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Invisible lines: patterns of alignments in the renderings of Frank Lloyd Wright's Wasmuth Portfolio

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This article analyses Frank Lloyd Wright's composition techniques in the renderings of his Wasmuth Portfolio by diagramming perspective drawings of the K. C. De Rhodes and Victor Metzger houses. Previous studies of Wright's drawings have focused primarily on his graphic devices, whereas this article demonstrates how he employed patterns of alignments systematically to arrange key elements in the picture into geometric relationships. Additionally, in comparing the pattern system used in Wasmuth renderings with that in Japanese woodblock prints, this article provides new insights on Wright's artistic debt to the latter, and Utagawa Hiroshige's work in particular. In revealing the underlying patterns of Wright's renderings, this study contributes to a refreshed and more nuanced perspective of Wright's work and advances our understanding of the role of patterns in architectural representations.

Published in 1911, *Ausgeführte Bauten und Entwürfe von Frank Lloyd Wright* — later known as the Wasmuth portfolio — contained an introduction by Frank Lloyd Wright and drawings of his building projects from 1893 to 1909.¹ It exerted a great impact on European modernists who were impressed by the indigenous characteristics, the dynamic profiles and open plans of his buildings.² This folio also included beautiful architectural renderings that added to the aesthetic appeal of Wright's work.

Aside from their representational purpose, renderings in the Wasmuth portfolio transmit a sense of harmony and repose, and this effect is probably a result of an underlying pattern system that governs the composition of the picture. This article demonstrates how this system works by scrutinising patterns of alignments in the renderings of the K. C. De Rhodes House and Victor Metzger House. It also traces the source of this composition technique to Japanese woodblock prints, especially those by Utagawa Hiroshige (歌川広重).

Previous studies have focused mostly on how patterns played a role in Wright's plan, elevation, and ornament designs. For example, Anthony Alofsin has demonstrated how rotated primary forms informed Wright's designs of room accessories (furniture, light fixtures, windows, etc.) and eventually became motifs for his plans.³ Kevin Nute has argued that interlocking line patterns inspired Wright's plans of interpenetrating spaces and ornamental designs, whereas Jonathan Hale has observed that the window pattern of the Robin House also helped compose its facade design.⁴ Few have discussed the role of patterns in Wright's renderings, and this study will concentrate on that topic.

The specific issue of the linkage between Wright's drawings and his collection of Japanese woodblock prints has also generated extensive discussions in the past. Scholars, such as Arthur Drexler, Bruce Brooks Pfeiffer and Julia Meech have noted similar strategies in representing space in prints and Wright's renderings, such as using multiple planes to suggest distance and replacing frames of a drawing with foliage or tree trunks to achieve a more engaging effect.⁵ In examining the influence of traditional Japanese art on Wright, Nute suggests that Arthur Dow's grid analysis of prints in his book *Composition* of 1899 might have inspired Wright to use a similar device to compose his renderings.⁶ Whereas orthogonal grids might have been used to arrange the overall relationship between buildings and landscapes in the picture, patterns of alignments are concerned with buildings alone, adapting key points of building outlines systematically to minute details.

The Wasmuth renderings and Japanese ideals

In his introduction to the Wasmuth portfolio, Wright offered a brief overview of the renderings in the folio and acknowledged their debt to 'Japanese ideals'.⁷ Nonetheless, he did not explain what he meant by this.

Among all Japanese art forms, woodblock prints played a central role in Wright's life and career. By 1911 when Wasmuth portfolio was published, Wright had been collecting prints for nearly two decades.⁸ His affection for prints grew with his evolving understanding of them. Their influence penetrated into his daily life: at home, he pinned prints on the walls of the children's playroom and the master bedroom.⁹ In retrospect, Wright acknowledged: 'during my later years at the Oak Park workshop (1889–1910), Japanese prints had intrigued me and taught me much. [...] If Japanese prints were to be deducted from my education, I don't know what direction the whole might have taken'.¹⁰ Therefore, it is fair for us to reason that in 1910 when composing his introduction to the Wasmuth portfolio, by 'Japanese ideals' Wright was referring to inspirations and values he found in Japanese woodblock prints; however, what are they and how do they exert an impact on Wright's renderings in the Wasmuth portfolio?

Part of the answer lies in *The Japanese Print: an Interpretation*, a booklet Wright published in 1912, in which he analysed prints from a purely aesthetic perspective. Wright claimed that the artistic value of prints takes priority over their historic or realistic implications; for him, prints are primarily beautiful designs, and 'what other meanings they may have are merely incidental, interesting, or curious by-products'.¹¹

Wright argued that the beauty of prints stems from the geometric composition that governs their designs. Japanese art is 'a thoroughly structural art' he keenly observed, and having structures in form is a fundamental rule that informed every art medium of Japan. He explicated that 'structure' designates 'an organic form, an organisation in a very definite manner of parts or elements into a larger unity — a vital whole'.¹² Here Wright equated the 'structure' of a print with its most essential form — an arrangement that manifests the relation-

ships between parts and between parts and the whole. This definition is, in a way, analogous to Christopher Alexander's idea of 'structure': to extract the structure of something means to paint a simple picture of it that lets us grasp it as a whole; as structure distils the form, it consists primarily of patterns of relationships.¹³

Whereas structure guides print designs, geometry composes structure. Wright found that geometry features in the structure of prints: 'at the beginning of structure lies always and everywhere geometry ... geometry is the grammar, so to speak, of the form. It is its architectural principle'.¹⁴ Grammar describes rules of a language, determining the interrelationships between words and how they constitute a sentence. In comparing the role of geometry in a form to that of grammar in a language, Wright illustrated that geometry is an overarching principle of a form, which formulates relationships between parts and integrates them into a whole.

Along with aesthetic value, geometric structure also holds symbolic implications, or, in Wright's word, 'a spell-power'. In his view, we usually associate certain given ideas or sentiments with geometric forms — for instance, infinity for the circle, integrity for the square, and structural unity for the triangle — and thus geometric structure in turn bears a 'spell power' that conveys these ideas to the viewer. These connections constitute the poetic soul of prints and contribute to their mystic charm.¹⁵

However, despite their essential role, geometric structures remain invisible to the viewer, and therefore it is the artist's task to recognise the underlying geometry of the subject and reveal it in his/her works.¹⁶ Wright admired Japanese artists for mastering this very skill to extract the kernel pattern of their subject:

A Japanese artist grasps form always by reaching underneath for its geometry. No matter how informal, vague, evanescent, the subject he is treating may seem to be, he recognizes and acknowledges geometry as its aesthetic skeleton ... it is also the suggestive soul of his work.¹⁷

Consequently, out of his deep appreciation and understanding of the constitutive role of geometric structure in creating visually pleasing pictures, Wright adopted it in his own work.

Patterns of alignments in the Wasmuth renderings

Renderings in the Wasmuth portfolio were generally developed by two-point perspective from plans. It is likely that after his apprentices had completed the perspective projection, Wright modified the drawing with patterns of alignments: he drew regulating lines that positioned key points of building outlines into geometric relationships. This act entailed manipulation of perspective for expressive ends, and Wright was willing to do so. He articulated a rather relaxed attitude to presentational accuracy in his introduction to the Wasmuth portfolio:

They [these drawings] merely aim to render the composition in outline and form, and suggest the sentiment of the environment. They are in no sense attempts to

treat the subject pictorially, and in some cases fail to convey the idea of the actual building.¹⁸

It seems that for Wright, renderings were not merely mechanical presentation of a building project, but rather they created a particular reality of their own and thus offered him an opportunity to convey his ideal vision of the project.

Wright drew a double-line frame for most of his Wasmuth renderings, and regulating lines usually emanate from certain points on the outer frame. The most important generating points are usually intersections of the outer frame and the front ground line of the building (Figures 1, 10 and 12).¹⁹ However, if a terrace features in the picture, the primary generating points are intersections of the front edge of the terrace and the outer frame of the picture (Figures 7 and 13). Regulating lines launching from these points engender a geometric pattern that governs the outline of the building, in particular accentuating its horizontally expansive features.

Wright usually employed secondary generating points to adjust the composition with more precision. The choice of secondary points varies according to the shape and complexity of the building massing. For example, if a building is characterised by sweeping roofs or overhanging eaves (as many of Wright's prairie houses are), the intersections of roofline extension and the outer frame of the picture usually serve as secondary generating points that help adjust key points on the building outline and adjust the locations of windows and doors (Figures 3, 12 and 13). By contrast, if a building has a prominent vertical feature, the secondary generating point usually falls on the intersection of the extension of the building's dominating vertical line and the upper frame of the picture (Figures 8 and 13). Wright sometimes utilised an additional auxiliary point within the building to refine the inner relationships between building parts (Figures 2, 9, 10, 11 and 13).

Take the rendering of the K. C. De Rhodes House, for example (Fig. 1). It is a two-point perspective drawing from normal eye level; one vanishing point is within the picture, slightly right to the right of the figure of the woman, whereas the other vanishing point is out of the picture far to the left. The primary generating points A and B fall on the intersections of the extension of a building ground-line and the outer frame of the picture. Point A also bisects the left border. Secondary generating points C and D are produced by intersections of the roofline extension and the outer frame. The major part of the building falls into the area defined by these four points. Lines emanating from them weave a triangular pattern that aligns important points on the building outline, making each key part related to and affected by other key parts. For example, regulating lines A1 and B1 link the chimney corner (point 1) respectively with a roof corner and a turning point of the building profile (points 3 and 7); regulating line A2 and B2 align the roof apex (point 2) with roof corners (points 6 and 10), whereas B3 links roof corner (point 3) and the turning point of the building profile (point 9).

