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PLENARY SESSION I: TECTONICS IN THEORY THREE ASPECTS OF TECTONIC IMAGINATION

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We are such a stuff. As dreams are made on and our little life is rounded with sleep.

W. Shakespeare, The Tempest

My original intent was of presenting this musing on the role of tectonic imagination within the project of architecture without images, letting the readers create them in their mind's eye. Neither photography nor drawing can replace the phenomena of constructing ideas and mental pictures in a properly constructed environment. Joints, reveals, courses, frames, slabs, girders, I-beams, joists, rafters, cornices, moldings, friezes, beams, pipes, doorjambs, fascias, bricks, floorboards, parterras, domes, baseboards, canopies and ceilings in a well integrated assemblage, keep human imaginativeness alive. The essential temper of architecture is imagination, and it is quasi-impossible to show evidence of this essential quality using images. The attempt of showing the nature of imagination by using images is comparable to the reading of a book after we have already seen the reduction of it in movie form. The vivid images created by the author-guided-imagination ruling the text cannot become autonomous products, because they are pre-formed in our oculus imaginationis, the eye of imagination, by the camera's

Even though the core of the architectural discipline is imagination, the definition of the discipline has always been done by outlining its boundaries, taking for granted that, as a result, the core will become apparent and obvious. The discourse on architecture has focused on styles, functions, modernity, structures, facadism and many other peripheral components of the discipline without ever singling out the focal point. The problem with the boundaries of architecture is that they are ceaselessly vague and unstable. Furthermore, the domain of the discipline had been constantly declining. Nowadays, although the field is probably at its possible minimum dimensions, the margins are extremely indistinct and problematic. If by the power of some strange occurrence the boundaries are traced the core does not become substantiated, nor apparent since it belongs to a different nature altogether.

Architects have an innate perceptual blindness for the nature of their discipline. The core of architecture is the blind spot of the architect's cone of vision. To reveal the phenomenon of the blind spot, an image of a spot is necessary. This image that disappears when positioned in front of our blind spot makes us conscious of its physical existence. By the reason of their blind spot, architects cannot see the core of their discipline. In the light of this analogical consideration, I had to reevaluate my initial intention and decided to use images.

As the blind spot is revealed by properly locating a card

with a black spot in front of our eyes, few images are necessary to pin point the central role of tectonic imagination within the project of architecture. The only way to keep the project of architecture alive and substantive in its purpose is to delineate the imaginal core of it. This is the mediating place where architects erect their building figures. These are images that, at the same time, are a construing of a construction and a construction of construing.

It is essential to know how to construct images within the space of this *mundus imaginalus*: the imaginal world of construction and construing. The realm of the imaginal is a world that is ontologically as real as the world of senses and that of intellect. For architecture, this *mundus imaginalis*, a "realm of images in suspense," is a tectonic landscape. The eminent Islamic scholar, Henry Corbin (1983:57) defines the *mundus imaginalis* as an intermondo, a space where visual imagination establishes true and real thoughts: imaginative perceptions and imaginative knowledge, that is an imaginative consciousness. This is the realm of the constructive imagination not to be confounded with the realm of the imaginary, the fanciful imaginativeness. This world is ontologically above the world of senses, and below the pure intelligible world.

In this world, in this *intermondo*, constructive images become the corporeal reality of one's tectonic world. The immediate mediating of the cognitive function ascribable to imagining takes place within the *mundus imaginalis*. The cognitive function of imagination provides the foundation for a rigorous constructive knowledge permitting us to evade the dilemma of current rationalism. A dilemma that gives us only a choice between the two banal dualistic terms of either "matter" or "mind." By way of the cognitive function of imagination, it is possible to recognize that architecture is the solid stuff of the edifices of our constructed world and that solid stuff is interwoven with dream stuff. This is the quintessential condition for having a thaumaturgic and therapeutic constructed world.

It is believed that architects make a sensory phenomenon out of an idea, but on the contrary, they shape the sensory phenomenon into an idea. Architects with their dreams do not open the doors for the spirit to enter everyday life; on the contrary, the raise the everyday to the spiritual plane, releasing the spiritual content of physical reality. Consequently, tectonic design procedures cannot be represented. They can be mastered only by visual tropes and constructive analogies. Fostered by fluid mental attitudes, this procedure dwells between the classical dichotomies proposed by philosophy and the mystifying but powerful structure of thinking by images. The union between the dream stuff and the solid stuff is the established locus of this condition between rationality and non-rationality.

