(Th)reading the Library - Architectural, Topological and Narrative Journeys in Borges' Library of Babel

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Abstract

In this paper we explore the route structure in Borges' fiction: The Library of Babel. Based on local spatial connections mentioned in the text we extrapolate the global structure of movement. This is then used to illuminate the discourse and the philosophical message. Using the topological definition of 'simple alternate transit mazes' (Phillips, 1993) we propose: firstly, that the Library has a single sequence graph that stands in a systematic relationship with the narrative structure and content. Secondly, Borges creates a correspondence between space and language adding semantic significance to spatial configuration and syntactic significance to the narrative content. Thirdly, his work is relevant to space syntax research from the point of view of architecture as a creative discipline structuring spatial cognition.

1. Introduction

Despite their obvious differences buildings like libraries, museums and archives have a similar identity. They are all spaces that contain and influence knowledge and culture. Their expressive strength is based on their function as repositories of knowledge. But it is often based on the physical arrangement of their spaces carrying a scientific or philosophical message. Michael Owen's plan for the Natural History Museum in London, for example, expressed a taxonomic model to the study of nature, (Yanni, 1999)

Architecture employs philosophical models to acquire intellectual strength, but writers often use architecture to express their thought mechanisms and preoccupations. In The Library of Babel Jorge Louis Borges constructed an enigmatic library-universe composed of an infinite array of hexagonal galleries containing an indefinite number of books. The Library is easy to visualise based on a repetition of identical rooms. Borges' description of one hexagon is so detailed and clear that a drawing of the layout must have assisted the development of the ideas. However, apart from the images of staircases thrusting into infinity and the sense of vertigo evoked in our mind, he has not equipped us with a map or specified a way to navigate through his hexagonal spaces.

Architectural models play a strong role in Borges' fictions. Primitive or historical structures are used to recall the image of the labyrinth expressing the reader threading the text and the writer constructing the plot (Faris, 1988). But in The Library of Babel architecture and writing are so entangled with each other that the architectural expression becomes an integral part of the narrative content. The Library is the universe; its architecture forms the universal substance. So, the underlying dilemmas in the story, whether the universe, or by allegory the Library and its books have a meaningful design becomes implicitly a question of whether its architecture can have a meaningful pattern for navigation and orientation.
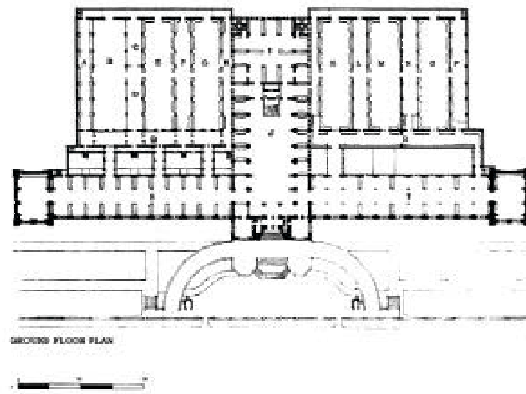
SECOND FLOOR PLAN

Figure 125: The Natural History Museum. Source:Yanni.

Threading the Library of Babel becomes the starting point of this chapter. The questions we are trying to answer are: What kind of labyrinth is implicit in Borges' description? Has the author implicated a system of movement that has a clear and ordered structure or has constructed an environment that confirms the fears of the narrator for a meaningless universe? Following evidence from the text we will explore the route system inside the Library deriving a pattern relevant to the story's content. As the Library portrays a labyrinth of language, our second task is to examine the narrative structure and see how it relates to the trajectory of movement. We will argue that The Library of Babel has a meaningful spatial design that has a systematic relationship with the narrative structure and content.

2. Short Description

"The universe (which others call the Library) is composed of an indefinite, perhaps infinite number of hexagonal galleries. In the centre of each gallery is a ventilation shaft, bounded by a low railing. From any hexagon one can see the floors above and below - one after another, endlessly. The arrangement of the galleries is always the same: Twenty bookshelves, five to each side, line four of the hexagon's six sides; One of the hexagon's free sides opens onto a narrow sort of vestibule, which in turn opens onto another gallery, identical to the first - identical in fact to all... Through this space, too, there passes a spiral staircase, which winds upward and downward into the remotest distance".

Constructing an image of three-dimensional tessellations Borges describes the Library as a total formation. He then presents it from the viewpoint of the narrator, a librarian once a traveller to other hexagons that is now waiting his death near the hexagon of his birth. The Library is filled with random books, but its occupants search for order to explain the universe, or look for the Book, the compendium to the indefinite number of volumes. Yet, in spite of numerous speculations, the Library is impenetrable and unknown. The titles of volumes do not prefigure their content, and the words in their pages do not have intelligible meaning.

