Eleven Exercises in the Art of Architectural Drawing

Slow Food for the Architect’s Imagination

Marco Frascari
Chapter seven

Architectural Consciousness

Architecture consists of three fundamental entities—space, time and matter—played within human consciousness. Space, time and matter have their own degrees of freedom controlled by architect’s consciousness that sway users’ consciousness. Architecture is fundamentally the creation of controlled places and spaces, through the use of walls, columns, arches, beams, ceilings, surfaces, textures, lights, shadows, shades, music, noises, perfumes, and odors. Nowhere is this more evident than in the architecture of public-use spaces. The casinos, the malls, the stadiums, the commercial malls, the courthouses, the schools, the hotels, the theaters and the museums are all environments carefully orchestrated to orient, to disorient or to reorient the visitors and inhabitants, or to make a specific pitch effective. In these environments, the total exclusion of the sensory stimuli generated by the external reality of the world means that patrons are dependent on manufactured cues for their behavior. Eliminating all external stimuli prevents random reactions. As virtual modes become more sophisticated in providing an approximation of tactile environments into which we can lose ourselves, so does atmospheric architecture.

While the science of how architecture around us affects human neurological activity is still relatively new, its principles are not. For instance, the buildings of commercial businesses have been known to use their architecture to lure people into their stores since commercial trading began within cities. Lyman Frank Baum, better known as the author of the Wizard of Oz, was among the first professional retail art directors.1 During the 1890s, Baum began by testing combinations of color surfaces and materiality played with light, glass and mirrors to find how to stimulate positive responses to certain products. Baum perfected an architectural spirit of affluence and opulence within the building’s spaces and embodied sumptuousness and luxury in the architectural finishing and decorations deliberately studied to elicit feelings of class and provoke inferiority in the patrons. Baum’s postulation was that for the patrons the only
way to rectify their perceived inadequacy was to spend money on the products sold therein and prove their worth accordingly. During the medieval age, many church fathers suggested similar procedures for the architecture of cathedrals and holy places to elicit religious feelings and to persuade the faithful to accept religious coercions. Fascist government played the same game, Fascist architecture made people eager to accept political oppression.

There are genuine neurological connections between behavior and the physical space within which it takes place. Humans in different phases of development learn how to think their way through the world almost entirely through sensual stimuli, which are intimately connected to the surrounding environment. Contemporary architecture has generated an incredible number of places for living, eating, sleeping, playing, working, practicing sports, and so on. However, only a few of these places have "thinking" as the dominant dedication. Only the existence of places that allow thinking besides a merely structural functionality makes the neurological union of body and mind within the built environment the real project of architecture. Although I must recognize that too many professionals belonging to the present praxis deem this projection as ill fated. To hide the gratuitousness of their artifacts, these architects resist the projections of neurological life in the built environment and generate distressful architecture, which coerces the inhabitants into unnecessary mental or emotional conflicts.

The built environment in which we live sets an important backdrop to what we are and what we do, because we build architecture, but in return architecture builds us. The thinking and living within architecture reflects and casts light on the values existing in any society. In many constructions, the devising and nurturing of architectural happiness has been prevented by the fusion of fashionable elations with financial gratification. This fusion has changed the
thought process of many architects: they no longer think within architectural consciousness, but merely think about architecture.

Consciousness, perhaps the most complicated brain-function involving, presumably, most of the other functions of the brain, remains one of the most daunting areas of human knowledge. In architecture the question is double sided. On one side there is a search for what constitutes the consciousness dynamics of an architect marshaling the large number of variables involved in a conceiving of a building. How will knowing the consciousness dynamics associated with the production of architectural drawings and representation enhance the art of building well? On the other side the quest is for understanding how consciousness, memory, and our sense of the “self” come about within a built environment.

How can the power of one’s “thinking well” be enhanced by architecture? “Thinking well” is based on cognitive processes combined with the feeling of emotions, intuitions and sensations. What causes the “art of thinking well” to be tied to architecture and how is this approach to thinking mapped on architecture and how does it differ from other modes of thought? Architectural thinking aims to develop the human capacities of embodiment and embedment by fostering efficient body-mind activities and contemplations within the ecology of the built environment. This process will offer a liberating life-enhancing condition in opposition to an analytical thinking based on an ideal disembodied knowledge.

In architectural conceiving, the images of knowing are based on wordless storytelling framed within a natural cosmopoiesis, as Antonio Damasio, an internationally recognized neuroscientist has pointed out:

"Wordless storytelling is natural. The imagetic representation of sequences of brain events, which occurs in brains simpler than ours, is the stuff of which stories are made. A natural preverbal occurrence of storytelling may well be the reason why we ended up creating drama and eventually books, and why a good part of humanity is currently hooked on movie theaters and television screens. Movies are the closest external representation of the prevailing storytelling that goes on in our minds. What goes on within each shot, the different framing of a subject that the movement of the camera can accomplish, what goes on in the transition of shots achieved by editing, and what goes on in the narrative constructed by a particular juxtaposition of shots is comparable in some respects to what is going on in the mind, thanks to the machinery in charge of making visual and auditory images, and to devices such as the many levels of attention and working memory." 

An architect’s brain is primarily an organ for homeostasis—a center that collects and collates responses on body states, and acts to maintain constancy of the internal milieu. This notion vastly clarifies the role and nature of emotions, provides a feeling of knowing and an enhancement of architectural understanding, and allows the images of the human and built bodies, assisted by memory and reasoning, to become the fundamental core of architectural consciousness.
Emotions are vital to the higher reaches of distinctively architectural intelligence. According to Damasio and other scientists, in opposition to the common notion of unemotional rationality, emotions do not impede rational thinking but rather they are essential components of rationality. These emotions and the motion of human bodies shape non-verbal architectural inferences, architects' drawing factures that strengthen the processes of core consciousness at the base of architectural conceiving.