Designing architecture is like dreaming, however, dreaming is not like the practice of architecture. The majority of architects deals with arrays of dubious values rooted in fashion, corporate images' fabrications and dashing publicity. In the present ambiguous condition of the profession, architecture has lost almost completely its tectonic nature and consequently the essence of its thaumaturgic and therapeutic dimensions. On the one hand, in a desperate search for obtaining aesthetic, antiaesthetic or iper-aesthetic outcomes, architects are designing buildings that generate discomfort and tension in the users. On the other hand, frustrated by the lack of status of the profession, many designers use architecture to air their ego. Both ways of designing generate neurosis and an array of mental and somatic ailments in both users and designers. Caught in this loop, architects must recover through a proper theory and practice of constructive dreaming their lost capability of harmonizing the solid stuff with the dream stuff.

To further elaborate this thesis on tectonics and its roots in the interweaving of the solid stuff with the dream stuff. I will use a small number of the illustrations prepared by Cesare Cesariano for his translation and commentary of Vitruvius' *Ten Books On Architecture.* To further refine the concept of tectonic imagination, I will also analyze few drawings and photos of the work of an Italian firm: Ridolfi L. Frankl.

During the first quarter of the 16th Century, Cesariano, an architect of the Milanese entourage, produced an edition of Vitruvius—published in Como in 1521—where an imaginative architectural technology is postulated as the core of the discipline. "Technology is seen as techna, as method for a tectonic making [fare construttivo] that is concurrently pregnant of human, rational and sacral values" (Tafuri 1978: 433). With the excuse of translating illustrating and commenting Vitruvius' Ten Books in Architecture in Italian, Cesariano produced an innovative and daring approach. Envisioning a project of architecture that placed the tectonics at the center of architectural design, Cesariano was giving a direction for freeing tectonic making from the constrains of mimesis. It was such an original proposal that the contemporary Milanese intelligents is try to put Cesariano's effort under a collective name to reduce the impact of his tectonic view of architecture. The result was a long court dispute that hampered the distribution of the book for several decades.

In the Ridolfi & Frankl firm, Mario Ridolfi (1904-1984) is a particular Roman architect who was, some years ago, labeled by Manfredo Tafuri as one of the two disquieting muses of Italian architecture—being Carlo Scarpa the other muse (Tafuri 1975, pp. LXIII-LXIV, pp. 4-34). Ridolfi set the firm's project of architecture within the realm of the surreal, a project of consolidation of the dream stuff with the solid stuff. Son of the distinguished Architectural Historian Paul Frankl, Wolfgang Frankl, is the young partner of the firm. Frankl joined the firm of Ridolfi in 1948-although his collaboration with Ridolfi began before the II World War. Frankl contributed to the firm's tectonic view of the architectural project with his German tradition of Werkgerechgkeit, the aesthetic of a proper building art, to the development of Ridolfi's poetic search in the realm of tectonic.

The substance of Ridolfi and Frankl's search and Cesariano's approach is the mastery and the handling of the of the vigor and vividness of architectural imagination embodiment within the details of the constructed world. The only way

of describing the configuration of this imagination is to construct a technological figure of thought. Architectural imagination is analogous to a spinning wheel. The hub is the tectonic imagination. The spikes are the stereotomic imagination and the circle of the wheel is the material imagination. Tectonic imagination is completely different from stereotomic imagination although the stereotomic imagination is a necessary component of it. Through Stereotomic imagination architects arrange solid and empty volumes through a sequence of subjunctive cutting determining the inside and outside, the above and below and the front and back of architectural objects. The same condition is true of material imagination. Material imagination is the mother of both measures, as expression of materiality, and materials, as expression of measures.

To elucidate this triadic idea I will use a short sequence of images selected from Cesariano's wonderful treatise on tectonics. The book is famous for its xilographic illustrations. Cesariano is trying to establish sensible and substantial ties between the long lasting products of the art of construction: the solid stuff—an individual and technological contribution—and the art of construing the dream stuff—a cultural and societal contribution. In his powerful illustrations, Cesariano presents the construing procedures of a society as the are embodied in constructive phenomena.