Centuries of investigation led to the theory that the twenty-two letters of the alphabet, the space, the comma and the period are the essential elements of all books. The Library contains all possible combinations of these symbols and eventually all possible knowledge: volumes that are written will be written, and those that are possible to exist. This discovery instigated pointless searches for the Book containing the universal order of things, and for the 'Vindications', where librarians can read the prophesies of their lives. Searches included shuffling letters to produce "canonical books" or eliminating volumes that are misleading. The narrator ends the story with a speculation of his own: the Library has a periodic and infinite cosmological order with its volumes repeating themselves in remote and impenetrable regions.

"If an eternal traveller should journey in any direction, he would find after untold centuries that the same volumes are repeated in the same disorder - which, repeated, becomes order: the Order. My solitude is cheered by that elegant hope".

3. The philosophical context

Using architecture as an allegory for language and language as an allegory for the universe Borges renders the Library as a philosophical dilemma using strong opposites. The Library expresses the gap between the total perception of the world as infinite possibility, and the time bound life of humans whose experience of a system from within prevents them from grasping its construction. But it also evokes the history of ideas in philosophy, linguistics and mathematics as a condensed message. Our focus is on how these ideas are synthesised through architecture. But it is also essential to see the Library in a philosophical and historical context.

The origin of the Library is in the Biblical story in Genesis 11. The whole earth was of one language and of one speech, until humans tried to erect the tower of Babel to reach heavens. God punished their arrogance by confounding their language. The tower served as an explanation of the diversity of languages. But it also formed the starting point for restoring the first language used by Adam when he named all living creations. The Library models in this way, something like the European "search for the perfect language" (Eco, 1995). This search was influenced from the explorations found in the cabbala, a Hebrew mystical current that considered the creation of the world a linguistic phenomenon.

The preoccupation in the cabbala was to discover the arrangement of letters that at the moment of creation were not joined up to form words [1](Eco 1995). One branch of the cabbala established sacred references to the ten hypostases of God representing the ways in which the universe expands into infinity fig 126a. To read was equivalent to doing an anatomy of the text in which meaning was found not only in its literal content but also through allegorical, hermeneutic and mystic interpretation. Metaphysical reality could be reached through various techniques like combining the initial letters of words, producing anagrams, and calculating a numerical value for each word by summing the numbers of

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[1] "...language in the cabbala did not represent the world by simply referring to it. It did not, that is to say, stand to the world in the relation of the signifier to the signified or sign to its referent. If God created the world by uttering sounds or by combining written letters, it must follow that these semiotic elements were not representations of existing things, but the very forms by which the elements of the universe are moulded. The significance of this argument in our own story must be plain: the language of creation was perfect not because it merely happened to reflect the structure of the universe in some exemplary fashion; it created the universe. Consequently it stands to the universe as the cast stands to the object cast from it." (Eco 1995).

its letters.

The cabbala had an impact on western philosophy like in the studies of Raymond Lull, Giordano Bruno and Paul Guldin. In his Arts Magna Lull proposed an alphabet of nine letters combining concepts expressed as values and dignities to produce a number of universally held propositions, fig 126b. Bruno devised a more complex system of combinations including Latin, Hebrew and Greek letters (Yates, 1966). Bruno and Lull developed a language based on abstract concepts. In contrast, Paul Guldin used permutations of alphabetic sequences to calculate the combinations generated by 23 letters (Eco 1995). He arrived at 70,000 billion billion locutions. These could be written using over a million billion billion letters. If these words were to be included in books, each consisting of 1,000 pages with 100 lines in each page and 60 characters in each line, 257 million billion of books would be needed. Guldin imagined room circulation and shelf space in cube shaped libraries the sides of which measured 432 feet. Each library could house 32 million volumes. The number of cubic buildings required to take all books was 8,050,122,350. Using the total surface on earth would not suffice to construct the entire number of library buildings, (Eco 1995).

Like Guldin's volumes, the Library's books derive from "endlessly repeating variations" of letters: "... the Library is 'total' - perfect, complete, and whole - and that its bookshelves contain all possible combinations of the twenty-two orthographic symbols (a number which, though unimaginably vast, is not infinite) - that is all that is able to be expressed, in every language".

Borges combines two intellectual traditions: the cabbala and its linguistic search of infinity and languages that were constructed to satisfy interpretive purposes like those of Bruno and Lull, or mathematically driven like Guldin's combinations. It expresses constructing the world through language as divine order and representing the world through language as human creation. Its dual nature carries longstanding dilemmas in European discourse: Were languages differentiated as a result of divine punishment or a result of a natural process? Is there a secret universal order and how does it match the thought systems like language, mathematics and art used to interpret the world?

