## SIMPLE VISIONS, COMPLEX VISIONS

Jorge Tárrago Mingo

"May God keep us from single vision and Newton´s sleep" wrote the English poet and painter William Blake (London, 1757-1827). The ironic sentence appeared little after the recent Newtonian physics, which Blake criticized bitterly, started spreading globally as a plausible explanation for the physical phenomenons. And, as we know, through really simple formulations, insufficient today for the complexity poised by the theory of relativity, systems, and chaos, or the development of quantum physics.

The Tate Britain keeps also one of Blake's illustrations, seemingly drawn a few years later, signed on 1804, and laconically titled Newton, where he depicts an idealized nude physician of athletic, sculptural body, seating on a rock upholstered with lichen and moss, of accidental, whimsical and voluptuous shapes and textures. He appears leaning forward, with his back to nature handling a compass over his own tunic spread out on the ground, and while being perfectly flat where the instrument is used, it ends up in a fussy volute. The creative imagination confronted with Newtonian reasoning. Nevertheless, a second glance at the drawing, not an immediate one reveals another possibility, going further than the slight description we have just made. Although the underlying intention, accident against reason, is the same one and it its reinforced. In this second vision the rock is really –or could be, who knows– a sort of creature swallowing the physician with its open jaw. In the upper left side of the drawing, a shadow resembles an eye, below that one can sense something similar to a nose, and the diagonal shadow rising form Newton's buttock separates a cranium from the jaw of the creature. Once you discover this appearance it is difficult to forget the image of a monster rock swallowing Newton.

This new issue of RA continues to support the heterogeneity in its topics that has defined the magazine. Nevertheless, this does not prevent to draw connections and bonds between the articles in it. Since on top it, over the specific topics presented, in most of them, renovated approaches and visions are proposed, sometimes original, questioning the commonly accepted thesis in these fields. The most simplistic approach of architectural reality are sometimes hidden behind these, simple examinations, that while they arrange, classify, and explain facts..., they forget more complex connections, that even when studied from these points of views, remain buried by the most easily accepted simplistic visions on the matter. In these, everything serves a history made up of the architecture itself and its personalities, exclusive and self-justified, therefore eliminating everything that does not fit in the most purified histories.

Thus, Stanford Anderson has handed over the Spanish version of an article, originally included in Oppositions and later on as a chapter in Peter Behrens and a New Architecture for the Twentieth Century (MIT Press, 2000), where the traditional concepts of the relationship between technique and artistic form in Germany are examined through Peter Behrens' designs, perhaps the first industrial designer, for AEG.

On the other hand, Maristella Casciato examines and credits Pierre Jeanneret's and the British couple Jane Drew & Maxwell Fry's contribution, although it still remains in the backdrop, to the creation of Chandigarh, that is most of the time blatantly attributed exclusively to his cousin Le Corbusier's endless genius.

After that, Carlos de San Antonio narrates the journey that Ricardo Fernández Vallespín took during 1947 through Switzerland, Netherlands, Denmark, Sweden, and England, through the letters and a series of slides of the barely known architect. That trip, practically ignored by the historiography, matched with the one his colleague Miguel Fisac took two years later. One has been practically unnoticed, the other one has been mythologized, although it was the first one the one that motivated and partly arranged the second one.

Francisco González de Canales brilliantly questions digital architecture and the validity of its paradigms by its own precursors, mainly coming from the East coast universities of North America. He thus, commemorates the shift in the postmodern North American architecture of the 80s towards the computing architecture appearing in the early 90s, uncompromising with the previous theoretical practice, lacking of significance, nonhistorical and nonpolitical.

Luis Burriel Bielza throws new light, discovered through thorough investigation other possible relations above the obvious or reknown, reveals functioning mechanisms and precedents, analyzing the evolution of Le Corbusier's project for Saint Pierre de Firminy-Vert parrish church in the relationship between the altar and the door: continuities, paths, movements, displacements, tensions, links, symbolisms.

Lucía Nuria Álvarez Lombardero questions, at least partly, the failure imposed by the historiography to the proposals and involvement of Team X urban strategies resulting from the mat building concept. Reviews the success, points out the failures, poses the limits, perhaps not exhausted, of a urban planning that tried to overcome the heritage of the first CIAM tendencies and promised a greater spatial association and social interaction.