More strikingly, many of these regulating lines (A2 and B2, A4 and B1, A11 and B10) intersect along the axis of the building (Fig. 2). Point E — the intersection of the axis and the garden wall — serves as an auxiliary point in the com-

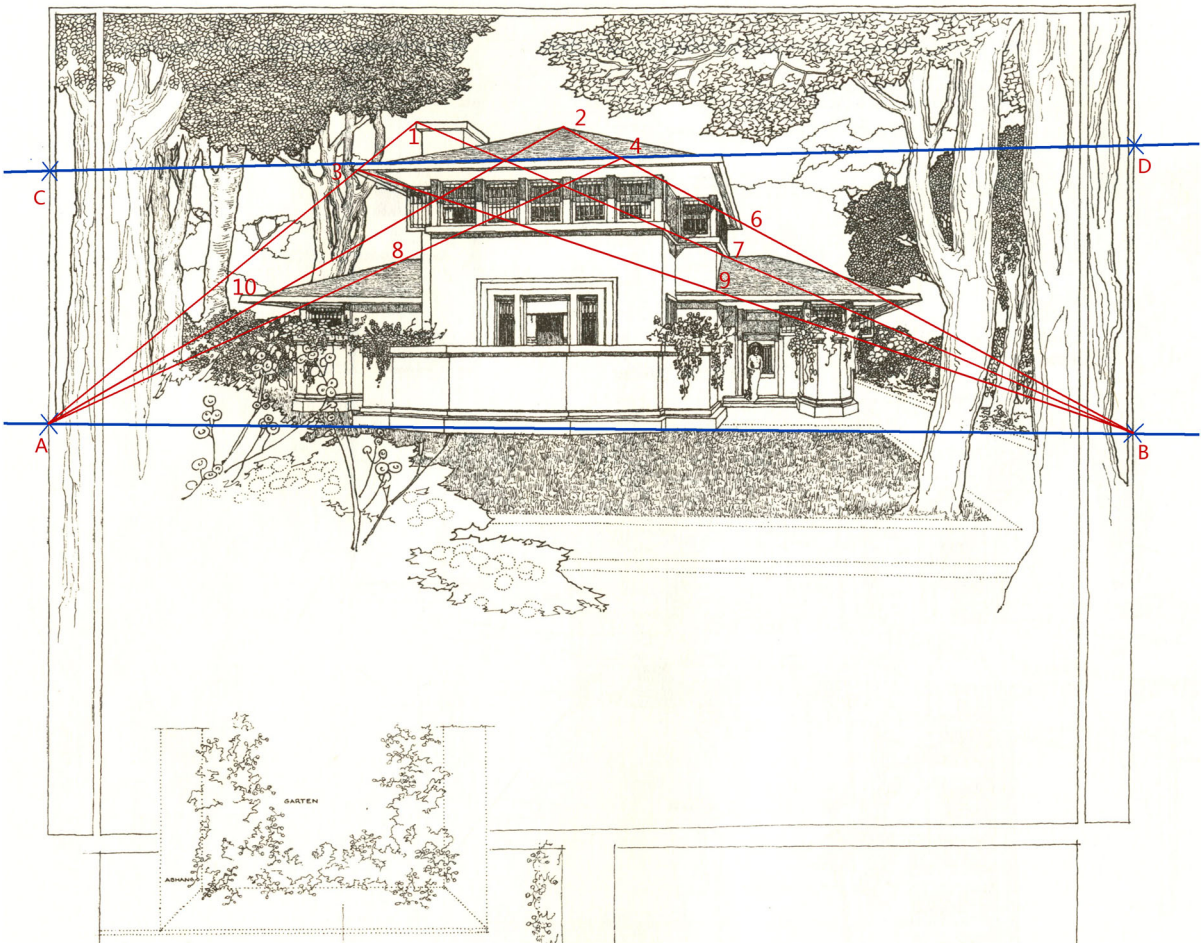
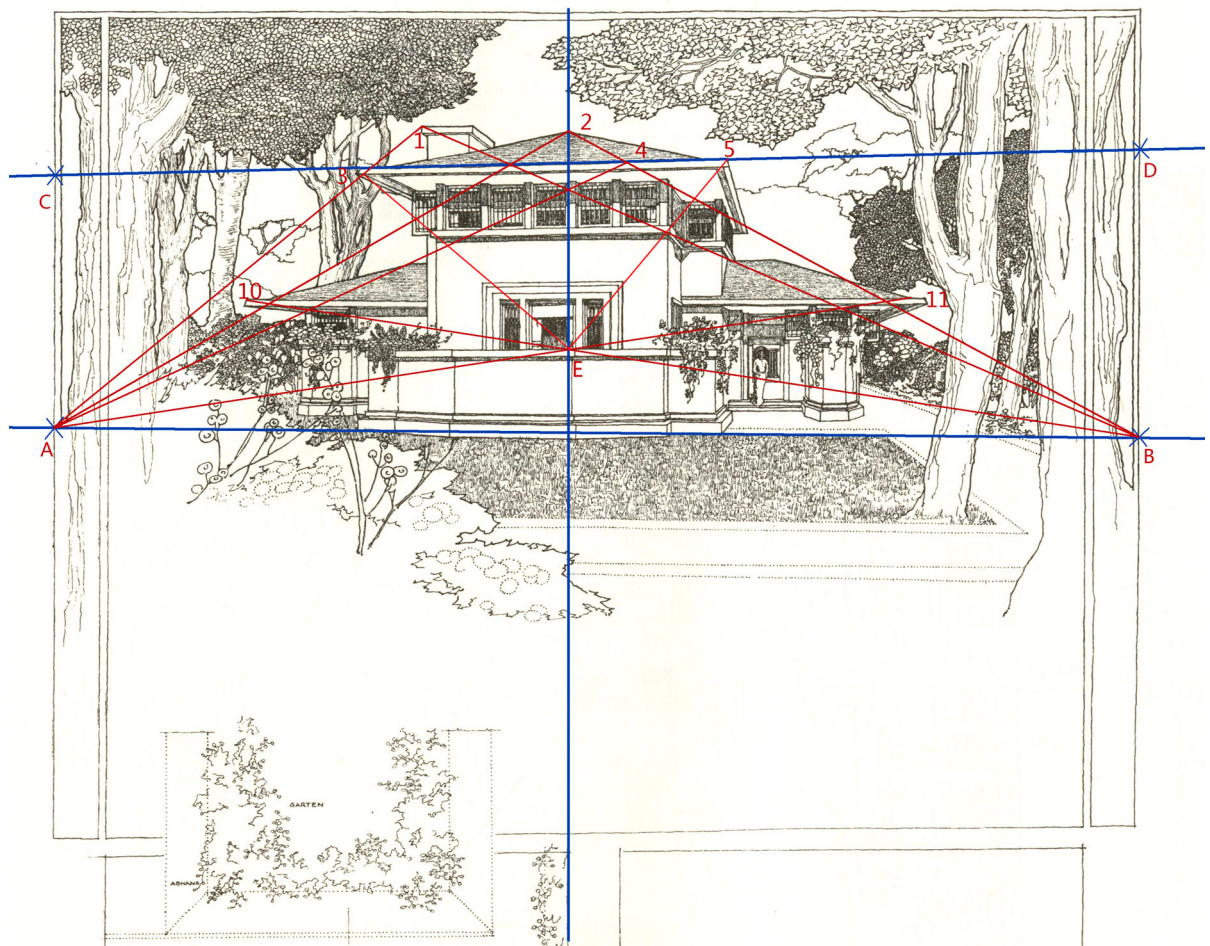


Figure 1.
Perspective Drawings of K. C. De
Rhodes House, Wasmuth Portfolio,
Plate 29. (Diagram by author).
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position. Not only do A11 and B10 converge here, it also helps manage the inner relationship between building parts: from it launch two lines, E3 and E5, which align corners of the roof and the window sill, thus tightening the relationship between the main structure and its overhanging roof. The axis of the building also plays a role in the layout of the entire plate. Its extension line overlays the edge of the ground plan shown in the lower part of the plate. Although all these relationships are not readily visible, one can still recognise a sense of harmony and structural unity (ideas associated with triangles) transmitted through the picture.

Generating points C and D play a supporting role in the composition: AD and BC — lines connecting four generating points diagonally — help adjust details within the building outline: the roof apex of the wing, the shape of the central door and the position of the figure (Fig. 3).²⁰ Wright observed that in prints



human figures are usually depicted 'in place, harmonious with the rest,' and he tried to do likewise.²¹ Therefore, in the rendering of K. C. De Rhodes House, regulating lines BC and D12 adjust the position of the figure and thereby anchored her into the composition of the drawing.

