Defying Dreams and Gravitation: On the Architecture of Stairs[1]

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The existence of the image of a stair assumes engaging both the body and mind, our bodily existence and mental presence. The bodily existence activates the body in a series of movements that assume recognition, repetition and reconciliation with the object of the stair. The mental presence engages the mind with dreams of flight, visions of attainment, and thoughts of grandeur. The two seemingly independent experiences are juxtaposed on each other as the intention of engaging a stair commences and the procession continues.

Similarly the experience of movement along a stair involves multi-levels of engagement, namely physical (flexing the legs, arms and body), sensual (triggering the sense of touch, sight, sound and smell), and psychological (the exertion of effort, anxiety, and pleasure); a complex sequence of activations that go beyond Jacob's dream of a ladder reaching the heavens or Mesopotamia's reality of a ziggurat elevating the gods.

In her built projects, Eva Jiricna addresses the notion of stairs as "an opportunity for invention and escapism," a series of investigations reminiscent to Duchamp's two-painting series *Nude Descending a Staircase*. Her work has been perceived by many critics as works of art eluding to the decorative effects of her creations within the space in spite of their evident functional presence. The minimalism portrayed in her work, while reducing the material effects of the object, amplifies many of our emotional, mental and bodily experiences; increasing in the process, one's awareness of being elevated from the common ground datum to a level of arrival yet to be discovered. The machine-aesthetics reflected in the steel and glass compositions demonstrate a high level of precision and attention to detail, bringing its status to a sculptural object. Yet what is engaging in Jiricna's stairs is the transparency of the glass treads which dematerialize the acts of ascending and descending; eluding to the notion of flight and the perception of being airborne. This is further amplified by the reduction of the structural skeleton to the minimal number of load-bearing members and bolt-connections; a decision that deceives the eye and questions the common perception of counter-acting gravity and resisting the natural forces present within the built form.

This study examines the designs and constructions of Eva Jiricna within the popular understanding of stairs as instruments of flight and elevation; leading to the deliberate making of a stair that ignores the norms of its function as a connector, leading to the unexpected abandoning of the acquired mental and physical skills of stair engagement. Its very presence evolves as a means to challenge the laws of gravity and turns dreams of lightness and transcendence into a mental inquiry and physical reality.

> "Height and depth bound the natural capacity of human mobility, and man thus either entrusts the flights of his fancy to the gods or clings to instruments that allow him to glide and soar." (Ulrich Giersch, *On Stairs*, 1983)

The human's desire to ascend is embedded in the early rituals of building, most prominently so in the steps of the ziggurats of Mesopotamia where the entire form is reduced to a giant stair bringing humans closer to the gods. Almost every built structure in past and present times accommodates stairs or steps to facilitate the possible mobility from one level to another, be it ascending or descending. Moreover, steps are used regardless of the topography; they are present in sloped as well as in flat sites. Thus, the decision to construct stairs lies beyond the contextual and functional requirements dictated by site or design; it is constructed as a rational form and symbol even when placed in the most irrational structures and places; a case in point is one of Bernard Tschumi's follies in Park La Villette in Paris where the stair's normative design is positioned in an obscure setting. The red spiral stair holds the identical proportions and details of a typical stair yet substituted people with water cascading down. This can be contrasted with Joseph Esherick's wooden stair for his studio which exaggerates its aesthetic qualities and obscures its functions.

Ascending can be conceived as a dream and a reality. We can attach ourselves to engines designed to help us soar but it is not quite the experience of flight. Such machines as airplanes and elevators define time and motion but neglect

space.[2] Or we can aspire for a more phenomenal and less tangible proposition through the perception of flight.

Mircea Eliade eludes to the symbolism of ascension through the notion of "magical flight," in which he distinguishes between two categories: one related to *myths and legends*, referring to winged humans and their ability to soar beyond earth; the other related to *rites and beliefs* implying an ascend to heaven and the experience of flight.[3] Many cultures tell stories of humans who aspired to imitate a bird in flight with wings extended from their bodies; the Greeks had Icarus and the Arabs had Abbas Bin Fernas. These individuals were concerned with the act of flying itself as a final goal. In every event, a human wanted to be equal to a bird in flight, free to soar in space beyond the surrounding lands. The experience implies a physical displacement of the body from the firmness of the ground to the lightness of the air. It would provide a different view of the world while challenging the reality of gravity.

