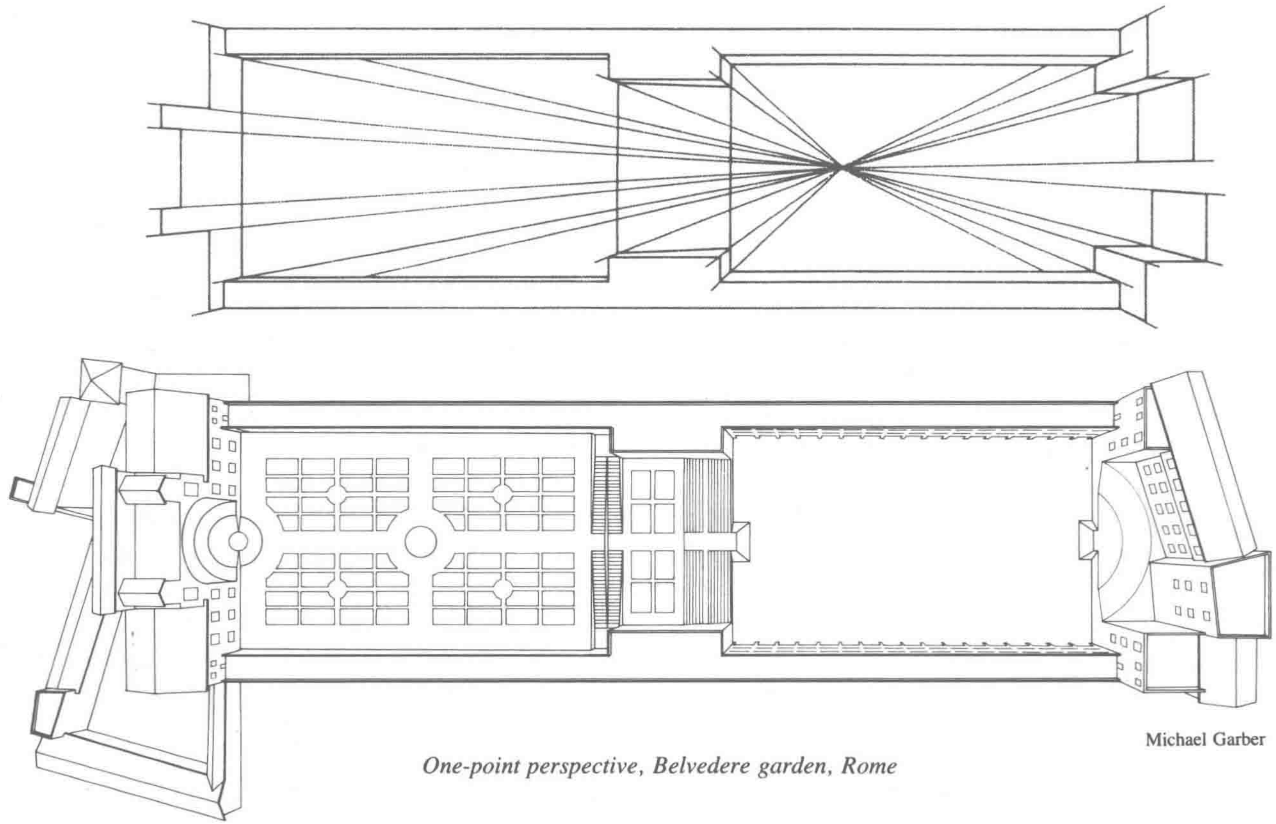


This book explains a new and useful system of measured pictorial drawing called glide projection. Named after the distinctive way in which they focus images, glide drawings are intended to complement the conventional range of pictorial drawing constructions. For centuries, the two most common graphic methods, perspectives and paralines, have effectively depicted the views of objects and surfaces only as they appear in the context of space. The purpose of glide drawings is to depict the opposite of this spatial view — in other words, to show built-up forms within the context of broad and shallow surfaces.

