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Cosimo Monteleone

Frank Lloyd Wright and the play with geometric abstraction

Abstract
Friedrich Fröbel is known in history as the creator of the *Kindergarten*, a pedagogical institution established in Germany in 1837 that spread all over the world in fifty years. This educational method was a significant moment in Frank Lloyd Wright's training and the following essay investigates the learning mode of the American architect and its possible repercussion in his works. The analysis does not focus on the formal similarities that can be found in his design, because these aspects were already investigated by many scholars, but it is based on the traces that the rules of the play have left in the compositional method of the Maestro.

Keywords
Frank Lloyd Wright — Kindergarten — Fröbel

There are many opinions on the weight to be attributed to the influence that play and study exert on the creation of our personality, but all the pedagogues agree in considering both fundamental for a healthy psychophysical growth of the self. In particular, the so-called "construction" games encourage the reinterpretation of reality by introducing the child to what experts define deferred imitation (Trisciuzzi 1984), that is, the ability to reproduce behaviors even in the absence of a model. If game and study play such an important role in the formation of the ego, how much of what we learn during the training period is poured into the behavior and actions of an adult? If this question is addressed in deepening a great personality like that of Frank Lloyd Wright, the exploration becomes insidious, first because the cultural roots of the American architect are more than one and, second, because there are already a lot of studies about it (Kaufmann 1981). So, what is the purpose of insisting on these topics if critics have already probed the relationship between the educational method of Friedrich Wilhelm August Fröbel and the architectural production of the *Prairie* period? This essay proposes an overtaking of formal and symbolic analogies between the drawings of the Kindergarten manual and his plans or volumes of buildings, which, however, I do not want to deny, but I want to highlight how in Wright the game has become a tool for composition.
To understand how profound was the *Kindergartern* influence in Frank Lloyd Wright's training, it is better, before studying in deep the philosophy of the method, to specify briefly, but precisely, which part of the pedagogical institution the American architect attended thanks to the help of his mother Anna Lloyd Jones. This short path of historical and

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biographical reconstruction starts from a privileged source, the words of the architect that can be read in *An Autobiography* (Wright 1998)[1]. Anna learned about Fröbel's method in 1876, during the Philadelphia Centenary Exhibition and bought the *gifts* through which her two children, Frank and Mary Jane, aged 9 and 7 respectively, playing, should have started a new learning path.

We note some aspects: the first is that Wright was introduced to the method when he was older than usual; the second is that he never participated in a real *Kindergerten* in a strict sense of the word. Indeed, Anna adapted Fröbel's method to the family economic condition, giving up professional educational educators and focusing exclusively on the activities that could be carried out inside a room. In the original intentions of the pedagogue, the *Kindergarten* was addressed to children between 3 and 5 years old, they should be gathered in classes of about 25-30 and should spent time outside playing and farming (Owen 1906).

But Wright had a lonely childhood, attending an incomplete *Kindergarten*, and if the experience of sharing time and confronting with other children was never regained, on the other hand, he had a privileged contact with nature, completing in part, as a self-taught, his first training received during his personal *Kindergarten*. Indeed, his mother, worried about the solipsism of her son, who preferred to read and fantasize rather than going outside and playing with other children, sent him, still a teenager, to his uncle James, so that he could introduce Wright to the hard life of farming. The direct contact with the lush meadows and the thick forests of Spring Green (Wisconsin) revealed in all their adamant clarity the relationships between what was learned at the game table and the rules of nature.