Jorge Francisco Liernur attempts to demonstrate how one of the attributes that define modern architecture, the flat roof, has been explained from the historiographical point of view as a result of the advance in construction technique, hygiene and physical culture or the influence of the contemporary artistic trends, mainly cubism or neoplasticism, forgetting the influence of North African vernacular architecture. Beyond stereotypes and without denying the previous ones, this contribution demonstrates the complexity and the combination of processes in architecture, above more simple visions.

Wilfried Wang has arranged and developed for RA the ideas from the lecture given on February 5th, 2010, at the Navarra University Architecture School where he sets the change in paradigm that architecture must confront if it wants to respond to the true challenge of sustainability and, lightly, restarts the debate on architectural quality, previous to its construction.

On his side, Werner Oechslin, in a long awaited and exceptionally long article, demonstrates a surprising erudition to question simple and simplistic interpretations of the dutch contribution, deeper culturally, to the theoretical body of architecture, departing from the thesis of a modern era that has created itself from nothingness.

José Ángel Medina offers us a clarified version, distanced from the mythical and triumphant interpretations of the famous meeting of the CIRPAC delegates in Barcelona 1932. The thorough study of the abundant internal correspondence of the GATEPAC offers a different, less mellow and closer to reality, interpretation of this outstanding episode of the history of Spanish modern architecture.

Juan Coll-Barreu proposes a particularly original analysis on the Crown Hall, Mies van der Rohe's building for Chicago's IIT Architecture School, completed in 1956, questioning and turning upside down the canonical historiography's consideration of it as one more of the master's transparent pavilions.. A thorough glance and the examination of its context demonstrate a different image to the immediate one, a complex vision.

Last but not least, Rubén A. Alcolea explains what happened in the VII Congress of the History of Modern Spanish Architecture celebrated in May 2010. Its records demonstrate how the congress allowed indeed to reconsider the architects' journeys and provide with a broader vision of the Spanish architects of that time and of the foreign architects visiting us.

In short, this 'heterogeneous' format of the magazine and its defined editorial aims precisely welcomes to unravel these details so that they can keep shedding light on canonical explanations. And, paradoxically, it can not be but through simple arguments how to feed little by little this other complex visions on the same facts. As one can read in between Blake's lines or can see in Newton's drawing there might be more meanings than the simple and apparent.

## INDUSTRIAL DESIGN, A STRATEGY FOR UNITING TECHNOLOGY AND ART

Stanford Anderson

Early and repeated claims for the innovative role of Peter Behrens in the field of industrial design may serve as an instructive point of departure from which to examine traditional German concepts of the relationship between artistic form and technique. Nikolaus Pevsner most successfully propagandized these claims for Peter Behrens (Figs. 1-3):

> The importance of Germany in the early years of the twentieth century lies altogether in the shift from craft to industrial design and concurrently in the discovery by architects (and engineers) of the aesthetic possibilities of industrial architecture... The most important architect was Peter Behrens, the most important organization the Deutscher Werkbund founded in 1907 and dedicated to the cause of good functional form in the crafts and soon in industry too. Peter Behrens was made consultant to the AEG, the Berlin manufacturers of electrical products, both for these products and for their buildings –a completely new and highly influential job. His tea kettles, his street lamps, his notepaper and invoices, his shop interiors and his large factories have all the same functional directness. Art Nouveau which had been Behrens's own point of departure about 1900 was left leagues behind. The style and the spiritual attitude of the twentieth century had indeed been achieved.

Pevsner remained loath to abandon this position, first expressed in his *Pioneers of the Modern Movement* of 1936, even when he felt compelled to recognize that others did not share his view. An attempt at a better understanding of Behrens's contribution might well start with an examination of his design of an arc lamp (Fig. 1) for the AEG. Though this lamp was his first work in industrial design, it quickly became –and has remained– the touchstone for his reputation as the first industrial designer.

AEG publicity and internal histories misdirect the interpretation of Behrens's role in the origins of industrial design. Two publications illustrate only the ornate "late Victorian" arc lamp (Fig. 4, left) and Behrens's most renowned design (Fig. 1), both produced by the AEG. The former was labeled "aus dem Jahre 1906", the latter dated 1908. Such presentation implied that Behrens, in one fell swoop, swept out nineteenth-century abuses and achieved "the spiritual attitude of the twentieth century". The situation was not that simple; while honoring Behrens's achievement, such comparisons obscure the facts.

