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The Stylistic Characteristics of the Shampay House of 1919: A Formal Analysis

This paper analyzes the stylistic characteristics of the Shampay House with a series of formal methodologies. It focuses on three parts: spatial arrangement, symmetry and proportion. For the thorough analysis, archival drawings are enhanced through reconstructing new drawings and through the building of a quarter-inch scale model.

1 Introduction

The Shampay House project of 1919 has been commonly understood as one of Frank Lloyd Wright's cruciform Prairie houses. It was planned to be erected in Beverly Hills, Illinois, but never realized. The demise of the project might have been due to financial difficulties. It has been assumed that Wright designed the house in his Tokyo office, and that Rudolph Michael Schindler altered it in the U.S. However, at the outset, Schindler claims authorship of the work. In a previous paper, Park and March [2002] proved that the authorship of the Shampay house design is attributable to Schindler based on newly-found correspondence and drawings.

The earlier historic discussion left out most of the stylistic characteristics of the project. Schindler's stylistic tendencies characterize his architectural practices both before and shortly after the Shampay project. This paper examines in detail the stylistic distinctions between Wright and Schindler's work at that time. First, there is the general spatial arrangement of the scheme; second, the use of symmetry; and third, proportional design. Some commentators have speculated about the characteristics of the project, but their conclusions have remained unexplained. For example, David Gebhard gives Schindler negligible credit for his contributions to the design: in particular, the placement of the garage as part of the main body of the house [1980, 37-38]. B. Giella differentiates its characteristic features from Wright's typical Prairie designs, describing the "asymmetric" spatial configuration, "the placement of the bank of tall, narrow windows" and "the blank wall" [Giella 1985, 243-246]. Futagawa and Pfeiffer claim the Shampay house as a direct source for the development of Wright's Usonian houses fourteen years later [Futagawa and Pfeiffer 1985, 192]. These historians devote their research to the characteristics of the design. However, many of their arguments have risen partly through misunderstanding and misinterpretation of the project. Hence, detailed examination of several key stylistic features of the project is required to identify Schindler's contribution to the project, thereby confirming the authorship.

2 Spatial arrangement

Wright acknowledges that Schindler has captured the Prairie house style. In their paper "The language of the prairie: Frank Lloyd Wright's prairie houses," architects H. Koning and J. Eizenberg make use of Wright's own descriptions and buildings to define a formal grammar [1981]. "Consistency in grammar is therefore the property – solely – of a well-developed artist-architect," Wright wrote towards the end of his life [Wright 1954, 182].

It appears that Schindler had familiarized himself with the grammar of the Prairie before coming to the States, starting with the drawings in the Wasmuth portfolio and then by visiting and photographing Wright's houses in the Chicago area.¹ He would also have been familiar with the latest Taliesin practices: "one of the best of my houses," as Wright described, designed for the future Governor Allen of Kansas, was barely off the drawing board when Schindler joined, and was awaiting Paul Mueller's release from his Imperial Hotel commitment before construction

commenced [Futagawa and Pfeiffer 1985, 126]. Koning and Eizenberg quote Wright on the underlying principles of the Prairie house: first, the fire, the hearth is at the center of the home, the chimney should be a “broad generous one... kept low on gently sloping roofs, or perhaps flat roofs” [Wright 1953, 136-137]; second, the simplification and consolidation of functional areas on the principal floor by elimination of partitions and doors – a “more ‘free’ space and more livable too” – and “cutting off the kitchen” with other service spaces “semi-detached” [Wright 1953, 139]; third, to reduce throughout the dwelling the necessary parts of the house and the separate rooms to a minimum; fourth, to associate the building as a whole with the site by extension; fifth, “to eliminate the room as a box and the house as another” [Wright 1953, 14].