There is no doubt that the maternal teaching, mythologized by the American architect, marks a particularly significant moment in Wright's training, as evidenced by the design process of a life, from which it is evident that he absorbed above all two aspects of the pedagogical method: geometry, derived from the formalistic logic of Heinrich Pestalozzi (teacher and reference point of Fröbel); and symbolism, as expression of the romantic vision of the German educator (Fröbel 1993)[2]. These are the two aspects of Wright's works that have been more studied by critics. As an example of the consequences related to the use of geometric shapes linked to the Fröbelian method, let's consider the famous stained-glass windows of the *Priarie* period; they are abstract representations of nature obtained through an appropriate distribution of regular and irregular coloured surfaces. The *Unity Temple* in Oak Park of 1906, instead, refers in its volumetric forms to the assembly of the maple blocks. The formal suggestions of the pedagogical method enriched Wright's architectural conception also with a further fundamental nuance, that wanted each shape linked to a meaning. According to Fröbel, a direct connection between forms and symbol was spontaneously established in the mind of the child, so the square could become expression of stability and firmness, the circle of dynamism and the triangle of asceticism. This type of influence, mostly didactically induced with direct experience and experiments carried out on objects, has left a profound mark on many of the Maestro's buildings, which always stand out for their considerable symbolic charge, associated with form. An emblematic example of this attitude can be traced back again to the *Unity Temple*; the building con-

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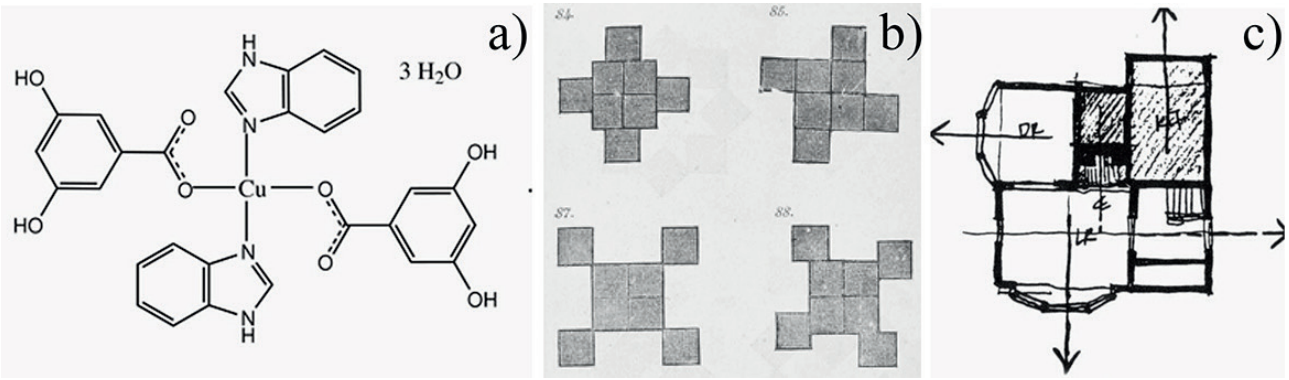

Fig. 1
a) copper crystal; b) windmill configurations; c) F. L. Wright, Home and Studio, Chicago, Oak Park (1889).

stitutes a case of evident connection between architecture and concept, since the aggregation of the volumes encloses a pure cubic inner space, that alludes to moral solidity, a theme very important in the Unitarian religion, which preached a life in harmony with nature and, at the same time. an intimate relationship with the divinity. The cube, the most stable polyhedron among the Platonic solids, perfectly embodied these aspirations.

A brief analysis of the cultural roots on which Fröbel founded his *Kindergaten*, makes us able to overcome the geometric-symbolic connections between pedagogical method and architecture, focusing our attention on how the play rules influenced Wrightian composition. Before becoming a successful educator, Fröbel accumulated a lot of knowledge in different fields: he was an employed at the Office of Forests, a topographer, a cartographer, a private secretary, an accountant, a tutor and a crystallographer (Fröbel 1889). In particular, the latter work, attended in Berlin between 1811 and 1812 as assistant of professor Christian Samuel Weiss at the Mineralogy Museum of the city, suggested to him a scientific base for a solid theoretical structure, suitable to support his innovative pedagogic method. Fröbel was looking for simple natural laws to apply to all types of growth, including the human one (Spielman Rubin 2002). For this reason, he turned to crystallography trying to isolate the germs of transformation, growth and energy from the rock fragments. Formal memories, similar to the Weissian graphic model to show the development of a crystal, can be found in Fröbel's windmill figures, obtained starting from the constitution of a central nucleus, around which the other elements have to be arranged. An echo of the way to arrange the maple blocks at the *Kindergarten* table can be found in the centrifugal and dynamic organization of the plans of the *Prairie* houses. In this sense, the Oak Park *Home and Studio* is the first and most emblematic example; the windmill planimetric arrangement of the rooms is very similar to that suggested by the German pedagogue in distributing the maple blocks starting from a central core (the fireplace for Wright), around which the outermost rooms of the house must be rotated and translated always in the same direction; this rotation closely resembles the ways of growth of inanimate matter and, in particular, of crystals (Fig. 1). There is another important aspect, also if it is a hypothesis, which could constitute a further link between Fröbel's method and the American architect's design. During the years spent in Oak Park, Wright was also involved in the education of his children, giving them lessons at the *Kindergarten* table. So, the American architect passed from the role of student to that of teacher, with the aim of deepening that this task entails and the possibility to see not only the figures of the text but, above all, to read the theory that the

