

COMPOSITION AT THE ECOLE DES BEAUX-ARTS

The composition techniques of the Ecole des Beaux-Arts related below are a complex series of design processes that, as a group, were at their greatest influence around 1850. An abridged history of the evolution of the program at the Ecole des Beaux-Arts is relegated to Appendix A. The compositional concepts were derived from the Roman classical text of Vitruvius, Roman building, and the Renaissance writings and building of Alberti, Palladio and lesser well-known theorists, all of whom relied heavily on Vitruvius and Roman building as bases for their arguments. Design activities related to the program at the Ecole des Beaux-Arts were carried out in ateliers outside the school set up specifically to teach design. Each atelier had a master and he gave a particular emphasis to the methodology of design within the generally accepted conceptual framework that the Ecole des Beaux-Arts taught. Therefore, it is impossible to state with any clarity a single all-encompassing theory of composition which was applied to design in a rigid manner. What will be described here instead, will be a general methodology and set of techniques that had emerged by 1850 and was justified by the work of Vitruvius and other scholars.

The techniques are presented in the format that will be used to compare it to the Modern Movement in architectural theory and the Gestalt and Ecological theories in psychology. This format is one of describing first the physical ordering systems, by geometry and by the development of hierarchy within the geometry, and second, the symbolic systems of mood or tone and the application of explicit symbols.

Geometry

The geometries employed in the Beaux-Arts were circular and grid forms derived from Vitruvius's description in Book III Ch. 1¹ of the proportions of man fitting a circle inside a square, which so influenced the imagination of Renaissance Architects². The grid was expanded to accommodate two principles. The first was the use of natural light in all primary spaces, and the second was roof drainage;³ both can be traced to Vitruvius' discussions of the use of atriums in Book VI Ch. 3. Both principles are based essentially on practical concerns, but have obvious formal consequences.

The grid form was also allowed to expand into a limited set of proportional rectangles⁴ in order to match the functional space requirements and as a means of developing hierarchy and unity in composition.(fig. 1). Elements were connected by symmetrical circulation patterns developed from nested

rectangular grid patterns of organization. The concept of separate circulation and the nested rectangular geometry as a method of achieving it were a unique contribution of the Beaux-Arts to composition. D. Van Zanten discusses Charles Percier's 1786 Grand Prix Design as one of the first competition winners to use this methodology.

Percier's reduction of almost all the spaces to rectangles adhering to a continuously modular grid greatly increased the ease with which they might be combined and manipulated. Furthermore, the rectangle-within-rectangle figure produced a system of communication quite different from that of the Renaissance and Baroque enfilade.⁵

He goes on to state "The rectangle-within-rectangle figure and the overlapping of the outer rectangles introduced the possibility of the separation of functioning spaces and communications, which by the time of Guadet (1901) had become one of the cardinal rules of Beaux-Arts composition."⁶

Hierarchy

Hierarchical composition is the presentation of the relative importance of various elements of a building and their interrelationships. In Beaux Arts competitions, the elements of a building were assigned a scale in relation to their importance. L. Anderson writes that this determination of scale was the primary requirement for the student.

The elements themselves--auditoria, exhibition galleries, libraries, lecture rooms, down to classrooms, offices, and smaller dependencies--were largely pawns in the game. Their forms were taken for granted. It was up to the student to rank them in order of actual size, need for easy access, and symbolic importance in his composition and to place them accordingly.⁷

Student responsibility was increased by the lack of specific program data. As Carlhian claims,

It should also be remembered that no Ecole's program, beyond merely stating the maximum overall dimension of the project at hand and the scale at which it was to be presented, cared to even give exact desirable sizes pertaining to the functions of elements to be accommodated. The governing factor, in a plan arrangement exercise, was the determination of what relative importance was to be given to the programs' enumerated parts, and in elevation studies, to the overall proportions given to its various parts. Exact sizes were never a consideration.⁸