The foliage and bushes in the picture do not, however, conform to the patterns. The freehand style of foliage depiction serves to temper the rigid outline of the building. Wright took different approaches to representing his building and the landscape and usually set the two in contrast. He utilises layers of greenery to create a sense of depth in the picture: vertical elements, such as tree trunks, are placed at the very front to define the left and right sides of the picture. The effect of this strategy, as Arthur Drexler observes keenly, is to 'establish the foreground plane closest to the observer, setting up a tension that pulls the eye backward and forward in the implied space

Figure 2.
Perspective Drawings of K. C. De
Rhodes House, Wasmuth Portfolio,
Plate 29. (Diagram by author). ©
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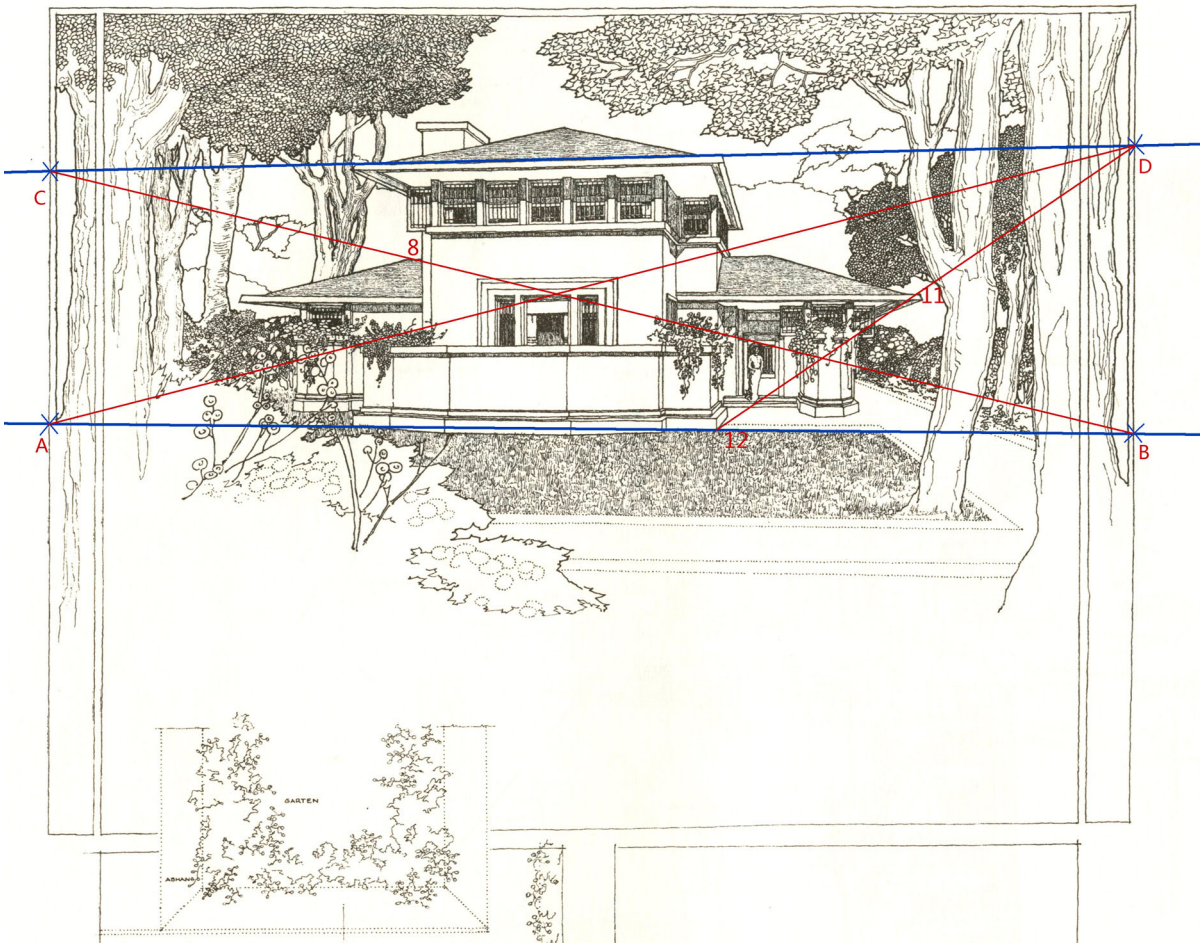
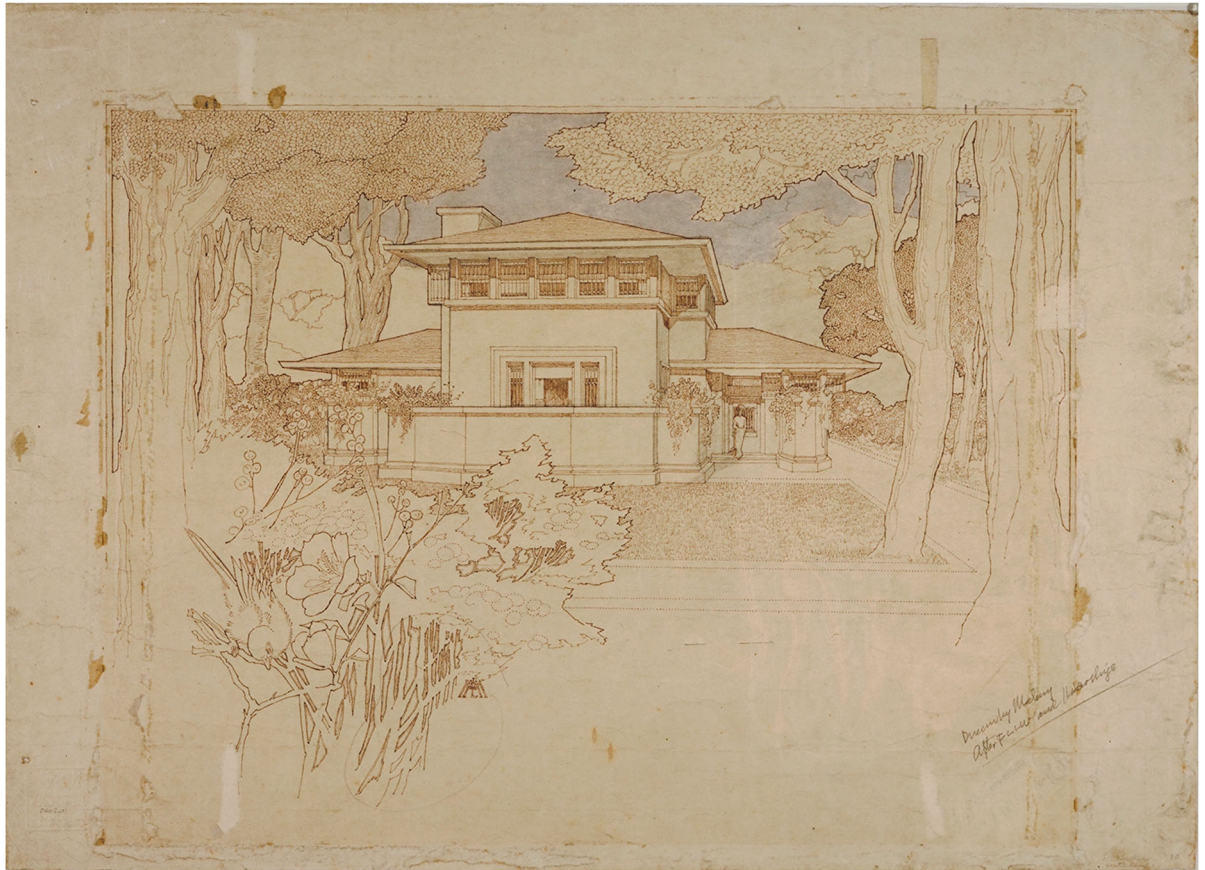


Figure 3.
Perspective Drawings of K. C. De Rhodes House, Wasmuth Portfolio, Plate 29. Diagram showing the pattern of lines locating the figure in the picture. (diagram by author).
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between tree and building, insisting that the building is not an isolated form'.²² In the rendering of the K. C. De Rhodes House, this device works nicely: trees and bushes at the front establish the foreground plane where the viewer stands; the lawn extends the middle ground and situates the building in the background. This arrangement engages the viewer and creates a sense of distance between him/her and the building in the background.

The Wasmuth rendering of K. C. De Rhodes House is a revised version of a drawing by Marion Mahony, a talented apprentice and delineator who, by the completion of this drawing, had worked in Wright's Oak Park studio for a decade. At the bottom of the original drawing, Wright wrote: 'Drawn by Mahony after FLW and Hiroshige'²³ (Fig. 4). Although in adding this line, Wright probably wanted to highlight his contribution, this remark seems to be justified nevertheless. All apprentices in the Oak Park studio must have



seen Wright's print collections, listened to his appreciation and interpretation of them, and, more or less, were influenced by them. As a matter of fact, the entire studio was decorated with so many oriental artworks Wright collected over the years — prints, Buddhist scrolls, pottery figures, jars, just to name a few — that it would be hard not to be nourished by them (Fig. 5). Paul Kruty, in tracing the evolution of Mahony's architectural renderings, notes that she worked out a style of her own around 1906 when she was producing presentational drawings for Wright.²⁴ The original rendering of K. C. De Rhodes House was completed in 1906. This coincidence makes it tempting to think that Mahony's development was catalysed by Wright's direction and the cultivation of prints.

A bird and flower at the left bottom of the picture features in the original rendering by Mahony (Fig. 4). Together they constitute the immediate foreground plane for the scene and attract the viewer's attention greatly. A similar arrangement is often found in Hiroshige's prints which usually have strong motifs in the foreground, such as a flying bird, a blossoming tree, or part of architecture, to dominate the scene, engage the viewer's gaze, and then direct it towards back-

Figure 4.
Perspective Drawings of K. C. De Rhodes House by Marion Mahony, 1906. The Frank Lloyd Wright Foundation Archives (The Museum of Modern Art | Avery Architectural & Fine Arts Library, Columbia University, New York).

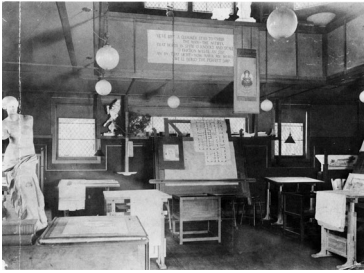


Figure 5.
Frank Lloyd Wright, Oak Park Home
and Studio, Drafting Room, 1898.
This photograph was originally
published in *The Architectural
Review* (June 1900).



Figure 6.
Utagawa Hiroshige,
Nihonbashi Edobashi (日本橋江戸
橋駅), 1857, no. 43 from the series
of *One Hundred Famous Views of
Edo*.

ground.²⁵ These motifs are sometimes presented in a cropped form. For example, in the *Nihonbashi Edobashi* (日本橋江戸橋駅), a section of the bridge balustrade possesses half of the scene, but it also provides a compositional frame through which the viewer sees the river bank and Edobashi Bridge in the background (Fig. 6). This arrangement gives the viewer a feeling of standing on the bridge looking out onto the wider landscape.