The Shampay achieves all of these criteria. Wright’s concern about the size of the chimney is consistent with his views, but it is arguable whether Schindler had not already made the chimney “broad and generous.” The dining room, living room and entry lobby all flow together spatially without partitions or doors, with the kitchen and maids’ room “semi-detached” from the living area behind the hearth. It follows that separate rooms are kept to a minimum, and even on the second floor the arrangement is remarkably simple. The house is locked into its site with a well-developed parterre. This is particularly evident in the August foundation plan.² The house exhibits considerable transparency, especially in the see-through living room, the dining area with its conservatory glazed on three sides, and the entry area and porch. On the second floor, the owner’s room shows similar openness. In a Wrightian manner, Schindler pries the corners apart and lets the roofs appear to float above ranges of fenestration – the box is destroyed. The Shampay is in this sense a classic, even conservative, Prairie house. Yet Pfeiffer claims “elements in this Shampay house point directly to the Usonian houses that come fourteen years later” [Futagawa and Pfeiffer 1985, 192].

Fig. 1a. The Shampay House, First Floor Plan, Reconstruction from June 9, 1919 drawings: ordered numbers on each unit in the first floor plan identifies the division of 2-foot unit grid. [G: garage, L: living room, E: Entry, D: dinning room, M: maid room, and K: kitchen]

Fig. 1b. The Shampay House, Second Floor Plan, Reconstruction from June 9, 1919 drawings [O: owner's room, B: bed room]

Fig. 1c. The Shampay House, 1919, a quarter inch scale model constructed by Adrian Shih

Wright gives nine points that identify the Usonian: first, visible roofs are unnecessary; second, garages are not required, a carport will do; third, basements are not required; fourth, interior “trim” can be eliminated; fifth, no radiators, no light fixtures; sixth, furniture and pictures can be built-in; seventh, no painting of surfaces; eighth, no plastering of walls; ninth, no gutters, no downspouts.³ The roofs are very visible in the Shampay design, and Wright even wanted to enhance that visibility. The house has a built-in garage. The house has a large basement area. None of these satisfy Wright’s specification for a Usonian. The other requirements concern details and finishes, some of which are true of Prairie houses as well.⁴

Fig. 2. The Shampay House (1919), Exploded Axonometric

What is absolutely certain is that Schindler, just two years after the Shampay project, designed and built his own house, Kings Road House (1921-22), in which all nine of these Usonian criteria were radically met.⁵

Terry Knight has also considered the stylistic transformations required for the development from the Prairie to Usonian houses [1994]. Her most pertinent observation, here, is that typically the hearth is positioned differently in the two types. Formal, grammatical details aside, the fireplace in the Usonian is placed in the single space of the living area in such a way as to define distinct functional zones, particularly the entry and areas for sitting, dining and cooking without the need for partitions and doorways. In the Prairie house the fireplace usually just marks one end of the living area. Again the Shampay conforms not at all to the typical Usonian configuration, but falls nicely into the Prairie arrangement.⁶

3 *Symmetry*

Not only would Wright have surely known of Viollet-le Duc's comments on symmetry, [Viollet-le-Duc 1959, 274-275] but also Wright himself had written in 1908:

Fig. 3. Subsymmetry drawings for the first floor plans of the Ward Willits House, 1901: a. long axis through porch piers; b. axis through the dining room; c. axis through the living room and hearth; d. minor axes through various parts of the plan; e. remaining elements having no overall symmetry

In laying out the ground plans for even the more significant of these buildings a simple axial law and order and the ordered spacing upon a system of certain structural units definitely established for each structure in accord with its scheme of practical construction ... and although the symmetry may not be obvious always the balance is usually maintained [Wright 1941, 39].

Wright's Prairie principles of spatial composition resonate with his tenet of symmetry.

It is reasonable to assume that Schindler – who was an admirer of Wright and who respected Wright's philosophies of design – was also aware of Otto Wagner's view⁷:

A simple, clear plan in most cases requires the symmetry of the work. In a symmetrical arrangement there is some measure of self-containment, completeness, balance; an impossibility of enlargement; even self-assurance ... The aping of unsymmetrical buildings or the intentional making of an unsymmetrical composition in order to achieve a supposed painterly effect is totally objectionable [Wagner 1988, 86].