The key images demonstrating Cesariano's anti litera awareness of tectonics are at the beginning of the second book of Vitruvius' treatise. In this book, under a Luoretian spell, Vitruvius describes the origin of humanity and architecture. With two mythical representations, Cesariano elucidates both the text and the commentary. The one on the left page shows the condition for the origin of architecture during the Golden Age, the symbolic and aureate beginning of humanity, and the role of fire as center for the human community and its institutions. The second one on the right page shows the beginning of architecture where, as Vitruvius describes, emulating the procedure of swallows nest building, folks are constructing their houses. In his forceful volgare, Cesariano tells us, Et primariamente con le furcha et con le virgulte interposite con il luto texerono le pareti.

[And firstly, with the forked posts erected, they are weaving the walls using saplings mixed with clay.]

Furthermore, the indication of the origin of architecture in weaving is utterly endorsed in a powerful visual statement. The timber frameworks are giant vertical loom where the golden age builders are weaving the fabric of their walls.

In these two illustrations, the four elements that, from a Semperian point of view, denote architecture—a heart, an earthwork, a framework and a weatherproof textile—are present in an exemplifying and symbolic say. They indicate that when construction is made evident it can have *pathos*, a powerful condition that offers way for getting imaginally involved with buildings, to appropriate them and to inhabit them so that their authentic construction will satisfy the human dream of construing.

The original hut of the second illustration shows an architecture of tectonic demonstration. The knots, the posts, the warp and the weft are demonstration of construction. It is a building that reveals the way of its tectonic making. Demonstrations occur both in the constructing of theoretical schemata and in the constructing of building plans. Architects demonstrate through tangible signs, the drawings, the intangible that operates in the tangible. This demonstration is the setting of the

enigma of the labor involved in an architecture.

The illustration of the Tuscan temple, in the Fourth Book, presents Cesariano's perception of the nature of the tectonic imagination and how the concept of play is different from our modern understanding of tolerance. Within the frame of this illustration, Cesariano presents a tiny plan of the temple -the sanctioned selection of fragments of the Tuscan order and an unusual image. Cesariano shows two beam-joints in a large scale. The two joints are the dominant part of the illustration. This hierarchical inversion and peculiar presentation of the parts of an Order places a specific emphasis on the idea of joints and on that subtle coupling of parts present in every joint and that the old craftspersons used to call play. Play is an essential tectonic concept. Play describes the apportionment necessary for having a perfect relationship among the elements of a construction. It is a necessary condition of design. The design of the building is attained by a synthetic and analogical assembly of details proportionally interrelated and guided by norms ruling the play of parts. The thoughtfulness of play in construction generates details that are poetic statements, whereas tolerance—a modern translation of play in an a-tectonic concept—generates elemental imprecision. Tolerance causes explicit prosaic conformity, something that must be tolerated.

The arcane aspect is the most difficult to explain but it is the one where the relationship between the dream stuff and the solid stuff is at its maximal. The best way for understanding it is through its embodiment in construction drawings. A true construction drawing, Cesariano's illustration of the Doric Temple presents an axonometric view unfolding three possible roofs and at the same time showing the three aspects of tectonic imagination. The lower roof represents the demonstration of a Doric framework, the top the play possibility actualized in it and the merely delineated one the possible arcane evolution embodied in it. This delineation manifests the possibility of the transformation of a pitch roof in a vaulted cover. An act of embodiment, showing an evolution from rafters to ribs.

Within the section of the treatise where Vitruvius lists the tectonic typology of walls, Cesariano illustrates the *opus reticolatus* through three variations on the theme of this entangled piece of masonry. Scrutinizing the illustration it appears that the fantasy is taking over by generating a decorative pattern out of an otherwise simple tectonic procedure. However, considering more carefully the image, it follows that Cesariano is giving us a demonstration of the power of a constructive procedure where the courses do not need to follow a parallel line to the ground. Furthermore, with this depiction Cesariano makes evident how the solid stuff can be twisted together with the dream stuff, in a demonstrative play of tectonics.