Hierarchy implies the bringing of things together into a meaningful whole as much as it means assigning relative importance to parts. This requirement for singular wholeness was a principal of Beaux-Arts composition as it was for some classical and most Renaissance design. It implied a unity of idea which was then given a unity of form. Anderson writes concerning the rules of composition during the early 20th century Beaux-Arts design that

We must above all remember two truths: composition is necessary for all beauty, and the overall concern of composition is unity. The elements of any composition must subordinate themselves to one principal dominant element. The avoidance of equality is the basis for all orderly composition.⁹

The technique for developing hierarchy was the use of axes of symmetry. The underlying justification for this technique can be traced to Vitruvius, who based its importance as one of the fundamental principles of architecture on the symmetry, and therefore harmony, exhibited by man and nature.¹⁰

The process of composition then, was to identify within a given program the singularly most important element of the program and place it on the axis of symmetry. Secondary elements were identified and allocated symmetrically around the axis, with tertiary elements placed in a second level away from the main axis. David Van Zanten's description of the activity is simply that "the manner in which the students arranged these spaces and volumes was to group them along axes, symmetrically and pyramidally." In the educational setting these compositions tended to be limited to one level, or sometimes two, while in practice there was greater latitude; however, even there the concept of 'piano nobile' or prime floor flourished.

In the Beaux-Arts, the composition process moved from organization in plan to that of section, to that of elevation.¹² Being the singular key to the solution of the problem in section as well as elevation, the plan was developed in detail and "remained to the very end the horizontal expression of a load-bearing wall structure."¹⁷ The scale of plan space had a corresponding scale in the cross section of the structural members so that its section and elevation could be read from the plan.

Decisions about the placement of the dominant element were first made in plan and were based on the number of axes of symmetry. This placement could be at the top of the page with the assumption that the approach to the building was from the bottom, or alternatively, the prime element could be placed in the center of the page at the intersection of two perpendicular axes. In this latter condition, the prime axis or approach was

still the vertical one but entry was developed symmetrically from the top and bottom.

While symmetry around two axes in a square plan order centered the major elements, the axes were usually not exactly replicas of each other and their difference usually implied an axes of approach from one or two ends of one of the axes, making that one slightly more significant. Palladio's villa rotunda was one of the few earlier models of purely symmetrical organization, and suggested as well the perfection strived for in all building.

D. Van Zanten states that

The tension one sees in the Grand Prix projects between biaxially symmetrical planning and directional layouts is characteristic of a basic conflict in Beaux-Arts composition: that between the purity of the geometric pattern and circumstantial distortions required for the fulfillment of the given function and for the expression of that function.¹⁴

This conflict, it should be noted, never was great enough to disturb the basic system of symmetrical layout.

Despite which axial scheme was used, the dominant element remained the focus of the building. Anderson reports that on the approach axes on either the centering scheme or the linear one, the major element of the building was never to be masked by other elements.¹⁵ The clear experience of the primary element as one approaches the building and travels through it is the 'marche' of the scheme. The 'marche' was not always possible to achieve in a purely biaxially symmetrical scheme because some elements might be blocking the approach view of the prime element. In these situations, a forecourt was often utilized to open the view to the major element, thus making the axis of entry dominant and directional. In linear progressions, a rising topography was usually employed to further emphasize the primary element at the highest level.

The sections were developed to reflect the plan hierarchy. "The section was essentially an exercise in asymmetrical organization...the western tradition of reading from left to right resulted in sections which usually feature their highest elevation towards the right."¹⁶ Schemes where symmetry was developed around two perpendicular axes would in section cascade in scale from the middle.

Many Beaux-Arts schemes would be raised on plynths to ensure the purity of the composition. This reflected a concern of Alberti who felt that the most beautiful and important building was the church and that it should be separated and raised above

all other buildings.¹⁷ Since great beauty was expected of Beaux-Arts composition it was only natural to separate their designs from any real context and to raise them on plynths.