The phenomenon which is more ambiguous and harder to comprehend is that of the Sovereign's flight. Throughout history, there are tales of the Gods reaching the heavens; in many religions, their holy books refer to various incidents of ascension.[4] For instance, the Quran explicitly states prophet Mohammed's night journey, with the assistance of Gabrielle, on a celestial horse, from the "Sacred Mosque" of Mecca to the "Farthest Mosque" of Jerusalem. Ultimately, the prophet ascended, referred to by Muslims as al-Mi'raj, through the seven heavens to the Sublime Throne. This incident is a witness to the miraculous bodily journey and does not exclude other occasions in which a spiritual journey occurred.[5] Ultimately, "... at every level of culture and in spite of their widely different historical and religious contexts, the symbolism of "flight" invariably expresses the abolition of the human condition, transcendence and freedom."[6]

For a more attainable condition in which reaching a higher level is possible, wings which are configured in relation to the bird's proportions are substituted with stairs designed to accommodate the human body. Stairs become the "instruments" which allow us to make the journey. It is designed to activate and be activated by the human's body and mind. It is the latter condition that is most ambiguous as it involves both an intrinsic engagement developed by habit (a condition that is individualistic in nature), and extrinsic engagement developed through practice (a condition which is acquired through repetition).

Unlike other architectural elements, a stair remains a static object until mounted. It then becomes an integral part of the process of ascending. Vitruvius prescribed a formula for the construction of the stairs of a temple in accordance to the body's reaction to the act of climbing a stair, ensuring one's comfort;[7] and Palladio went further in his prescription to restrict the number of steps in a single flight and necessitated the use of light through the proper positioning of windows to ensure the climber's safety.[8] It is from this desire for human comfort that the characteristics of stairs begin to materialize in the form of tread and riser proportions and dimensions, handrail height, and even lighting conditions.

While walking on a horizontal plane at an average pace, the body sets into a comfortable and familiar rhythm which extends from the proportions of one's body. Our gait on the horizontal plane begins with the strike of a foot's heel, extends to the foot then toes, followed by an identical motion of the other foot. Upon mounting a stair, our gait becomes very different. Toes are the first to touch the horizontal plane, while the heel may or may not follow pursuit. The various gaits (while walking, ascending, and descending) are further associated with the body's position to maintain the center of gravity while in motion.[9] The series of gaits is thus translated to a physical presence through optimum dimensions for treads and risers, and the handrail is designed to assist the body in maintaining its balance. The number of continuous steps is further dictated by the body's ability to ascend and endure. This ability further lends character to the stair; thus higher risers lead to steeper inclines which challenge our physical ability to ascend. It also portrays the stair under two opposing conditions, one is where we are discouraged from climbing, yet only those with strong wills and bodies are permitted, a case in point is the stairs leading to temples and mounted by priests and pilgrims; the other is where hardship is ignored and comfort or ease of climbing is neglected as in service stairs.

Along with the physical interaction with the stair is a sensual engagement. The placing of the foot on the first step initially engages our eyes with the immediate task of climbing. As the body adjusts to this motion, the eye travels upwards measuring the path yet to be taken and seeking the landing which implies arrival and destination. Our sense of sight provides the signals necessary to assess the stair and the task of mounting it. Yet this is only possible when light is present. In the absence of light, our sense of touch is what guides our awareness and sharpens our sense of hearing. As we place our hand on the handrail, its smoothness implies its gradual rise, encourages our upward ascend, and assures us of the support necessary on the descend.

