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DIAGRAM AND METAPHOR IN DESIGN: *THE DIVINE COMEDY* AS A SPATIAL MODEL

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ABSTRACT

Translations across symbolic forms necessarily involve shifts and transformations of meaning due to the logic of the medium. They challenge us to examine fundamental metaphors as an aspect of design reasoning, particularly in relation to the construction of spatial relationships and meanings. They also involve the exploration of diagrams as a way of moving from the space of linguistic description to architectural space where topology and visual image are tightly interfaced. In this paper, Terragni's unrealized design for a monument to Dante, which projects *The Divine Comedy* into an architectural schema is examined as a case study. *The Divine Comedy* is treated as an expanded body of work that includes, in addition to the original text, a multitude of paintings, as well as Terragni's project. The paper draws a distinction between transformations of meaning that arise of necessity due to the internal logic of symbolic forms and transformations which manifest specific design intentions. *The Divine Comedy* with its compositional, numerological, and descriptive attributes forms the program for the architectural project. Nevertheless, as in any project, the program does not, in itself, generate architecture. This paper shows that in the Danteum project three major operations are involved in design synthesis. The first inflects the familiar metaphor of the column as a body. The second uses recursive 'extreme to mean ratio' proportions to establish nesting, repetition and scaling, and through these a sense of unity. The third uses a pattern of overlapping squares so as to create a dialogue between strongly differentiated interiors and transitional zones. These operations in conjunction with the compositional and narrative aspects of the poem interpreted as program make the translation from linguistic space to architectural space possible. Thus, in this case, design formulation is not based on a single metaphor, but rather on a system of metaphors working together to bring physical elements, spatial relationships and design operations within a coherent framework of design reasoning.

1. Introduction

In 1938 the Italian architect Giuseppe Terragni was commissioned to design a monument to Dante. Terragni chose to base the design on *The Divine Comedy*.[1] This makes the project rather unusual within the history of architecture since it is rare to find an architectural design based on a previously existing text. The project brings into focus issues of translation, which plays a crucial role in any design activity as design involves translation from abstract spatial models and programmatic requirements into a formal realization. More specifically, it points us to how meaning can be transferred across symbolic forms.

In his discussion on charge and brief, the art historian and theorist Baxandall draws a significant distinction between the formulation of a design problem and specific requirements that need to be satisfied.[2] The term "charge" is used to refer to the design problem and requirements as given at the outset, while the term "brief" is used to refer to the designer's approach to the problem. The distinction becomes especially relevant when there is a weak charge because the critical factors in the understanding of design reasoning are not linked to the usual specifics that guide design decisions whether typology, program, or function. The architectural project examined in this paper is unique since the charge given to the architect was to design a monument to Dante, but the choice of the brief, in this case, to base it on *The Divine Comedy* came after. *The Divine Comedy* is treated as an expanded body of work that includes, in addition to the original text, a multitude of paintings (ranging from early illuminated manuscripts and Botticelli's drawings to more recent

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[1] Both Giuseppe Terragni and Pietro Lingeri were officially the architects of this project, but Schumacher's extensive analysis of this project attributes the seminal ideas to Terragni. For details see Thomas L. Schumacher's *The Danteum,* (Princeton: Princeton Architectural Press, 1993), p. 17. Although Etlin does not agree with this and claims both to be equally involved in the design process, refer Richard Etlin's *Modernism in Italian Architecture, 1890-1940,* (Cambridge: MIT Press, 1991) pp. 517-568. In this paper I refer to Terragni being the designer purely for matters of convenience since the subject of authorship is not a matter of concern in this work.

[2] Michael Baxandall, *Patterns of Intention: On the Historical Explanation of Pictures*, (New Haven : Yale University Press, 1985)

ones by Blake, Dore, and Dalí) as well as Terragni's project.[3] In examining translation across symbolic forms, the paper draws a distinction between transformations that arise of necessity due to the internal logic of symbolic forms, and transformations, which manifest specific design intentions. I shall discuss three design operations that work in tandem in the Danteum project in addition to the architectonic and the compositional aspects of *The Divine Comedy* that the project adheres to.

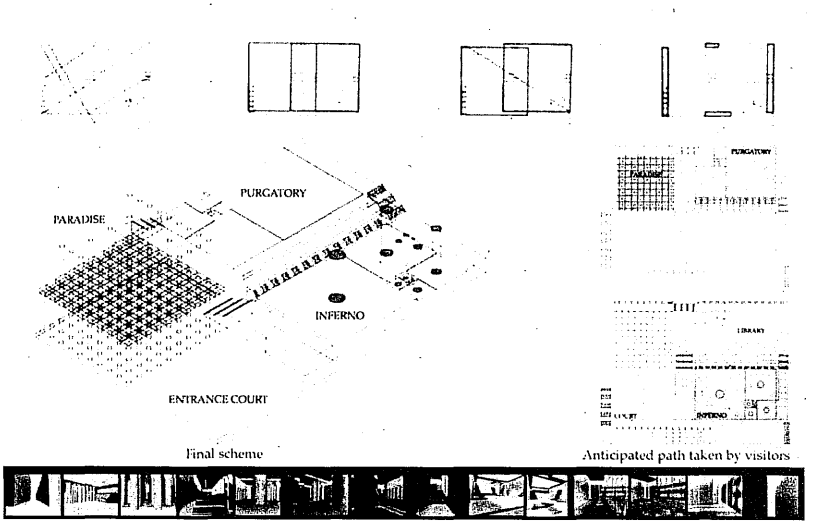

ILLUSTRATION 1: Drawings of the Danteum (top row shows the proportioning system as analyzed by Schumacher; bottom row shows stills of the visitor's experience from the 3D animation model.