Another origin of the Library is in the classical myth of the labyrinth. Built by Daedalus in Crete the labyrinth concealed the Minotaur, a monster that devoured sacrificial victims. Theseus, the son of the Athenian king Aegeaus, was once amongst the fourteen to be sacrificed. Ariadne, daughter of the Cretan king Minos, gave the hero a golden yarn. Theseus fastened the yarn to the entrance of the maze and unwound it as he proceeded to the centre. He slew the Minotaur and followed the golden thread back to the exit (Ovid, 2004).

No evidence has been found of a relationship between the myth and archaeological facts. However, representations of the labyrinth in coins and vases show a twisting path of eight tracks moving towards a centre with a single point of entry and exit (Wright, 2001) fig 126c. The ancient myth was transferred in the Middle Ages into Christian symbolism expressing a pilgrim's route and a trip towards redemption. Borges has used it extensively in poems and fictions to signify the quest for meaning hidden away in the centre of a bewildering path.

The allusions to myths and philosophical dilemmas in the story evoke in a shorthand fashion the history of philosophical ideas and their routes in oral tradition. But they also provide evidence that the Library contains everything that has been expressed, including The Library of Babel since it has been already prefigured in European discourse. The story becomes thus, self-referential reflecting its own narrative content.
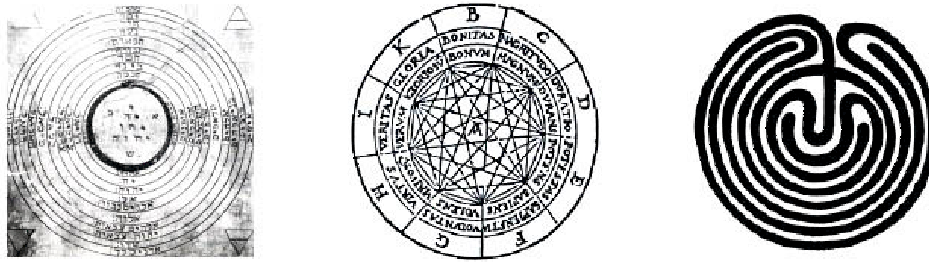
Figure 126: a, Kabbalistic plaque (source: Aszel). b, Raymond Lull, rotating disc (source: Eco). c,Cretan Labyrinth. The sequence of tracks progresses from the outside to the inside repeating the same steps in reverse order as it unwinds to the exit (source: Phillips).

3.1. Self-reference

Using the paradoxical constructions of Escher Hofstadter explains the notion of self-reference as a "strange loop". This loop occurs "whenever, by moving upwards or downwards through the levels of some hierarchical system, we find ourselves right back where we started" (Hofstadter 1979). Using different types of loops Escher blurred the distinction between real and mythical worlds. The loosest version is in "Ascending and Descending", fig 127a, involving many steps before the starting point is regained. A tighter version is the "Drawing Hands", fig 127b, consisting of two steps, while the tightest of all loops is found in the "Print Gallery", a picture that contains itself, fig 127c.

Self-reference expresses the conflict between an infinite process departing from and returning to the initial point, and its representation in a finite way (Hofstadter, 1979). Since the Library is total, Borges' Library of Babel must be contained somewhere on its shelves. The fiction and its content are linked through a strange loop breaking the hierarchical boundary that separates the real from the fictitious domain. A second strange loop is in the notion of a universe that contains the Book that contains the universe. A more complex one is implicit in the suggestion that the Library has "leagues of senseless and cacophonous books". It follows from this that the librarian's story must also lack meaning. If this proposition is true the initial suggestion looses validity, as a phrase that is contained in a meaningless story. But if the first statement is false and the Library does not contain misleading books, the final statement becomes also immediately cancelled. The logical structure of these statements is mapped in the sentences shown in fig 128.

Statement 3 has the paradoxical nature of being both true and false. Strange loops contradict our habitual understanding of sentences as being exclusively one or the other. Such paradoxes found mathematical translation by Kurt Gödel (Hofstadter 1979). In his Incompleteness Theorem [2] Gödel showed that there are propositions that cannot be proven within a mathematical system or are inherently insoluble. Cantor's work on the theory of sets was also related to this theorem formulating that there is always a larger

[2]   Gödel, K., On Formally Undecidable Propositions in Principia Mathematica and Related Systems I, 1931.