Thinking about architectural events makes active the sympathetic nervous system; just as real life built events can cause its activation. The bodies, as scale figures, used in drawing become inferences that reveal, for instance, the close linkage between the regulation of life and the processing of images that is implicit in the sense of individual perspective. Their presence makes clear when the following assumption can be made: if these scale figures have the perspective of this body I now feel, then these images are in my body—they are mine. As for the sense of action, it is contained in the fact that certain images are tightly associated with certain options for motor response. Therein is our sense of agency—these images are an architectural presence and I can act on the architecture that caused them.

**Storytelling**

"The body believes in what it plays at: it weeps if it mimes grief. It does not represent what it performs, it does not memorize the past, it enacts the past, bringing it to life."

Pierre Bourdieu

Architecture is embedded storytelling based on sapient factures. These factures are formative works because they result from a making that, meanwhile, is in the process which invents its way of its own making. Furthermore, architectural factures as formative works do not carry out their processes of formation in a sphere of pure intellectual and extramundane order, instead they are tangled in the concrete of experience. They are engaged in a body tackle with the materiality of drawings first and subsequently with the one of buildings.

To believe naively that just by thinking of a building a corresponding artifact will exist is a misleading idea since the thought of a building is not a building. For a building to exist, someone has to tell its facture in a "formative storytelling". The story is told by a hesitant delineation of many lines. A hesitant set of lines is a sensible and sensitive form of drawing, dwelling constantly on pensive borders, where the drafting and writing of lines are buzzing backward through history and igniting genetic and anagogic drawings. These lines are a way of reaching what it is beyond the functional quotidian. Hesitate comes from Latin haesitare, meaning to stick fast, to stammer. It is a momentary holding back in doubt, a difficulty in doing or making something. In our age of aggressive digital imaging and atrociously hasty construction, hesitation must be brought back into architects' drawings to make them truly heuristic devices.
For the ancient Greeks there were two different kinds of time: Chronos, straightforward chronological, historical time, measured with timepieces and calendars; and Kairos, the less tangible, mercurial, unpredictable time of chance, of opportunity, synchronicity. Chronos, the god of linear time, is traditionally depicted as an old man, slow-moving and with a long beard. The god of opportunity, Kairos, called by the Romans Occasio (opportunity), is young and agile, he possesses winged feet to hover and dance, he seizes the opportunity at the right place and the right time and he can randomly cross the solidly planned trail of Chronos. These two aspects of time are interwoven as the warp and weft in a textile. Astounding drawings materialize when these two aspects of time cross or merge since drawing is based on the right timing. We often think of the duration of time as a chronological resource, as in the sentence: “we have three months to complete the project”. We need to be equally aware that there is another manner for looking at time that it is also an essential resource: “now is our window of opportunity”. Both types of time are resources for the architect. Patience in drawing, often overlooked as a resource, is more than the willingness to wait: it is also the willingness to facilitate rather than to dominate and to know when it is that the opportune moment presents itself.

Within the realm of cooking, the difference between culinary sapience and “filling food” is clearly expressed in the opposition between slow food and fast food and a parallel comparison can be made of the opposition between slow and fast drawing. The overpowering request for lines to erect an edifice or a small house no longer allows one to take time for slow drawing. Without a lingering drafting sapience, there is no architecture. Sapience stems from thoughtfully sensible considerations on how material transforms into matter and this is the foundation of thinking in architecture. Sapience comes from the Latin sapere, a tactile appreciation, which is a savoring and operates in the same manner by which the sense of taste discerns different essences or flavors. During the process of drawing, architects determine and savor architectural objects and their causes.

The protracted translation of lines of drawings into building lines and vice versa is the most essential phase of the architectural process of imagination by which buildings are conceived and erected because the ontogenesis of architectural lines assimilate within itself the primary processes of designation that takes place on construction sites. Lines weave enigmas that are slowly translated on paper and their solution determines architects' ability to consider and savor the facture of the building.

Architecture is built to transcend its epoch so are architectural drawings; buildings outlive their builders and so too drawings should outlive their drafters. The implication of this parallelism is that both buildings and drawings carry in their facture the constructed virtue of architecture. Buildings should respond to the requests of their own epoch, but at the same time they should be able to adapt to requests that cannot be anticipated or even imagined. By the same token, architectural drawing done to accomplish the exclusive requests of a specific building construction should be able to be read for searching answers to constructive requirement of other buildings. These possibilities are achieved in the inauguration of both buildings and drawings.
The innermost intention of a facture is in its revealing the inauguration of a drawing, a building or a dish. At this point, a cosmopoiesis absorbs within the configuration of the artifact. The results are poetic artifacts. Poetic architects and poetic chefs are those who have mastered the often-complex techniques and comprehended the history and diversity of their cuisine or architecture. For instance, poetic chefs elaborate and cook "dishes full of feeling" that after being eaten are declared "pure poetry". Gastropoiesis underscores how the food of a certain cultural milieu makes itself first historical and then a-historical. For instance, this move from historical to a-historical can be seen in the sequence of appetizers, called "carpaccio" of salmon, beef, tuna and so on. The sequence was inaugurated with a plate devised by the great Venetian chef, Giuseppe Cipriani. The original carpaccio was made of thin slices of raw beef sirloin, arugula (rocket salad) and shavings of parmesan cheese all drizzled with extra virgin olive oil, it was a poetic artifact conceived to celebrate the reds, the greens and the whites typical of the paintings of Carpaccio at the opening of a great exhibition of Carpaccio's paintings held in Venice in 1963.