Wright made frequent use of global, axial symmetry in his public works, including the Imperial Hotel. In his domestic work up to 1919 such obedience to symmetry is rare although the more formal spaces often exhibit local symmetry. In the 1909 Como Orchard Summer Colony, illustrated in the Wasmuth portfolio, the clubhouse and many of the cottages are axially disposed along the crest of the hill, but the symmetry is broken where the terrain makes it impossible to maintain, or where the variety of accommodation is required [Wright 1910, pl. 100]. This is a good illustration of Wright's approach: symmetry is used where it makes some sense, and not pursued elsewhere. The most Beaux Arts of all of Wright's domestic designs is the unyielding axial project for the C. Thaxter Shaw mansion in Canada.⁸ An elaborate play of multiple axiality is to be seen in the 1901 Willits house [Wright 1910, pl. 70].

Fig. 4. Classification of axialities in residential designs from the Wasmuth portfolio: a. plain axial; b. staggered axiality; c. angled axiality; d. cross, or T, axiality.

Four types of axiality may be discerned among residential designs in the Wasmuth portfolio:

- one simple axis;
- two parallel axes, or staggered axiality;
- two non-intersecting axes at right-angles, or hinged axiality;
- two orthogonal axes forming either a T, or cross depending on the degree of overlap (fig. 4).

The latter type of axiality is to be found in the Shampay. Schindler, in fact, turns the clock back.

A survey of built projects by Wright in the five years before the Shampay house design shows little use of symmetry in house planning, but a residual use appears in the principal façades. Wright's remarkable Bach residence (1915) exhibits bilateral symmetry to the street, preserves much symmetry to each side, and abandons it altogether at the rear; in the interior the living space is freely and asymmetrically planned. The American System-Built Homes that were built from 1915 mostly eschew axiality.⁹

The fine Allen residence designed by Wright in 1916 has some vestigial axiality in the living room only, and this is staggered: one axis can be drawn through the fireplace, and another parallel axis through the opposing window wall. The axes run some three feet apart. Wright's Japanese residences (1917-1918) possess only rare instances of local symmetry. The Olive Hill project, which Schindler supervised, hints at axiality and symmetry for the major spaces in the three residences, but on each occasion strictness is deliberately frustrated by the intrusion of some local incident, such as the location of the fireplace or – in the case of residence B – the accommodation of a dining area [Smith 1992]. His practice shows that Wright himself was largely finished with axiality and symmetry as major form-makers in residential buildings by and during Schindler's tenure.

What of Schindler? His Wagnerschule student projects mostly adhere to strict axial symmetry,¹⁰ although Schindler's early sketches indicate an interest in picturesque groupings in vernacular architecture [March and Scheine 1994, 51]. Schindler's 1914 submission for a neighborhood center in Chicago holds to strict bilateral axes.¹¹ Schindler's adobe proposal for the Thomas Paul Martin residence in Taos, New Mexico, is an academic study in bilateral symmetry and very much in tune with Wagnerschule student schemes [E. Smith et al. 2001, 186, 274].

An axial plan for a community center in Wenatchee, prepared by Schindler in May 1919, was criticized by Wright in the same letter of 25 June in which he complimented Schindler on the Shampay design. In a sketch, Wright turns the building at right angles to the "axial street," which enters the park on its long side, to create a new axis down the center of the park and parallel to the Columbia River.¹² Both the Monolithic house designed by Schindler in Wright's absence [K. Smith 1992, 104-115], and another independent project for a residence in Oak Park, dated c1917, are somewhat stiffly axial in plan, especially the latter [E. Smith et al, 2001, 185-186, 187-188].

Schindler's 1920 competition entry for a branch of the Free Public Library, Jersey City, New Jersey, demonstrates his extraordinary skill in orchestrating distinct symmetries, a facility to be continued in other early independent works such as the 1922 Popenoe Cabin, the 1925 How house, and through to the 1930s with the Schindler Shelters [Park 1996, 2000, 2001]. The Buena Shore Clubhouse, designed by Schindler for Ottenheimer, Stern and Reichert before joining Wright, is an asymmetrical L-form with local axialities in the principal rooms [Giella 1994]. The 1918 Log house designed at Taliesin belongs to more progressive developments in Europe influenced by Gottfried Semper's *Der Stil* and the transmission of these ideas especially in Henrik Berlage's works and writings – the Dutch artist Vontongerloo comes to mind – than anything Schindler might have learned from Wright.