Figure 127: a, Escher, "Ascending and Descending". Escher composed fictional impossible worlds involving "strange loops" that blur the distinction between categorically different domains. b, Escher, "Drawing Hands". c,Escher: "Print Gallery".

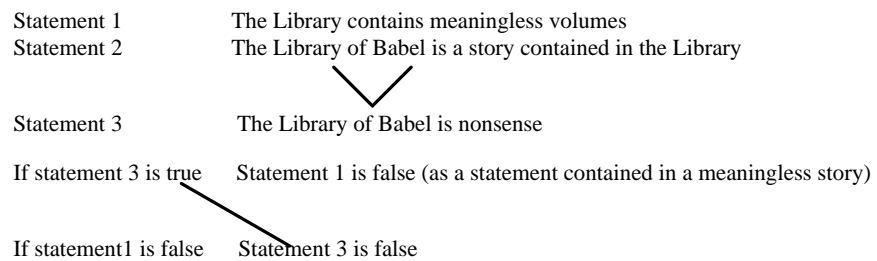|	
Statement 1	The Library contains meaningless volumes
Statement 2	The Library of Babel is a story contained in the Library
Statement 3	The Library of Babel is nonsense
If statement 3 is true	Statement 1 is false (as a statement contained in a meaningless story)
If statement1 is false	Statement 3 is false

Figure 128: Map of the logical sequence of sentences contained implicitly or explicitly in the story. These propositions cannot be proved as they cancel each other.

set consisting of all subsets of a given set. Within any limited system, there are entities that cannot be proved or perceived. To comprehend them we need to move up to a larger system, a concept that is often illustrated using the example of the Russian dolls (Aczel, 2000).

3.2. The narrative maze

The strange loops in the story reinforce the idea that the Library and its books form a labyrinth of obscure meaning. But the self-conflicting theories proposed as explanations to the Library's secrets are a stronger source of disorientation. So, mirrors contradict the infinite extension of space creating the illusion of infinity. All rooms are identical hexagons, but there is a circular chamber containing an enormous circular book. The universe might be the handiwork of God, but the divinity is manifested in the perfect symmetry of typescript letters. The 23 characters define the modular order of books, but they produce incoherent formations. Words might be in ancient languages, but no language can contain endless repetitions of the same three letters. The Library contains all knowledge, but there is zero probability of finding a complete language. Shuffling letters can produce meaning, but equals mimicking the divine disorder. Disorder is the law of the universe, but there is meaning hidden in any incoherent sequence of letters. There is no limit to the extension of galleries, but there is a limit to the indefinite number of volumes.

Instead of bringing the line of reasoning forward through irreversible propositions Borges employs paradoxical loops and a shifting sequence of hypotheses to create a disorientating reading experience. The concept of the labyrinth is built into the text, calling attention to itself as a philosophical and spatial device. It seems to suggest that if a reasoning path is laid out as a maze, the spatial labyrinth must play a larger role in explaining the Library's secrets. Using Borges' description we will attempt to map the Library's routes and study their logic. If this hypothesis is correct the path through the labyrinth could be the key to the Library's narrative and philosophical space.

4. Threading the labyrinth

Visual interpretations of the Library show it either as a geometrical pattern, or as a Piranesian interior (fig. 129a). Grau sees it a network of spaces connected through rings of circulation (fig. 129b), (Grau, 1989).

Her representation might derive from the probabilistic nature of the Library based on random combinations of letters. However, it does not account for three things: first, the galleries are hexagons rather than octagonal shapes. Second, Borges implies two doorways in each gallery rather than four. Finally, as the labyrinths in the story seem to match the labyrinths in the text (Faris 1988), the reasoning shifting towards new directions suggests a route based on sequence rather than one when movement bifurcates at each node. Let us consider three hexagonal units, (fig. 130). If all spaces are interconnected forming a circuit, there is no possibility for a doorway linking with a fourth hexagon, as there are only two openings in each space. In the context of all hexagons the circuit would form an isolated route or a sub-system. The same characteristic would apply to a larger circuit connecting more than three units.