The unity which is conceptually an intrinsic part of hierarchical composition was accomplished by the proportioning of all parts to each other, by the connection of elements by corridors, by the appropriate selection of orders, and by visual rhythm or pattern along axes, corridors, and in elevations. The Beaux-Arts, as did Vitruvius, considered the proportional relations of elements to the whole as one of the fundamental principles of architecture.¹⁸

In (Beaux-Arts) architecture, relative proportions are always important--we look for them in details of the plan, in the balance of masses, or in the most refined moldings of a facade. Generally, neighboring elements need to differ dimensionally almost from single to double to completely avoid a sense of duality. For instances, at the cornice molding of the Ionic Order, large elements are always separated by small ones. The importance of contrast comes from a fear of duality.¹⁹

The modulation along corridors also followed this requirement for high contrast between sections of repeating rhythms.

Symmetry is maintained in the smallest detail or space. In the Beaux-arts drawing technique, scales were seldom utilized and instead proportional dividers were employed to layout elements in proportion to each other. The rules for proportioning were generally based on the writings of Alberti and Palladio who had very specific proportioning systems.²⁰ The concept of unity was applied to the most functional elements. For example, "It should be noted that in order to safeguard the precious precept of unity, all roofs on any one building were assigned identical pitches."²¹

The sectional and elevation proportions were developed from the plan proportions.

With a well-ordered plan with its main features properly stacked in hierarchic order, its various elements correctly articulated in accordance with a working roof plan, a well-modulated poche figuratively expressive of the relative compressive forces generated by various spans or heights, the section was a cinch.²²

In a similar fashion the proportions of the elevations were developed from the spaces behind the elevations and the proportions of the orders which were used to provide the appropriate decoration and reference to the interior scale.

Hierarchy then was generated by the assignment of an element's scale and location while unity was provided by proportioning all parts to the whole, all within the strict application of symmetrical ordering techniques. The current concept that a building requires a base, middle, and top which seems such an integral part of Beaux-Arts composition, Wittkower attributes to Palladio's dissemination, through his writings and work, of ideas present in the palace architecture of Bramante and Raphael.²³

A major widening of the compositional methodologies occurred in the 1860's as a response to more specific programmatic and site specifications for the Grand Prix as well as to the theoretical expansion of Viollet-le-Duc, Charles Garnier, and their contemporaries. For a while, these influences became a major direction in the Ecole, but their impact on the program weakened quickly.

Mood or Tone

Buildings have certain moods or tones which are attributes of light and shade, material choice, color, scale and proportional decisions and compositional methods. What will be recorded here are simply the stated methods of producing a mood or tone, though these can hardly be considered systematized. A. L. T. Vaudoyer, an atelier patron and secretary of the Ecole, sums up what the sensation of mood or tone is in his presentation to the Academie in 1832.

And monumental architecture, architecture that is art, arrives at the same end; the material that comprises it is forgotten, when the architect who has produced it has deeply probed the human heart and sees how the human heart is affected by places under different circumstances; when he studies within himself the varying emotions he has experienced when seeing, caught by surprise or upon reflection, under a clear and luminous sky or a dark and sad horizon, the curious combinations of effects, of certain places, of this great universe. When this artist produces the same impression by means of imitation, we have what cannot be expressed in words, let alone be reduced to principle.²⁴

Since the concepts of moods or tones were presented in ateliers outside the Ecole, there are few records of this important aspect of Ecole design. David Van Zanten describes this as an architecture of tableaux and

this conception of architecture in terms of tableaux of building masses and interior spaces was an eighteenth century phenomenon, first stated by Leroy of the

generation of Soufflot, and then by Boullée of the following generation. But it persisted through the Empire and the Restoration and down to the Romantic revolution around 1830.²⁵

Van Zanten relates how Etienne-Louis Boullée, a prominent maitre d'atelier of the 1780's, rejected the importance of the orders and to some extent proportion. Boullée states "'In architecture, faults in proportion are sensible to any great degree only to connoisseurs. It is clear that proportion is not the first law...The first law of architecture...is regularity.'"²⁶