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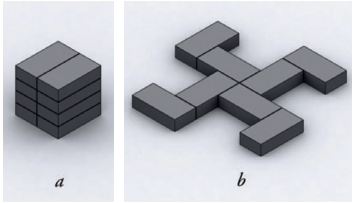

Fig. 2
Forth gift (maple blocks); Law of Unity.

German pedagogue associated them. Maybe this event constituted a summary, a real moment of synthesis, in support of the new organic architecture. According to Weiss, the growth of crystals respected precise laws, that Fröbel borrowed to transform them into the rules to use during the game: the Law of Unity, the Law of Contrast, the Law of Development and the Law of Connection (Hughes 1911).

The Law of Unity can be applied to all entities, each of them has to be considered simultaneously as a whole in itself, and as a fragment of a larger portion, which in turn becomes part of a last unity. For Fröbel the Law of Unity constitutes a fundamental background that must be taught from the beginning in the attention to pay when the games are presented to the child. The boxes containing the maple blocks were, indeed, turned upside down on the table, making the top cover slip to present its content to the children in the form of a solid unity, also if made of single elements. During the play the elements could be moved to obtain different configurations, but at the end of the game the child had to put the single components back into the box by reconstituting the original unity (Fig. 2).

For Wright the Law of Unity is a pivot to all his architecture, often described as an organic entity expressed in the details that integrate with the project, as well as the final design relates to the orography of the place. An example of this unitary approach can be seen in the second project for *Herbert Jacobs House*: the house was built near Madison (WI) and, therefore, it is exposed to the cold of the north weather. The architect develops a specific scheme called *Solar House*, interring the northern side of the building to protect it better from the cold: the plan, the shape of the garden and many other details, are based on the circle, referring to the solar disk and, while the connection to the earth is guaranteed by an excavation in the local sandstone, the resulting material was used to create the bricks of the walls (Fig. 3). The Law of Contrasts (also called the Law of Opposites) can be considered a direct consequence of the Law of Unity; it embraces all possible differences, from the most similar to the opposite extremes, it is characterized by a co-presence of polarity which manifest a common property. Fröbel concludes in *The Education of Man* that between the different degrees of contrasts there is always a point of mediation where the opposites reach a balance and calm down, exalting each other (Fröbel 1889). In the *Kindergarten* the Law of Contrasts happened every time the eye was deceived in the interpretation of the figures, because the alternation of full and empty areas. This was the way to show the reconciliation of opposites: the students had to distribute the geometric figures following a specific order on the game table so that, once arranged, a modular drawing was created in the foreground and background (Fig. 4). Traces of the Law of Contrasts in Wright's work can be found in the wind-pump, known as *Romeo and Juliet* (Fig. 5). The planimetric composition of this small building is generated by the interpenetration between an octagon (*Juliet*) and a rhombus (*Romeo*). Referring to the activities carried out around the *Kindergarten* table, the first figure can be obtained arranging eight equilateral triangles with a vertex and two sides in common, while the second can be considered as a consequence of the first, obtained by overturning a single triangle around its free side; indeed, in the equilibrium of the interpenetrated figures, created by the matter and