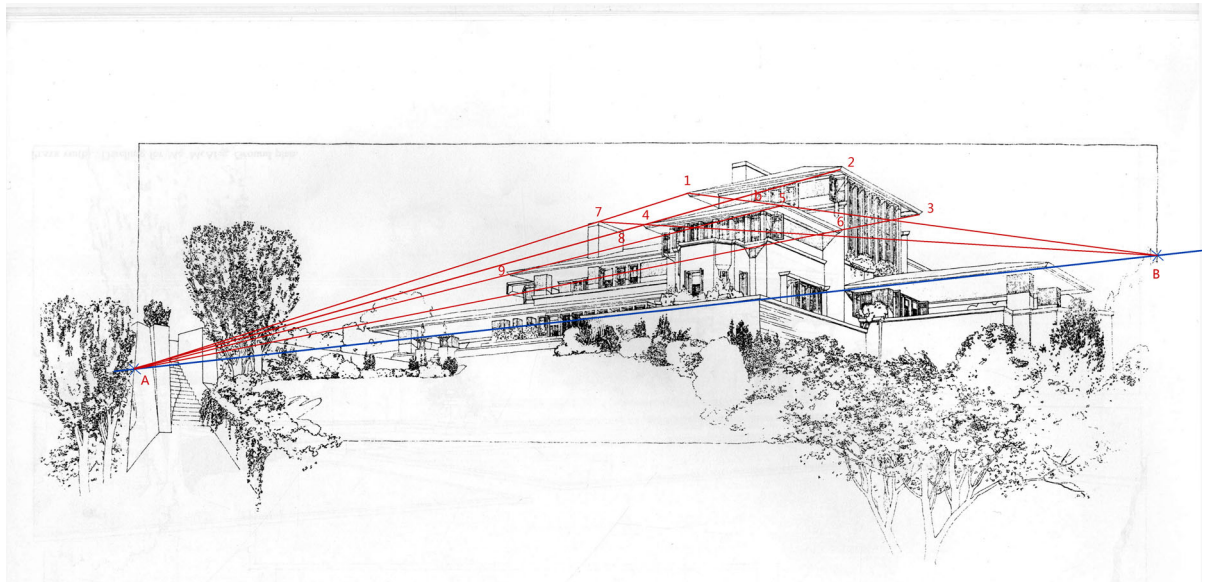
Despite his deep appreciation of Hiroshige's prints, Wright never had a non-architectural motif take half of the scene, although he also employed cropped motifs, usually tree branches, at the margin of the rendering to frame the building scene. For Wright, the primary task of the rendering is to represent his building, and all other motifs are secondary and subordinate to this goal. Following this principle, in revising Mahony's drawing for the Wasmuth portfolio, Wright simplified the depictions of the foliage in the foreground and completely erased the bird and flower, perhaps because he felt that they were too delicate and thus would distract viewers' attention from the building.

Compared to the K. C. De Rhodes house, the Victor Metzger house has a strong vertical feature and is characterised by layers of terraces and overhanging roofs (Fig. 7). Its rendering is again a two-point perspective, and two vanishing points are out of the picture far to the lower left and right sides. It represents the building from an observational point below the site. This angle highlights the layout of the projecting terraces and manifests how the building sits in relation to its sloping site. This drawing presents the building at a seemingly 45-degree angle and gives equal importance to each side, a strategy Wright often employed to represent buildings with extended wings.²⁶ This rendering omits the lower frame and thus creates an impression as if the space were flowing out and engaging the viewer into the scene.

Wright used a similar pattern system to guide the composition of this rendering (Fig. 7). The most prominent generating points A and B are the intersections of the frame and the extension line of the edge of the central terrace (this extensional line also overlays the doorway roofline on the right). Regulating lines launching from these two points align most of the roof corners and weave them into a web of triangular interrelations. For example, regulating line A1 links a roof corner and chimney corner (points 1 and 7); A2 aligns roof corners 2, 4, and chimney corner 8; A3 arrays roof corners 3 and 6 whereas A5 links 5 and 9. Regulating line B1 aligns roof apex b and roof corners 1 and 5, whereas B7 links a roof corner and chimney corner (points 4 and 7).

To cope with the vertical feature of the building, Wright employed a secondary generating point C, the intersection of the upper frame and the extension of the corner-line of the main structure, to adjust the building profile vertically (Fig. 8). The extension line of doorway roof also meets the upper frame at C (line C11). Additionally, AC, the line connecting two generating points, aligns a chimney corner and roof corner (points 7 and 1). These lines constitute a triangle that encloses the building and divides it into two parts facing different directions.

The apex of the main building roof (point a) also plays a key role in the composition (Fig. 9). From it launches regulating line ac that aligns apexes of sloping



roofs (points a and b) and the terrace corner c. It also radiates two regulating lines a10 and a11 that link the roof apex a with roof corners 4, 9, 10 and 3, 11, respectively. The terrace corner (point d) serves as a compositional pivot within the building: from it diverge two auxiliary lines d3 and d7 that tune the inner relationships between various parts of the building.

The rendering of the Victor Metzger house is a complicated picture. The arrangement that so many elements fall into alignment is too neat to be purely coincidental. In addition to the renderings of K. C. De Rhodes and Victor Metzger houses, I have diagrammed another five renderings in the Wasmuth portfolio, and four of them — the renderings of the Winslow House, Hillside House School Building, Concrete House Project designed for *Ladies' Home Journal*, and the Thomas P. Hardy House — have patterns of alignments (Figs. 10–13).²⁷ To make my study more efficient, I try to sample diverse types of renderings, including perspectives made from eye-level, bird's-eye (Fig. 11) and worm's-eye views (Figs. 7 and 13) and including renderings of both single buildings (Figs. 10 and 12) and a building complex (Fig. 11).

In comparing patterns in these diagrams, we shall summarise that this pattern technique is highly adaptable, and Wright adjusted it each time to specific building characters. The most distinct example is the rendering of the Hillside House School: regulating lines do not rely on generating points on the picture frame but are generated simply by linking key points on the building outline (Fig. 11). This divergence might have to do with that it was a bird's eye perspective so that the ground-line of the building played less of a role in the composition. In the rendering of the Thomas P. Hardy House, regulating lines comprise two triangles penetrating each other and pointing in opposite directions (Fig. 13).

Figure 7.
Perspective Drawings of the
Dwelling for Victor Metzger,
Wasmuth Portfolio, Plate
9. Diagram showing how to
determine the generating points on
borders and regulating lines align
roof corners (diagram by author). ©
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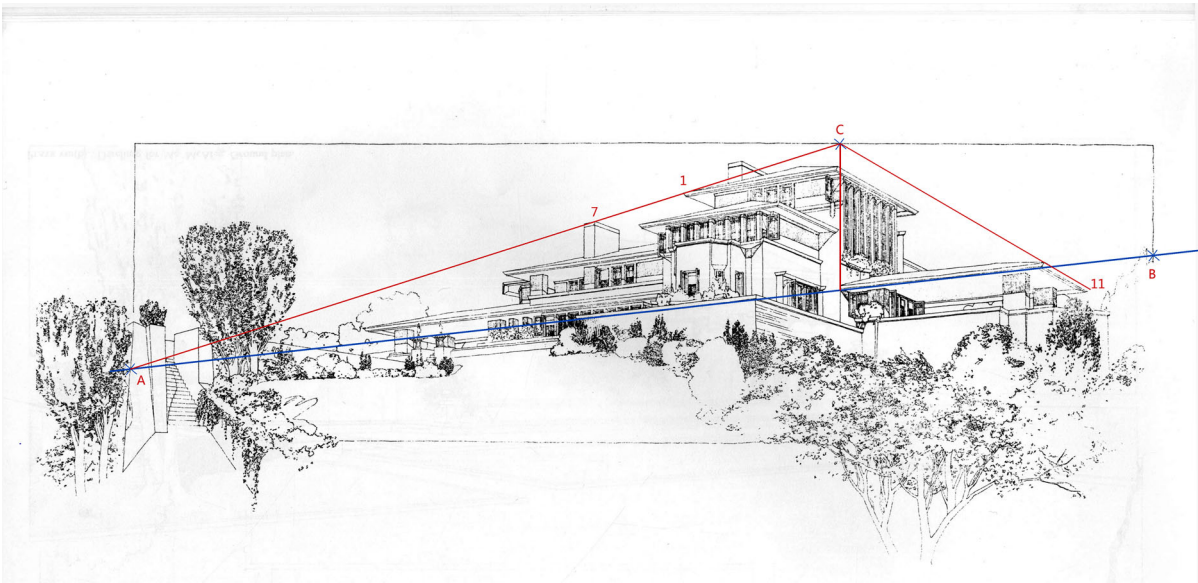
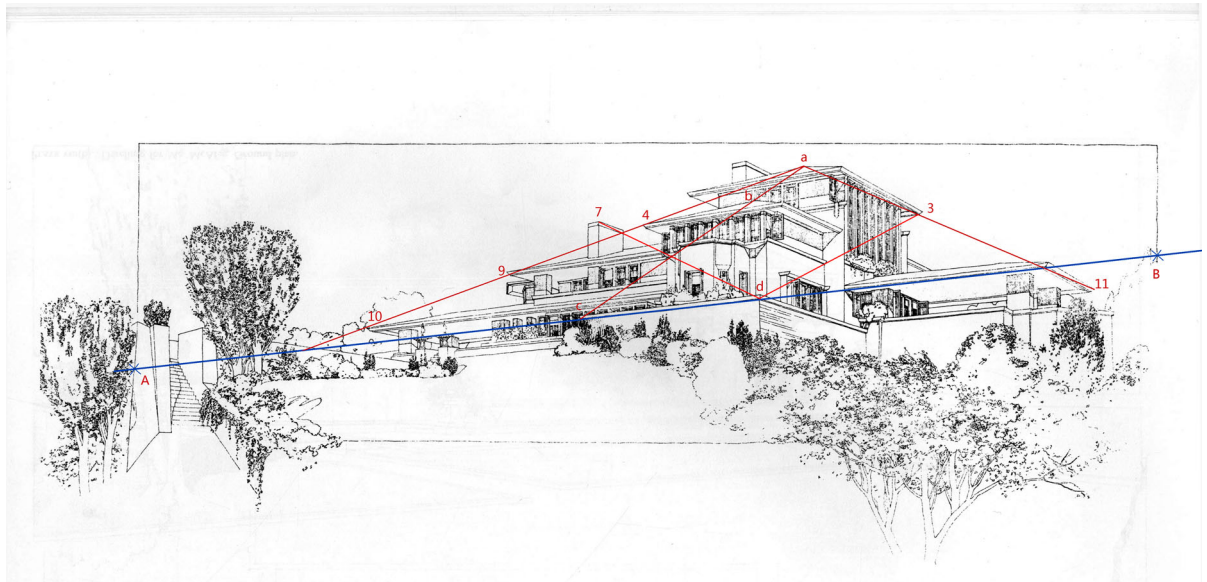


Figure 8.
Perspective Drawings of the
Dwelling for Victor Metzger,
Wasmuth Portfolio, Plate
9. Diagram showing the secondary
generating point and its role in the
composition (diagram by author).
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This elegant pattern aligns key points on the building profile and makes them mutually related to each other.