Paths in the Library can be disconnected from each other forming sub-labyrinths in the form of circuits or sequences that extend along one or more directions, (fig. 131). However, the narrator's final statement about "an eternal traveller [that] journeys in any
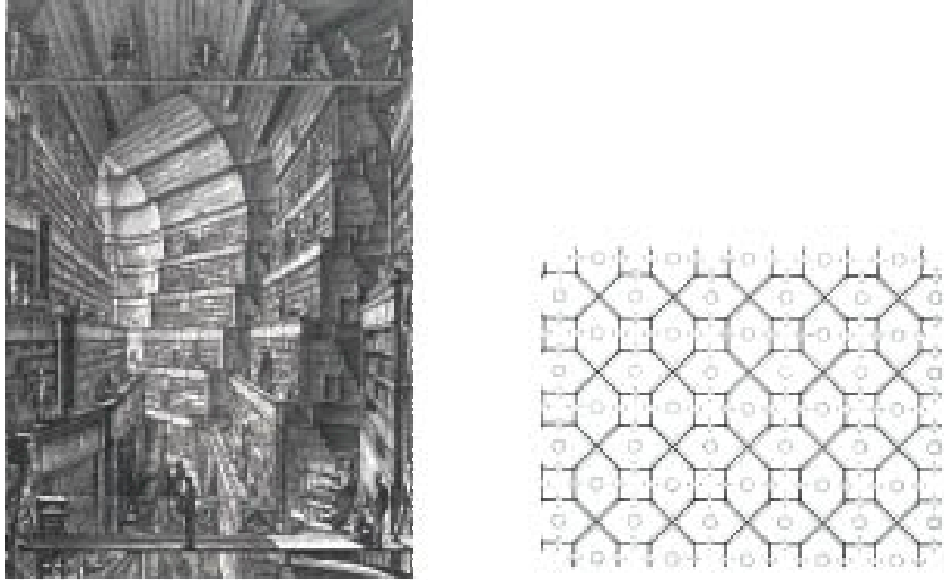
Figure 129: a, Desmazieres, Representation of the Library of Babel (source: Borges). b, Grau, representation of the Library of Babel (source: Grau).
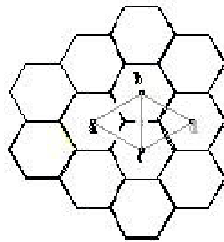

Figure 130: If three hexagonal units are interconnected forming a circuit, they cannot connect with a fourth space, as this would require more than two openings in two rooms.
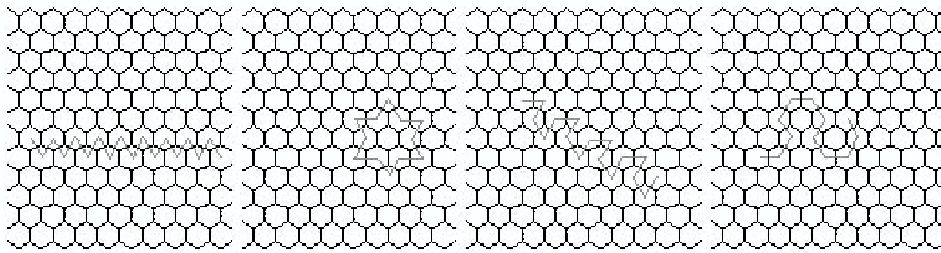
Figure 131: Possible routes in the Library. The spaces crossed by movement are disconnected from the rest of the system.

direction..." suggests that the Library is a continuous, permeable and navigable system. Not only it is possible to move along all directions of the hexagonal tessellations, but also like words in a continuous text, any space can be accessible through a trip that crosses all other spaces in a linear sequence. An analogical relationship between a path through a text and a path through the labyrinth like the one that Borges tries to create requires that the latter is a continuous, meandering, non-self intersecting (without circuits) line on a two dimensional surface, as in the Cretan labyrinth.

A study of the possible paths based on these topological rules is beyond our scope. Our interest is not on the combinatorial relationships that generate these mazes, but on a spatial pattern that can illuminate the structure of the discourse and the philosophical maze. Based on the influence the Greek labyrinth has exerted on Borges, we will adopt this pattern, and adapt it to the hexagonal geometry of the galleries, fig 132a. If we label the 8 concentric tracks starting from 1 and moving to track 8 at the centre, we produce a sequence of tracks progressing in the following way: 32147658 (Phillips 2001). We realise that there are fifteen paragraphs in the story and fifteen tracks as we move from the entrance to the centre of the labyrinth and then back to the exit. There is also numerical symmetry with respect to paragraph eight and route symmetry with respect to track eight.

$$\frac{(321476585674123)}{15} \tag{14}$$

For Phillips the Cretan labyrinth falls into the topological classification of 'simple alternating transit mazes of depth n' [3](Phillips 2001). These must satisfy three necessary conditions: The sequence starts with 0 (exterior) and ends with n, odd and even integers alternate, and the path changes direction between consecutive levels. We can draw a simpler maze based on the sequence of natural numbers: 12345678(fig. 132b). This labyrinth follows the topological rules for a path covering all hexagons in a system of 8 tracks progressing along three directions, and is a simple alternating transit maze. It captures each paragraph by a hexagonal track with the gaps between the paragraphs occurring when the path changes direction and level. Finally, it reproduces itself in reverse order as it unwinds from the centre. These properties seem to suggest that in the second half of the story we