Within poetic artifacts, the intent lays in the edifying understanding of materials, in how the ingredients are ranked in the culture, the distillation of the objects' essence in the acts of making; consequently the fundamental role of the maker becomes a process based on nurturing, discovering, and revealing. Cosmopoietic artifacts always give a feeling that something strange concerning their nature is not completely revealed but it is still contained in them. Such a sensation results from the factual making of it since in making cosmopoietic artifacts architects and cooks bend the material stuff to their intent, to their insights of the ways of the world.

Cosmopoietic cooking and building defamiliarize the known world and make it strange; to that extent, the resulting artifacts inspire a consciousness that makes us realize how arbitrary and conventional relations actually are. The putting out of place of food components or building details or metaphorical hangings as one would hang a salami in a cellar allows one to defamiliarize the day-to-day experience, enables the "other" to peek behind the screen, to reach down into the deep bottom of an old cof fer hidden in the attic of the brain, and reinvest the world with meaning. The first roots of cognitive neuroscience lie in phrenology, a pseudoscientific approach that claimed that behavior could be determined by the shape and bumps of the head. This hypothesis was initially proposed and championed in 1796 by Austrian physician Franz Joseph Gall, a marginalized curiosity that will allow us to say that architects have a phrenologic bump for architecture.

Having already recognized that most architects do not erect buildings, but merely formulate them in drawings, the tracings of real and non-trivial architectural drawings are not obvious and objective, as the descriptions of the accomplishments obtained with the use of building information modeling is trying to affirm them as a solution to architectural uncertainty. In making their drawings, architects do not presume that architectural traces are worldly or unworldly, existing or non-existing, physical or mental, subjective or objective. Architectural drawing must avoid such labels. The only thing that the act of drawing assumes is that which is marked, inked, penciled, brushed or chalked comes into being through a facture and not through an iconoclastic algorithm.
Architectural drawings must not be understood as mere visualizations but as architectural factures. They are factures because they are made and done. Consequently, the reading of a drawing is based on the construing of the marks or touches, a productive procedure that David Summers calls "inferences from facture".6

Architectural drawings are factures captivating their makers and readers. They don’t just represent something—they are something in their own right since the signifying power is in the ceremonial facture and how this aura can be interfered from the drawing itself. Architectural drawings have the same signifying power for architects, clients and builders—the aura of the drawings themselves will inspire awe and reverence that will lead to a better facture of edifices and buildings.

If a set of architectural markings and inscriptions stands for architects, builders or clients in some respect or capacity, then every pen stroke, brush stroke, pencil line, charcoal mark, wash run, smudge, erasure, pentimento and blur must have a signaling function and a meaning. For the most part, architectural criticism and history have concentrated on the large-scale question instead of on the process of assembly and interaction among different kinds of signs and productions, and on the interface between media and supports. There is no meaningless mark in a genetic architectural representation, they encode mundane, physical and extramundane qualities in the conceiving of an architectural artifact. Even accidental marks play a major role in a genetic representation.

The making of genetic architectural representations is a theoretical framework focused on the cognitive configurations of architectural factures. These configurations map out the expressions and patterns recording the physical or mental actions corresponding to specific acts of intelligence ruling the development of the multiple and interfacing stages of architectural projects. The practice of genetic representations always produces a speculative edifice—a mirror of the architectural cosmos—that will help to recognize the foundational
nature of architectural imagination and how these acts of imagination can be transmuted within the triad of the arts of building well, thinking well and living well.

A critically constructed genetic analysis of architects' drawings is the most effective and efficient way to learn architecture. The critical investigation of genetic architectural representation examines the sedimentation of architectural materiality in weathered papers and models inscribed with pentimenti, additions, replacements, and erasures. Although it is a collection of tangible documents such as architects' sketches, notes, drafts, models and blueprints, the real objective is much more intangible: a movement of emotions that are not optically but imaginatively real. The world-making of genetic representations remains concrete, for it never posits an ideal architecture beyond those documents, but rather strives to reconstruct, from all available evidence, the chain of events in the conceiving processes. A critically constructed genetic analysis is a continuation of the architectural imaginative act itself. The study of beginnings, of alternative and concurrent architectural representation, makes possible to rethink and refine complex theoretical questions about the efficacy in the architectural production of buildings.

In one of his Socratic teachings, Scarpa points out that “drawing” is the only way for an architect to understand the built reality.7

“Photographs are of no use: a drawing that is useful. Take a photograph and a drawing. I understand the drawing better. A bad photograph is a public act of falsification. The human eye is better than the camera, because is mobile, and a camera though you cannot reproach it for anything regard to ... it does not state anything true, everything is false; or else, it is a great photographer who is taking the picture and then he seize the particularly illuminating angle of view, and it is the artistic instinct of the photographer which is involved instead of colors, pencil or pastel strokes.”8