Instead, he emphasized the importance of the mood or tone of a building which he felt could be based on the moods evoked by the four seasons: Summer, shimmering light on many objects with bright colors; Fall, contrast of light and shadow, dissimilar shapes, irregular quality of mixed and checkered colors; Winter, dark and sad, shapes hard and angular, bare walls, squat proportions and concealed in the earth.²⁷ While this list is undoubtedly not the only set, nor entirely complete in itself, it conveys a sense of the feelings that are meant to be evoked by architecture. Over time, these feelings became more concrete in specific components of a building and will be dealt with in the next section under explicit symbols.

Explicit Symbols

The Beaux-Arts developed the use of specific configurations of building elements (symbols) to a level of complexity unequalled in architectural education. The intent was to identify a series of proper responses to any stated architectural program. This intention evolved from Vitruvius' fifth principle in his *Fundamental Principles of Architecture, Propriety*.²⁸ For Vitruvius, Propriety came from the perfection of style and the appropriate application of it. The first set of appropriate symbols were the Orders. In Book IV, Vitruvius describes the origins and appropriate uses of the Orders, and in Ch. 1 of Book V, he explains the application of the Orders in public and commercial buildings.

Over the centuries, the range of building types designed by the Orders was expanded from public and commercial buildings to include residences and churches. Wittkower discusses Palladio's expansion of the uses of the Orders in the development of domestic architecture.

Facades of ancient domestic buildings were unknown, but with the application of the temple front to the house, Palladio believed that he had re-created them in form and spirit; his reconstruction of the front of the ancient house in Babbaro's Vitruvius shows a large

eight-column portico.² (Pl. 23c). His conclusion was founded on two fallacies, an erroneous theory of the development of society, and an erroneous theory of the genesis of architecture...Therefore, he concludes, private houses were the nuclei of public buildings; in other words, temples reflect the appearance of the ancient house³....Thus to utilize the temple front for private buildings appeared to him a legitimate regression to an ancient custom...He was the first consistently to graft the temple front on to the wall of the house, and through him the type was most widely disseminated.²⁹

Finally, with the neat trick of applying the Orders, which originally symbolized aspects of pagan religion, to church architecture, the Orders became the dominant decoration of all architectural building types. The choice of order and the scale at which it was applied was based on appropriateness to the building type, the building's intended tone and the intended hierarchy of the parts within the composition.

At this point in history, the subtlety of some of these decisions is totally opaque. D. Van Zanten relates that Quatremere, director of the Academy at its beginning (1816-39), taught that the Doric Order had the most character because it was supposed to be the most primitive and thus most vital.³⁰ However, this attitude did not permeate the work of the Beaux-Arts, as one can see from the numerous Grand-Prix drawings of record. Also, it must be clearly noted that much of the Beaux-Arts' architecture was formed by arches and vaults based on Roman precedent, and walls reinforced by engaged columns, all of which Quatremere disapproved.

The real intricacies of the Beaux-Arts education can be seen in the relation between design problem statements and the theory lectures in the Ecole. Students had to pass a series of design problems written by the Professor of Theory at the Ecole. The programs were a set of key words that related to appropriate design responses that could be learned only in the lectures.

J. P. Carlhian writes of the lectures that

This is where one learned the difference between step, stoop, stair, staircase, stairway, stairwall, (marche, perron, gradin, escalier, emmanchement or the like) or between un peristyle, un hall, un vestibule, une entr'ee, un degagement, une galerie, une circulation. It was indeed extremely important to understand the professor's way of thinking, as one was called upon repeatedly to cope with the necessity of reading between the lines of the austere text of his programs.³¹

Historic precedent was, of course, an important part of this, and in many instances historic examples were referenced in the introductory paragraphs of programs.

The written comments about successful projects were equally cryptic and stylized, requiring the student to understand formal relationships that corresponded to specific words. Restated, the problem was to learn the appropriate form for a context; in a problem statement the underlying assumption was that specific form symbolizes a specific relationship that can be verbalized and justified. These form-word linkages covered everything from building type (such as the distinction between a country hotel and a major city one) to the detail of stairs and corridors. Every idea had an appropriate architectural response.