The "Victorian" lamp was composed of two basically simple parts: a spherical globe shielding the arc and diffusing its light, and a cylindrical tube housing the regulator and the feed mechanism for the carbon electrodes. The floral decoration was literally "applied art" intended to make the lamp acceptable in rooms with similar decoration. This applied art was supplied by the *Fabrikzeichner* (factory draftsman), one of the predecessors of the industrial designer. According to Arnold Schürer, this lamp was in production in the late nineteenth century and still represented in AEG catalogs after Behrens's arrival. It was always offered not as *the* arc lamp model, but as an alternative to unornamented models. An AEG catalog of 1901 shows a very handsome, unornamented lamp, literally just a sphere and a cylinder with a short cylindrical collar at their juncture. Figure 4, right, shows another model available prior to the arrival of Behrens at the AEG. In such a lamp, one recognizes a fundamental, engineered form. One should not imagine either that such form is achieved automatically or that it is the best solution. However, successive AEG catalogs reveal increasing recognition of the problems addressed, mastery of the technology employed, and articulation of these factors in the changing forms of the products.

When Behrens turned to the problem of industrial design, he could accept neither the loose application of ornament nor the simple refinement of "functionally direct" form. Rather, he sought to give such technological products their place within the greater synthesis of *Kultur*.

> It is true that the works of engineers are not without a certain beauty. One need only think of the great iron halls, the broad-spanning roofs which definitely give an impression of grandeur. We cannot deny that the simple utilitarian buildings built by engineers, still more their machines, achieve a certain aesthetic impression by means of their often bold and logical construction. This effect is achieved despite the fact that no conception derived according to artistic principles prevailed in these examples and that the aesthetic result is accidental. This phenomenon can be explained in that these works possess a pseudo-aesthetic embodied in a certain lawfulness, that of mechanical construction. This is the lawfulness of organic development which nature also reveals in all her works. But just as nature is not *Kultur*, so the purely human fulfillment of functional and material needs cannot create *Kultur*. Despite all this genuinely enthusiastic recognition of the accomplishments of technology and transport, nothing could be more natural than that the desire for absolute beauty should be awakened in us. Quite naturally we will not believe that from this time on the satisfactions called forth by exactitude and utmost functionalism will take the place of those values that have formerly delighted and elevated us.

For Behrens, then, the engineer's "pseudo-aesthetic" achievement was not art. Far from allowing industrial products to be formed in accordance with the dictates of purpose, material, and technique, he insisted that art was a response to human expectations and psychic pressures. Art must then be free to fulfill itself unhindered by (and perhaps even in contradiction to) material conditions. This was an explicit instance of Behrens's resistance to what he saw as the materialism of Semperian thought and his acceptance, via Riegl, of the dominance of artistic will.

In Behrens's formulation, it was the artist's role to accept the imperatives of technological civilization and then to overcome them in the interest of a holistic culture. In redesigning the arc lamp, he saw his problem as the formulation of an aesthetic that accepted the blunt, prosaic power of the machine, of engineering and industry, but which also raised this power to an electric, economical poetry expressive of a suprapersonal and modern *Kunstwollen*. Behrens's lamp (Fig. 1) did not tamper with the mechanics of the lamp; it was the housing that he reformed. Without apparent coercion, the silhouette of the lamp became simple and harmonious. A strong, central shaft replaced the jointed and molded midsection of the earlier lamp. The absence of these moldings allowed the cap unit of the new lamp to be easily distinguished; the reflector, now shaped in a pair of graceful, repeated curves, was complemented in the similar, reversed curves of the globe below. Even the operable hardware, though still rather flat, asserted itself as a set of bolder stokes in interplay with the massive form of the housing. Beyond the calligraphic elegance of silhouette, this new simplicity suggested that the lamp was made of a few solid parts. The forming of the sheet metal enhanced this effect; rather than expose the sharp edge of this light material, Behrens turned down and gave a bronze facing to each exposed edge, "portraying" the termination of a sturdy material. In contrast to the engineered design (Fig. 4, right), which was perfectly frank in its jointing, assembly, and character of material, Behrens's design was sculptural, almost Egyptian in both its line and weightiness. The engineered lamp was admirably direct, and yet Behrens's design offered, in this instance, the more compelling image of technical efficiency. Wolf Dohrn records the anecdote that salesmen for the AEG were so pleased with the new form of the housing that they requested a similar redesign of the working parts.