[3] This building project was proposed by the Director of the Royal Brera Academy in Milan, Rino Valdameri to the Italian government to celebrate the Dante, "greatest of Italian poets". It was enthusiastically received by Mussolini in late 1938 and would have been built in Rome had the political situation remained the same. Thomas Schumacher, *The Danteum: A study in the Architecture of Literature*, (Princeton: Princeton Architectural Press, 1985). The Danteum drawings are accompanied by the *relazione* document written by the architect which explain the design decisions and how every aspect of the design is intrinsically related to *The Divine Comedy*. The very nature of the document is reminiscent of Dante's *relazione* document.

2. From Text to Building: Relations

The Danteum can be understood at various levels much like the literary work it is based on. In the *Epistle to Lord Can Grande della Scala*, an apocryphal work attributed by many scholars to Dante, he writes about the levels of meaning infused within *The Divine Comedy*.[4] In it, he explains the various levels at which *The Divine Comedy* can be read, by a term that can be roughly translated as "polysemous," that is, having several meanings; the first meaning is that "which is conveyed by the letter," and the next is that "which is conveyed by what the letter signifies; the former is called literal, while the latter is called allegorical or mystical."[5] The idea of a text capable of multiple readings is a characteristic quite common during Middle Ages, and it is a well-established and accepted fact that *The Divine Comedy* can be read at four levels. The categories derived from the medieval four-fold exegesis are literal, allegorical, moral (sometimes referred to as tropological), and anagogical (sometimes referred to as mystical). In terms of the architectural project, the very notion that design is based on a poem can be thought to be metaphorical. Emulating Dante, Terragni also explains his internal design reasoning in the form of a *relazione* document wherein he outlines his design steps in relation to the poem.[6] In a sense, the *relazione* is a discursive bridge between text and design. The document begins with a general rhetoric of monumentality, symbolism, Fascist ideals and the adherence of his work to these 'lofty ideals'. We are told that one of the initial design decision was the use of the golden section rectangle. This is more or less the starting point of the explanation. There is a rather unconvincing rationalization by the architect regarding its use:

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[4] There is immense controversy surrounding the issue of whether the *Epistle to Lord Can Grande della Scala* was actually written by Dante himself. For details refer Barlow Lectures delivered at University College London on 17-18 March 1993 by Professor Robert Hollander of Princeton University.

[5] Dante Alighieri, Epistle to Lord Can Grande della Scala, in Giuseppe Mazzotta's *Critical Essays on Dante*, point number 7 (Boston: G.K. Hall & Co., 1991), [translated and published originally in *The Letters of Dante,* edited by Paget Toynbee, (Oxford, Clarendon Press: 1920)].

[6] Schumacher. *The Danteum.*

> In our case the architecture could adhere to the literary work only through an examination of the admirable structure of the Divine Poem, itself faithful to the criterion of division and interpretation through certain symbolic numbers: 1,3,7,10 and their combinations which can happily be synthesized into *one* and *three* (unity and trinity). Now there is only one rectangle that clearly expresses the harmonic law of unity and trinity, and this is the rectangle known historically as the 'golden'; the rectangle, that is, whose sides are in the golden ration...*One* is the rectangle, *three* are the segments that determine the golden ratio...[7]

Once this is established the reader is more or less taken through the building and the correspondences between the building and the text are pointed out. This literature would almost have us believe that the overriding shape was the first design-decision and once this was established things neatly fell in place. However, there is one sketch by Terragni, which scholars believe to be that of the initial schemes of the Danteum which suggest other ideas at work, at least in the early stages of the design. This sketch dated 25 February 1938 reveals a composition of alternating parallel walls and columns. A closer examination of what many consider to be the Terragni's initial diagrammatic idea for the Danteum project brings up interesting issues regarding diagram and metaphor in design. The diagrams for the first scheme are obviously descriptive of generative ideas and not of particulars. Nevertheless there is a precise aspect of the text which is embedded into them. This is particularly obvious in the choice of number of columns. At a formal level, this scheme seems to be inspired by precedent, ranging from the Corbusier's spiral museum and Baldessari's Padglione della Stampa at the Fifth Trienale in Milan, to the *sette sale* of the Golden House of Nero in Rome. When we seek precise links to the poem we notice significant numerical correspondences such as five lines of ten circular columns, two lines of seven square columns, and two lines of three square columns.[8]

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[7] *Relazione* document.

[8] Number was thought to be the key in the perception and representation of harmony. Dante shares the enthusiasm for number with the renaissance humanists and artists. Number, measure, and more specifically proportion, were more than mere quantitative ideas, in fact, it was through these ideas that comprehension of the unity of creation and beauty was possible. It was common practice to explore mystical numbers in the Bible,

However, the first scheme appears to be devoid of an overriding geometric organization, such as the one subsequently generated by means of "golden rectangles."