The fact that a large portion of the tested renderings conform to patterns of alignments indicates that Wright employed this technique purposefully and somewhat consistently. However, most of the Wasmuth renderings are based on drawings completed originally by apprentices working at Wright's Oak Park studio. In attempt to attribute the individual authorship of the Wasmuth renderings, H Allen Brooks notes that the delineations of buildings is stylistically uniform and thus makes it impossible to trace their author; only the various depictions of foliage give clues to their delineator.²⁸ Based on his identification, of all the drawings examined in this article, the renderings of the Victor Metzger House and the Hillside House School Building were originally drawn by Birch Burdette Long and all others by Marion Mahony.²⁹ But, Wright probably revised most of the drawings produced in his studio to his specific taste and standards, especially presentational renderings. Barry Bryne, an apprentice who worked in the Oak Park studio, tells that Wright often came to the studio after office hours and spent hours working over the drawings: 'he had infinite patience and would devote endless time to a minute and seemingly boring job that normally would be delegated to a draftsman'.³⁰ This act of Wright's may account for patterns of alignments and the resulting uniform style found in his Wasmuth renderings.

Although in Wright's renderings the compositional pattern is invisible, its geometric 'spell power' pervades the picture. In the early 20th century, in attempt to understand how our minds organise chaotic visual stimuli to forge meaningful perceptions, a number of experimental psychologists proposed principles of



gestalt perception, which were later supported by laboratory research in neurology. This theory maintained that when things are lined up in space or form an orderly pattern, our minds tend to perceptually see them as a whole; and, if parts of this whole are missing, our perceptions will subconsciously fill the gap.³¹ Accordingly, our eyes, seeing the finished renderings, have the inclination to compensate for the disruptions, fulfil the necessary connections, and integrate aligned elements in our minds. With that, we enjoy a sense of charm and repose transmitted by the picture, in the very same manner Wright appreciated Japanese woodblock prints.

Patterns of alignments in prints by Utagawa Hiroshige

Roger Keyes, in studying composition of Japanese prints, argues that a number of artists, notably Utagawa Hiroshige, Katsushika Hokusai (葛飾北斎) and Suzuki Harunobu (鈴木春信), employed geometric composition systematically in their print designs during the second half of the Edo Period (1603–1868).³² Among these print artists, Wright's approach seems to resemble Hiroshige's the most: both of them used generating points on the frames of their drawings. By contrast, Hokusai adopted generating points within the picture.

Hiroshige was Wright's favourite artist. Wright travelled to Japan in 1905 and returned with prints in great quantities and excellent quality. Many of them were by Hiroshige, which enabled him to assemble an exhibition of Hiroshige's prints at the Art Institute of Chicago in 1906.³³ All 213 prints on display were provided by Wright alone.³⁴ This was the first retrospective exhibition of Hiroshige's work in the world and, surprisingly enough, not arranged by a specialist

Figure 9.
Perspective Drawings of the
Dwelling for Victor Metzger,
Wasmuth Portfolio, Plate
9. Diagram showing the auxiliary
generating points and their role in
the composition (diagram by
author). © ARS, NY and DACS,
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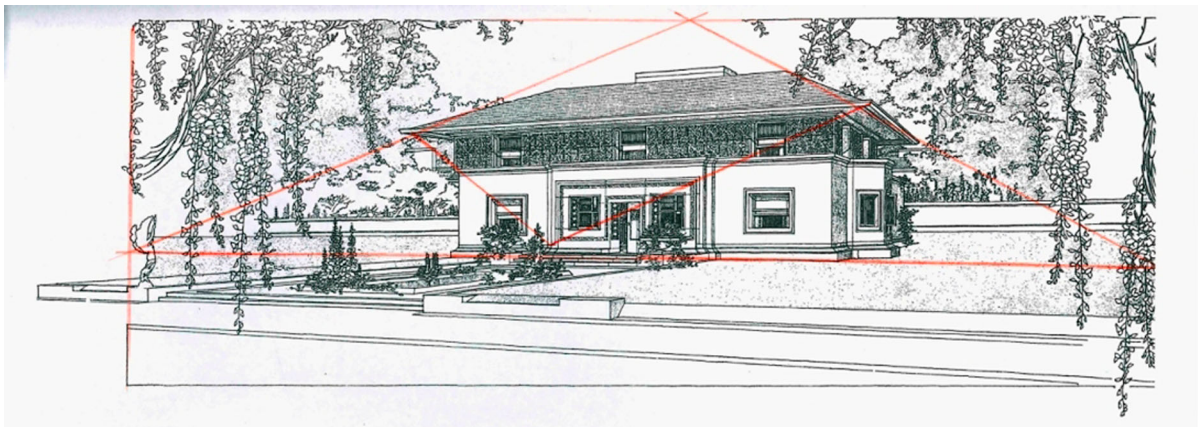
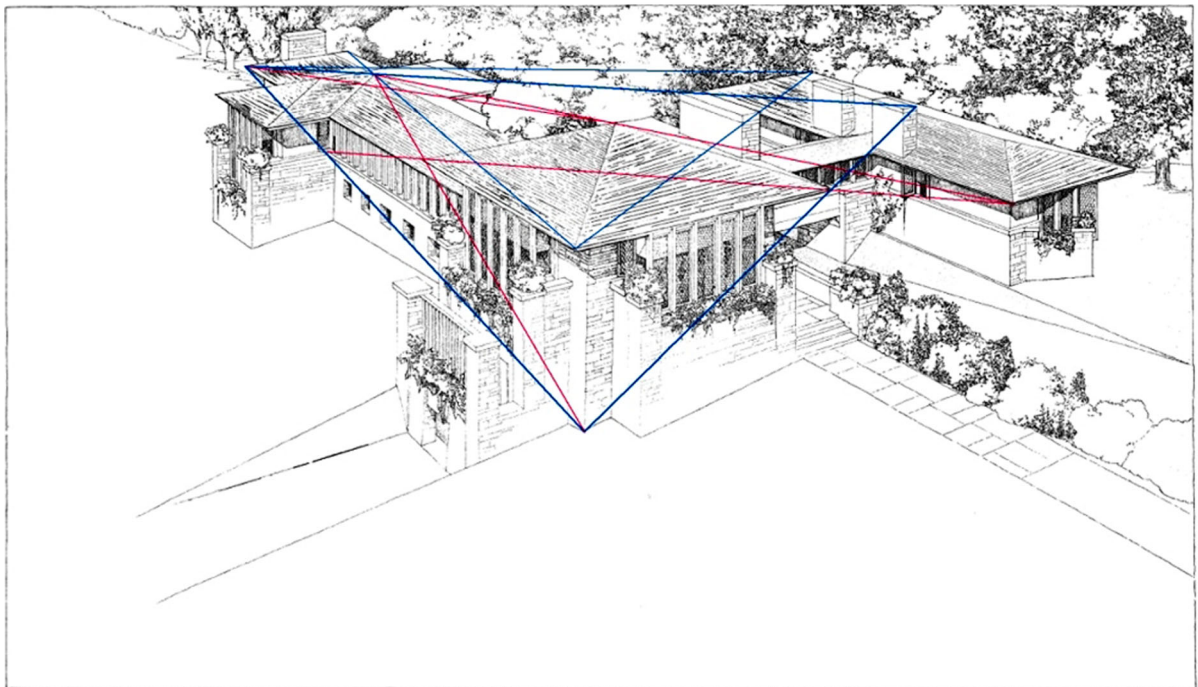


Figure 10.
Rendering of Winslow House,
Wasmuth Portfolio, Plate 1(diagram
by author). © ARS, NY and DACS,
London 2018.

Figure 11.
Rendering of Hillside Home School
Building, Wasmuth Portfolio, Plate
10(diagram by author). © ARS, NY
and DACS, London 2018.

but by an architect. Wright designed the layout of the exhibit, arranged its catalogue, and wrote an introduction to it, which served as a draft for his later, essential text *Japanese Print: an Interpretation*. Given Wright's extraordinary interest in Hiroshige's prints, it is more likely that Wright studied the composition technique from his rather than other print artists' work.