All material for this book is presented in nonmathematical terms, requiring only an acquaintance with the methods and procedures of linear perspective in order to be applied and understood. Due to the ease with which glides can be learned, and due to the fact that glides effectively structure the views of many different situations — from long and narrow street facades to aerial views of gardens to shallow sections and floor plans, to certain trompe l'oeil effects — glide drawings should appeal to designers in many fields, from architecture to interior design, landscape architecture, art, and urban design.

Much of the reason for linear perspective's enduring success can be attributed to the fact that for centuries its principles have been transmitted from person to person or from book to person on both procedural and theoretical levels. Procedural linear-perspective techniques, handed down to us in the form of treatises on rules and conventions since the days of Alberti, provide us with painless means for expedient application but at the expense of any real intellectual appreciation of perspective principles. On the other hand, theoretical linear perspective, in taking us beyond requisite skill levels to the foundations of perspective projection, is simply beyond the grasp of the casual user. Regarded positively, the delightful consequence of these stratified learning approaches is that linear perspective has always offered something for everybody to understand.

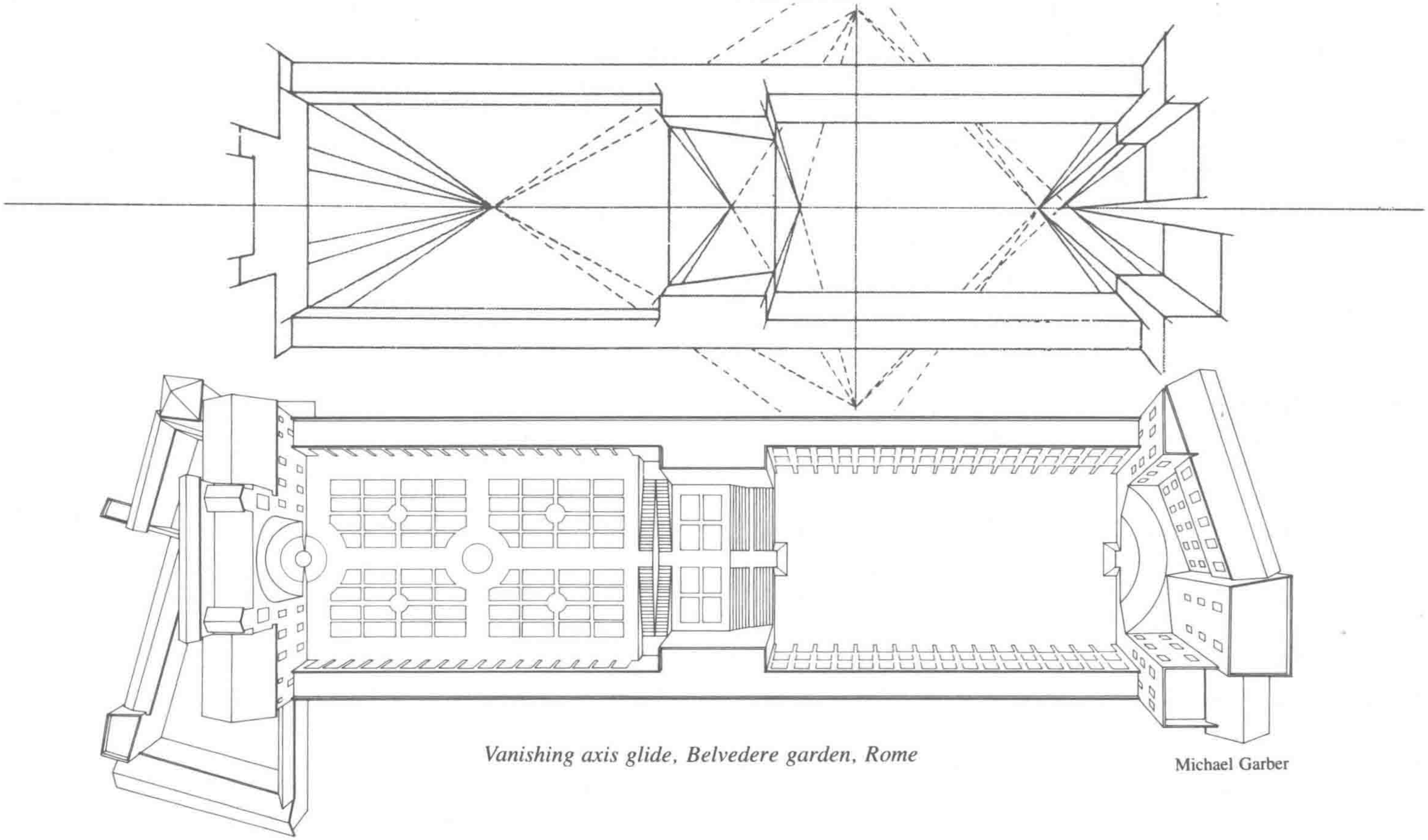
In keeping with the flavor of this perspective model, the main chapters of this book are devoted to glide-drawing methods and glide-projection theory. For readers who are intent upon quickly applying glide principles, I recommend reading the glide-drawing chapter first. The glide-application chapter supplements this approach. For readers in search of enlightenment, I recommend reading the first two chapters, followed by the chapter on glide projection.