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and St. Augustine is supposed to have explored this to a great degree. 33 became especially significant due to its association with the years of Christ's life and many important works such as Augustine's treatise *Contra Faustum manichaeum* had 33 books, while Cassiodorus' *Institutiones* was divided into 33 chapters and Godfrey of Viterbo's *Pantheon* was in 33 *particulae*, just to name a few that used this symbolic property to sanctify their work. Dante's use of 33 cantos in each section, as well as 33 sections in the epistle to Can Grande, was therefore much in keeping with this tradition. The use of such ideas in composition helped the poet to attain the formal scaffolding to build upon and the symbolic profundity. *The Divine Comedy* is essentially divided into 3 canticles, each of which have 33 cantos except for the first part, i.e. the Inferno having an extra one to make a total of 100 cantos. The Poem is composed of three line tercets where the first line rhymes with the third and the second line rhymes with the first of the next stanza -- hence the sequential overlap. Inferno has 9 major divisions with the vestibule that makes it 10, Purgatory has 7 cornices, 2 terraces, and Earthly Paradise, giving a total of 10, and Paradise has 9 spheres of heaven with the Empyrean making it 10. The use of one and three throughout the *Comedy* signifying unity and trinity is well known, but besides this the importance of other numbers, such as seven, is evident at various stages in the poem. The symbolic significance of seven is reflected in the seven days of Dante's journey, as a numeric addition of threes and ones, and is used subtly within the pattern of cantos. For details refer to Charles Singleton, "The Poet's Number at the Center," in *MLN*, 80 no. 1(January 1965), pp. 1-10; Ernst Robert Curtius, "Excursuses XV. Numerical Composition & XVI. Numerical Apothegms" in *European Literature and the Latin Middle Ages*, translated from German by Willard R. Trask, (New York: Bollingen Series XXXVI, Pantheon Books, 1953, pp. 501-514; John Guzzardo, *Dante: Numerological Studies*. American University Studies, Series II Romance Languages and Literature Volume 59, (New York, Peter Lang: 1987); J.L. Logan, "The Poet's Central Numbers," in *MLN*, 86, no.1 (1971), pp. 95-98. Also see V. F. Hopper, *Medieval Number Symbolism,* (New York: Columbia University Press, 1948). Also refer Lionel March, "Theological Number" in *Architectonics of Humanism: Essays on Number in Architecture* (London, Academy Editions, 1998).

ILLUSTRATION 2: Diagram of the first scheme showing the plan and section and Terragni's water color of the Inferno.

In this scheme there is a notion of promenade or a sequence and not much emphasis on a overriding form. In a small sectional diagram accompanying the plan one observes the word "Virgilio" attached to a column, revealing a proclivity to personify architectural elements. This diagrammatic sketch then already has built into it numerical correspondences to the text, the analogy of the promenade or journey, and perhaps most importantly the metaphor of the column which becomes especially significant in relation to the Comedy. The metaphor of the column as body has been quite common through architectural history and in a sense independent of *The Divine Comedy* and internal to the medium.[9] *The Divine Comedy* deploys language towards explicitly mapping landscapes and realms; at the same time, it alternates the function of mapping. The Inferno is most obviously a physical landscape

[9] Refer Vitruvius Pollio, *Ten Books on Architecture* (Cambridge, UK ; New York, NY, USA : Cambridge University Press, 1999) and Joseph Rykwert. *The Dancing Column : On Order of Architecture* (Cambridge, Mass. : MIT Press, c1996).

in which events are contained in different circles and the sufferings of the bodies are reflective of the classificatory nature of the realm. The presence and co-ordination of bodies, however transient, shape the various circles of Paradise. Bodies and their arrangement forms the map in Paradise which otherwise is not amenable to precise description, while the map situates the body in Inferno within a progression of repentance and forgiveness. Thus, within the poem there is a continuing tension between what is being described and what is being narrated. Reference to the body continues to be critical throughout the text. In the Comedy there is great stress placed on the contrast between Dante's living body and the souls of the dead, some of whom long for their lost bodies while suffering. While in Inferno the emphasis is on the suffering body, in Purgatory the body is indirectly referenced by its shadow or the absence thereof. Finally, in Paradise, the body is almost dematerialized and described in terms of light or glowing flesh. This emphasis on the body is transferred into architecture through the personification of the column in the Danteum. Terragni, as an archtitect, draws from his "background knowledge" a familiar metaphor of the column as body, but the metaphor fits only because the poem repeatedly refers to body in the first place. Thus, as the poem situates bodies and their states in described landscapes, so the design situates the column in an architectural setting, rather than use it as a functional element to support weight.

Let us now consider the final scheme for the Danteum to understand how these analogies and metaphors operate when subsumed within the over-riding shape. The building is organized in four basic parts: first, the entrance court which is open to sky with an area of multiple columns at the same level; this is followed by the three realms interpreted as large halls - Inferno, Purgatory, and Paradise - in an ascending order; a flight of stairs returns to the ground level at the end of the journey. Numerical symbolism is carried throughout the design from the general to the particular. But the critical design decision here is the use of the golden rectangle in the overall design. This not only ensures proportional unity but can also be linked to the notion of spiral movement in Inferno and Purgatory.