The sequence of steps reflected off the treads further amplifies one's movement on the stair; stepping on metal treads generates an echo, while stepping on wood causes a dampened sound. There is a distinct note for every step we take. In 1929, the Bauhaus celebrated this acoustical dimension of stairs through various proportions of steps which led to specific tonal qualities during their *Metallfest* "In the Bauhaus over which the favour and hatred of the fractions rolled there was at last once more a festive gathering, and beyond all doubt it was a unique occasion ... Leading to the tombalo there was a stair, truly an *esprit de l'escalier* must have conceived it, each step of which rang with a different note (in the end there were experts in running up and down the scales!) ..."[10]

Scala, Italian for stair, refers to scale; other than the musical scale, there is the measuring scale. When inserted in a volume, a stair provides a proportioning system as well as proposes a way of inhabiting the space it occupies. Similar

to the use of the human figure marking the scale of a drawing, the presence of a stair in a design can achieve this end. Not only can it provide clues to heights and areas but can further provide the visual connection between spaces on various levels.

The contemporary interpretations of the stair as an instrument of flight are evident in the stair designs of Eva Jiricna. She perceives stairs as "the most unique three-dimensional object in any interior of more than one floor."[11] Upon mounting a stair by Jiricna, one does experience a floating sensation associated with air travel in spite of our grounding. The glass treads give way under our bodies reminding us that we are not weightless in spite of our experienced lightness.

Jiricna's prototypes for stairs are conceived as separate objects, independent of their surroundings both physically and tectonicaly. The space-frame structure by definition, encloses a volume of space; in this case, it is an assembly of intricate trusses, supporting stainless steel rods and bracing steel rods.[12] The more obvious and typical parts of the stair, the stringer and handrail, are now incorporated into the total structure of the form, while other parts, such as the treads and risers have been suppressed. The stringers are deconstructed and incorporated into the structure of the stair itself, and the risers have been eliminated. The treads achieve their transparency through their design and construction. They are formed in plate glass sandblasted in strips to provide friction and maintain visibility of the plane. To avoid accidental falls