The representation of the *opus reticulatum* is arranged in three parts. The first part on the right demonstrates the tectonic nature of the *opus reticulatum* and consequently its naming resulting from the layout of the courses. The part in the middle shows the possibility of a tectonic play and the part on the left makes evident the arcane aspect of it. This third kind of *opus reticulatus* is a surrealistic trophy. From the point of view of this surrealistic technology, tectonics generates astonishing images that give us the possibility of not drawing any firm distinction between the concrete and the abstract, between dream and reality. This cogent illustration confirms that the role of technology in arcane tectonic thinking is of providing substance for a new creative vision of objects, contaminating the tangible with

the intangible.

The tectonic imagination possesses three precise aspects: a demonstrative angle, a play angle and an arcane angle. This tectonic triad controls the spinning wheel of architectural imagination in its entirety. The Demonstration, the Play and the Arcane aspects govern the work of Ridolfi. He worked mostly in Rome and in his hometown Terni, and taught in Rome and Pescara. However, Ridolfi does not belong to the Roman School, nor to a pre-post-modern view of architecture, although the Roman Professor will try to claim him and has presented his work in the famous Venice Biennale of Architecture devoted to the presence of the Past and to the inauguration of architectural Post-Modernity. Ridolfi conceived his architecture in a direct "surrealist" reference to local and critical realities and constructive facts. Ridolfi was an architect who was able to devise the implications of the simultaneous presence of several tectonic elements. He handled magisterially the elegant, the rough, the concrete, the abstract and the dynamic factors and characters of building elements. Ridolfi's building elements compose an architecture grounded within a rich and powerful tectonic conglomeration of solid and dream stuff.

To bring together the solid stuff with the dream stuff, Ridolfi used layers of heavy tracing paper (carta da lucido) for his tectonic thinking. Employing a fountain pen, and editing the drawing with a skillful use of scissors and adhesive transparent tape, Ridolfi drafted freehand in ink. The sign is vibrant and has the same surrealistic qualities of the astonishing architectural background delineation devised by George Harriman for the comic-strip Krazy Kat. The dense and vibrating fountain pen hatching imparts an hyperrealistic appearance to Ridolfi's drawings. In his design procedure, Ridolfi also produced more drawings than calligrams of tectonic thought, analogical expression of the processes of construction. They are visual description of processes that are not visible. They are conceived not to be read as prescriptions, but as visual suggestion carrying out a display of tectonic intent, a building on paper to which a building on site concurs.

Consider my work almost as a building on paper and all at full scale, unconcerned with the large quantity of paper necessary. Because only in this manner one can be... drawing... as it is my habit, which pushes me to ascertain and to consider every aspect of building, and to give oneself the joy of working and to the builders, the indispensable tool for its execution.

(Ridolfi 1977:2)

Ridolfi's drawings are graphic representations analogously related to the built world. These drawings are illustrations belonging to an architectural encyclopedia, a thesaurus of tectonic images that have been assembled for a specific building.

Ridolfi strides to assemble such a thesaurus of tectonic images. In 1946, a work which began in 1940 as a compilation of building details, was published as the *Manuale dell'Architetto (Architect's Manual)*. Ridolfi was the chief editor and directly drew over seventy of its plates. The Manual was a gift of USIS [United States Information Service] to the reconstruction of Italy. In its original political intention, the Manual was to be an Italian version of Ramsey and Sleeper's *Architectural Graphic Standards*, a way of putting Italian architecture within the track of industrial construction procedures, by a platonic book-being the Sweet's Catalogue, the Aristotelian book. Nevertheless,

Ridolfi made the Manuale dell'Architetto his contribution to the process of the architectural project refuting industrial standards in favor of tectonic norms. A superficial reading of it will position the Manuale dell'Architetto as one of the products of after the war Italian Neorealism, ranging from the artistic heights of Rosellini's Roma Citta Aperta, to the lows of Pane Amore a Fantasia. However, the Manuale dell'Architetto embodies a subtle metaphysic approach that has common traits of the gentle surrealism characterizing another famous movie of the period: Miracolo a Milano.

The plates of the manual are a collection of details not unlike the ones collected in the mind of an artisan, repeating a tradition. The manual is a map of the imaginal landscape of Italian tectonics. The plates can be considered as illustrations of wunderkammer of architecture, a non-empirical work. They are the illustrations of an architectural thesaurus based on construction details. Part real and part invented, they are useful images, transparent drawings which one day may come in handy.