Through Behrens, the AEG lamp received a form that provided an aesthetic reformulation of the "new nature" of industrialization, and thus an indirect testimony of the underlying technical efficiency. This comparatively small artistic form drawn from the new nature also implied a new architecture, for Behrens's flowerlike lamp would have been as out of place in a work of raw engineering construction as the florally ornamented lamp had been. Behrens's arc lamp and his AEG Turbine Factory, for example, are complementary designs.

A deeper understanding of Behrens's approach to industrial design and of his opposition to Semper emerges from a consideration of the German concept of *Tektonik*. The late Schinkelesque classicist Karl Bötticher wrote a detailed study of ancient Greek architecture entitled *Die Tektonik der Hellenen*. The motto for his book indicates the immanence of meaning in form to which *Tektonik* was to refer:

> *Des Körpers Form ist seines Wesens Spiegel!*
>
> *Durchdringst du sie-löst sich des Räthsels Siegel.*

On his first page, Bötticher explained that *Tektonik* referred not just to the activity of making the materially requisite construction that answers to certain needs, but rather to the activity that raises this construction to an art form. That is, every element of a building –a column, for example– has an actual technical function, but this function may not be fully apparent. The functionally adequate must be adapted so as to give expression to its function. The sense of bearing provided by the entasis of Greek columns became the touchstone of this concept of *Tektonik*. Under this interpretation, the Greek temple became a composite of functionally expressive members relying on organic analogies, a kind of mosaic of functions. According to Bötticher, in the Hellenistic tectonic, as in nature, the form of a body was the embodiment or plastic representation of its essence. Form gave to the construction material the expression of its fulfillment of function.

Gottfried Semper shared Bötticher's belief that the Greeks achieved the highest tectonic expression and that this achievement bore a relation to the forms of nature. Semper insisted that "every art form must be the expression of a definite law of the innermost necessity, just as this is certainly the case with natural forms". He also stressed that plans, sections, elevations, and all laws of beauty developed from them were artificial and fell short of the organic tectonic forms of the Greeks, which were not constructed, turned, or cast, but organically developed. He specifically chastised Bötticher for his *Strukturschemen* and his applied symbolic ornament. Rather, in Greek art "the forms in themselves are such as are brought forth when organic ener-

gies are thrust into conflict with ponderous matter". Semper drew a lesson from this: "the more the works of our hands appear as though they were the result of a similar conflict between elemental energies and vital energies, the higher these works stand on the ladder of artistic fulfillment".

The book quoted here is Semper's small study of Greek lead shot for slings (Fig. 7), in which he questioned why these missiles should have been almond-shaped. In giving his answer, Semper offers a general study of objects moving in a resistant medium. The book demonstrates his submission of an ancient "industrial" product to a theoretical study conceived to elucidate both timeless artistic problems and production-related concerns such as those of boat or missile design. In his statement of purpose, Semper removes some concern about what might appear to be a simplistic naturalism: "I have been driven to the following study by the desire to demonstrate, by means of a simple example, that the Greeks did not merely observe natural laws and then strive to imitate the forms that resulted from the operation of these laws. Rather, I would like to demonstrate that the Greeks actually researched these laws and out of these laws, independent of all imitation, created their own forms. These new forms relate to those of nature only in the commonality of the underlying natural laws".

As figure 6 indicates, Semper's aerodynamic studies satisfied him that the "almond-shaped" missiles of the ancients were the expression of a definite natural law. In the final section (§21), he returns to more conventional aesthetic concerns. Noting that his study of objects moving in a resisting medium revealed that the forms exhibited a "spring-powered resistance" to the straight line, tending to bend into a curve, he remarked that it is such contours and expansions that characterize the Greek tectonic profile in strong differentiation from all other styles of architecture. Finally, he claims not "that the Greeks constructed their forms according to mathematical formulas, which would be absurd in the arts. On the contrary, the Greeks did not merely sense, but clearly recognized a law of nature: in achieving form in objects, extreme limits are observed and energy controls everything".