Since it took an education at the Ecole to understand and apply these symbols appropriately it must be assumed that the belief was that people would, when viewing a building, either be educated to appreciate these subtleties or respond to them instinctively. It is not necessary for this work to enumerate any particular Beaux-Arts theorist's word/form vocabulary. They, along with the appropriate application of the orders, have long since dropped from use in architectural education. The fact that they existed and were so succinct is what is of importance to this work.

Conclusion

Beaux-Arts composition was fairly strict. Its most obvious aspects were the complete application of symmetry, proportion, and the orders to every facet of a problem. The symbol systems utilized in design were quite intricate and explicit, but seemed to vary with the attitudes of the various teachers of theory at the Ecole. By 1850, the date at which this study is defining the Beaux-Arts compositional method, the Beaux-Arts began facing criticism from within which foreshadowed some of the attitudes of the Modern Movement.³² These criticisms affected the Beaux-Arts for a short time, but were eventually rejected in favor of the system as it had existed earlier.

Footnotes & Illustrations

1 Pollo Vitruvius, The Ten Books on Architecture, trans. Morris Hicky Morgan (Cambridge: Harvard University Press, 1914).

2 Rudolf Wittkower, Architectural Principles in the Age of Humanism, (New York: W.W. Norton & Co. 1971).

Wittkower reports that "This simple picture seemed to reveal a deep and fundamental truth about man and the world, and its importance for Renaissance architects can hardly be overestimated. The image haunted their imagination." p14 He goes on to state: "But Palladio goes on to explain more fully what Alberti only adumbrates. For he states authoritatively which form is most worthy for the house of God. 'The most beautiful and most regular forms' he says 'and from which the others receive their measure are the round and quadrangular.'" p22. Wittkower shows that in the Renaissance mind the purity of these forms represented the purity of God and man's essential relation to that purity.

3 Jean Paul Carlhian, "The Ecole des Beaux-Arts: Modes and Manners," Journal of Architectural Education, Vol. XXXIII, No. 2 (November 1979):7-17.

Carlhian, in discussing the design process of Ecole students identified two basic pragmatic considerations: "the handling of natural light and provisions for the shedding of rain water.

Artificial light was never recognized as an acceptable solution justifying the assignment of windowless spaces to human use. It was deemed acceptable only for storage areas . . . never for people. . . . If and when permissible, top light had to be incorporated into a system of pitched roofs. . . . The resulting necessity of never allowing the disposition of more than three elements side by side thus becomes readily apparent." p12

4 Vitruvius, The Ten Books on Architecture.

Acceptable proportions for rooms varied with the theorist. Vitruvius in Book VI gives appropriate proportions to the variety of possible temples based on the orders and their proportioning. The dimensions given are outside proportions, so interior room dimensions seem not to have a direct proportional nature. In describing a forum in book V ch. 1, he relates the size of space to population. "The size of a forum should be proportionate to the number of inhabitants, so that it may not

be too small a space to be useful, nor look like a desert waste for lack of population. To determine its breadth, divide its length into three parts and assign two of them to the breadth." p132

and Wittkower, pp. 114+132.

Wittkower describes Alberti's very complex proportional system on page 114 of his book. He relates it to theories of mathematics and harmonics. In the same book on page 132 he describes Palladio's ratios for rooms and its musical scale interdependence. Both systems are reasonably complex and while the use of ratios and proportions for orders have transferred to the Beaux-Arts it seems that the rationale based on greek musical notation has disappeared in favor of a concept of mathematical unity.

5 David Van Zanten, "Architectural Composition at the Ecole des Beaux-Arts from Charles Percier to Charles Garnier," in The Architecture of the Ecole des Beaux-Arts, ed. Arthur Drexler (New York: The Museum of Modern Art, 1977), p. 129.