Pupils should learn to represent objects in such a way that they can be rebuilt [-] I tell them that they should see the opaque objects as if they are transparent. They should learn to see also beyond them to be able to draw them in a constructive manner. (Ridolfi in Polo & Casdei, 1972, pp. 4-7)

For Ridolfi, it is clear that it is one thing to apprehend directly an image as an image, and another thing to shape ideas regarding the nature of images in general. Tectonic drawings are graphic manipulations of images making visible what otherwise will not be visible. They are cognitive representations of precesses of construction, graphic construing of a construction.

Objects make an impression on the percipient, just as the percipients impress themselves onto objects. Tectonic drawings are graphic representations of these happenings, representing themselves and their causes, presenting the material object and its cause, a construction and its construing. Tectonic drawings help architects to solve one of the most difficult tasks of their profession, since they give the appropriate measure of the building. Ridolfi has noted this intuitively.

The difficulty is in finding the right measure of the individual parts...the willingness to give life to things almost to make them to breathe, to try to make them speak. (Ridolfi 1977:3)

During the winter of 1927, Ridolfi, still a student at the school of architecture in Rome, prepared his contribution to the First Italian Exhibition of Rational Architecture. His contribution was based on several designs, but the most important design is the Tower of Restaurants. The worm's eye view of these eleven circular platforms was the most outstanding image of the whole exhibition. This eccentric tower, badly reviewed by the contemporary critics, is a masterpiece of the tectonic imagination. Ridolfi indicates as sources of its inspiration the columns of the Bernini's Baldacchino in San Peter, but the tower is not a product of formal stereotonic imitation, but rather a demonstration of tectonic potentiality of the rising movement manifested in Bernini's columns.

The Tower of Restaurants is a curious demonstration of tectonic power. As it has been pointed out by critics, this demonstration evokes a metaphysical scope of architectural

curiosity (Brunetti 1985:8). This is a constructive curiosity that considers tectonic events and marvels at them. Architectural curiosity is a reflective, or better, a speculative procedure that is taking care of the constructed world. This taking care of construction is always based on the idea of *scrupolositas*, a concern for minutiae. This concern for minutiae is at the basis of one of the most powerful tools left to the architect for helping his or her tectonic imagination. This taking care of minutiae develops a visual clarity that also causes a peculiar lulling of the mind. The aim is to lead the distracted inhabitants of architecture to their limit of visual clarity. The consequence is that buildings move us as we are moved by them. Architecture is a curious science, which deals with the metamorphosis of the constructed environment by producing significant images, which unifies the nature of the *maker* with that of the *dreamer*.

The tower is a clear indication of Ridolfi's curiosity in construction that will move to a different level of tectonic detailing after an encounter with the German culture. Wolfgang Frankl is a German Jew exiled in Rome. He had studied with Schmitthenner and Bonatz in Stuttgart and he had part of his architectural training in Neufert's office. Through Frankl, Ridolfi connected also with Konrad Watchman who then was pensioner at German College at Villa Massimo. The meeting with German culture included Ridolfi's trip to Germany on the back-seat of the motorcycle driven by Dieter Osterlen.

The appreciation of the German tradition of the act of refinement belonging to the art of building converted the Ridolfi-Frankl Firm to undertake an operation of transformation of craft habits in processes of elegant fabrication and structure. The study of the purpose and validity of details transforms traditional building components in elegant elements that determine the tectonic aspect, from demonstration to arcane. An instance of this process of transformation of a traditional building component in an elegant element of construction is Ridolfi's elaboration of a traditional terra-cotta tile generally used for making ventilation screens in most of the Italian Vernacular architecture. This piece is Ridolfi's equivalent to Cesariano's elaboration of the opus reticulatus. The slanted out of the clay-extrusion generates a tile that will not allow rain water to stagnate and at the same time modulates the light by the slanted surfaces of the central diamond. This tile was used for the first time in small apartment building in Via Vetuloni in Rome. The tile was used in many other buildings including Ridolfi's house. The tile was used for the kindergarten that Ridolfi designed for Olivetti and Ivrea. In this building the pregnant geometry of the tile is elegantly translated in the fabrication of the metal gazeboes protecting the skylights.