I am here concerned not to verify the historiographical or scientific adequacy of Semper's study but rather to examine the theoretical insight it offered to his contemporaries. Discovering the form that answered to all the demands of its context (the complexity of the context varying with the problem), Semper asserted a relation between the process of "streamlining" and the form of the Parthenon. Two generations later Le Corbusier wrote:

> "The airplane is indubitably one of the products of the most intense selection in the range of modern industry".
>
> The War was an insatiable "client", never satisfied, always demanding better. The orders were to succeed at all costs and death followed a mistake remorselessly. We may then affirm that the airplane mobilized invention, intelligence, and daring: *imagination* and *cold reason*. It is the same spirit that built the Parthenon.
>
> Let us look at things from the point of view of architecture, but in the state of mind of the inventor of airplanes.
>
> The lesson of the airplane is not primarily in the forms it has created, and above all we must learn to see in an airplane not a bird or a dragonfly, but a machine for flying; the lesson of the airplane lies in the logic which governed the enunciation of the problem and which led to its successful realization. When a problem is properly stated, in our epoch, it inevitably finds its solution.
>
> The problem of the house has not yet been stated.

*Tektonik* was, then, a complex and evolving concept that attempted to establish a relationship between form and technical considerations. According to Bötticher, such a concept was necessary because what was technically functional might not be sensed as such. This implied the demand that the artist assert himself in giving expression to the function of the object. The artist must be brought in not for an a priori personal sensibility but for the ability to give expression to what was objective in a situation. Semper sought to give a still more reasoned interpretation of good form by demonstrating the necessity of considering all the conditions which the environmental context placed upon the object. *Tektonik* thus received a still more precise functional interpretation.

Such concepts, bringing function to expression through carefully considered form, were overt in much *Art Nouveau* and *Jugendstil* work –notably with van de Velde (Fig.10) and Riemerschmid (Fig. 9), bur also in early Behrens (the chairs in figure 8). The polemics of the time referred to such works as "functionalist". Thinkers as seemingly different as Bötticher and van de Velde were committed to this inferentially functional, organismic world of forms associated with Greek classicism (and Gothic architecture). Semper went on to describe an alternative –an abstract, nonorganic formal world labeled *Stereotomie*, associated with the Renaissance (and Romanesque architecture).

The terms *Tektonik* and *Stereotomie*, as well as the architectures with which they were associated, indicate that these represented, respectively, constructs of articulated elements (elastic skeletal structures, e.g., timber or metal frames) and comparatively inert assemblies (intractable masses, e.g., masonry walls). Successive sections of Semper's principal work, *Der Stil in den technischen und tektonischen Künsten*, are titled "Tektonik" (carpentry) and "Stereotomie" (masonry, etc.). The Greek temple remained the highest form (p. xlii) even though, as a tectonic assembly in stone, it was a heterogeneous combination of the form allied to *Tektonik* and the material allied to *Stereotomie*. The major distinction between the types was that tectonic structures were composed of members; stereotomic assemblies of identical or similar pieces. These pieces all had the same function, the absolutely mechanical one of compression and resistance to compression. In contrast, the members of the tectonic structure (even if executed in stone) were differentiated in their action, in their position in the frame, and consequently "could, by means of art, be brought to life as organisms". In opposition to this functionally expressive and organic quality of the tectonic structure, the stone mass had a lifeless, crystalline mineral quality which built up into totalities of a crystalline or eurhythmic character and which could only be conceived in terms of a regular, closed form.

Behrens's own development reflects a shift from functionally expressive to crystalline form as he passed from his *Jugendstil* work in Darmstadt (Fig. 13) to the *post-Jugendstil* work of his Düsseldorf period (Fig. 11). Four years later, beginning work for the AEG in Berlin, he was faced with problems that encouraged a less absolute division between *Tektonik* and *Stereotomie*. His *post-Jugendstil* preference for *Stereotomie* came into confrontation with the tectonic qualities of metal-framed factory structures. While a new conception of space assisted Behrens in resolving the contradiction between these two structural principles, this understanding held little relevance for the design of industrial objects.