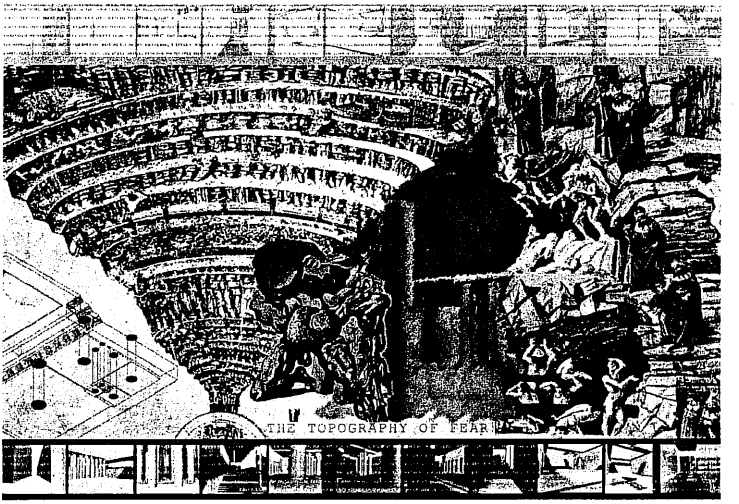


ILLUSTRATION 3: Depictions of Inferno by Botticelli, Dalí, and Terragni.

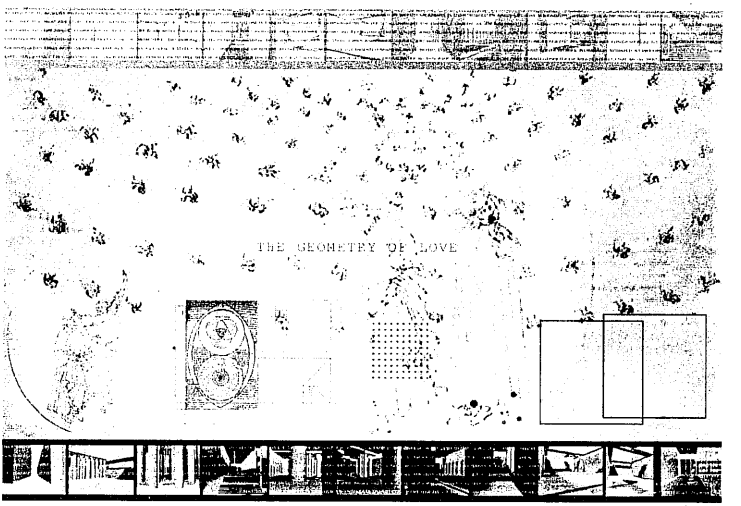


ILLUSTRATION 4: Depictions of Paradise.

3. Personification of the Column

If one considers the handling of the column in the Danteum in greater detail, it is evident that the poetics of the column is in contrast to what is generally expected of the modernist tradition. In the latter, columns are the structural grids of reference and the walls create the drama. In the Danteum the reverse seems to place, the walls create the classification of the realms while the columns dance in space. Here their disposition is unencumbered by structural considerations and varies according to plastic intent. The treatment of the column permeates almost all aspects of translation.

The column is used to denote the abstract structure of the poem in terms of number (reflecting the compositional aspects). The first encounter of the columns is after the courtyard. Here the 100 columns represent the 100 cantos of the poem. The 33 glass columns in Paradise signify the number cantos of that particular part of the poem. Columns are also used to represent qualitative aspects of the numbers as seen in Inferno, where the 7 columns are representative of the seven sins.

At one level, columns signify the symbolic landscape. At an iconic level, the grid of 100 columns after the courtyard, with light filtering through the glass blocks above, is evoactive of a forest; this is how Terragni also interprets it. More interestingly however, columns are used to represent almost opposite ideas, such as the possibility of immediate perception of an arrangement as a grid, in the areas of the courtyard and paradise, as contrasted to the sequential and spiral placement in the Inferno. At the same time, the presence of the columns in Inferno and Paradise and their absence from Purgatory could also be interpreted to represent the eternal nature of the former realms as opposed to the latter, which is more transitory in nature.

At another level the columns embody the states of the body, qualities such as dematerialization or suffering. In the Inferno, Terragni plays with the scale as well as light and materials to create an atmosphere of heaviness, darkness, and weight. It is the distribution as well as the transformation of columns that contributes to the creation of meaning. Here the seven columns vary in size according to their position in the spiral, from the heaviest, which one sees immediately in the front when entering the Inferno to the thinnest which is further behind. The general feeling that is created is of the columns being crushed – in other words,

they are the suffering bodies and could be considered as representing the shades. In this space, the columns maximize differentiation of positions even in the absence of other visitors present in space. In the area dedicated to Purgatory, there are no columns. Here, it is the visitors themselves that are positioned in space. The absence of columns underscores the differentiation of the ground that is potentially occupied by the bodies of the visitors. The third encounter of the columns is in Paradise. Here, Terragni uses glass as the material for columns, glass blocks arranged on a grid for the floor, and glass beams creating the grid of the ceiling. It is the transformation of materials, as well as the ample light flooding the space that help create an ethereal feel. Here it is the dematerialization of columns that is significant. In the process, the columns have a blurring effect on the position of the visitors and even create multiplicity of colors and facets. These dematerialized glass columns can be considered as almost representing the pure souls and angels. The columns are not mere abstraction but manifest concretion. Whether representing suffering or dematerialized state they elicit questions about the subject.