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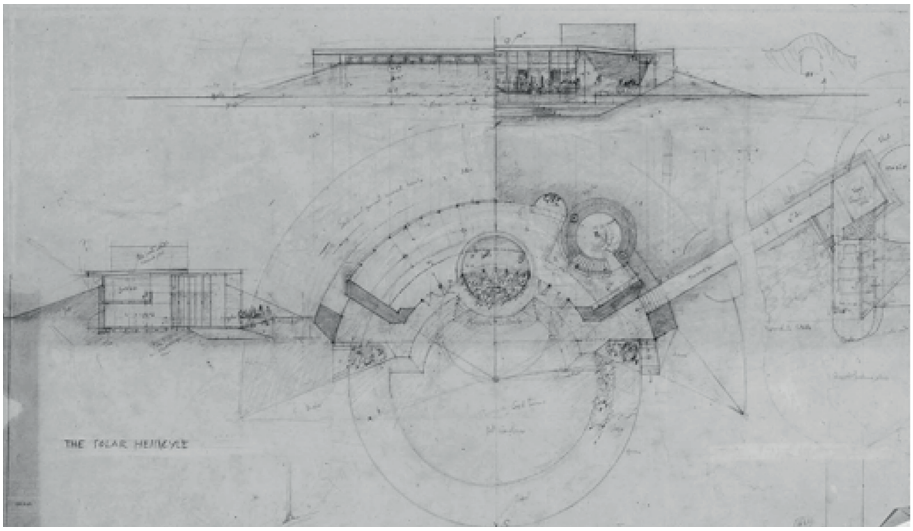

Fig. 3
F. L. Wright, H. Jacobs House, Middleton, WI (1943).

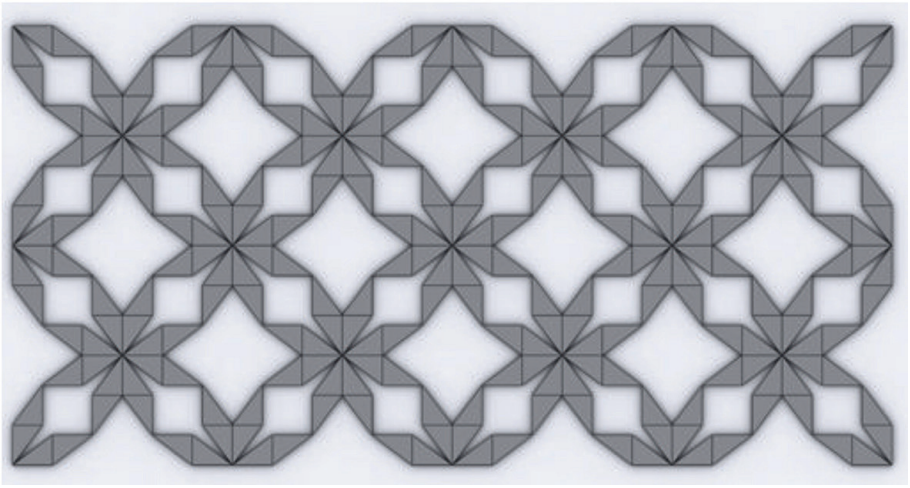

Fig. 4
Seventh gift (families of triangles); Law of Contrasts.

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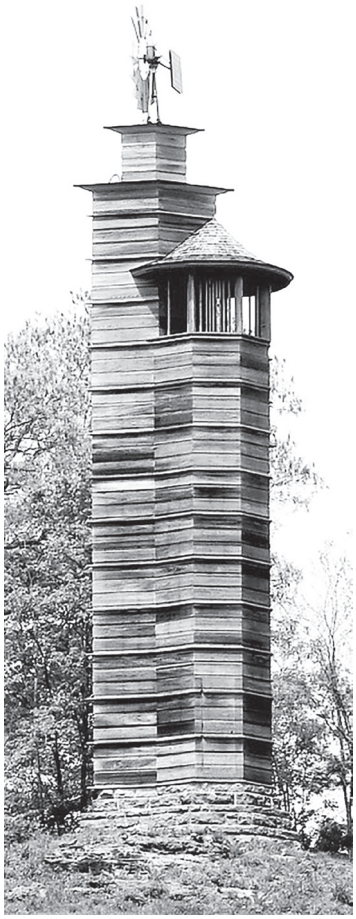