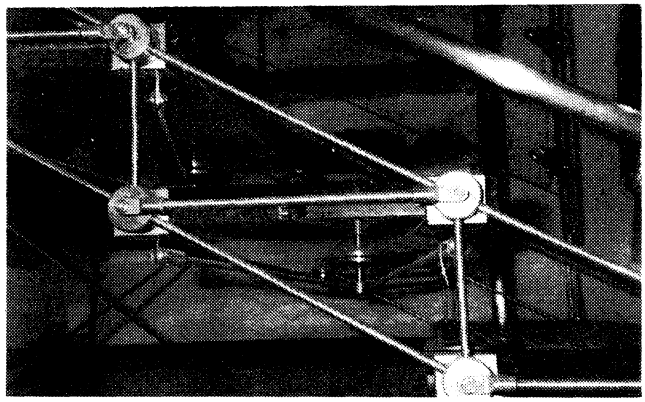

Fig. 2. Eva Jiricna Architects: Tread Detail.*

Fig. 1. Eva Jiricna Architects: Single Flight Stair, Joseph Shop.*

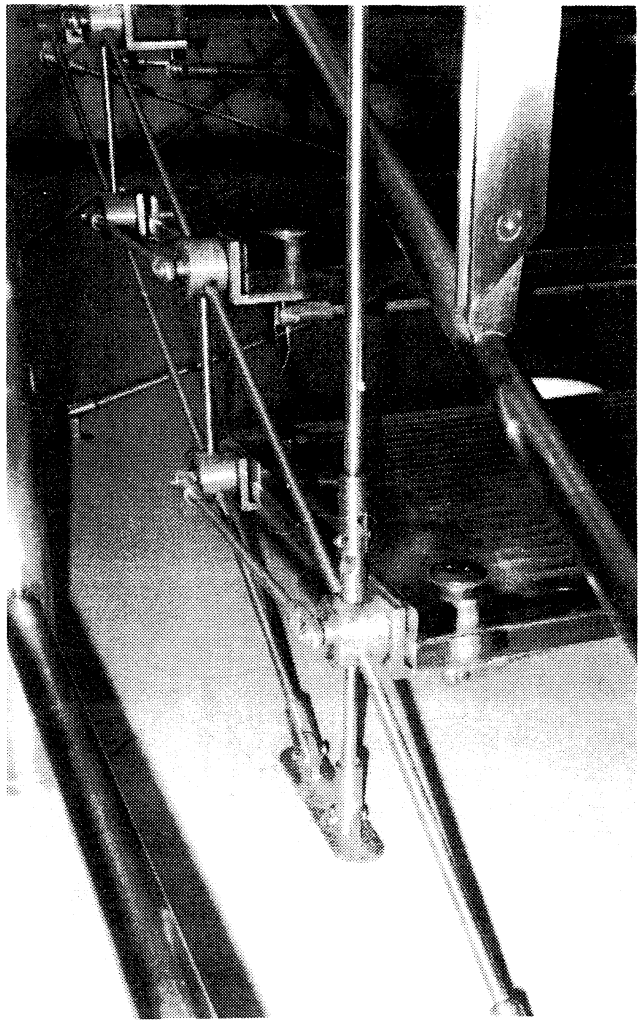

Fig. 3. Eva Jiricna Architects: Stringer Detail.*

of glass in case of breakage, the treads rest on transparent perspect bearers.

In spite of the structural stability of the stair, the experience of mounting it leaves one somewhat reluctant, awaiting the shuttering of glass or the release of a cable; a feeling similar to that of a floating sensation. This is not surprising since Jiricna is very familiar with the structure and construction of marine artifacts. Throughout the seventies, upon her arrival in London, Jiricna worked on a project at the Brighton Marina in England. The scheme required the building of heavy engineering components. This entailed using expensive as well as high performance materials such as stainless steel, glass fiber, neoprene and other composites. The project's harbor location revealed to her the technology of ships, yachts and boats; an industry embedded in the concepts of strength, lightness, and durability. These same principles define the essence of Jiricna's creations.[13] A close examination of her glass stairs reveals the integration and hierarchy of various structural and functional parts, and the testing of the material limits to endure tensile and compressive loads.