Columns at successive positions may be thought of as the equivalent of the depiction of Dante and Virgil in successive positions within the Divine Comedy paintings by Botticelli. The column as a body in the Danteum can also be compared to some of Dalí's paintings of *The Divine Comedy*. His fascination with the human body and its transfiguration is paralleled in an abstract manner in the Danteum. Terragni's use of the column in the entrance courtyard, the Inferno, and the Paradise, is comparable to Dalí's use of the body that varies from almost sculptural and monumental in the Inferno to painterly in the Paradise. In fact, Terragni's use of the column, getting compressed between floor and slab, monumental and gigantic, is almost like the suffering sculptures of Dalí, while columns of Paradise are suggestive of Dalí's dematerialized bodies. It would not be too far-fetched to say that in this comparison between Terragni and Dalí we see differences in the symbolic medium and the language rather than the content that is being communicated.

The first encounter of columns may be seen to fit the idea of a society. Here the grid of 100 columns personifies the multitude. As we proceed through the three realms, the distribution of the columns continues to have effects upon the potential perception of other visitors as a society. In *The Divine Comedy* there is always a presence of the

other who accompanies Dante - as a guide, whether in the form of Virgil, or in the form of Beatrice. In addition to the father figure, Virgil, or love, Beatrice, there are friends, family, enemies, and citizens. In the Danteum columns qualify potential co-presence in contrasting ways. In Inferno, the other visitors would help scale the building, and thereby, enhancing the perception of the scaling of columns and the overall experience of distortion embedded in the environment; in Paradise, the presence of visitors would produce a multitude of refracted facets and colors which would in turn intensify the impression of disembodiment.

4. The Golden-section & the Overlap

The golden-section rectangle, which was one of the many proportioning systems in Euclidean geometry, has been consciously favored by architects after the Renaissance, especially in the 19th & 20th century.[10] Terragni used this proportioning system in many of his projects. The drawings of the Danteum point to the recursive use of the golden-section rectangle, an overarching geometrical discipline that governs much of the design. The *relazione* document certainly makes that point amply evident. At what stage in the design process after the initial diagram this proportioning system became the guiding feature we shall never know. Nevertheless, once the decision was taken there are certain properties that the golden-section rectangle inherently possesses which were exploited to its full. The rectangle can be divided into a square and another golden-section rectangle. This means that there is an aspect of infinite recursion since this division theoretically can go on indefinitely. Each golden rectangle would also have other golden rectangles nested within, in the same proportion. So, while the square shape is normally associated with stability, the golden rectangle, which can be derived from a square, becomes associated with a recursive series of similar rectangles. In the Danteum, the contour of the entire building and all internal spaces are golden rectangles in plan. This proportioning system has an added dimension - its geometry generates the positioning of columns. The columns in the courtyard are all the same size and arrayed upon a square

[10] Lionel March. *The Architectonics of Humanism.*

grid. The ones in the Inferno follow the spiraling and recursive break-up of the large golden-rectangle. They successively diminish in scale as each is positioned at the center of a nested square.

The third operation that is used to generate the design that of overlapping two squares, is also disciplined according to extreme and mean ration proportions. The two basic overlapping squares are so shifted as to define a golden rectangle as their composite perimeter. The pattern of overlap however also generates the narrow transition spaces that mediate the connection between the realms.

5. Internal Logic of the Medium: Experiential, Spatial, and Conceptual

As a symbolic medium, architecture engenders patterns of co-presence and co-awareness, which become integral to the construction of architectural meaning. In fact, buildings frame and condition the patterns of co-presence, co-awareness, potential communication, and potential interaction through which we realize, reproduce, and control social and cultural relationships. By implication, architectural space can be seen in two complementary ways. First, plans can be read as maps of social relationships because spatial boundaries function as means for making social distinctions and as devices that govern social intercourse. Second, the morphology of space can be read as the abstract framework within which the morphologies of movement and encounter become intelligible in their own right. Co-presence is not as directly and as pervasively present in language, even though language implies communication. The spatial positioning of the recipient of linguistic communication is only partially embedded in the formal structure of language itself, and largely inferred from context.[11] In *The Divine Comedy*, however, the pattern of co-presence is in the foreground of narration. Not only is the sequence of movement through landscape associated with patterns of encounter with named individuals. The social relationships in which those individuals participated while alive are extensively discussed, while their

[11] Ernst Cassirer, *The Philosophy of Symbolic Forms. Volume 1: Language*, (New Haven: Yale University Press, 1955).

abstract spatial relationship in the scheme of the after-world is a precise map of their position within the divine judgement and hierarchy. When the poem is transcribed into architecture, the pattern of co-presence is automatically engendered by space as a medium even before becoming architecturally thematized, accentuated or qualified.