The translation of the ideas behind *Tektonik* into industrial machine construction and machine products had already occurred in Semper's time with the noted mechanical engineer Franz Reuleaux. As the head of the German delegation and a judge in the mechanical section of the Centennial Exhibition at Philadelphia in 1876, Reuleaux wrote periodic letters to the *Nationalzeitung* that caused a great stir in Germany. Reuleaux found that Americans were evolving good form in their machines (Fig. 12), a fact that he both appreciated and found tectonically significant: "Certain details of the steam-engine have been further developed, and [the Americans] are able to give it a truly admirable external finish and appearance. This is a significant sign. For when beauty of form is developed as the object of special care, the difficulties of purely utilitarian design must already have been overcome". Going so far as to refer to German industrial production exhibited at Philadelphia as "billig und schlecht" (cheap and nasty), Reuleaux made a point that anticipates the advocacy of the Deurscher Werkbund around 1910:

> "German industry must relinquish the principle of competition in price alone and must decide whether to turn instead to competition in quality or value. Nevertheless... German industry must adopt machines... when bodily effort can thereby be abolished or lightened...; on the other hand, industry must use the intellectual power and the skill of the worker to refine the product, and this to a greater degree the more it approaches art".

Now consider this traditional problem of "good" form and use in relation to Behrens's work for industry. The early nineteenth-century neoclassical architect Bötticher and late nineteenth-century mechanical engineer Reuleaux both accepted that an excellent utilitarian design was not yet necessarily good form. Good form was a further development; it would express the utility of the object, but, as expression, it had as much or more to do with the perception and psyche of the user or viewer as it did with its actual function.

Semper did not hold the mechanically deterministic view that the satisfaction of utilitarian demands insured an ideal form. But his example of the lead shot indicates he

would go further than Bötticher or Reuleaux in claiming a symbiosis between utility and good form. We may assume that Bötticher's acknowledgment of good form in a column would be conservative, insisting on the fulfillment of certain traditional expectations. The thrust of Semper's argument suggests that he would be more prepared to alter his understanding and acceptance of conventions in accord with his analysis of the practical problem. Semper's analysis would appeal to Behrens, one might think, since he was willing to work with industry and alter traditional expectations; but we know of Behrens's antagonism toward Semper. Behrens stands in the classical tradition of Bötticher, although his modern, broadly cultural, and more psychological understanding of Hellenism led him to conceive an even weaker bond between good form and technique.

Like Bötticher and Reuleaux, Behrens accepted the excellence of a utilitarian design; to our knowledge, he did nothing to alter the technical design of AEG products. But whereas Bötticher attempted to rationalize the excellence of Hellenic classicism as an assembly of expressed functions, Behrens was persuaded by the more complex psychological and symbolic interpretations that evoked the "spirit of the time" and the collective and individual wills of a civilization and its artists. Consequently, Behrens's own work had other, more abstract sources than functional expression. In his designs for industrially produced objects of domestic use, Behrens was often conservative. Certainly there were predilections based now on tradition, now on ideal geometry, that contributed to the form of the Behrens –AEG electrical heating units (see figure 2). These objects suggest more strongly the qualities of Carolingian reliquaries than those of a revolutionary new heating system. In accord with Behrens's design conceptions, many of the details of these objects derived from other sources than a strict analysis of functional expression. Similarly, his electric tea kettles (Fig. 14) relied more on late eighteenth-century *chinoiserie* than on a new functional analysis. Or, to make the point differently, had the handsome Behrens teapots relied for their form on the expression of function, they would not have appeared simultaneously in three different forms and several finishes (including two "machine-hammered" ones).

In domestic or luxury objects, and in domestic or institutional architecture, Behrens was prepared to have established expectations influence the form. Even if electrified, a teapot or a source of warmth in the home had to participate in human expectations beyond functional expression. He stated specifically that manufactured objects that come into close contact with people permit a richer forming, better materials, and ornamentation –though the ornamentation should be economical and "impersonal", as is the case with simple geometric figures.

Only in a secondary sense were the nondomestic arc lamp (Fig. 1) or even the simplest tea kettle (Fig. 14) or electric fan (Fig. 3) more functionally direct than their predecessors (Figure 4, left; fans with similarly ornamented motor housings were also produced). Both Walther Rathenau of the AEG and Behrens accepted the role of science and technology in modern society with a pessimistic resignation. Where traditional forces were not dominant, Behrens adopted a historicist compulsion to use his artistry to create an image of technological efficiency and perfection beyond what the engineered object would have provided. He sought such an image because he believed his place in history compelled him to do so. It is the curious position of an individual human will dominant over material matters but subject to the imagined collective spirit of a people and its history. Thus Behrens was willing to see new forms; but as the theoretical discussion of the preceding chapter suggests, he sought the conventions of a new sensibility that encompassed functional expression rather than seeking reciprocity with it.