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[3]   They are simple because the path makes a complete circle at each level. Transit because it runs without bifurcation from the outside of the maze to the centre.
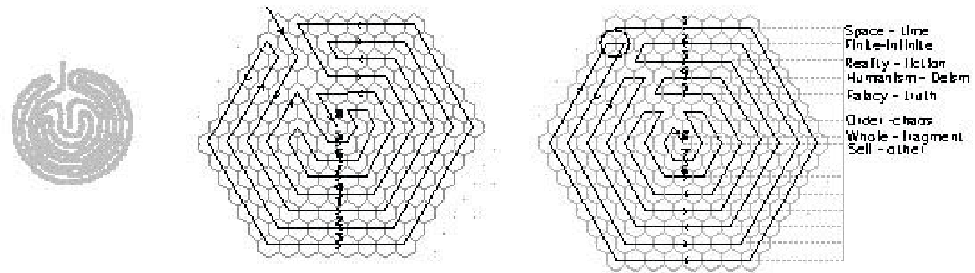
Figure 132: a, Hexagonal adaptation of the topological sequence of the Cretan labyrinth (032147658). The Cretan labyrinth and the hexagonal one represent the path instead of the partitions. b, A model of the route through the Library that captures: 1, The rule pattern based on local spatial connections mentioned in the story. 2, The topological definition for "simple, alternating transit mazes" (Phillips 1993). 3, The sequence of natural numbers. 4. The sequence of paragraphs (1-8) in the story. 5, The topological symmetry in the route structure and the thematic symmetry in the paragraph content (1-15, 2-14, 3-13, etc.).

encounter the same narrative steps as in the first part, as though we move backwards in space and time. In other words, it is possible that a thematic symmetry in the paragraph content exists with respect to paragraph eight.

5. Threading the narrative

Our next step is to examine the conceptual relationship between paragraphs that are symmetrical in relation to paragraph eight. We will suggest that the numerical symmetry translates to a conceptual order grouping antithetical concepts beyond the place they hold in the text sequence.

The opening paragraph describes the Library as a total geometric construction (1). The closing one defines it as a periodic repetition of books discovered by an eternal traveller (15). The start and the end of the fiction relate an absolute notion of space we can perceive at once to a relative notion of space experienced gradually through time.

The second paragraph contrasts the life of the narrator reaching the end of its course with the infinite fall of his dead body inside a Library shaft (2). In paragraph fourteen the finite-infinite contrast extends to the destiny of humanity approaching extinction against the eternal and vast Library (14).

The third paragraph refers to a lack of correspondence between the book titles and their content (3). Paragraph thirteen suggests that a justification for nonsensical titles (like "axaxaxas mlo") exists, buried somewhere in the universe (13). For Alazraki "each discipline...constitutes a system of signs that can operate and make sense only within the bounds of its own framework. Transfer those same signs that are part of a given system to a different one and the sense becomes nonsense,..., their reality turns into unreality... into fiction" (1986). Assigning meaningless words to potential linguistic systems that can be meaningful but unknown Borges blurs the distinction between languages that are real and those that are possible, or cultural convention with nonsense, poetry or fiction.

The notion of a "primordial designer" is brought up next as an answer to the Library's

secrets (4). An alternative theory is for a book, "a cipher and compendium to all other books", and a librarian who becomes analogous to God by reading this volume (12). Book and librarian, artefacts and nature, Humanism and Deism become equivalent to each other.

The Library contains leagues of books that are fallacious and misleading (5). Trying to eliminate them librarians achieved only an infinitesimal reduction of volumes. In a universe where books differ by no more than a single letter every copy and every original have the same validity (11). Truth and folly are identical turning humans to powerless agents in the construction of truth and the destruction of meaning.

For some librarians books can be explained using a code (6). Others start from the opposite premises. Using dice and metal discs they shuffle letters to produce canonical volumes bringing us close to the combinatorial systems of Guldin and Lull (10). Borges explains that Lull's rotating discs were philosophically absurd (Borges, 2000). But as literary devices they model the poetic thought process and its search for startling combinations of words that modify their meaning. Codes in the service of order and combinations used to transfigure it are made symmetrical narrowing the gap between order and chance, the conventional systems of communication and their poetic manipulation in literature and fiction.