If we accept the proposition that the columns are associated with the body and its states of suffering, the arrangement of the columns implicitly represents a pattern of virtual co-presence, while also conditioning the real co-presence of people visiting the monument. If we were to assume a group of visitors proceeding to enter at roughly the same time, the entrance would impose first procession and then assembly, regardless of whether the visitors were coordinated as a group. The forest of columns would disperse the group and dissipate literal co-presence even though the columns themselves, treated as virtual bodies, are rigorously ordered. This is the exact equivalent of the introduction to the Comedy, where the poet is literally lost in the forest but metaphorically lost in the scheme of life. In Inferno, the virtual bodies are distorted out of common scale and their suffering is expressed in the exaggeration or reduction of the column diameter, as well as the dislocation of floor and ceiling. The presence of other visitors would allow a familiar scale of human bodies to juxtapose itself to the scale of virtual suffering. This is in analogy to the dialogues, and narration within the dialogues, which help Dante to make sense of the landscape and the sufferings to which he is introduced by Virgil. In Purgatory, the absence of columns potentially accentuates our impression of the body as a virtual column placed on prepared pedestals. We also get an impression of uneven, unequal positioning and potential ascent much in the same manner that souls progress in *The Divine Comedy* and are not fixed forever at a given location. Ultimately, in Paradise, visual patterns of co-awareness are established, however refracted, because the evenly distributed columns are transparent. This entire progression from courtyard to paradise is framed between clearly defined points of entry and exit. It would therefore not be far-fetched to claim that the architectural body of the building serves as the means for the emergent poetics of co-presence of visitors. What is significant here, from the point of view of the notational systems used to construct architectural meaning, is the fact that the same device, the column, is deployed both as symbolic personification and embodiment of subjective states, and as literal generator of states of co-awareness between visitors.

Geometrical structure and relationships between numbers can be treated as another common denominator, or bridge, between literature and architecture. As each medium is used to constitute additional meanings, our focussing on geometry and number would raise a rather familiar problem of proliferation or elimination of meaning: Would geometry and number be seen as residual structures after the more explicit layers of meaning have been eliminated, or would the significance of geometry and number endlessly proliferate as other layers of meaning are being woven on their canvas? Potentially, any form, which is imbued with proportional relationships, would then become meaningful, if the cultural context of interpretation incorporated the ideas of cosmology that inspired the classical tradition (or *The Divine Comedy*). However, meaning based on formal properties appears precarious and the underlying symbolism disappears. We may then advance to a different question: What is being constituted in the building that can be termed a genuinely architectural experience? One answer to this question could be that the way in which spatial organization, geometry, number, all operate in unison with other features that contribute to the atmosphere inside, such as materials and light that make the whole experience a special one and specific to the particular work.

The general emphasis in the scholarship on the Danteum is on the conceptual dimension of the building. However, while the physical form of buildings is subject to constructive logic and conceptualization, the design of buildings is normally aimed at engendering significant spatial experiences. Our understanding of architecture is incomplete when we do not try to reconstruct the experience actually engendered by, or projected by the design for, a building. In this sense, the foregoing analysis complements existing literature. If the Danteum is explored in terms of the peripatetic experience that it would engender, the diversity of views and situations can be gradually assimilated within a synthetic comprehension of the building as a statement of feeling and as an affirmation of meanings that cannot be entirely reduced to propositional form.[12] This is precisely where a comparison to what was probably the initial scheme for the Danteum project becomes significant. The initial

[12] For this purpose a three dimensional model was created and a walk through experience generated by animation. Refer to the stills in illustrations for the anticipated viewer experience of spaces within this building.

scheme of the Danteum project lays emphasis on the sequential and diachronic dimension of the literary work, while taking into account certain numerical aspects of the poem. Nevertheless, the numbers do not provide a geometric composition for the building, though it might be possible to see them as providing a structural underpinning.

Let us consider whether the emphasis on geometric composition plays a significant role in the understanding of the building by a visitor. *The Divine Comedy* is one of the most elaborate journeys in literature; many have even referred to it as one of the most intricate promenades. In comparison, the Danteum seems to epitomize the notion of a discontinuous sequence in architecture, even though a single path is suggested for the viewer. However, spatial progression is of necessity built into our comprehension of architecture as inhabited space: buildings can not be understood until we move around them. To understand a given building as a product of design intention, we must emphasize not the actuality of progression but the manner in which it is architecturally staged. In the Danteum, sequences are handled in quite the opposite manner to a promenade. Thresholds in the Danteum maximize discontinuity and in that sense are consistent with the poem. The realms themselves, on the contrary, are exposed to complete panoramic views, an architectural endowment not always present in the poem. Our common ideas of promenade play on the interaction between continuity, whether of axis, or of the fabric of the path, and change, whether of setting or of view. The Danteum establishes a more stringent tension between panorama and discontinuity. Each realm corresponds to a more or less clear horizon within which the differentiated positions and conditions become almost panoramically visible. The transitions between realms, by contrast, are abrupt and intense.

6. The Body and the Tomb

Terragni's design provides for the formation of a narrow strip of space, the Empyrean, which extends from Paradise over the interstitial zone between Purgatory and Inferno. From there, one has the overview of the three realms and also of the entrance sequence. In addition, at the Empyrean the dual function of the cross becomes apparent: the cross divides the parts of the building through its disposition inside the outer

perimeter, but it also articulates the transverse connections between those parts "inside" its own body. Thus, the Empyrean offers scope for a more synchronic perception of the building that counterbalances the strong sense of discontinuity that permeates the rest of the progression through its parts.