Fig. 5. Subsymmetry drawings for the first floor and second floor plans of the Shampay house: a. and b. elements and sub-elements, which are bilaterally symmetrical along the longitudinal axis; c. and d. elements and sub-elements along the latitudinal axis; and e. and f. the remaining elements having no overall symmetry

Axiality is buried in just one of the layers of the log sub-structure, and bilateral symmetry is found only at certain cross-sections; otherwise the plans and elevations of the Log Cabin are studies in asymmetrical design [March 1994b].

The Schindler house of 1921-22 is without symmetry in any conventional sense. The Shampay house falls under that class of Prairie houses with intersecting, orthogonal axes.

An analysis of the Shampay house plans (fig. 5), clearly indicates that much of the design is accounted for by two overlapping parts, each of which is bilaterally symmetrical. The symmetrical parts are assigned to the service areas. One consequence of the intersection is that global symmetry is lost even while local symmetries are preserved. Schindler uses a similar approach in the basement and first floor plans of the 1920 Library project where the auditorium, children's and reading rooms are located [Park 1996, 80, fig. 14].

4 Proportion

By the time the Shampay house was designed, Schindler was engaged in a search for a reliable unit system that he could invariably apply to composition as well as construction. The Shampay house plans are set out over a square grid (see fig. 1a). The June plans are shown with a 2' x 2' grid with every other gridline marked at 4' intervals along the bottom and up the right-hand side of the drawing. These plans were drawn at a scale of 1/4" to 1', so that the grid lines were set 1/2" apart. The blueprints sent to Wright in May indicate a 4' x 4' grid. Since the May blueprints were scaled 1/8" to 1' foot, these gridlines are also shown at 1/2" apart.

Wright did not usually place gridlines on house plans before the concrete block houses of 1923. One example is the Stewart house. This house had been left to van Holst to "detail" when Wright left for Europe in 1909 [Alofsin 1993, 312]. One of the earliest house designs to show a grid on the plan is the George Gerts Double house, 1902, where mostly a 3' x 3' square unit is used [Storrer 1993, 74, S.077, T.0202]. The same unit is employed throughout the Mrs. Thomas H Gale Cottage, 1909 [Storrer 1993, 84, S.088.1, T.0521]. The buildings for the Bitter Root Inn, 1908, and the Como Orchard Summer Colony, 1909, used a 3'-6" square unit shown on plans [Storrer 1993, 146-8, S.144, T.1002, S.145, T.0918A]. The American System-Built Homes are set out on a 2' x 2' square unit system, but plans do not show the grid.¹³ The three summer houses at Grand Beach, Michigan, 1916, mostly work to a 2' planning module [Storrer 1993, 200-1, S.196, T.1601; S.197; T.1607; S.199, T.1603]. Three more houses are attributed to Wright in Japan: two use a double tatami module, 6' x 6', and one a 4' x 4' unit system [Storrer 1993, 209, S.206, T.1702; 210, S.207, T.2901; 215, S.212, T.1803]. The Olive Hill development is shown with a 20' x 20' grid derived from the original olive tree planting, which is further subdivided into 4' square units for architectural planning purposes. This 4' module is seen extended upwards in the elevations, but it is not used to determine vertical dimensions [K. Smith 1992].

Not all of Wright's houses of this same period use a unit system. The plans for the Emil Bach house (1915) show many different dimensions which cannot simply be related to a regular grid [Futagawa and Pfeiffer 1985, 63, figs. 88, 89]. The Sherman Booth house of the same year shows one dimensional scheme for the living room and a different one for the dining room [Futagawa and Pfeiffer 1985, 66, fig. 94]. The symmetrical façade to the Frederick C Bogk house, 1916, divides into alternating solids and voids in a subtle play on the brick length [Futagawa and Pfeiffer 1985, 108-109, figs. 190-192]. Like the Booth house, Governor Allen's residence (1916) uses different and distinctive dimensional sets for separate parts of the house: the living room, the dining room, kitchen, the entry and the porte cochere [Wright 1994, 35].