Photographs, however, are extremely powerful in carrying human ideas. Chew on this simple example of non-architectural use of photo-renderings. Try to imagine how a future set of housing blocks could be represented in a photo-rendering to convey contrasting ideas. On the one hand, we could use a color-saturated image of the housing blocks shown during a mid-spring sunny day with the glass of the windows reflecting the sky, staging open, green space, children playing and group of people staging communal activities. On the other hand, we could use an aerial view, a grainy black and white image presenting a view of the surrounding environment of concrete housing blocks during a murky winter's afternoon. Furthermore, the view could use a telephoto effect that emphasizes their proliferation, crowding and gives a sense of dilapidated dereliction inhabited by scale figures of disaffected looking youths, urban anomie. Although both the representations look real, they are not accurate representations of the “reality” of the proposed architecture and what will be the genuine architectural effect of the housing. This is considered irrelevant because the representational strategies adopted have been selected to fulfill specifically the rhetorical and normative aims of their advocates very well.
Once built, those buildings will seem less real than the glamorous "photorealistic" renderings used to promote them. In part this is due to the gap between the growing sophistication of our means of representation and a corresponding visual impoverishment that results directly from the means of everyday construction. Crudely built rather than carefully executed, and generally devoid of the close range enjoyment of refined materiality that can compensate for the disappearance of craftsmanship, such buildings rarely offer multi-scaled architectural delights.

To persevere in my telling of edifying stories regarding the tellurian and cosmic twins that are architecture and cuisine, I must sit at a historical table at the Trattoria del Gaffaro. This was a small restaurant not far away from the IUAV (Istituto Universitario Architettura Venezia) main seat at the Tolentini in Venice, where, during the days devoted to the review of student work for Scarpa’s studio courses, the Professore and his assistants enjoyed their lunch.9 The event I am recalling happened during one of these communal lunches when the special dish ordered by him for his cohort and prepared by the patient chef of the Gaffaro was the risotto col tastasal (to taste the salt). Offered traditionally in the Venetian mainland at a specific time in winter when salamis are made, this seasonal risotto is prepared using some of the fresh blend of ground pork meat, salt and spices destined to be stuffed into the salami casings and subsequently properly aged. The fresh salami stuffing is not cooked in the risotto just to give it flavor, but because it is an excellent way to assess the balance of its ingredients, especially the proportion between ground meat and salt, therefore assuring the quality of the future salami. Indeed, as an alchemic procedure of analogies, the cooking process with the rice achieves the same result of the evaporation that will take place in the dry cellar where the salami are going to be aged and stored. Although the final flavor is totally different, the balance of spices and salt in the risotto will reflect accurately the balance in the salami made with that stuffing.

Making a few considerations on the strange nature and role of the food to be eaten—a fictitious victual (res ficta), to unveil something hidden, the salt, in something (res facta) that in the end will be completely different from the preparation tasted—Scarpa digressed by setting a parallel between the function of the risotto col tastasal and the function of drawings. A set of architectural drawings is completely different from a building, but its purpose is to taste in advance the architecture of a future building.

**EXERCISE #4**

**Spolia**

The advocating of collage in architectural drawing is not meant in the pictorial sense, but rather related to the tradition of architectural spoils. The collage should be the drawing for a “pasticcio”. Meaning an artistic work consisting of a medley of pieces taken from various sources, the Italian word “pasticcio” appeared in the English language during the early eighteenth century and means a work or style produced by borrowing fragments, ingredients or motifs from various sources, making a potpourri, a strangely disguised form of...
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cosmopoiesis. The most famous English architectural Pasticcio is a 30-foot-high architectural folly acting as the central visual pivot in the Monument Court located at the center of Sir John Soane's House at Numbers 12–14 Lincoln's Inn Fields in London. Soane erected this structure composed of spolia, a collection of architectural elements coming from many different construction or archeological sites, to symbolize architecture, and he put his preferred Tivoli capital, used at the Bank of England, on the top of it. By the end of the nineteenth century Soane's Pasticcio was leaning dangerously to one side, and, as a result, it was dismantled in 1896, but it has been rebuilt recently. Soane's Pasticcio is a demonstration of the work of architecture produced by borrowing pieces, fragments, ingredients or motifs from various sources, a potpourri of spolia to coalesce unsightly building elements and attractive architectural spoils in a unique statement of the making of cosmopoiesis.

The fundamental condition of the spolia is that, on the one hand, the use of left-over building elements could either be intentional conservation or conscious subversion of the past, and on the other hand something that “just happened” as a result of the limited availability of materials in the locality. The use of spolia becomes common during the late period of Roman architecture, and for centuries it had been seen as a purely negative development. For instance, Vasari saw the use of spolia as disintegration of artistic capability, confirmation of pathetic efforts due to not having anything better.10 Vasari's evaluation of the use of spolia in fourth-century church basilicas was less negative; he understood the re-use of exotic non-Italian marble and granite column shafts as an indication of good taste.11 Only during the twentieth century, architectural historians and critics defined spolia as a purposefully tectonic development.

Following a constructive idea of spolia, a collection of blueprints of disparate buildings belonging to different time periods (scanned and reduced to the same drawing scale) should be used for this exercise: select sections or portions of plan, sections, and construction details from well detailed construction or production drawings and then with these pieces compose plans, sections and elevations of a new edifice. The chosen pieces should be cut physically with scissors and glued on a plywood board, composing a decoupage. The decoupage should be completed with grids of reference and measures. Gold paint should be used to highlight the sectioned walls, making it an effective spolia drawing. The striking example of this kind of drawing is Tiberio Alfarano's 1571 plan of St. Peter's Basilica in the Vatican Archives. The drawing was prepared by Alfarano, a scholar of the Basilica history, as source—a brutta copia or copia di lavoro—for the engraving—bella copia—that he made to illustrate his De Basilicae Vaticanae Antiquissima et Nova Structura.