How then can we relate our discussion of the sequential and panoramic perception of shape and space, as it is organized by the disposition of the linear boundaries that constitute the cross, to our discussion of the pattern of embodiment as foregrounded by the handling of the columns? Quite naturally, the function of the cross is to divide space in accordance with the classification of the realms proposed by *The Divine Comedy*. The disposition of columns is then choreographed within classified space, in a manner that renders explicit the symbolic content of the classification. Put simply, the linear boundaries define the configuration of the container, and the columns represent the content. Again, there are two aspects to the columns, distribution and transformation. The grid of columns, or the spiral placement that follows the logic of distribution can be seen to link with the idea of the landscape in *The Divine Comedy*, while the transformation of size and materials is suggestive of the events. We may, however, push the interpretation one step further. The building as a whole is called "Danteum"; it is a monument to Dante. It chooses to represent Dante, the individual person, by representing his creation, the poem. The hermetic closure of the building as a whole evokes less the form of a statue, the direct representation of the body associated with many monuments to persons, and more the tomb, the most powerful monument to the physical, restricted, and closed spatial form that monumentalizes the absence of the person that was once able to move among others and to occupy normal built space.

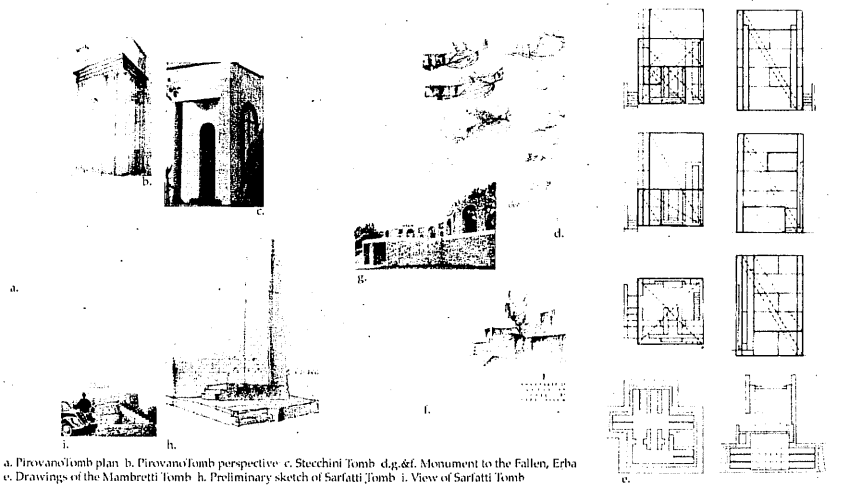
If we look at the Danteum as a tomb to Dante, the internal classification of its parts acquires a new significance. The normal tomb suggests ultimate spatial integration, ultimate centering at a particular point, of everything that a person has been. In the Danteum the center is an intersection of a cross distinguishing three realms. The three realms correspond to the poetic reconstruction of the realms occupied by the poet, realms that represent aspirations and fears, abstract understanding and particular historical events, hopes and regrets, encounters and communities, transience and permanence. By emphasizing the distinction

of those poetic states the Danteum fails to establish the centering and integrity normally associated with tombs. The body of the poet is as if dispersed in death, in order that the body of the poetry, the creation and inheritance of the poet be embodied in the sharpest relief. Also, it is in the choice of the golden-section rectangle, the over ridding shape that binds the entire scheme that has built into it this powerful metaphor of recurrence by its continuous breaking down into smaller golden section rectangles and squares. From this point of view, the architecture of the Danteum, seen as a transformation of *The Divine Comedy*, is a monument to the poetic body, not the physical body of Dante. This reading is consistent with the integrity of the poem, which is multifaceted and dispersed into various media from paintings, to music. But more than that, this reading is consistent with the suggestion that the Danteum can be appreciated more clearly from the point of view of the subject and the life of the subject, than the point of view of a reconstruction of a cosmology. The Danteum seems to reconstruct the narration of a subjective journey, from which the imagination addresses the structure of the cosmos. This reverses the thrust of the poem which seems to situate the subject within a clearly established cosmology, and to aim at orienting life in accordance with the broader scheme embedded in that cosmology. The apparent reversal of implicit and explicit meanings, figure and ground, may, as we have seen, be interpreted as the most fundamental discontinuity in the transformation of *The Divine Comedy* - not only from text to building but also from classical to a modern work.

In the Danteum project then, architectural meaning is constructed through spatial relationships that involve an abstract order, movement and co-presence, as well as visual fields. Here, the mapping from text to space entails a relationship of part to whole, as well as experiential movement and conceptual understanding. But, this in itself is not sufficient. Architecture as a medium does not visually constitute descriptions provided in language, rather it presents metaphors in space. Some aspects of the text are internalized and reconstituted through metaphors, be it the column or even the seemingly arbitrary yet very crucial choice of the golden-section rectangle in this case. It is also obvious that the analogies and metaphor seen in the initial diagram in relation to the final scheme offers us insights into the idea of how the synchronic understanding of the shape acts as a design metaphor. In this project, the initial diagrammatic scheme adheres to a certain extent to

numerical analogies and the metaphor of the column, but these ideas in themselves are not sufficient. It is the integration of these ideas in the geometric and spatial organization of the final scheme, in other words, the use of the golden-section rectangle as the generating shape that embodies in-itself recurrence, and absence, as well as the overlapping squares, that create a system of metaphors that work in tandem with the compositional and narrative aspects of the poem.