Fig. 6. F.L. Wright, the Stewart House, Montecito, CA, 1909. The garage is built on the main floor of the house next to the chauffeur's room in the original design. Later on, the design was changed and built while Wright was in Europe from late 1909 to early 1911 (Storrer, 1993, 162-3). In the final design, the servant's quarters including the kitchen, pantry, maid/chauffeur, laundry, and bath are enlarged by removing the garage. The functional arrangement of the Shampay house is almost identical to the original design of the Stewart house Key: G, garage, L, living room, P, porch, D, dining room, and K, kitchen

Schindler had used a 6'-6" square unit in laying out the plans for the Buena Shore Club (1917) before joining Wright [Giella 1994, 42]. While at Taliesin, he produced drawings for the Log Cabin on a 2' square unit which is presented on the two principal plans [March 1994a]. Unlike Wright's work up to this time, the square unit system also controls the dimensions in elevation. This is a simple matter since the logs are either 8" or 6" square in section – three or four logs fit into each 24" module. But what makes the Log Cabin scheme stand out is Schindler's first known use of his space reference frame [March 1994a].

Here the grid is marked along the bottom with numbers from 1 to 26, and up the right-hand side with letters A to Q. This is original to Schindler. Schindler's 1920 competition entry for the Free Public Library shows neither, although, on a site 100' x 100', the building is planned within nine squares 20' x 20', each further sub-divided into 4' square units.¹⁴ The Shampay house shows a grid, but does not use the reference frame.

Whereas the main outlines of the Shampay house plan relate to the unit system, detailed considerations give rise to divisions such as 7" + 41" + 7", the mullion + French door + mullion pattern of the east and west living room walls, or the 7" + 17" + 7" pattern of the dining room walls (fig. 7). From Charles E. White Jr., apprentice for Wright, we know of Wright's use of unit system employed in "the casement window unit of about these proportions" [Nancy and Smith 1971]. While this is not the place to go into technicalities, the first division is, center to center of the mullions to the opening, in the ratio of $\sqrt{4}:\sqrt{3}$,¹⁵ and the second in the ratio of $\sqrt{2}:1$. These are

typical relationships to be found in Wright's early work.¹⁶ For example, the living room piers and openings in the Allen house have the pattern $16'' + 68'' + 16''$ which gives $84''$ center to center between piers: a proportion of $84:68::21:17$, or $\sqrt{3}:\sqrt{2}$.¹⁷ It is not necessary to assume that Schindler was influenced by Wright in this. Otto Wagner had been a master of proportional design, and Schindler, who was known to be very adept at numbers, had excelled in the Wagnerschule ornamental design class – essentially a course in applied geometry. He would have appreciated and been familiar with the game that Wright played. As Wright once wrote to Schindler concerning a personal matter, “your instinct for proportion and a few other things may help save some of the pieces.”¹⁸

Fig. 7. Photograph of the Shampay house model showing the living room and dining room fenestration patterns

Fig. 8. R. M. Schindler's row-7 construction of wall openings in the Shampay house. Left, a length 7 is drawn and a 45° line is struck from the end of the line. All rectangles of integer length which lie along the 45° line belong to row-7. Center, counter 45° lines cut the lengths of the $17/24$ and $41/48$ rectangles into the dimensions found in the Shampay French door and window plans. Right, namely the $7 + 41 + 7$ and $7 + 17 + 7$ patterns

Despite the similarities with Wright's proportional schemes, the living room and dining room openings in the Shampay design provide perfect proof of Schindler's own preoccupation with a special kind of proportional theory at this time, which might be described as his unique signature. Two years before the Shampay project was on the drawing board, Schindler had delivered a series of lectures at the Emma Church School in Chicago. When he came to discussing proportion, he rejected the principle of the regulating line (which was favored by his European contemporary Le Corbusier), in favor of a theory of “rows.”¹⁹ It is a proportional theory which is completely

compatible with Schindler's use of a modular planning grid. Schindler used the term "row," a sequence, "a following of unequal units with definite changes". If a/b is a term in the "row", the next term is $(a + 1)/(b + 1)$. In these Shampay openings, Schindler employs two elements from the seventh row, row-7: $1/8$, $2/9$, $3/10$, ... $17/24$, ... $41/48$, $42/49$, (fig. 8).