Within this context we may return to the question of Behrens's precedence in the field of industrial design. One aspect of industrial design is surely the design of capital goods and major machinery for public works and for industry itself. The turbines and large equipment of the AEG were prominent items in this category, but there is still no hard evidence that Behrens had any more than an indirect influence on the design of these products. That indirect influence stemmed from his well-known designs for mass-produced objects.

If "industrial design" means design of mass-production, mass-distribution goods, certain of the designers for whom precedence might be claimed can be eliminated on the grounds that they were designing for handicraft production or, at most, for machine-augmented handicraft production. In the late nineteenth century, first in England and then on the continent, artists and craftsmen banded together to form workshops where they might produce and market objects meeting their own standards. These workshops were too closely tied to the handicraft tradition to lay claim to an innovative position in design for industry. In 1908, J. A. Lux went so far as to compliment the *Wiener Werkstätte* as one of the few remaining shops where the worker could devote a labor of love to a single object. At times, much has been made of the "machine furniture" of Bruno Paul or that of Richard Riemerschmid designed for the *Deutsche Werkstätten* of Hellerau. The *Werkstätten* published Riemerschmid's designs in a book in which they were at pains to designate themselves as a workshop devoted to careful handwork rather than a factory (Fig. 15).

In point of fact, the Dresden Workshops were quite large and might have some claim to serial production of furniture. However, that claim could be pressed earlier and more convincingly for other industries, such as glass, ceramics, wallpaper, and linoleum. Many *Art Nouveau* artists, including Behrens, created designs for firms engaged in such manufactures. Sèvres in ceramics, Wedgwood in china, Boulton in iron casting, and the English Arts and Crafts movement provide earlier instances of designers for large-scale production working both within industry and as "consultants". In such industries as ceramics, glass, and weaponry, the existence of "design for industry" must trace back to antiquity. Clearly, there is ample precedent for the design of objects for mass production and mass distribution. The question, then, would seem to be whether the twentieth century, and Behrens in particular, developed an innovative approach that should be distinguished as "industrial design".

One might attempt to distinguish Behrens's contribution by the modernity of the industry for which he worked. But the electrical industry was not totally new in 1907; and the industrial revolution had introduced other technologies, such as steam power, that posed a wide range of industrial design problems. These problems evinced the sometimes functional and sometimes rather loosely conceived design contributions of engineers and *Fabrikzeichner*, as instanced by the AEG arc lamps.

Nor was the scale of mass production of the AEG a distinguishing characteristic. The bentwood furniture manufacture of Michael Thonet was an earlier example of design for large-scale production: an example that also demonstrates a methodology in contrast with Behrens's industrial design. Thonet furniture produced in Boppard in 1836-1840 (Fig. 16) reveals both his new technique and the reminiscences that came to him in his role as his own "factory draftsman". Had Thonet stopped there, he might be viewed as little more than another *Fabrikzeichner*; but in Austria, Thonet and his sons developed their designs until they achieved the still-admired bentwood chairs with wicker seats, one version of which appears in figure 17. Through research devoted to their material and technique, and to the more general problems of seating and furniture, the Thonets achieved a variety of seemingly timeless designs. This furniture was made in such numbers (reportedly forty million chairs of the basic style no. 14 between 1859 and 1896) as to clearly establish the Thonets as mass producers.

A chair, as a traditional object, contrasts with the technical objects of the electrical industry. But the important difference between Thonet's design and that of Behrens is in method, not in the type of object or scale of production. Generations have now taken pleasure in Thonet chairs, the design, development, and production of which suggest comparison with Semper's idea of *Tektonik*. For Thonet, as for Semper, there was no conception of a technical form that an artist should improve. The fully developed and beautiful form was to be achieved along with the refinement of the material and technique –and this need not imply a deterministic, one-way path from technique to form. According to this conception, it was the oneness of technical and visual excellence that was important, whether the person who achieved it was labeled engineer or artist. Under this interpretation, design for industry was not new with the twentieth century, certainly not with Behrens.

As we have seen repeatedly. Behrens made a clear distinction between technique and art. He influentially diminished the aloofness of early twentieth-century artists to industry; but his acceptance of industry was fatalistic rather than optimistic or wholehearted. Even the best products of the engineer, whether mass-production or capital goods, were eliminated from the canon of good form on the theory that they participated in a pseudoaesthetic. These products or machines, according to Behrens, had an "organic" lawfulness just as nature does; but just as nature is not yet art, so neither is an "organic" machine yet good design, art, or culture. For Behrens, the work

of the engineer is a given of modern Western civilization, but an independent *Kunstwollen* must operate upon it if there is to be a modern Western culture.