The discovery that all books contain combinations of the twenty-two letters made the Library momentarily lucid (7). The universe is knowable encompassing everything that exists or is conceivable to exist. But if combinatorial entities are human creations incapable of expressing the true nature of things, a linguistic system of a higher order construction must exist that can capture the infinite universe (11). This paragraph introduces a contrast between whole and fragment, a language that is extraordinary and divine and human languages that are ordinary and incomplete. As our synchronic reading approaches the thematic centre of the fiction we come closer to the philosophical dilemmas underlying the cabala and the search for a perfect language.

Discovering that the Library contains all knowledge the librarians look for their 'Vindications' (8). Rushing along spiral staircases they struggle each other, hurl books down ventilation shafts or are hurled "to their deaths by men of distant regions". At the heart of all opposites in paragraph eight is a relationship between the self and the cosmos. The limitations of grasping the Library are equivalent to the limitations for knowing oneself deprived from an external position. Hofstadter proposes a metaphorical translation of self-reference into self-knowledge (1979). Stepping outside the mind to read its mental structure implies two hierarchical domains connected by a strange loop: the mind as the object of observation and the agent that observes. Moving between these domains we never achieve an external viewpoint, an effect similar to two mirrors that face each other. The fall of bodies and books inside the voids metaphorically carry this message, while the shafts signify the arrival at an empty centre, a point of infinite regress.

Borges has expressed his debt to Lewis Carroll for his influence in this fiction (Borges, 1998). In Carroll's "Through the Looking Glass" Alice moves through a house reflected in a mirror and the garden outside it (Gardner, 2001). Symmetry and the game of chess underline this story consisting of word play, logic and philosophical implications for language and identity. Borges locates a mirror in the vestibules of the Library to remind of Carroll's reversals and indicate that The Library of Babel reproduces itself backwards as in the looking glass house. He seems to imply that underneath the semantic surface of the text where ideas about chaotic words and labyrinthine spaces are tightly interwoven there is symmetry connecting antithetical concepts beyond their position in the textual plane.

These concepts point at contrasts like space versus time, finite versus infinite, every day language versus poetry and fiction, human versus divine, fallacy versus truth, order versus chaos, whole versus fragment, and self versus other. These opposites bridge the gap of the world as a total formation and the limitations in grasping it as a whole based on human experience. They carry associations across higher levels of meaning like universal versus particular, abstract versus concrete, invariable versus variable, absolute versus relative, eternal versus ephemeral, synchronic versus diachronic. They all seem to converge to the opposition between intellectual order and sensory observation, or Plato's distinction between eternal ideas and their representation.

But while the story focuses on the difficulty of arriving at a theory that unites the totality of the world with the changing world of experience, the narrative structure joins the two worlds through symmetry. The overlay of the conceptual framework on the semantics of the text expresses the contrast between the narrative structure and the narrative sequence, purposeful design and inexplicable chaos, akin to the opposites in the Library and to the librarians' search for order. If the world, Borges seems to suggest, consists of irreconcilable contradictions, the task of the writer is to express the conflict. But the means of expression are separate from the effect. The Library as universe might be the work of a creator or the outcome of chance. But the Library as story is the work of an author recognisable through a crafted set of reading instructions and a meaningful order.

6. Architecture and narrative

A closer look at the hexagonal labyrinth shows an inconsistency with respect to the hexagon at the centre. As in all galleries there should be two doorways in this space. Consequently, one of the adjacent spaces should have three openings contrary to the rule requiring two points of entry and exit. The resolution of opposites leads to a larger enigma: Is there a centre in the Library? How is it reconciled with the topological pattern and the philosophical message? To address these questions we will return to the Library's architecture. The aim is to see whether apart from the route structure there are further correspondences between the story and the architectural space. It is also to clarify the role of architecture and its contribution to the narrative content.

For Bell-Villada the Library derives its strength from an architectural imagery based on hexagonal rooms, hallways, spiral staircases and voids (1993). We will suggest that like the narrative based on antithetical concepts it derives its strength not from individual elements but from strong contrasts. These contrasts juxtapose rigid spatial enclosure and infinite void, spaces that repeat horizontally and shafts that thrust vertically, a labyrinthine claustrophobic interior and a tessellated boundless sphere. From the inside the Library is incomprehensible based on a complex route and identical spaces. But as a whole, it has a geometrical logic that makes it intelligible at an instant. In two dimensions it offers a sequential and fragmented experience. In the third dimension it provides a glimpse to the large scale. The distinction between threading the Library and knowing it as an entire construction, between the partitioning of the plan and the unifying character of the section, expresses the difference between sequential experience based on movement through space and simultaneous apprehension of spatial relations across space. It is related to the ways we derive our knowledge about buildings: as sequences of spaces accessible by the senses and as conceptual frameworks connecting these sequences into larger systems of order. This distinction is linked to the numerous opposites in the story, between knowledge

based on observation and knowledge based on conceptual pattern. It is also akin to the contrast between the sequence of the text and the geometrical symmetry synchronising pairs of antithetical concepts.