Fig. 5
F. L. Wright, Romeo and Juliet, Spring Green, Wi (1896).

the physical empty space, participate together in close collaboration in generating the final composition (Fig. 6).
The third rule identified by Fröbel is called the Law of Development, which involves all possible changes of forms, no matter how infinitesimal they may be. For the pedagogue there is an indispensable condition, according to which each subsequent step of development does not exclude its precedent, ennobling it, transforming and increasing it. From this, it derives an important awareness to be acquired during the play: each new object, given to the child, must be connected to the previous one in order to complete and integrate it, encouraging to proceed with order from the simplest to the most complex activities. In Wright's architecture, it often happens that the geometric figures are declined in successive variations as counterpoints; so, the triangles alternate with the squares, and these in turn with hexagons, octagons, dodecagons until the number of sides dissolves in the continuous arc of a circumference. To clarify this aspect it is better, also in this case, to consider the houses of the *Prairie* period. For *McAfee House* Wright juxtaposed, in two separate and ideally connected sequences, the rectangular roof that covers the octagonal library and an octagonal roof that closes the rectangular dining room (Fig. 7) (Mc Carter 2005).
The last rule found by Fröbel is the Law of Connections and it is useful to reconnect all the other three laws for a correct outcome of the training activities. The *Kindergarten* educational project highlights this assumption by dividing the learning program into two game phases, they are separated but interconnected. While the *gifts* (maple blocks, sticks, seeds and geometric cardboard figures) provide the material to transform the impressions coming from the world into personal considerations, moving from the real objects to abstract entities; *occupations* generate an opposite mechanism, leading from inner ideas to the free expressions, starting from the abstract entities to arrive at real objects. The educational method, in practice, invited children with *gifts* to a first process of analysis by rationalizing the real world by means of solids, surfaces, lines and points; while a second process of synthesis, the *occupations*, connected the points to the lines, the lines to the planes, the planes to the solid. In Wright's work reminiscences of the Law of Connection can be found in the appropriate 'folding' of lines and surfaces that envelop the space, as in the case of the living room of *Taliesin West* (Fig. 8) (Pfeiffer 1992). This environment is characterized by a roof that has different inclinations emphasizing the expansion process of the space. The interior is delimited by a thin white cloth, similar to a diaphanous surface, stretched over a system of wooden beams, folded in a C, in a configuration that could easily be traced back to the ludic experience performed by connecting lines and surfaces.
The whole Fröbelian educational structure revolves around these four laws that had to be strictly applied in the act of composing figures and solids, embodying the typically American aspiration to bring every aspect of man back in close contact with nature. The *Kindergarten* answered perfectly to Wright's need to found a national architectural identity able to free himself from European cultural dependence:

«He [Fröbel, ed.] insisted on Nature, with the capital "N", as the basis for any fruitful study, which would allow the child to learn from Nature, to draw from Nature the effect he saw; until, with the bases of those effects, he is introduced to elementary

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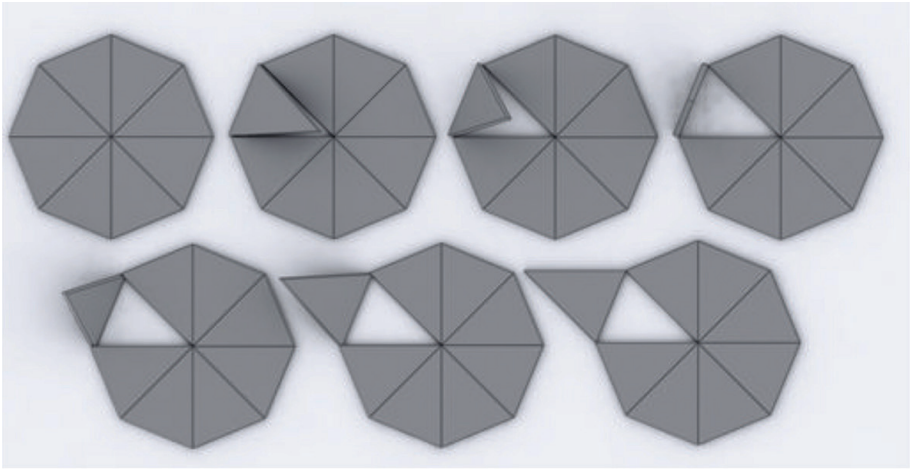

Fig. 6
Rhombus-octagon intersection, attributable to the plan of Romeo and Juliet.