Michael Garber

One-point perspective, Belvedere garden, Rome

Introduction



Vanishing axis glide, Belvedere garden, Rome

Michael Garber

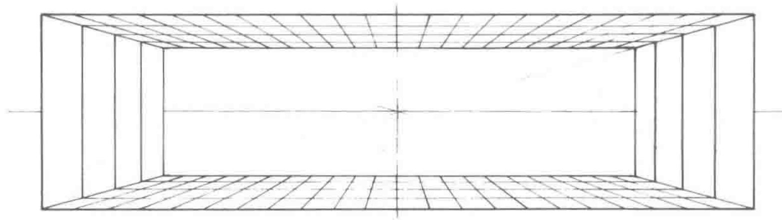
The problem involved constructing an aerial one-point perspective view looking down upon the site plan of an Italian formal garden. Michael, the student who was working with me at the time, was searching for the clearest way to express the garden's three-dimensional form. However, after several futile attempts, it became apparent that no matter how he chose to structure its image, significant graphic tradeoffs and unwarranted compromises were involved; conventional drawing methods were not adequate graphic tools for describing the garden's overall form.

Because of the long and narrow shape of the garden, one-point perspective constructions were ineffective. Garden endwalls and sidewalls competed for correct visual expression, with the result that no perspective setup satisfactorily revealed the essential surface details of the garden walls without noticeable visual distortion.

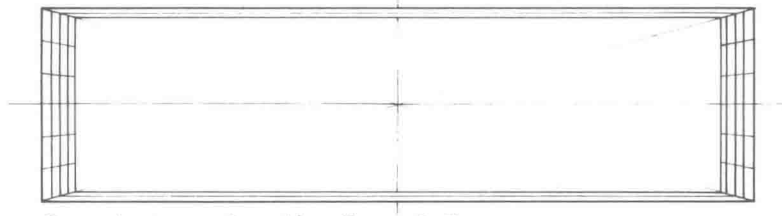
Four different pictorial views of the same long and narrow rectangular courtyard are shown at right. Two of these constructions illustrate the one-point perspective dilemma. Note that in both of the perspective constructions, the center vanishing point determines the line or edge along which adjacent perimeter wall planes must meet. Because the courtyard is rectangular and not square, the constructed widths of end- and sidewalls cannot be made equal. In fact, the narrower the rectangular courtyard, the greater the difference in the projected widths of the perimeter walls. Thus, if the long sidewalls are made wide enough in the perspective view to see details such as windows and arches upon their surfaces, then the endwalls will appear very deep and the overall aerial view will not suggest a shallow space. On the other hand, if a shallow width for the endwalls is first constructed, then virtually no surface detail will be seen on the resulting narrow sidewalls.

Paraline constructions, both normal and split variations, were also ineffective. Normal paralines revealed only two of the garden's internal wall surfaces within a single view, making it necessary to construct two views in order to see the detail on all four internal walls. Split paralines solved this problem but created another. In effect, a split paraline is two separate paralines that mirror each other across a central axis. All internal walls can be seen at once, but if the floor level changes within a split paraline, there is a wedge of space along the central axis that is undefined, resulting in a sectional view through the changing floor levels.