So, architecture is a mirror Borges holds to the story to express its pattern or a thread to unwind through its inaccessible space. Like Ariadne's thread fastened at the labyrinth's entry, he fastens a mirror and the description of one room at the opening paragraph, or the narrative's entrance. This description helped us to extrapolate the route structure, the thematic symmetry and the philosophical message. It also helps us to realise that the two hierarchical systems, the fictitious architectural domain and the actual narrative domain of rules by which the story is made, are symmetrical. This is the most fundamental of Borges' paradoxical loops, reflections, and contrasts: an exact correspondence between the Library as narrative construction and the Library as representation or narrative content. Like Tsui Peng in "The Garden of Forking Paths" (Borges, 1998) Borges adopts the dual role of writer and architect indicating that the labyrinth represented in the story and the story itself are 'one and the same'.

7. Into the void

Based on the symmetry between architecture and language we can propose a solution to the enigmas of the last space. Letters can correspond to hexagonal spaces, while the other three characters, the comma the period and the space, have also their spatial equivalent: vestibules connecting galleries (commas), walls that separate them (periods) and shafts or voids (empty spaces between letters). The dual nature of the empty space as a linguistic and architectural element suggests the possibility for a void at the centre of the configuration. This element can have one doorway and satisfy the topological structure since the requirements for two openings apply only to gallery spaces.

The proposed void cuts through the centre, but is divorced from embodied experience. A focal point that is spatially empty but geometrically present is akin to the oppositions between unity and infinity, infinite modular repetition and a route converging to one place. This element has further significance corresponding to the thematic centre in paragraph eight and the librarians' search for their vindication. The conflict resulting from this search involves bodies that fall into the voids supporting the proposition for an empty space at the place of track eight.

Unlike the classical/medieval labyrinth with good or evil positioned at its heart, the Library has emptiness at its centre. The route converges on a finite limit, but the discovery of the void poses again the enigma of infinite space. The mathematical philosophical and ordering systems we build help us to interpret the world and orientate ourselves inside it. However, they have no more meaning than guiding our navigation. But if our destiny is to wander in the labyrinth, our privilege is to apply systems of thought that make it intelligible. Ordering architecture and narrative is one of the means by which we render the labyrinth meaningful and make it widely available. The purpose of art is to bridge the void between opposites creating the illusion of a seamless transition between order and chaos, fiction and reality, things and their representation.

Using a narrative and a topological system the author identifies with the efforts of librarians to construct order out of chaos. Discovering a rigorous geometry around an empty centre, we identify with the characters threading a labyrinth the most synchronic elements of which are the infinite voids. The Library's operations of self-reference extend to con-

tain the author, the reader and those who engage with scientific, artistic or philosophical systems of thought or with the less demanding activity of analysis and interpretation.

Borges has larger implications for the theoretical study of space. The correspondence between language and architecture, narrative and representation, he creates shows that spatial configuration can have not only syntactic but also semantic significance, and that the non-discursive aspects of space (Hillier, 1996) can be brought to the service of the discursive aspects of language. Using architecture as a mirror to literature Borges enables us to look at both disciplines through fresh methods of interpretation and cognition. He shows that in spite of their actual differences both structure the cognitive mechanisms of immersive experiences. Both seem to relate the perceptual systems we reach with our senses with the conceptual systems we access with our intellect.

8. Reflections of infinity

"Mystics claim that their ecstasies reveal to them a circular chamber containing an enormous circular book with a continuous spine that goes completely around the walls. But their testimony is suspect, their words obscure. That cyclical book is God".

If we extend our interpretation in the direction of Borges' imagination we can imagine his eternal traveller reaching the last space. We can imagine the galleries he has crossed, the images erased from his memory to leave only words in their place, in languages he has forgotten in the alphabet of the 22 letters. No other gallery is like the new space. The walls are lined up with mirrors and there is a circular balcony along its six sides. From this position he can see the void disappearing into the distance. But he can also see what his journey could not embrace: a kaleidoscopic image fanning out into infinite space, the Library, "total, perfect, complete and whole" (Borges 1998). The mirrors that multiply his image to infinity may gratify his journey and reveal the Library's secrets: The Library with its galleries and labyrinths of 22 letters is the enormous circular book, The Book, whose spine goes completely around the walls.

From these mirrors he can infer that the Library of his untold centuries is not infinite - if it were, what need would there be for that illusory replication? (Borges 1998).

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