The three main design operations just discussed are of course at work with other ideas involving materiality, light, etc. Nevertheless, as in the work of any mature designer, these operations are not unique to the particular project, rather, one observes ideas that these designers have been developing and refining in prior works. In Terragni's case one can observe the cross that establishes the linear boundaries and distinguishes major spaces in the Palazzo dei Ricevimenti e dei Congressi, designed in 1937 for the 1942 exposition, the overlapping squares are present in the conceptual diagrams of some houses, and the golden section too is present in prior works. It is even more significant that he designed considerable number of other tombs and monuments that have different ideas all of which come together in the Danteum.



a. Pirovano Tomb plan b. Pirovano Tomb perspective c. Stecchini Tomb d,g,&f. Monument to the Fallen, Erba e. Drawings of the Mambretti Tomb h. Preliminary sketch of Sarfatti Tomb i. View of Sarfatti Tomb

ILLUSTRATION 5: Tombs and monuments designed by Terragni.

7. Other Tombs and Monuments by Terragni

Terragni's work prior to and during his design of the Danteum includes many funerary monuments that serve as obvious comparisons to the Danteum project. The Monumento ai Caduti (1928-32), the Stecchini Tomb and the Pirovano Tomb both designed in 1930, and the Sarfatti Tomb (1935), all show certain features that reoccur in the Danteum project. There has been extensive writing about the progression from Novecento to Modern Movement observed in Terragni's tombs and monuments. Based on the scholarship available on Terragni's work one can make several observations of formal and stylistic features exemplified by these tombs that are later seen in the Danteum project in a more sophisticated form. In the Monumento ai Caduti in Erba and the Monument to the Fallen one observes the initial use of the free standing wall and the ideal of an ascent towards a higher plane commanding an imposing view. The Ortelli tomb at Cernobbio has the slipped rectangle motif, which was since then used consistently by Terragni. The Stecchini Tomb and the Pirovono Tomb, which stand opposite one another along the axis of the Monumental Cemetery in Como, show the solidity of massing. While the interior space of the Stecchini Tomb is square, the Pirovano tomb has a golden section for its inside volume. The Sarfatti Tomb (1935) has the monumentality and grandeur, the theme of the double square, the staircase leading up to the smooth block of the sepulchre. All the features just described in various tomb are present in the Danteum, nevertheless, it is the Mambretti Tomb that becomes most fascinating to compare with the Danteum project.

This project, also un-built like the Danteum shares many of the formal traits, which make it especially interesting. There are two versions of the project.[13] Interestingly, features in both schemes can be seen in the Danteum project. Consider for instance what Schumacher calls the oblong scheme, or Project 1, where the wall is dominant much in the same manner of the free standing wall of the Danteum project. In this scheme both the plan and section are based on the golden-section. In addition to this, the pattern of movement in this tomb can be seen in a

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[13] Thomas Schumacher, *Surface and Symbol: Giuseppe Terragni and the Architecture of Italian Rationalism*, (New York: Princeton Architectural Press, 1991).

more elaborate form in the Danteum. Both design versions of this tomb share certain features with the Danteum. For instance, there are two entrances, one through the front facade and another around the side. This idea of two entrances is also present in the second version of the tomb. The axial front entry in both versions is further elaborated into a peripheral promenade. In the second scheme, the wall breaks up into pillar-like shafts and is more columnar in comparison to the first. The drawings reveal the plan to be fundamentally based on a square and all four elevations proportioned as golden section rectangles.[14] The thickset walls and skylights present in both schemes are more refined as elaborated in the Danteum.

Some of these operations are quite common to other projects that Terragni was involved in prior to and around the same time as the Danteum project. Many of these can be recognized in the Danteum, but its uniqueness lies in the combination of these operative ideas and the complexity & richness that the project achieves when these design operations adhere to a literary masterpiece.

8. Conclusion

The Divine Comedy with its compositional, numerological, and descriptive attributes forms the program for the architectural project. Nevertheless, as in any project, the program in itself does not generate architecture. This analysis has shown that in the Danteum project three major operations are involved in design synthesis. There is no doubt that the compositional and narrative aspects of the poem are significant in the interpretation of the program. Nevertheless, it is the design operations in conjunction with the program that make the translation from linguistic space to architectural space possible. This project leads us to examine closely the question of formulation. Of course, it is obvious that design formulation is not based on a single metaphor, rather on a system of metaphors, but more importantly this project points to the fact that design moves are not in abstraction; rather they are based on precedent. The

[14] For details refer to Daniel Mancini, Paul Mankins, and Richard Yeager's *Giuseppe Terragni: Two Projects* (New Haven: Yale University School of Architecture, 1991).

personification of the column is observed throughout architectural history.[15] While the conscious selection of one particular proportioning system i.e. the golden-section rectangle has been an obsession after Renaissance especially the 19th and 20th century.[16] Terragni is obviously working with a design vocabulary that has been developed prior to the design of the Danteum and informs the design through the engagement of not only specific shapes but also particular operations, as this paper has argued. Nevertheless, design operations based on familiar precedents are not enough, there is an articulation of the design brief to the familiar typology of tombs & monuments that he had experience designing in the past. Thus, the metaphors and analogies that link the design to the text chosen as its program are explored against the background of design knowledge consisting of typological precedent, repertoire of forms and also repertoire of operations. The interaction between language and design knowledge generates a strong brief, of formulation of design intent, which successfully addresses the design charge - to design a monument to Dante - which was originally weakly defined.

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[15] Joseph Rykwert, *The Dancing Column*.

[16] Lionel March. *The Architectonics of Humanism*.