Alfarano, combining pieces of traditional architectural prints and new drawings in a decoupage and completing the work by using representation techniques typical of icon paintings, has made his a perfect spolia drawing. He made the plan using several sheets of paper of different dimensions, quality, and consistency, glued together on a wooden board. On them, Alfarano drew in graphite the actual ichnography of the Constantinian Basilica on which he glued Michelangelo's ichnography of the New Temple using a fragment of the 1569 print by Duperac aligning Michelangelo's central plan to the base drawing portraying the
old basilicas. Then he redrew on the print the covered portions of the Constantinian Basilica, highlighting the presence of the ancient walls with a gold paint.

The spolia technique—collage plus drawing—goes well beyond representing a one-time likeness, providing an extramundane gate into the cognitive dimensions drawings. The spoila of construction drawings used in this exercise seems to resonate with prominent themes of postmodern cultural criticism, such as appropriation, bricolage, historicism, the fragment, and ruin. However, these portions of drawings are spoils of construction drawings and consequently in putting them together it should be figured out a proper tectonic solution that should be drawn carefully in the point of commissure. Having done the decoupage (brutta copia) it should be generated into a new image (bella copia) using a scanner, then converting the raster image into a vector-based drawing and keep working on the building completing the missing parts.

The Drawing Body

"Buildings are as useful to our minds as they are to our bodies."

John Onians

The fashionable practices of many architects today produce architectural bodies without qualities. The works they produce are unhappy figures without proper body-images or body schemas. These patched-together monstrosities are to contemporary architectural practice what Mary Shelley's monster was to

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the popular culture of nineteenth-century Britain. The prevailing stance among these architects is that building-bodies do not require the presence of building bodies. Indeed, many writings by architectural critics and theoreticians are curiously without references to human beings or human activity; rather, they tend to reflect on architects' obsessions with building form and aesthetics.

As inbred neurologists, architects carry on investigations and assessments of architectural consciousness through their drawings. Without becoming acquainted with neurology, they lead us to think about architecture with our bodies, but also to think about our bodies through architecture. Mary Douglas, in *Purity and Danger*, points out how complex the structure of the body becomes if it is used to understand the neurological chiasmus of bodies and their environment:

"The body is a model, which can stand for any bounded system. Its boundaries can represent any boundaries, which are threatened or precarious. The body is a complex structure. The function of its different parts and their relation afford a source of symbols for other complex structures. We cannot possibly interpret rituals concerning excreta, breast milk, saliva, and the rest unless we are prepared to see in the body a symbol of society, and to see the powers and dangers credited to social structure reproduced in small on the human body." 14

Architectural consciousness generally originates within individuals' perceptual and motor systems. Architecture is framed by embodied experiences that in turn are framed by architecture. In using and drawing architecture, the body knows things about which the mind is ignorant, as Vico has pointed out in his *New Science*.
“Rational metaphysics teaches that man becomes all things by understanding them (homo intelligendo fit omnia), this imaginative metaphysics shows that man becomes all things by not understanding them (homo non intelligendo fit omnia); and perhaps the latter proposition is truer than the former, for when man understands he extends his mind and takes in the things, but when he does not understand he makes the things out of himself and becomes them by transforming himself into them.”

In architectural drawings, human figures are much more than anthropometric references because, from Vico’s point of view, they can be seen as the creation of base configurations that perform, form, reform and transform architecture by tracing metaphorical, metonymical and demonstrative patterns of life in plans, elevations and cross sections. They elicit human emotion with the use of mirror neurons.

During the last decade of the twentieth century, the purpose of mirror neurons was the radical discovery of Giacomo Rizzolatti and his team, a group of neuroscientists at the university of Parma, Italy. They have shown that part of the motor cortex in monkeys and humans not only controls movement but also perceive these movements in others. When a monkey or human sees an experimenter making a hand movement, the corresponding part of their brain becomes active: as if it had made the same movement itself. Indeed, when individuals see a hand movement in others, their own hand muscles get slightly more active, though not enough to move their hands.

The implications of the discovery of mirroring neurons and embodied simulation for empathetic responses to drawings of buildings, and to scale figures in particular, have not yet been assessed. The basic idea is that a crucial element of architectural response consists of the activation of embodied mechanisms encompassing the simulation of actions, emotions and corporeal sensation, and that these events are universal. This basic level of reaction to scale figures and architectural drawing is essential to understand the effectiveness both of everyday use of building and of their spatial and tectonic existence. Historical, cultural and other contextual components of the architectural discourse do not preclude the importance of taking account of the neural considerations that arise in the empathetic understanding of architectural structures.

Mirroring thought and emotions to architectural drawings redefines our relationship with them and enlarges our ideas about the relationships among drawings, body, mind and buildings. This closely interdependent relationship marks a turning point in the understanding of the connections between humans and its uses in architecture and in architectural conceiving. As Gerald M. Edelman, a 1972 Nobel Prize winner in Medicine, has pointed out: “The brain is embodied and the body is embedded.” Embedding is an essential architectural circumstance, since the “body is embedded and situated in a particular environment influencing it and being influenced by it”, and this occurrence takes us in architecturally determined econiches.

During the last two decades of the nineteenth century a methodical examination of the empathetic and elicitation possibilities generated by movements of bodies began in France with the work of Francois Delsarte. A French
acting, singing, and aesthetics teacher, Delsarte analyzed how people gesticulated in real life and elaborated a lexicon of gestures, each of which had a direct correlation with emotional states.\textsuperscript{17} Delsarte observed that for every emotion, of whatever kind, there is a corresponding body movement. He also believed that a perfect reproduction of the outer manifestation of passions would induce, by reflex, identical emotions in the audience. He was a precursor to mastering the essential role played by the mirror neurons system in echoing and understanding not just the actions of who is performing in front of us, but also their intentions, the social meaning of their behavior and their emotions. Mirror neurons let us grasp the minds of others not through conceptual reasoning, but through direct simulation: by feeling, not by thinking.