A celebration of both the tectonic play and tectonic arcane is in a design for a motel. In 1967-69, Ridolfi designed the Motel Agip of two-hundred rooms, in Settebagni on the highway belt around Rome (between the Salaria and the Autosole). The first images that come to mind are the neomedieval towers of Fritz Lang's movie, *Metropolis*. The decagonal plan of this eleven-story tower unfolds in a three-dimensional structure following the same helical rotation characterizing the previous Tower of Restaurants. However, by a carefully controlled play of the panels of the weather-proofing skin, the tectonic demonstration in this realm of the arcane. The tower has the same power of tectonic tension embodied by Brugel in his representation of the Babel Tower. Tafuri labeled this Ridolfi's tower "passione per la notte" (desire for the night)

(Tafuri 1982:112). Unfortunately the tower was never built. A similar design was proposed by Frankl-Ridolfi for the Motel Agip in Belgrade, but this tower also was never built.

The same tectonic pathos governing the tense constructive dynamism of the Motel Agip rules the tectonics of a sequence of designs that has been named the "Cycle of Marmore." A sequence of designs demonstrating the power of what Kenneth Frampton has labeled Critical Regionalism. Ridolfi and Frankl elaborated these designs before Ridolfi took his own life. The architecture of these buildings is the result of a surreal sum of events. The details and the devices are playful demonstration of arcane constructed events in an edifice. The realization of the details is based on a sum of concerns with the quality and quantities of the materials employed, and with craftmenship or workmanship in a Janus-like relationship between ornament and tectonic expression, between local and traditional system of construction and modern manufacturing. The tectonic presence is established by an awareness of building as a passive solid stuff on the verge of becoming active dream stuff, in the mind of the user or visitor of the constructed place. One of the constructions of the Cycle of the Marmore, Casa Lina, is the house Ridolfi built for himself. The decagonal plan is generated by merging and interlocking two pentagons. In this building as in many of those belonging to the Cycle, the use of the local stone gives the measure of the weaving of the construction. The knots marking the vertical bars of the entry railing remind us that an architect must weave the solid stuff in a stereographic plurality, to be certain of bringing it together with the dream stuff.

"Il Bidone" is the untranslatable pun used by Ridolfi to indicate the design for an addition to the historical buildings composing the City Hall of Terni, elaborated in 1981. "Il Bidone" is the last version of a design that has begun in 1964. An addition to Palazzo Spada—designed by someone of the School of Sangallo il Giovane—and two other contiguous palazzos, Il Bidone is a polygonal building inscribed within an oval and divided in 16 modular sanctions, alternating bow-windows and recess. It is 8 stories above ground and 2 underground. The building is enclosed by the square and joined at the rear with the trio of the renewed palazzos. The major axis is facing South. The

standard plan has a structure of two concentric ovals of concrete column. The outer oval consists of sixteen hexagonal columns underground and pentagonal above ground. The internal oval consists of 8 hexagonal columns. The plan of this structure does not derive from any known geometrical form. The stone panels of the weather proofing cladding are alternatively recessed and protruded both horizontally and vertically. When the stone panels are protruded above a recessed space there is no water problem since the rainwater can be kept off the wall with a dripping out under the floor slab. When a recessed space is above protruded panels, the exposed lozenge shaped area of the floor slab is protected with a stone piece having a double surface extending outwards to the edge of the slab and under it the usual dripping cut.

This regular 16-sided building, a sort of flat roof polyhedron, has captured in its solid stuff the arcane qualities of the dream stuff characterizing the baptisteries built in many of Italy's Medieval piazzas. Frankl and Ridolfi's Bidone is the modern omphallus of the city of Terni as the baptistery of San Giovanni dei Fiorentini was and is the ophallus of Florence. On the one hand, the tectonic demonstration ruling the cladding of this addition finds is counter part with the dream stuff of Borromini's Sant'Ivo della Sapienza and on the other hand the tectonic play of the framework finds its counterpart in the play of Gothic structures. The Bidone as well as all the tectonic objects make impression on percipients, as well as the percipients impress themselves on them. The dream stuff and the solid stuff are inseparable parts of our constructed environment. Interweaving through demonstration, play and arcane the project of architecture is based on the art of constructing well.

The three aspects of tectonics generates artifacts that are thinking constructions where wood, stone, concrete, metal, mortar, and glass are unified by tectonics in a stereographic plurality. Architecture then exemplifies and suggests rather than determining or imposing, and tectonics becomes an expression of pleasure, a subjective presence rather than an objective procedure to which both the user and the architects must be subjected.