Keyes analyses geometric composition of two prints by Hiroshige, *Driving Rain at Shōno* (庄野白雨) and *Night Snow at Kambara* (蒲原夜之雪), both



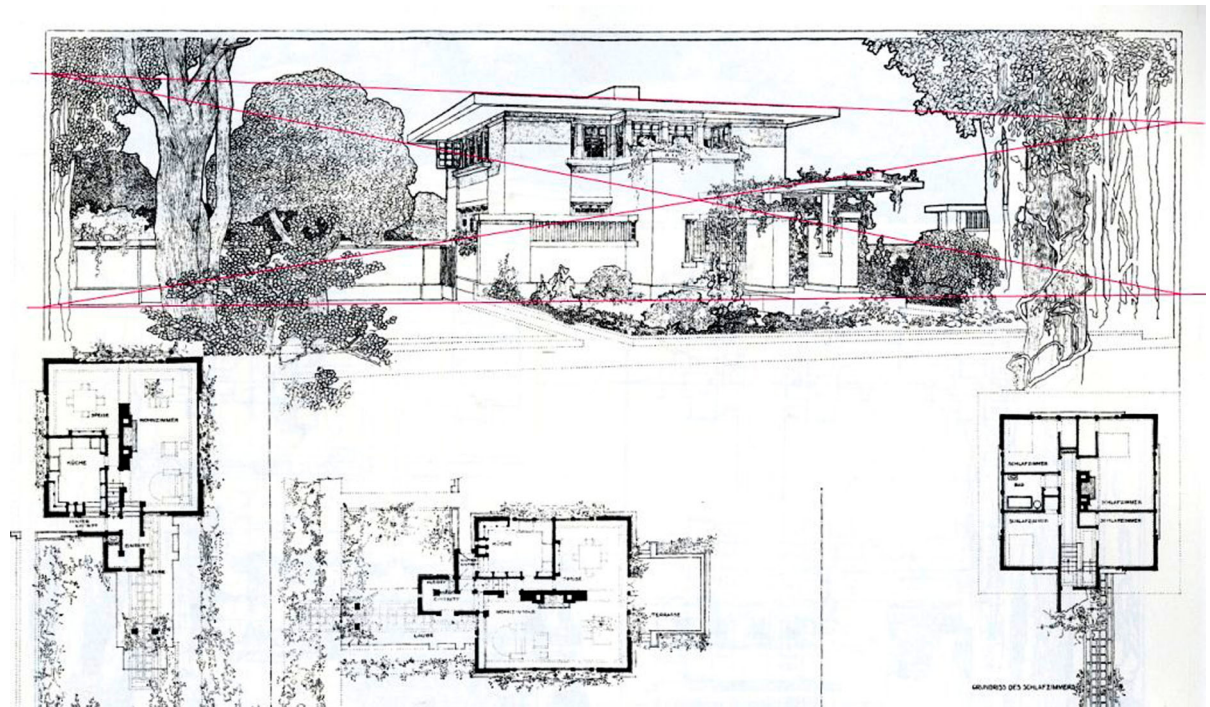


Figure 12.
Rendering of Concrete house
project for Ladies' Home Journal,
Wasmuth Portfolio, Plate 14
(diagram by author). © ARS, NY
and DACS, London 2018.

of which were from the print series of *The Fifty-Three Station of the Tōdaiō* (東海道五十三次). Keyes drew a series of diagrams to show how Hiroshige employed patterns of alignments to determine or adjust the position of almost every significant element in the composition. Here I assemble the most prominent ones to show the gist of his analysis. For example, in *Driving Rain at Shōno*, two of the most important generating points fall upon the intersection of the frame lines and extension of the pole held by the palanquin bearer on the left (Fig. 14). Lines emanating from these two points weave out a matrix that encloses all figures in the picture. These lines align key points on the figures' postures, regulate their placements, and adjust their relationships to the rest of the picture. The indented corners also play an important role in the composition (that explains why Hiroshige consistently drew them on his print borders): a line connecting an upper corner point with the lower generating point guides the posture of the first man, whereas the line linking a lower corner point with the upper generating point is tangent to the umbrella and also regulates tree profiles.

Hiroshige employed this alignment system to arrange both human figures and landscape in the picture. By contrast, Wright applied patterns of alignments primarily to the outlines and important details of his buildings but he rarely exploited them to manipulate the landscape. The two used the system to varied ranges because their representational foci differed. Hiroshige aimed to portray a harmonious scene; with no specific emphasis, his visual interest was

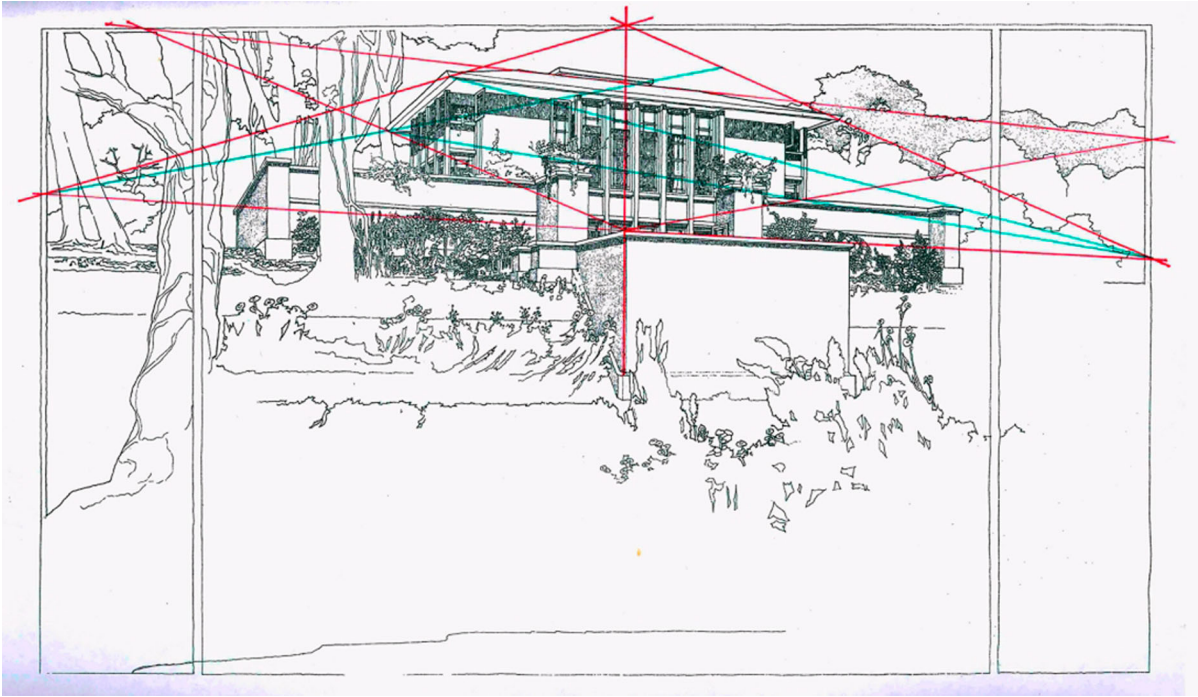
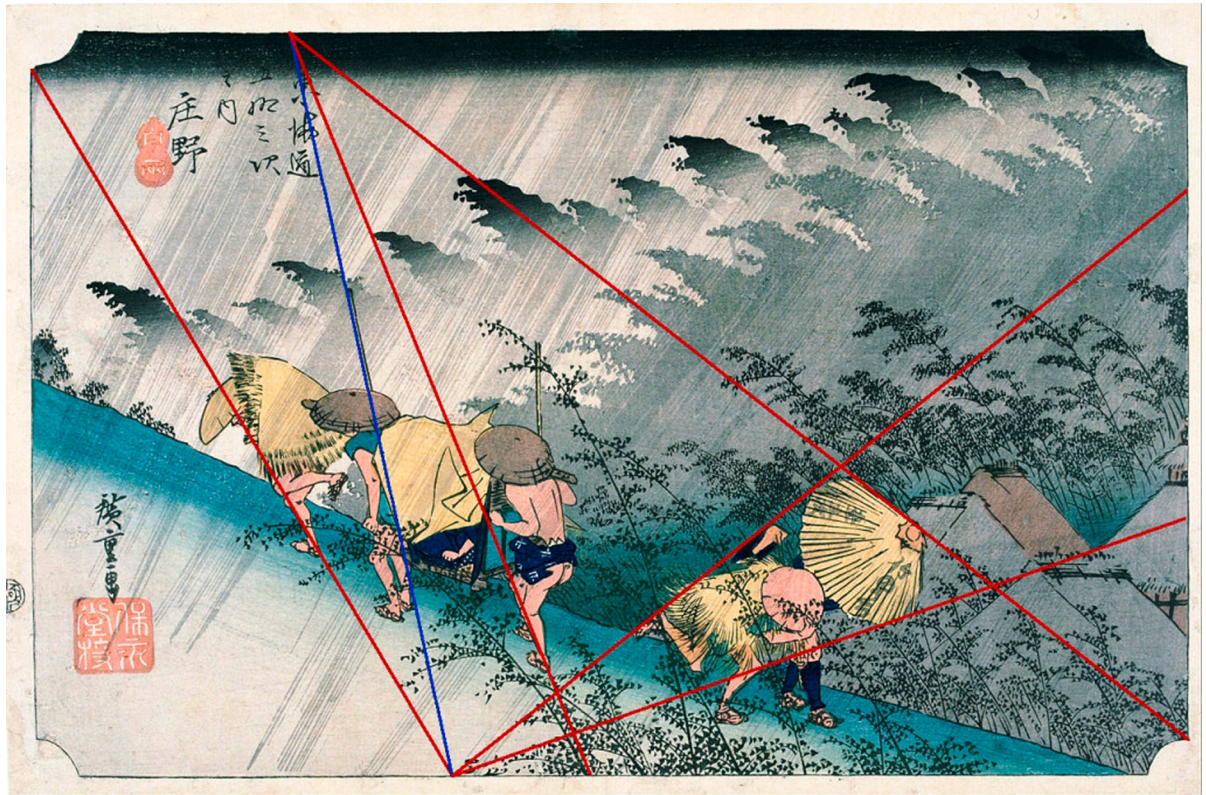


Figure 13.
Rendering of Thomas P. Hardy
house, Wasmuth Portfolio, Plate
15, (diagram by author). © ARS, NY
and DACS, London 2018.

distributed evenly over the picture. But for Wright, his chief concern was his building; all other things were subordinate to it, serving to bring out its charm.