\textbf{Distorted body-images}

The anorexics' distorted body-image inhibits them from seeing their starving bodies. When they look in the mirror, what they see is not what other people see. Recognition is altered. A morbid fear of fatness and obsessive determination to get thinner gives their mind control over their whole body, setting them on a course that leads to isolation and deep inner turmoil. Starving, excessive exercise and vomiting are methods used to keep the body miserably thin.

Distorted building body-images dominate in the production of many architectural professionals. When professionals look in the mirror of their drawings or computer screens they do not see the flatness of their architecture that others see. The morbid fear of not being up to fashion or the absolute determination to have their architecture green and sustainable gives to these architects a pseudo-commonsensical attitude, an obsessive control on the all-building body. Photo-renderings, excessive PowerPoint presentations and overworked CAD construction documents are strategies that keep the body of their buildings drearily dull and flat.

Evidenced in the graphic and photographic representations pervading contemporary architectural journals and magazines, these flat and dejected architectural bodies without qualities are the result of a process whereby prosthetic gadgets, mechanical carcasses, and perfunctory human remains supplant the time-honored portrayal of edifices as embodied constructs. These devices used in this body-less imaging intended to replace the habitus of corporeal figures that were used as inaugural mechanisms in the conceiving of architecture. The drawings and the resulting body-less building dissimulate the human bodies, suspiciously avoiding the more critical and nettlesome issue of how to assimilate a corporeal dimension within the context of architectural practice.

The coupling of human bodies and building bodies affirms that knowledge of architecture is supplied by the communal embodied experience of individuals. In \textit{Philosophy In The Flesh}, George Lakoff, a cognitive linguist, and Mark Johnson, a philosopher, explain that "our conceptual system" is in the human beings' "perceptual and motor systems".\textsuperscript{18} From this perspective, it is easy to recognize that the human conceptual grasping of architecture is inherently part of embodied experiences embedded in built econiches. Buildings can have a powerful effect, they can externalize things otherwise proscribed;
buildings are not repressed and they can express things that are otherwise taboo. Buildings have the capability to alleviate suffering in people who are ill, feel distressed or have a sense of dislocation, but if the buildings are conceived within a bodiless experience they can dislocate, distress and make ill their inhabitants.

The human body has long inspired architects who have in the majority acknowledged the role played by the body in the perception and understanding of architectural artifacts. However, too many architects today seem to suffer from an agnosia by which—to paraphrase a title used by Oliver Sacks in one of his stories—the nuptial's relationship with Lady Architecture, they constantly mistake their allegorical consort for their hats, as a well-known picture of a New York ball in 1931 demonstrates. At the annual Beaux-Arts Ball, at least two-dozen architects came dressed as buildings and their hats were revealing which skyscraper or tall building they had designed. They included A. Stewart Walker as the Fuller Building, Leonard Schultze as the Waldorf-Astoria, Ely Jacques Kahn as the Squibb Building, William Van Alen as the Chrysler Building, Ralph Walker as the Wall Street Building and Joseph Freedlander as the Museum of the City of New York. Like many other architects, in their architectural imagination and in the produced images, they had merely reflected body-looks, not body-images.

A body-image is a system of perception, attitudes and beliefs, whereas a body schema is a system of sensory-motor capacities that functions without awareness or perceptual monitoring. Architecturally speaking the most important of these two systems is the body-image. The somatosensory system and the sensory nerves carry the body-image, a representation of one's physical appearance. Constructed by the brain from experiences and sensations, the body-image is a fundamental aspect of both self-awareness and self-identity, and can be disrupted by several external and internal circumstances. The body-image is not merely a representation of the body but also an anticipatory arrangement for the detailed movements of the body, and rather than being a fixed structure, it is dynamic and plastic, capable of reorganizing itself radically with the contingencies of experience. The body-image can also be supplemented by incorporating objects, implements, and instruments, such as a pencil, a roll of paper or compass in the hand of an architect's portrait. The body-image can be referred to as the "imaginable body", as theorized by Paul Schilder, that can be converted into the realm of architectural imaging. The imaginable body, for Schilder, is a vivid and animated presence and is not merely the product of
sensation, representation, or perception, but results from a coalescing of the three. The imaginable body is so real that, for example, when body-image distortions lead to phenomena such as phantom limb and body dysmorphic disorder, it can lead some people to request amputation of what they perceive to be a supernumerary limb.

**Bodies as Imaginative Universals**

"I think it's one of the things that is part of the criticism about the way that architects are trained—they don't have a complex body in mind when they're designing."

Anonymous architect

By merging visible and invisible body-images and interweaving anatomy and posture with cultural and social conventions, it is possible to imagine a set of manifold tactics for architectural conceiving. These images offer the possibility of reuniting architectural production and human well-being: a union that has been substantially diminished by the majority of contemporary architectural practice.

The use of body-images and body schemas to conceive architecture ensures that the imaginable force of human bodies is impressed, received, and vividly transmitted into the built environment. This approach brings into play the lessons learned from the body, particularly the elaboration of the corporeal images evoked by mimes and dancers, especially when "counterpoised" to culturally bounded images of everyday people. Lately, only a few architects, in their conceiving of buildings, apply in their drawings the presence of human
bodies and the corresponding forms of multiple embodiment. The majority prefer to have no body presences in their drawings and in their photos of architecture, thinking that the absence of bodies in architectural representations helps to retain the clarity and purity of their designs. When the body is present as a scale figure, it is typically a “normal body”, a body corresponding to precise anthropometric standards. This understanding of the body has its origin in Julien Offray de La Mettrie's view, he saw human bodies as physical machines and subjected to mechanical laws. The scale figures, from this point of view, are little more than good-looking machines with fixed measurable parts; they have no gender, race, or physical differences.