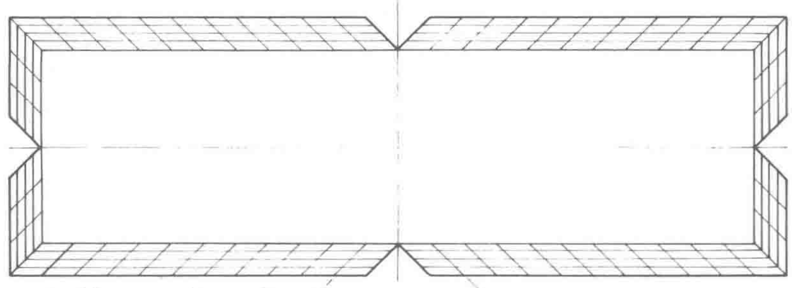
The garden construction problem was finally solved with a vanishing axis construction. This construction brought the perspective dilemma into balance by revealing all four of the garden's internal walls in controlled proportion to one another. It also eliminated the split-paraline problem by making the space continuous across the center axis. The perspective central vanishing point had dissolved into a vanishing axis.



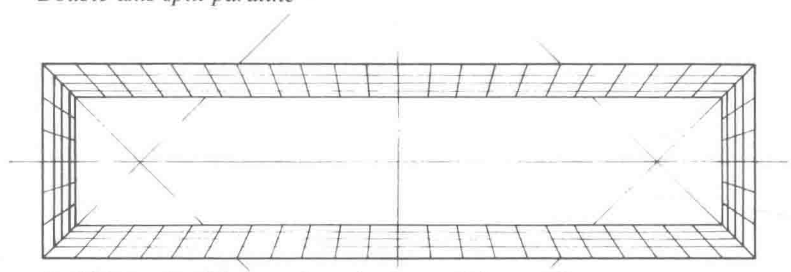
One-point perspective: endwalls distorted



One-point perspective: sidewalls too shallow



Double-axis split paraline



Vanishing axis glide: equal emphasis on all four walls

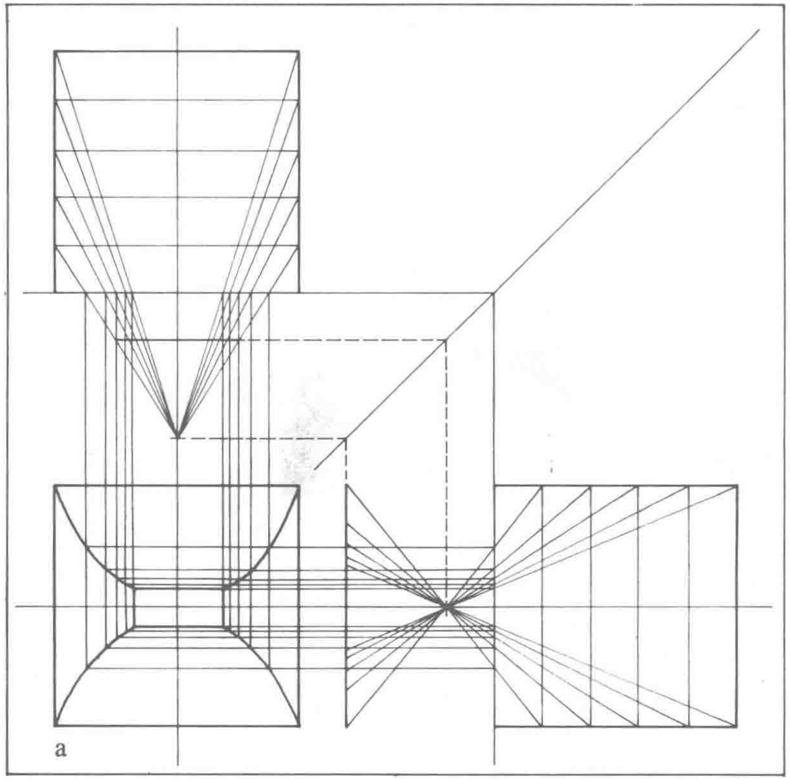
Soon after developing the geometry of the vanishing axis construction, other related drawing variations evolved. Some contained vanishing planes instead of vanishing axes; others combined vanishing planes and axes within the same pictorial image. All were governed by the principles of a more general projective order, a system conceptually different than perspective or paraline. Further, the geometry underlying these variations suggested an altogether different way of viewing their illusions. Unlike perspective constructions, which are meant to be optically viewed from the static vantage of a single spectator position, vanishing axis and vanishing plane images are structured to be laterally scanned from the dynamic vantage of a continuous viewing plane.