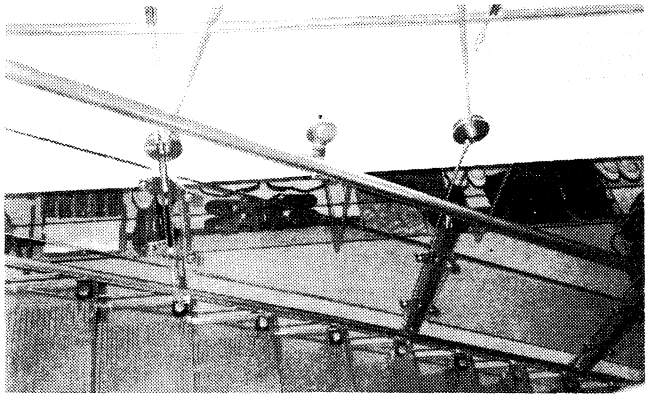

Fig. 4. Eva Jiricna Architects: Bracing Composition.*

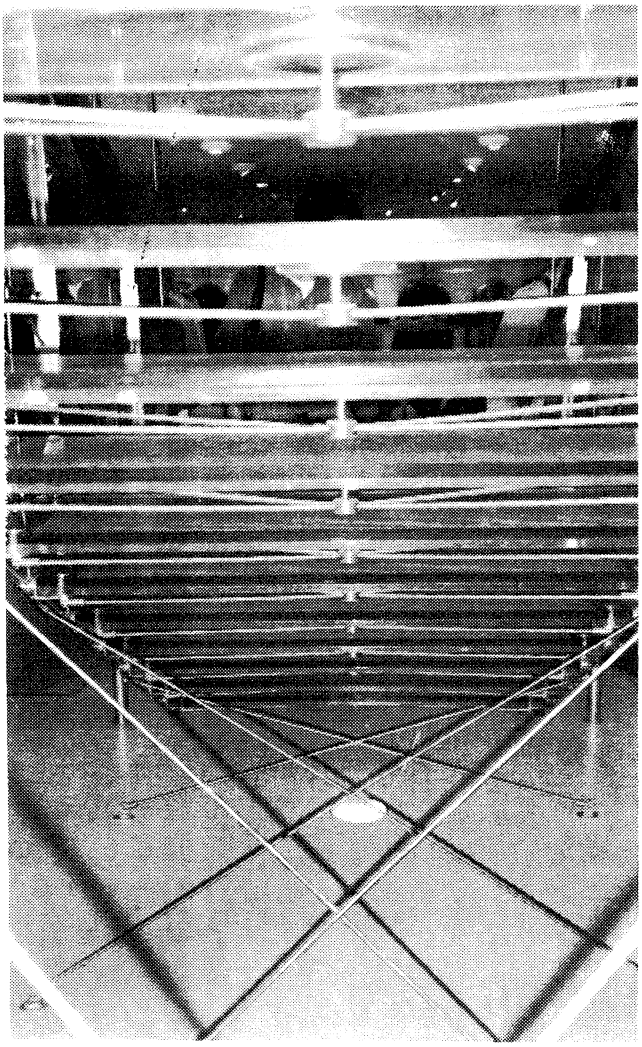

Fig. 5. Eva Jiricna Architects: Handrail Composition.*

This independent volume is contrasted against its surroundings. Its transparency highlights one's movement across space both horizontally as we step forward and vertically as we climb upward. One is instantly engulfed in this construction of steel cables and glass planes and focuses attention on navigating one's way through the fragility of the composition. For an instance, our immediate aim becomes conquering the suspended stair rather than reaching the next level. The use of mirrors to create a perceived rather than actual space amplifies the act of ascension providing it with a larger context, particularly given the confines of the interior space. Reflections of the stair magnifies its size and exposes its intricate composition and the body in motion appears to float from every angle. This instrument of flight succeeds in portraying its perceptual image of ascension. Unfortunately, this success of being an end in itself leads to the downfall of its design.[14]

As a child engages in a stair, it is approached with caution and a heightened sense of adventure. The small body adjusts its equilibrium by keeping as close as possible to the floor plane. By virtue of repetition, the body takes an upright position and this particular activity develops into a habit. The manipulation of the image or form of a stair creates a sense of newness requiring us to re-aquaint ourselves with both the object and acts of ascension and descension. What becomes significant in Jiricna's stairs is its success in making the body transform a daily habit into a form of ritual. One is led to step cautiously on the transparent glass treads and made aware of one's level by the absence of a physical riser. This new tension forces us to seek the steel handrail which in turn is small, light and cold. It is this process of re-formulation of the elements of a typical stair which is essential in re-capturing our attention and re-aligning our posture. Eventually, what is achieved is a reflection of the ancient processions ascending the exterior stairs of a temple or descending the interior stairs of a palace; images portraying grandeur and the repose of time.

The application of the human body as a measuring device in architecture has always existed; thus, the brick is sized to fit in the palm of a bricklayer's hand and the column is proportioned in accordance to the human body and identified with specific types (i.e. Doric-male, Ionic-female, Corinthian-maiden). Yet this association is highly abstract and is solely

perceived through prior knowledge and observation. In contrast, the stair is the most apparent of building elements which engages and is engaged by the totality of the human body. It stresses the dual function of our bodies in relation to the making of stairs. These functions are perceived as anthropomorphic (which are extrinsic) and ergonometric (which are intrinsic). The former is based on the study of the human body and its adoptation as a working scale to derive the dimensions and geometry of the stair; the latter is a translation of the data in forming the proportions and compositions of the actual stair to facilitate the body's ascend and descend. The stair is designed in accordance to our body's measurements for our body's convenience.

Eva Jiricna captures this duality in the process of making a stair from concept to realization. The human body is first used as a tool to give form to this "instrument of flight;" then the experiences of the human body and mind are formulated through an envisioned movement. By activating many of our senses, we are engaged in a stair perceived as "a funnel from which a certain suction effect proceeds;"[15] a static object made dynamic by amplifying through reduction the basic elements of what is now an instrument of flight.