Architectural drawing is not limited to envisioning the future construction of a building, but is also an implicit way of thinking about bodies interacting with other bodies (built and human). This manner of architectural imaging follows from corporal experiences constructed and construed in a corpus of body images. Dealing with the visceral character of building as fostering high spirits, these thoughtful embodiments bring forth the virtuous nature of architecture—an indispensable condition for implementing a proper life.

Body-images establish a potential architecture by delineating the relation of the visible and material icons of construction to the immaterial and invisible signs of architecture. These sketched scale figures reveal the noetic geometry, an intelligible geometry of tangible matter, underpinning architectural detailing—establishing the material qualities necessary for a serene inhabitation. These drawings tell a story of an empathetic correlation between body and building, demonstrating how foreseeing corporeal reasons, architectural images can anticipate the interrelation of inhabitation, construction, and imagination. The mystery of the incarnate building is never entirely conjured by using the skin and the bones of only one specific body image. They are not Frankensteinian hodgepodge of heads, torsos and limbs, but Stoic assemblages of anatomical parts playing analogical emphases informed by the quotidian world, enhancing the “wunderkämer” of architecture.

As scale figures, useful body-images can be ordered in three classes: (1) the nude mime, (2) the dancers in leotards, and (3) the shadow people. These classes correspond to three realms of inscriptions of potential activators.
for the mirror neurons to understand the conditions of embodiment and the bodies’ presence in the econiches generated by architectural artifacts.

Naked mimes are the essential expressions of the architectural mimesis, creating the counterpoint for the designed elements around them, meanwhile they portray a tectonic tale. Jean Dorcy, a voice for the silent theatre, describes the power of the mime:

“[It] is neither a natural impulse nor a physiological reflex; censored and elaborated by the intellect, as by an architect, it therefore offers us sharp images.”

The mime is not a mimic. He is not a dancer. He does not perform pantomime. He uses his body as a tool in the language of expression dealing with something that is not present. The mime-scale-figures portray the ineffable tectonic and structural essences of the building surrounding them. The mimes, as metonymic figures, carefully evoke the constructive nature of the spatial containers and as dynamic and metaphoric figures; the dancers outline the spatial representation with crossing paths reflecting the disposition of the building. These two types of scale figures transubstantiate the corporeality of time, tempo and weather within an a-temporality of design. The mimes’ dynamic actions condense events in evoking constructional principles.

Dancers describe spaces evoked in drawings by conjuring spatial configurations that delineate the tension of the surrounding structures:

“The stage is a place where space changes nature, size and architecture according to the body occupying it; ... scenic spaces become a sky, a meadow, or a garden, thanks to the magic of a dancing body.”

Dancing scale-figures delineate space and time. The dancers’ symbolic movements add perceptual details to future spaces. As dynamic and metaphoric figures, the dancers outline the spatial representation with crossing paths reflecting the disposition of the building.

In the drawings, the shadows detached from bodies set a dialogue between the possible use of spaces and programmatic requirements. The presence of these projections of ordinary individuals in the drawings enables one to comprehend the role of the two other classes of body-images. In contraposition, the shadows of the ordinary people in the drawings suggest the protean potential of architecture, regionally expressed. In “Les techniques du corps”, Marcel Mauss discusses the wide range of activities that shape the mutable human body, from styles of caring, to gender formation, styles of work, exercises, sexual postures and ritual events, etc., that may seem innate but in reality they are acquired expressions of culture’s values. Particular expressions such as work positions or other aspects of the body differ, sometimes radically, from culture to culture. Individuals, raised in a climate of surgery, drugs, orthopedic devices, and constraining social fashion, image their body differently from those who have been raised to use meditation, movement postures, herbs, sensitive manipulation, and acupuncture to maintain their health.
The naked bodies are corporeal mimes as theorized by Jean Louis Barrault. The originating idea of Barrault’s art of mime is the “counterpoids (counterweight) that is the use the use of a representation of the effort of the musculature in performing the act to show the mirroring effort on the musculature to show physically what is not present”. The counterpoid is the corporeal basis for assisting the imagination to disclose the intangible. Through their body, the corporeal mimes evoke that which is not present. The imaginary existence for an object becomes real when corporeal mimes express, through the tension and perturbation of their musculature, the intended effect that the use of a given object will impose on our bodies, revealing a presence, in absentia, through a projection.

The naked mime as scale figure is ultimately the direct expression of the tectonic being of architecture through the medium of the body. It is the connecting link between the traditional knowledge of columns as bodies, capitals as heads and so on, and a vital understanding of architecture, but at the same time the use of the naked mime avoids the use of the body as a perfect microcosm, or as a figurative condition to solve with compositional, proportional, and harmonic authority a Cartesian ordered geometry. It is the clue to the connection between mental and physical development and the power of architecture in tectonic expression.

The shadows are not organic, non-fleshy entities, but they are the best way to fight ergonomic standards by reaching through a projection the diverse sensory, emotional, and physical dispositions of the human body and at the same time avoiding the risk of using presentations enhancing bodies seemingly taut, normal, vigorous, and healthy. The body, when it is present as a shadow, is not a “nice” scale figure and consequently is not a menace or an endorsement to the aesthetic process, or “equivalent to a dangerous prohibition”; shadows are not dubious presences that with their impurities can perturb “the purity of architectural order”.