Although Hiroshige did not leave any preparatory drawings that manifested his composition patterns, Wright could have acquired this technique by studying his prints closely. Among hundreds of prints he once owned, Wright had drawn over at least twenty in attempt to understand their compositions.³⁵ In his copy of Hiroshige's *The Third Impression of Moon Promontory*, he drew grids on the print to study how Hiroshige organised the picture: he extended ink lines on the print to clarify the alignments and used colour pencils to tone down irrelevant elements to bring out the main pattern.³⁶ These efforts indicate that he sensed that there were some geometric patterns arranging the picture and he tried to uncover them. To avoid ruining the prints, he might have done much more of the graphic analysis on tracing paper, which are now lost to us.

Wright could also have acquired this technique by exploring the unorthodox perspective used by Japanese print artists.³⁷ Keyes suggests that patterns of alignments in prints might originate from a misunderstanding of Western linear perspective — Japanese print artists might have mistaken the linear perspective for a composition device, vanishing points for generating points.³⁸ By the end of eighteenth century, a number of sources provided Japanese artists with reference to linear perspective, such as imported Suzhou prints, Dutch optical prints or a Chinese treatise *A Study of Vision* (视学).³⁹ Nevertheless, it seemed that Japanese artists were not so much interested in principles of per-



spective as a science of seeing as in its effect of creating spatial illusions.⁴⁰ They employed this technique selectively and loosely, and the rules of perspective were usually overlooked for their own compositional needs. For instance, Hiroshige sometimes employed multiple vanishing points and shifted the view point for the visibility and expressiveness of the motif. For example, in his *Suruga-cho* (するがてふ), the bustling street is depicted with linear perspective from a high view point whereas the Mount Fuji was presented as a flat pictorial plane from a frontal view point (Fig. 15). In juxtaposition of the two, Hiroshige shifted the view point approximately 90 degrees.

Wright sharply observed that in Japanese woodblock prints, shifting view point sometimes created a more magnificent sense of space. In a print party, trying to help his apprentices understand this, he remarked (probably in front of a print): 'where is the focus? Show me. On what is your attention focused? Nothing. You're right in the great breadth and spread of the scene'.⁴¹ He knew that Japanese artists represented space in a way different from the western linear perspective, and he admired it:

See how simply they [Japanese print artists] get in three planes; they rendered all this sense of distance, there is no lack of perspective here, as you'll notice. They're supposed not to have known perspective. They knew all they wanted of it — they

Figure 14.
Utagawa Hiroshige, *Driving Rain at Shōno* (庄野白雨), 1830s. (diagram by author based on Roger Keys's analysis).

Figure 15.
Utagawa Hiroshige, Suruga-cho (する
賀てふ), 1856, no. 8 from the
series of One Hundred Famous
Views of Edo.



didn't want much of it. Because perspective introduced an element which was not necessary to their feeling for beauty.⁴²

Wright noted that the Japanese artists manipulated linear perspective to their artistic aims. If, as Keyes suggests, patterns of alignments in Japanese woodblock prints originated from a misunderstanding of the Western linear perspective, Wright could have acquired this technique by studying the unorthodox perspective of prints.

Conclusion

In adapting key elements into geometric relationships, patterns of alignments compromise perspective accuracy. If we extend parallel lines in the renderings of the K. C. De Rhodes and Victor Metzger houses, they do not all converge at one vanishing point, indicating that these drawings are not a product of exact mechanical projections.

To subordinate realistic accuracy to idealistic beauty was a common practice among print artists. In Wright's view, print artists, in weighing between the reality and the ideal, transfigure the subject to their ideal vision, which, in turn, 'competes with the actual and subdues it by superior loveliness and human meaning'.⁴³ He uses Hokusai's work to illustrate this point:

You see, Hokusai was a great designer — a conscious designer ... He looked at Fujiyama in 57 different ways! But never did he tell the truth about it once ... See what he could do in the way of blocking out defects ... See the pattern he made? He liked the design. He knew what would be natural but he wanted to get that lovely effect, and he got it. These always had a bad effect on me — I mean he did; I felt that if he could go at it that way, well, why couldn't I?⁴⁴

For Japanese print artists and Wright, drawings present a glorified transformation rather than a realistic portrait of life; they do not aim to tell the literal truth but rather to reveal the higher, ideal truth of the subject, as something 'it ought to be'. In a print party in 1950, Wright talked about how prints led him to see nature, and by extension, everything, in a more poetic and less realistic way:

When you once start with these prints, you never look at nature the same way after ... A certain natural selection and arrangement takes in your own sense of the thing as you look. Certain realistic things disappear, and the whole scene become[s] more effective and simple ...⁴⁵

Wright emulated Hokusai in his Wasmuth renderings, displaying his work from an artistic perspective and sacrificing precision for a more pleasing visual effect. He noted in his introduction that: 'They [the renderings] merely aim to render the composition in outline and form, and suggest the sentiment of the environment'.⁴⁶ It suggests that the Wasmuth renderings were not intended as a rigidly faithful record of his building projects but rather as a graphic ideal of them. For example, he depicted the living room of the Robin house a bay shorter than the real building so as to obtain a nicer proportion of the structure in the picture.⁴⁷

Wright seldom talked about his composition techniques. Like most creative artists, he was unwilling to discuss his tricks and sources closely perhaps because he believed that it would reduce his originality in others' views. On the other hand, Wright might have felt that the pattern system is too subtle and fluid to be instructed. It had no fixed rules or ready-made formula. He adapted it every time to the chosen view point and the characteristics of the building. Therefore, this technique could only be acquired through individual explorations and be mastered by industrious practices.

A more alarming possibility is that perhaps in Wright's world, using patterns for composition was just too common to be worth any discussion. Jonathan

Hale, in *the Old Way of Seeing*, demonstrates that patterns were once the norm dominating building designs.⁴⁸ Back then, the ability to see underlying patterns was considered an elementary intuition that ensured visual harmony in any design works. Modernist masters inherited this fine sensibility. Wright used grids in contriving a plan and patterns in composing a rendering; golden sections informed Le Corbusier's designs, and the exquisite proportion of a Mies van der Rohe's villa is reminiscent of that of a Greek temple.⁴⁹ Nevertheless, this mindset has gradually changed through modernist teaching: the unspeakable sensibility of seeing patterns has gradually been given away in favour of a rational analysis of pragmatic matters. Today we seemed to have lost this refined way of seeing mostly. To help reacquire it, it might be useful for us to start noting designs produced with traditional sensibilities and looking for their underlying patterns. It is my hope that this article will direct our attention to the role of patterns in designs and to Wright's drawings as a repertory of ideas still relevant, refreshing, and worth exploring.

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Notes and references

1. Wright did not complete the introduction to the Wasmuth Portfolio until December 2010, and therefore the portfolio came out in early 1911 rather than 1910 as many have believed. See Anthony Alofsin, *Frank Lloyd Wright – The Lost Years, 1910–1922: A Study of Influence* (Chicago, University of Chicago Press, 1993), pp. 88–91.
2. For example, Mies van der Rohe owned a 1911 edition of *Frank Lloyd Wright: Ausgeführte Bauten*, a special publication of the Wasmuth portfolio widely known as *Sonderheft*. Le Corbusier must have been familiar with the *Sonderheft* as well, as he mentioned it in a letter to Auguste Perret in 1915. Inspired by the Wasmuth Portfolio, R M Schindler sought contact with Wright and eventually came to the United States in 1914 working for him.
3. Anthony Alofsin, *Frank Lloyd Wright – The Lost Years*, *op.cit.*, pp. 101–126, 153–220.
4. In *Composition*, Dow described how structures of landscape paintings could be abstracted into irregularly spaced grids. See Arthur Dow, *Composition: A series of exercises in art structure for the use of students and teachers*, 9th edition (Garden City, Doubleday, Page & Company, 1914), pp. 57–59. Regarding how Dow's theory had an impact on Wright's work, see Kevin Nute, 'Frank Lloyd Wright and Composition: the Architectural Picture, Plan, and Decorative Design as "Organic" Line-ideas', *Journal of Architectural and Planning Research*, 14 (Winter, 1997), pp. 271–288. Based on Dow's analysis, Roy Behrens uses a similar grid pattern to diagram James Whistler's *the Artist's Mother* (1871–72) and Gustav Klimt's *Portrait of Fritz Riedler* (1906). See Roy Behrens, *Frank Lloyd Wright and Mason City, Architectural Heart of the Prairie* (Charleston, the History Press, 2016),