6 Ibid., p. 130.

7 Lawrence B. Anderson, "Rereading Gromort," Journal of Architectural Education, Vol. XXXIII, No. 2 (November 1979), p. 20.

Anderson's article is about the architectural theory of Georges Gromort who was the senior patron of the Atelier Gromort and served 1937-40 as Professor of Theory at the Ecole. While this then represents a time past the one considered in this work, the principles quoted are those of the earlier time as well.

8 Carlhian, p. 17.

9 Anderson, p. 19.

10 See Appendix B.

11 Van Zanten, p. 118.

12 Carlhian, p. 16.

13 Ibid., p. 13.

14 Van Zanten, P. 124.

15 Anderson, p. 20.

16 Carlhian, p. 13.

17 A detailed understanding of Alberti's philosophy which includes the centrally planned, white church separated from its context by placement on a plynth is well-documented in Wittkower, Architectural Principles in the Age of Humanism.

- 18 see appendix B.
- 19 Anderson, p. 19.
- 20 Wittkower, pp. 114 + 132.
- 21 Carlhian, p. 12.
- 22 Ibid., p. 13.
- 23 Wittkower, p. 77.
- 24 Van Zanten, p. 162.
- 25 Ibid., p. 160.
- 26 Ibid., p. 159.
- 27 Ibid., p. 159.
- 28 see Appendix B.
- 29 Wittkower, p. 74.
- 30 Van Zanten, p. 191.
- 31 Carlhian, p. 15.

32 Internal criticism of the Ecole des Beaux-Arts represented several changes in attitude toward composition. Viollet-le-Duc developed and promulgated a point of view that was distinctly geometric and abstract. "Violet-le-Duc's analogy of architecture and geology made one specific point, that his was, in a sense, a Copernican point of view. In the period from Boullée to Vaudoyer, a building had been conceived in terms of its marche--like the medieval universe, from the standpoint of the human occupant. In Viollet-le Duc's epoch, it was conceived abstractly, from everywhere and nowhere all at once--like the earth itself in Copernican astronomy, as an abstract diagram of natural forces."³³ His work also tried to integrate cast iron as a new structural material, which contrasted with predominantly wall bearing designs of the Ecole up to that point.

Charles Garnier's winning Paris Opera house project brought a different though no less significant challenge to the Beaux-Arts. He claimed through his principles of reason and

sincerity that the exterior volumes of a building should perfectly express the interior spaces.³⁴ And "Regarding decoration as such, and regarding what ordering and style to adopt, there is no guide other than the inspiration and will of the one who is doing the building; the decorative art has such independence and freedom that it is impossible to submit it to fixed rules."³⁵ He cared quite a lot about the individual's experience of space and sequence and in this respect he humanized and expanded the meaning of the marche.

And finally, to use the words of D. Van Zanten, "That momentous event in architecture during the 1830's seems to have been the simultaneous discovery that architecture in itself was a physical, structural entity, not inhabited by any physical ideal, and that it had no eternal form, but evolved in form with the passage of time from place to place. This, of course, was the Romantic realization, and architecture's crisis during the 1830's paralleled that of literature and painting."³⁶

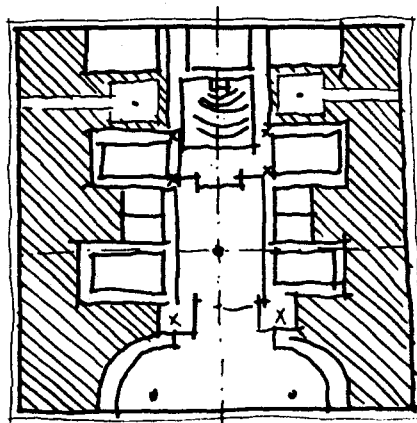
33 Van Zanten, p. 219.

34 Ibid., p. 278.

35 Ibid., p. 278.

36 Ibid., p. 231.

Illustrations



1 Beaux-Arts
Rectangular Geometry