Architectural Consciousness
**Scale Figures**

A pre-Socratic philosopher, Protagoras, is famous for the statement: “The man is the measure of all things.” This affirmation indicates the cogency of embodiment as a way for setting a proper cosmopoiesis. Since before Vitruvius wrote his treatise in the first century BC, the human body as a metaphorical and symbolic referent has provided what is perhaps the most prolific trope for architectural theory. The interrelationships between the body and geometric form, through circles and squares, and relating design parameters to the proportions of the human body have been at the core of Western architectural ideas and practices. The body was envisioned as a perfect microcosm, the figural basis of a cosmopoiesis, which located humankind at the centre of a regular or ordered macrocosm.

After Descartes, the human subject became divided into mind and body, with the body cast as an ancillary and detrimental counterpart of the mind. Cartesian conceptions conjure up the sterile spaces of screens or panels for geometrical projections, and the like. Presently, in architectural education, the critical discussion of the body is erratic and nearly extinct in professional practices. The intricacy of the human body’s connections with architecture is rarely presented in any depth in architectural drawings. The human body is reduced to physical presence, subsumed by the rationality of geometry and mathematics, or to an anthropometric tool for the control of measures and dimensional operations.

The gift which we possess of seeing similarities between human bodies and building bodies is nothing but a weak rudiment of the formerly powerful compulsion to become similar and to behave mimetically. The forgotten faculty of becoming similar extended far beyond the narrow confines of the perceived world in which we are still capable of seeing similarities.

Everything mimetic in non-trivial drawings is an intention with an established basis that can only appear at all in connection with something alien,
the semiotic or communicative element of drawing. Scale figures as signatures occupy a “middle world”, combining the virtual and the real into an environment of visualization that blurs the distinctions between subject and object—part of a continuum of experiences generated by creative choices by the drafter. During the performance of a drawing, scale figures act as catalytic agents in helping architects to define the nature of building.

In classical buildings the “human scale” was built within them. Alberti’s Palazzo Rucellai (1452–1470) in Florence, for example, meets the ground with a stone bench built to define the low margin of the facade. Even if it is not present, the human figure sitting on that bench determines the scale of this architectonic element. This does not happen in most of contemporary architecture. The human body, as a reference point for the scale of architecture showing human existential durability, is now absent. The stairs are the only presence of the embodiment left in many of the contemporary buildings. Scale comes from Latin by the way of Italian. The Latin word scala (from scandere: to climb) meaning stairs, in Italian, evolved also to mean: proportion of a representation to the actual object. If the scale of building is unknown, a look at the treads or raisers of stairs reveals immediately the proportional relationship of the drawing.

To do this exercise keep in mind that architecture is never autonomous from multiple embodiments and that the human body is the starting point and point of arrival of architecture. Begin a drawing of a section on a Bristol board by drawing several scale figures. The aim is to use human bodies as instruments for the production of form while at the same time the experience and the communication of the experience of the body is expressed by different kinds of movement. Some of the patterns of movement are potentially implied by empty space, because architecture restricts potential movement through the imposition of boundaries and the creation of spatial structure.

Draw *grosso modo* the line of a section then start placing scale figures and use their bodies and their shortcomings to further define the functions, the tectonic and the spaces of the building. Begin by drawing shadowy silhouettes representing quotidian events that will take place within the building, i.e. sitting on the toilet, climbing stairs, resting against a wall or looking out of the window. The use of shadows will avoid the risk of using the bodies as objects. Shadowy scale figures are concerned less with the symbolic nature of architecture, and more with the everyday practices “that shape the conduct of human beings towards each other”. In a projective way, shadows regard people as fleshy, corporeal matter as embodied in the making of the building.

Draw a second set of scale figures, a choreography of bodies that are dancing through the building. Dance is the art of movement and, through transfiguration, its figures introduce the element of time in the a-temporal conditions of drawing. The translational movement of dance amplifies times. Dance originates in common patterns of movement, as a conscious elaboration of correspondences and potentialities substantiated in such quotidian patterns. A dance script addresses the principles that generate dance movements as they connect bodies with the space around them. The script involves a vocabulary of individual moves, a transformational grammar governing the sequence of such moves in time, and a generative syntax of different dance actions occurring simultaneously or in parallel.
The principles that generate dance include a reflective awareness of the interplay between a locally applied rule that becomes visible as a movement, and an overall form that unfolds over time as a collective effect of such a rule. The representation of the individual moment must be considered as part of an overall flow, and as part of a complex coordination of other movements. Make sure that you draw the scale figures of the dancers immersed in the very flow they are creating. Dance is not constituted as a series of images but as a unified and continuous image summarized in one scale figure, a synchronic capture of a diachronic phenomenon.34

The art of mime is a rhythmic art just as dance, but the rhythm is internal to mime. In drawings, the space-occupancy of naked mimes oscillates between the two poles of movement and rest. The idea of representing space as a relational structure among bodies (mimes and building) is fundamental for conceiving the tectonic nature of the building.

Being a multi-sensory morphology, intersecting the morphology of movement, the dancers and mimes do not need to be represented in the section as whole bodies, sometimes only fragments of bodies are enough, meanwhile the shadows should always be in their totality.

The bodies of the scale figures should challenge bodily stereotypes. They are not paradigmatically acquiescent and static bodies. They do not always need to be fit, slender and healthy personas, being about 1.8 meters tall, delineated by using ergonomic data and information contained in a number of design manuals. The bodies of scale figures are not devoid of sex, gender, or sensory capacities.