This unique viewing condition inspired the name for the family of all vanishing axis and plane variations. Thus, the term ''glide'' describes how the eye of a spectator physically glides parallel to the surface of such constructions in order to accurately read their projected images.

Double-slit Projection

From the beginning, it seemed important to keep the rules and procedures for generating pictorial constructions simple, for if they became complex, no reasonable person would care to use the system. The problem with difficult procedures is brought out in the case of double-slit projections.

There is a way in which to focus images that is neither glide, perspective, nor paraline. Developed while working on glide theory, it was named double-slit projection for the way that it focused the



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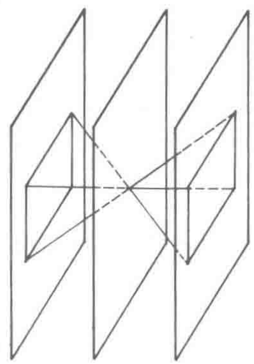

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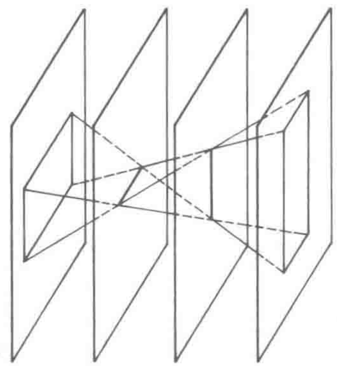
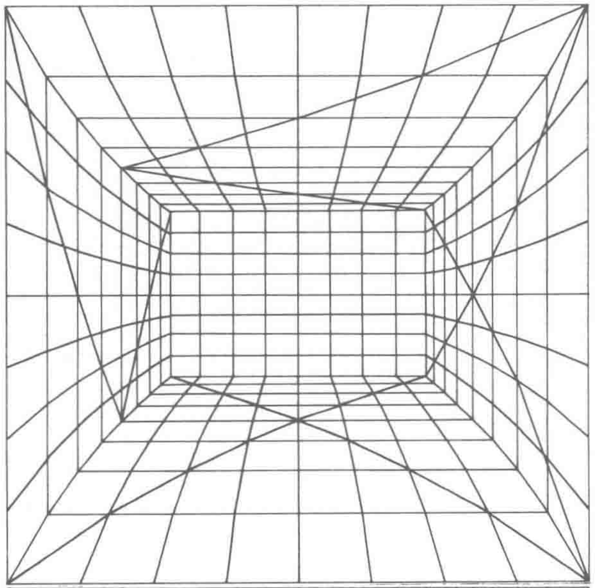


c

a. Double-slit image projected from top and side views of a cube
b. The geometry of point projection requires one focal plane
c. Double-slit projection requires two planes