NOTES

[1] This study is partially funded by a grant from the Graham Foundation for Advanced Studies in the Fine Arts.

[2] Malcolm Quantrill explores the notions of stairs and reaching higher grounds through the experience of space in "L'Esprit de l'Escalier," in *The Environmental Memory: Man and Architecture in the Landscape of Ideas* (New York: Schocken Books, 1986), pp. 174-181. This essay explores the attitude towards the stair as a forgotten architectural object within the functionalist understanding of the modern movement.

[3] Eliade, Mircea. "Symbolisms of Ascension and "Waking Dreams"," in *Myths, Dreams and Mysteries*. Translated by Philip Mairet (New York: Harper & Row Publishers, 1975), pp. 99-122. This chapter focuses on the various interpretations of the notions of ascension and flight, particularly in Eastern religions and philosophy. It blurs the boundaries between what is assumed to be "archaic reality" and what is known through "contemporary faith."

[4] For a comprehensive review of this subject, see Karen Armstrong's *A History of God: The 4,000 Year Quest of Judaism, Christianity and Islam* (New York: Ballantine Books, 1993).

[5] *Holy Quran,* the first verse in Sura XVII, Bani Isra-il.

[6] Eliade, op. cit., p.110.

[7] "The steps are to be so placed in front that they are always of an uneven number. For since the first step is ascended on the right foot, the right foot must also be set on the top of the temple steps. And the risers of the steps must be of such dimensions that they are neither deeper than ten inches nor shallower than nine. For thus the ascent will not be hard. But the treads of the steps, it seems, should be made not less than eighteen inches or more than two feet." Vitruvius, *The Ten Books on Architecture*, Book III, Chapter IV, 4.

[8] "The number of steps is not to exceed eleven or thirteen at most, before you make a floor or resting place, that the weak and weary may find where to rest themselves, if obliged to go up higher, and be able more easily to stop any thing that should happen to fall from above," and "The second opening is the windows that are necessary to give light to the steps; they ought to be in the middle, and high, that the light may be spread equally every where alike." Andrea Palladio, *The Four Books of Architecture*, Book I, Chapter XXVIII.

[9] John Templer studies in detail the similarities and differences between the various gaits. This analysis leads to a logical conclusion that ideally, there should be two distinct types of stairs; one for ascend and another for descend (Paris Metro stairs are designed in this manner). See *The Staircase: Studies of Hazards, Falls, and Safer Design* (Cambridge: The MIT Press, 1992), pp. 9-14. A classic study on the movement of the human body is Eadweard Muybridge's *The Human Figure in Motion* (New York: Dover, 1955); the study is filled with illustrations of the human body in various acts of movement.

[10] Quoted in Ulrich Giersch, from Oskar Schlemmer "Briefe und Tagebucher, hrsg. v. Tut Schlemmer, Munchen 1958, p. 241f.

[11] Quoted in Martin Pawley's *Eva Jiricna: Design in Exile* (London: Blueprint Monographs, 1990), p. 81.

[12] Eva Jiricna's stairs are designed in association with Matthew Wells, a structural engineer. For a complete description of the structural behavior of a typical stair refer to Martin Pawley, op. cit., pp. 89-90.

[13] Most of Eva Jiricna's stair designs have similar details and expressions. What distinguishes one from another is their typology. In an interview with the author, Duncan Webster (a design associate at the firm) expressed the importance of the stair's location within the interior as well as the proportions of the space in defining the stair's type. This criterion becomes definitive in creating variations on a theme (i.e. straight, elliptical, spiral, etc.).

[14] The stair for the 1989 Joseph shop in Sloane Street was removed after a short-lived presence. It is said that its presence was competing with the merchandise in the store. What contributed to its rapid dismantling was its kit-of-parts design and assembly.

[15] Giersch, Ulrich. "On Steps," in *Daidalos* no. 15 (September 1998): 28.

* All illustrations are courtesy of Fawn Walton.