It will be noticed that the common difference between numerator and denominator is 7, hence row-7. Now, $24/17$ is a good rational approximation to $\sqrt{2}$, the diagonal of a unit square; while $41/48$ is very close to $42/49 = 6/7$, where $7:6$ is a well known rational convergent for $\sqrt{4}:\sqrt{3}$, the side of a unit equilateral triangle to its altitude (fig. 9). And so the use of the "row" system allows Schindler to choose elements which relate to geometrical constructions, and thence to the drafting squares and the tiles of the Seventh Froebel Gift (fig. 10).

Fig. 9. The rational ratios 24:17 and 48:41 approximate the diagonal of a square (24) to its side length (17), and the side of an equilateral triangle (48) to its altitude (41)

Fig. 10. Top row: Froebel's tiles from the Seventh Gift. a. a square; b. half square, or right isosceles triangle; c. equilateral triangle; d. 120° obtuse isosceles triangle; e. half of a double square, a right scalene triangle. Bottom row: drafting triangles; f. 45° triangle; g. 30° , 60° triangle; h. 30° , 60° triangle composed of Froebel tiles c and d

Fig. 11. Fenestration proportions in the Shampay house compared with drawing board set squares and tiles from Froebel's Seventh Gift. a. the 45° set square, or Froebel's half-square tile, proportion the spacing of mullions and openings in the dining room; b. Froebel's obtuse isosceles triangle and the half double-square tiles determine the spacing of mullions and french doors in the living room; c. 30°, 60° drafting triangles in two orientations give rise to the same spacing

5 Conclusion

The authorship of the Shampay house has long been a subject of speculation. This formal analysis of the project confirms our earlier argument that while Wright has the ownership of the drawings, Schindler has the sole authorship of the work. Moreover, Schindler deserves full credit for the stylistic characteristics of the project.

The detailed analysis proves that the Shampay house is a conservatively designed Prairie house in Wright's grammar, with no embryonic Usonian features. The claim by Bruce Brooks Pfeiffer that the Shampay looks forward to the Usonian houses of fourteen years later would make Schindler in some part responsible for that development through this design.

At age 34 Wright designed and built the Willits house (1901), which exhibits a masterly command of multi-axial planning and modular flexibility. At age 32 Schindler designed the Shampay house in Wright's name. Apart from the service areas, the house is rigidly biaxial and strictly modular, based on the 2' unit square. The scheme is a dutiful "Lloyd-Wright facture;" like the Wenatchee project, it could be described as "a little too 'old school'." Nothing here indicates the radical form that Schindler's own house was to take two years later which truly set the agenda for the future Usonian houses.