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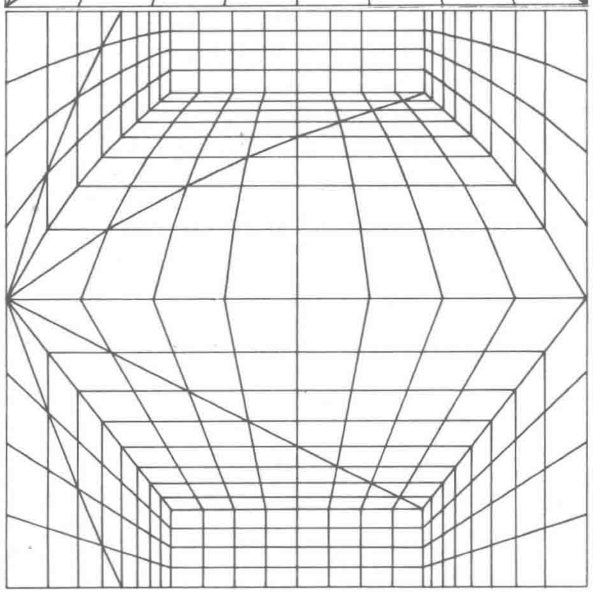


b

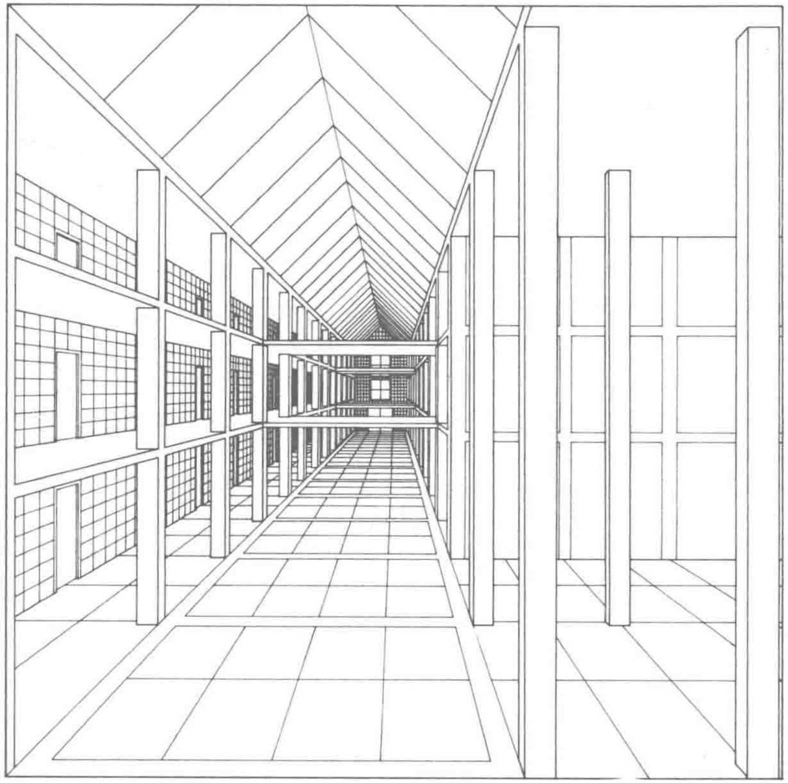
image of an object onto the surface of a picture plane by means of two slits oriented perpendicular to one another. Its image resembles a normal perspective view that has been stretched along one axis.

In terms of its structural and visual properties, double-slit projection is similar to vanishing-axis glide projection, yet it is different in one important respect. Many of the lines within a double-slit construction appear to curve, making its construction impractical.