- pp. 58–61; Jonathan Hale, *the Old Way of Seeing* (Boston, Houghton Mifflin, 1994), pp. 56–57. I would like to thank an anonymous reviewer for drawing my attention to Behrens's book.
5. Arthur Drexler, *the Drawings of Frank Lloyd Wright* (New York, Museum of Modern Art, 1962), pp.7–16; Bruce Brook Pfeiffer, *Frank Lloyd Wright Designs: the Sketches, Plans, and Drawings* (New York, Rizzoli, 2011), p.46 and p.414; Julia Meech, *Frank Lloyd Wright and the art of Japan: the architect's other passion* (New York, Harry Abrams, 2001), pp. 40–47.
 6. Kevin Nute, *Frank Lloyd Wright and Japan: the role of traditional Japanese art and architecture in the work of Frank Lloyd Wright* (London, Chapman & Hall, 1993), pp. 86–96. Also see Kevin Nute, *Frank Lloyd Wright and Composition*, *op. cit.*, pp. 283–84.
 7. At the end of his introduction, Wright wrote: 'Their [the Wasmuth renderings'] debt to Japanese ideals, these renderings themselves sufficiently acknowledge.' Frank Lloyd Wright, 'Studies and ... Executed Buildings by Frank Lloyd Wright,' in *Drawings and plans of Frank Lloyd Wright: The Early Period (1893–1909)* (New York: Dover Publications, 1983).
 8. There are primarily two opinions on the question of on what occasion Wright was first drawn to Japanese woodblock prints. In each scenario, his interest in prints started in the early 1890s. One theory suggests that he saw woodblock prints at the Chicago World's Columbian Exposition in 1893 and was attracted since then. An alternative theory, which I find more convincing, believes that Wright was introduced to Japanese woodblock prints through Ernest Fenollosa, who was at the time a leading scholar in Japanese arts and cousin of Joseph Silsbee, who was Wright's first employer. Wright purchased his first woodblock print from Fenollosa in 1892 and followed the latter's publication on Japanese arts closely. For the connection between Wright and Fenollosa, see Kevin Nute 'Frank Lloyd Wright and Japanese Art: Fenollosa, the missing link', *Architectural History*, 34 (1991), pp. 224–230. For how Fenollosa's theory influenced Wright's understanding in Japanese woodblock prints, see Kevin Nute, *Frank Lloyd Wright and Japan*, *op. cit.*, pp. 75–84.
 9. Julia Meech, *Frank Lloyd Wright and the art of Japan*, *op. cit.*, p. 32.
 10. Frank Lloyd Wright, *an Autobiography* (Pomegranate, 2005), pp. 194, 205.
 11. Frank Lloyd Wright, 'The Japanese Print: An Interpretation (1912)', in Robert Twombly, editor, *Frank Lloyd Wright: Essential Texts* (New York, Norton & Co., 2009), pp. 141–42.
 12. *Ibid.*, p. 138.
 13. Christopher Alexander, *the Timeless Way of Building* (New York, Oxford University Press, 1979), pp. 81–87.
 14. Frank Lloyd Wright, 'The Japanese Print', in *Frank Lloyd Wright*, *op. cit.*, p. 138.
 15. *Ibid.*, pp. 138–139.
 16. *Ibid.*, p. 150.
 17. *Ibid.*, p. 139.
 18. Frank Lloyd Wright, 'Studies and ... Executed Buildings by Frank Lloyd Wright', in *Drawings and plans of Frank Lloyd Wright*, *op. cit.*
 19. Sometimes it is hard to tell which ground-line Wright used to establish his generating points because there were multiple ground-lines in the picture. Wright usually chose the most front line where the building touched the ground (Figures 1 and 10), but he might occasionally use the front floor line (Figure 12). Sometimes, I had to experiment a few times to be sure which line Wright used.
 20. Julia Meech, *Frank Lloyd Wright and the art of Japan*, *op. cit.*, p. 46.
 21. Frank Lloyd Wright, 'The Japanese Print', in *Frank Lloyd Wright*, *op. cit.*, p. 144.
 22. Arthur Drexler, 'Introduction to the Drawings of Frank Lloyd Wright', in *the Drawings of Frank Lloyd Wright* (New York, Museum of Modern Art, 1962), p. 12.

23. Wright's note was added in early 1950s. See Bruce Brooks Pfeiffer, ed., *Frank Lloyd Wright Portfolio*, v.2 (Tokyo: A.D.A. Edita, 1984), p. 217.
24. Paul Kruty 'Graphic Depictions: The Evolution of Marion Mahony Architectural Renderings' in David van Zanten, editor, *Marion Mahony Reconsidered* (Chicago, University of Chicago Press, 2011), p. 51.
25. Gian Carlo Calza, *Hiroshige: The Master of Nature* (Milan, Skira; New York: Rizzoli, 2009), p. 22; Melanie Trede and Lorenz Bichler, *Hiroshige: One Hundred Famous View of Edo* (Köln, Taschen, 2015), p. 12.
26. Arthur Drexler, 'Introduction to the Drawings of Frank Lloyd Wright', in *the Drawings of Frank Lloyd Wright*, op. cit., p.11.
27. I was unable to find any evident patterns in the rendering of the E. H. Cheney House.
28. H Allen Brooks, 'Frank Lloyd Wright and the Wasmuth Drawings', *The Art Bulletin*, 48 (June 1966), p. 193.
29. *Ibid.*, p. 202.
30. *Ibid.*, p. 194.
31. Here I am referring to Gestalt principles of grouping, see Robert J. Sternberg and Karin Sternberg, *Cognitive Psychology*, 6th edition (Belmont, Wadsworth, 2011), pp. 113–120. Also see Roy Behrens, 'Art, Design and Gestalt Theory', *Leonardo*, 41 (1998), pp. 299–303.
32. Roger Keyes, 'Hidden Geometry and the Appreciation of Japanese Woodblock Prints in the West' in Matthi Forrer (ed.), *Essays on Japanese Art presented to Jack Hillier* (London, Robert G. Sawers Publishing, 1982), pp. 69–77.
33. According to Julia Meech, Wright returned from Japan with several hundred of Hiroshige's woodblock prints. Julia Meech, *Frank Lloyd Wright and the art of Japan*, op. cit., p.40.
34. Betty Y. Siffert, 'Frank Lloyd Wright and Japanese Prints: Inspiration on Display', *Wright Angels: Newsletter of the Frank Lloyd Wright Home and Studio Foundation*, 27 (May 2001), p. 3.
35. Narciso Menocal, 'Form and Content in Frank Lloyd Wright's Tree of Life Window', *Elvehjem Museum of Art Bulletin* (1983–1984), p. 26.
36. *Ibid.*, 26.
37. In the 1420s, Filippo Brunelleschi formulated linear perspective based on his optics studies and Leon Batista Alberti demonstrated how it worked in *De pictura* in 1435. With the increasing circulation of this treatise, by the early sixteenth century the linear perspective was applied widely in Western Europe. However, in Japan, art works did not show much knowledge of linear perspective until the 18th century.
38. Roger Keyes, 'Hidden Geometry and the Appreciation of Japanese Woodblock Prints in the West', in *Essays on Japanese Art presented to Jack Hillier*, op. cit., p. 71. When perspective first emerged in Chinese landscape painting, some Chinese artists also misunderstood it as a new composition technique. Jiao Bingzhen (焦秉贞, 1689–1726), a Chinese painter of the early Qing dynasty applied western linear perspective in his landscape paintings. However, a contemporary critic believed that the realistic effect was due to a new composition technique: 'His [Jiao's] compositions give the effect of distance, the objects decrease in size from near to far with perfect accuracy ... because he represented them according to the Western manner.' See Matthi Forrer, 'From Optical Prints to Ukie to Ukiyoe: The Adoption and Adaptation of Western Linear Perspective in Japan', in Thomas Kaufmann and Michael North (eds), *Mediating Netherlandish Art and Material Culture in Asia* (Amsterdam, Amsterdam University Press, 2014), p. 252.
39. *A Study of Vision* was first published in 1729 based on a translation of *Perspectiva pictorum et architectorum* (Perspective of Painters and Architects), a Latin treatise by Andrea Pozzo published in the late seventeenth century. So far, scholars have been unable to pin down the exact source of western linear perspective. Julian Lee maintains that the

Chinese treatise was a key influence whereas Shigemitsu Inaga believes that perspective shown in Chinese Suzhou prints and Western oil paintings was more likely to have a wider impact. However, in a more recent investigation of the beginning of Western linear perspective in Japanese prints in the mid-eighteenth century, Matthi Forrer argues that Dutch etchings introduced by Shiba Kōkan (司馬江漢) and Dutch optical prints were more plausible sources. See Julian Lee, 'The Origin and Development of Japanese Landscape Prints: a study in the synthesis of eastern and Western art' (Doctoral dissertation; Pullman, Washington State University, 1977); Shigemitsu Inaga, 'Reinterpretation of the Western linear perspective in eighteenth and nineteenth century Japan' in W. F. Vande Walle and Kazuhiko Kasaya (eds), *Dodonaëus in Japan: Translation and the Scientific Mind in the Tokugawa Period* (Leuven, Leuven University Press, 2001), pp. 153–154; Matthi Forrer, 'From Optical Prints to Ukie to Ukiyoe', in *Mediating Netherlandish Art and Material Culture in Asia*, *op. cit.*, pp. 245–266.

40. Shigemitsu Inaga, 'reinterpretation of the Western linear', in *Dodonaëus in Japan*, *op. cit.*, pp. 150–164.
41. Frank Lloyd Wright, 'The Japanese Print Party,' tape transcript, Taliesin, 20 September 1950. Frank Lloyd Wright Archives, Avery Architectural & Fine Arts Library, Columbia University.
42. *Ibid.*
43. Wright, 'The Japanese Print: An Interpretation (1912),' in *Frank Lloyd Wright*, *op. cit.*, p. 139.
44. Wright, 'The Japanese Print Party (September 20, 1950)' *op. cit.*
45. *Ibid.*
46. Wright, 'Studies and ... Executed Buildings by Frank Lloyd Wright.'
47. Donald Hoffmann, *Frank Lloyd Wright's Robie House: the Illustrated Story of an Architectural Masterpiece* (NY, Dover Publication, 1984), pp. 25–27.
48. Jonathan Hale, *the Old Way of Seeing*, *op. cit.*, pp. 1–45.
49. See Colin Rowe, 'The Mathematics of the Ideal Villa,' and 'Neo-'Classicism' and Modern Architecture II', in *The Mathematics of the Ideal Villa and Other Essays* (Cambridge, Mass.: The MIT Press, 1976), pp. 1–28 and 139–158; Francesco Passanti, 'Architecture: Proportion, Classicism and Other Issues', in Stanislaus von Moos and Arthur Rüegg, editors, *Le Corbusier Before Le Corbusier: Applied Arts, Architecture, Painting, Photography, 1907–1922* (New Haven, Yale University Press, 2002), pp. 69–98.