Notes

1. For example, there is a 1914 letter dictated by Wright, in the year of Schindler's arrival in Chicago, introducing him to Mrs. Coonley so that he might see her house. Several of Schindler's photographs of Wright's works are reproduced in [March and Sheine 1994, 50].
2. There are three different institutions that own Shampay house drawings. Two complete sets of drawings are available from the Getty Museum, copyright under the Frank Lloyd Wright Foundation. One set of drawing is dated 9 June 1919, Getty 1903.002-011, and the other set is dated from 13, 18 to 20 August 1919, Getty 1903.012-017. Both sets are signed 'Frank Lloyd Wright Architect per R M Schindler [signed]'. Among the drawings, there is an early schematic drawing, which does not belong to either set, 1903.001. It includes the second and basement floor plans, dated May 1919. In the Architectural Drawing Collection at the University of California, Santa Barbara, there are some schematic sketches, several blueprints and two perspectives, Garland 3234-3246 [Gebhard 1993, Drawing no. 3234-3246]. Recently, Maureen Mary discovered a set of six previously unknown and recently found blueprints. In 1919, Schindler worked on the design of the Shampay House from April 15 to May 12 when he turns to a commission for a community center in Wenatchee. Six 1/8" to 1' scale blueprints of the project are sent to Wright in Tokyo at this time, one of which, the first floor plan, is dated 4 May 1919. Penciled amendments on the Shampay House blueprints were mailed from Tokyo by Wright, postmarked June 4, and addressed: to 'Rudolph Schindler, c/o Frank Lloyd Wright, 1600 Monroe Bldg., Chicago, Ill., USA'. The envelope is marked in pencil 'Rec. June 24th 1919'.
3. [Wright 1954, 82-83]. The full text is on its side accompanied by two preliminary sketches of the prototypical Jacobs Usonian of 1937.
4. The Wasmuth portfolio refers to the body of work published by Ernst Wasmuth in 1910 [Wright 1910] entitled *Ausgeführte Bauten und Entwürfe*: "It is still in a comparatively primitive stage of development; yet radiators have disappeared, lighting fixtures are incorporated ... disfiguring downspouts ... become useless in the winter." Wright also indicates that he would like to see less furniture "at large" in his plans, and no easel pictures on the walls, but built-in artworks. He had already started to minimize the plastering of walls and the use of paint, often preferring exposed brick surfaces and natural wood.
5. [K. Smith 1987, 26]. Smith enumerates several other features of the typical Usonian foreshadowed by this house. See also [K. Smith 2001].
6. Nor does the Shampay conform as a Usonian to Storrer's diagram of the "Transformation from Prairie to Usonia." See [Storrer 1993, 219].
7. Wagner was taught under a former assistant of Karl Schinkel, C F. Busse at the Königliche Bauakademie in Berlin (1860-61) [Wagner 1988; Giella 1985]. Also, Wagner's theoretical development of modern architecture was deeply rooted in Semper's theory, including not only practical aspects, such as material and technology, but also formal compositional principles. Wagner's Beaux-Arts acquaintance was from the Academy of Fine Arts under August von Siccardsburg and Edward van der Nüll [Wagner 1988, 86].
8. The dramatic poché is [Wright 1910, pl. 70].
9. [Storrer 1993, S203 1-4, S204 1-6]. The Heisen residence S204.6 is a possible exception.
10. For example: the elevations to the undated neo-classical Post Office [March and Sheine 1994, 46]; and to his 1912-13 thesis project, "A Crematorium for a City of Five Million" [E. Smith et al. 2001, 17, 234].
11. [E. Smith et al. 2001, 21 and 186]. Wright's contemporary hors concurs submission for a Chicago quarter-section is remarkably free from Beaux Arts influences.
12. Getty Box 1 Folder 10. Wright comments: "Your layout of Wenatchee at hand. If anything comes of it – turn the main group of buildings side on the main axis – letting the approach from the city through to the river with a raking view of the facades. It is now a little too 'good school' – a pompous 'obstruction' rather than a sympathetic auxiliary to the natural features of the site. Suggest like this (sketch)."

13. It is entirely possible that the plans were drawn on paper placed over an underlying sheet showing a grid. Such a sheet, with 1" squares, was found among some Schindler drawings, for example.
14. The same large and smaller divisions used in the Olive Hill site plans [Park 1996].
15. The rational ratio here is 48:41. 71:41 is a convergent to $\sqrt{3}:1$. Since $3/\sqrt{3}=\sqrt{3}$, it follows that 41:71/3 is also a convergent to $\sqrt{3}:1$. But 71/3 is approximately 24. Thus, 41:24 can be said to be a near convergent to $\sqrt{3}:1$. 41:48 is thus $\sqrt{3}:2$, or 48:41:: $\sqrt{4}:\sqrt{3}$.
16. Ratios easily derived, using arithmetical approximations, from the 7th Froebel gift, as well as simple relationships taken from the diagonals of the unit cube [March 1995].
17. The well known rational convergents 7:4 for $\sqrt{3}:1$, and 17:12 for $\sqrt{2}$ give this result.
18. Getty Box 1, Folder 16, letter postmarked Tokyo, April 1920.
19. This theory is fully explained in [March 2003] and [Park 2003].

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