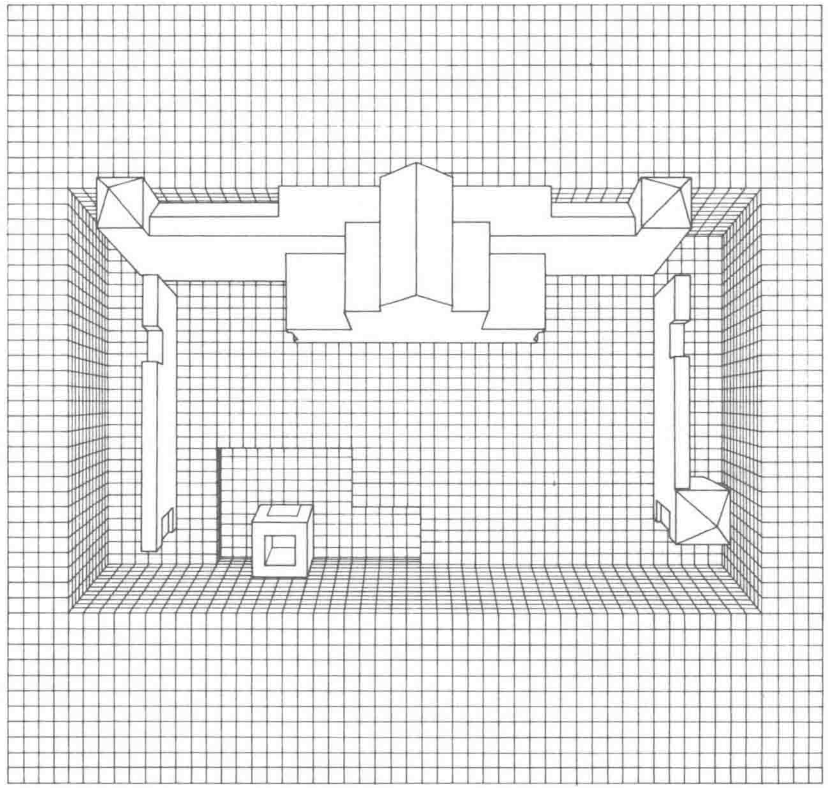
Glide Field Assumption

Glides are based on a different field assumption than paralines and perspectives. Early drafts of this book often referred to glides as compressed spatial constructions. Gradually, however, it became apparent that the spatial field, a real situation, had nothing to do with the idea of projective system, an uninterpreted logical structure. Thus, the orderly way in which points are transferred to the surface of the picture plane, which is another way of describing a projective system, is not related to our interpretation of the nature of the setting in which the view takes place. Projection systems may be used interchangeably for the purpose of depicting spatial or surface fields, but the system of perspective projection is structured to depict spatial situations with greater clarity than glide projection, and glides are structured to show surface conditions with greater clarity than perspectives. Space and surface are different open-ended field assumptions. Glide and perspective are different internally consistent projection systems. The nature of this glide visual field and its relation to the perspective field are described in more detail in the following chapter.

a. Double-slit construction
b. Double-slit image compared with vanishing-axis construction



Michael Garber

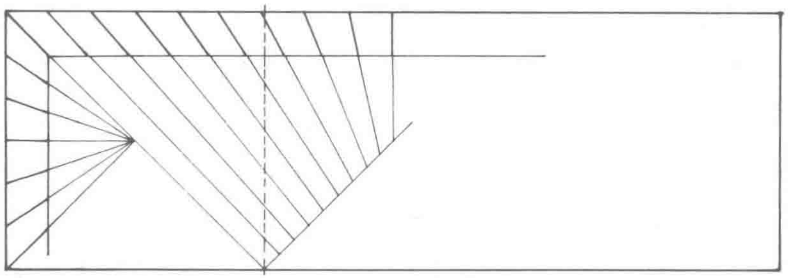


Michael Garber

One-point perspective view into deep spatial corridor

Vanishing-axis glide view of broad and shallow surface

Glide As An Alternative To Perspective



G. Viola-Zanini's traveling-vanishing-point construction

Vanishing-axis Constructions

In 1629, G. Viola-Zanini, an Italian architect and painter, devoted several pages of his treatise on linear perspective to an account of a construction method based on the idea of a traveling vanishing point. The method, which was intended to correct for visual distortion within long and narrow ceiling perspectives, actually worked, and was used by many of the painters of his era. In outward appearance, Zanini's vanishing-axis construction resembled a normal one-point perspective, conveying the illusion of lines vanishing towards the middle of the composition. In fact, few of its receding parallels ever did meet at the center point because they vanished along an axis instead.

Even though the traveling-vanishing-point construction was useful, Zanini's method never gained public acceptance. There were several good reasons for this. For one thing, his vanishing-axis structure contradicted one of the basic laws of linear perspective, which stated that all related parallels must vanish to a point. Few people during the 17th century were of a mind to deal with the seemingly absurd consequences of this contradiction. For another, Zanini's method described outward pictorial effects only. His method was not supported with a general theory, nor did its geometry have a basis in optical phenomena.