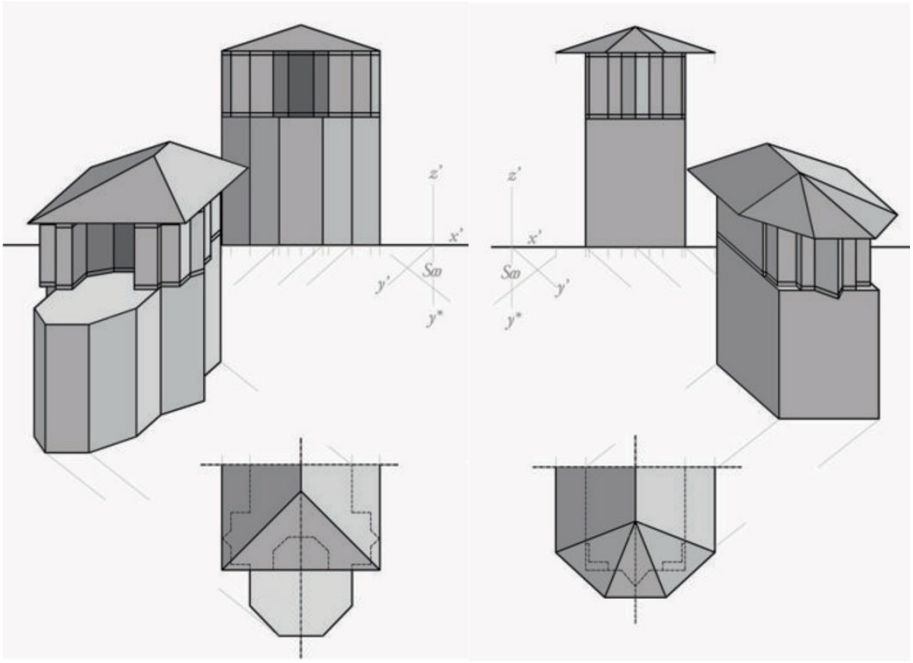

Fig. 7
Law of Development. Plans, elevations and axonometric views of the library (sx) and of the living room (dx).

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Fig. 8
Low of Connections. F. L. Wright, Taliesin West, Scottsdale, AZ (1937).

geometry to understand its causes. Isn't this wisdom? This is all organic, isn't it? Friedrich Fröbel is organic in the soul, in the character of his thought and his work. And I am one of the beneficiaries, through my mother, of that training process known as *Kindergarten*» (Pfeiffer 1987).

Notes

[1] Original edition: Wright F. L. (1932) – *An Autobiography*, Longmans Green, New York.

[2] Original edition: Fröbel F. W. A. (1826) - *Die Menschenerziehung*, Verlag der allgemeinen deutschen Erziehungsanstalt, Keilhau.

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Cosimo Monteleone is Associate Professor of Descriptive Geometry and Architectural Representation at the Padua University. In 2003 he obtained his degree in Architecture at the University IUAV of Venice, where he also earned his Ph.D. in 2010 in "Architectural Composition curriculum in Survey and Representation of Architecture and Landscape" with a study on the Guggenheim Museum by Frank Lloyd Wright. His focuses on architectural, urban and landscape survey; 3D modeling of architecture and city; augmented and virtual reality; gnomonic; science and technique applied to art and architecture; history of representation with particular skills related to Renaissance perspective. Among his publications is *Frank Lloyd Wright. Geometria e Astrazione nel Guggenheim Museum* (Rome: Aracne 2013).