It comes as no surprise, then, that one of the early claims for Behrens's contribution to design for industry was based on the dualism of technique and art, the engineer and the artist –and on Behrens's desire to aggregate these parts rather than to conceive of a single creative process. Wolf Dohrn, in speaking of the AEG arc lamps, considered Behrens's method to be a model for the future development of German industry. His lamp designs were the result of a cooperation in which the engineer became half an artist and the artist half an engineer. Behrens was the first, Dohrn said, to put his capability in the service of industry; the AEG had innovated in an exemplary fashion in achieving the cooperation of engineer and artist. It was widely recognized that the AEG had shown the greatest capacity to employ the results of German science for economic benefit, so it was no accident, Dohrn concluded, that this same industry understood how to adapt the artistic capabilities of the time to its economic life.

In summary, Behrens was not the first person to contribute designs (even "good" designs) for the fabrication (even mass production) of products (even peculiarly modern industrial products) by others. Nevertheless, he was the first artist to devote special care to the beauty of form of peculiarly modern industrial products in terms of some larger cultural conception *external to the immediate processes* of production and use. Industry, the machine, and industrial production had to be accepted, for at this point in history they were inevitable. For Behrens, the only remaining opportunity was to bridle this great force of technological civilization under expressive, reductionist artistic forms. The belief advanced by thinkers like Reuleaux –that a process of technical refinement of a particular machine should be accompanied by a refinement of form– was thus in danger of subversion. An alternative belief, rooted in a historical determinist account, that the twentieth century was generally characterized by technical refinement, called for the design of forms that were beautiful, precise, and expressive –forms that were often independent of the machines they housed.

Much, perhaps even the largest part, of what has been known as industrial design in the twentieth century assumes the separateness of technique and art, and the need to give a sympathetic yet independent artistic expression to a technical civilization. The broad acceptance of this particular conception of design for industry may indeed be traced back to Behrens and give him precedence within that interpretation of industrial design.

Before going on to consider Behrens's industrial architecture, it will be well to review the task Behrens and the AEG established for the designer. Behrens was not hired as an engineer with a sensitive eye. He was retained as an artist who could provide the signs of technical perfection through beauty of form, whether this involved a well-formed housing for the electrodes of an arc lamp, a well-formed factory building for a work force which the AEG was proud to say operated almost militaristically, or an elegant letterhead for an intelligent and complex executive staff.

The extensive adoption of Behrens's expressive design by the AEG served to create a corporate image, a precedent for such mid-twentieth-century firms as Olivetti and IBM. IBM in particular used reductionist forms in graphics, industrial design, and architecture to express technological efficiency and to establish an image. It may be the desire for such an "image" that has made Behrens's conception of industrial design dominant. The fruits of an inexorable search for the best solution to each problem (in the manner of the Thonet chair) would relate to one another only in terms of excellence and process; but the application of a dominant artistic will can assure a constant image through a great range of problems (the white plastic boxes of Braun electrical appliances, for example).

In Germany, industrial design is known as *Formgebung* and Peter Behrens is generally acknowledged as the first of these "form-givers". Industrial design may be said to range from product engineering to sales cosmetics. It is significant that Behrens was not engaged to work at either of the poles of this spectrum where engineers or draftsmen had already worked. Behrens was the first *Formgeber* through his exploring of the forms that would signal technical perfection, corporate image, and something still more obscure. Beyond the sign language of technique and corporateness, Behrens was still more interested in finding the symbols, proportions, and constructs that he believed would accord with and reveal the "rhythm of the time". There was also the further, self-imposed demand that this whole endeavor should achieve its "classical" form. Since steel, electricity, rapid transportation, modern industry, and modern enterprise were regarded as the sources of this rhythm, and therefore of the new culture, Behrens's cultural ambitions found support among his employers.

POSTSCRIPT

Peter Behrens's industrial design for the AEG is now thoroughly documented in the studies of Tilmann Buddensieg and his colleagues, and most fully presented in their book *Industriekultur*.

## FOUR EUROPEAN ARCHITECTS WORKING IN CHANDIGARH. LC + PIERRE JEANNERET, JANE DREW & MAXWELL FRY

Maristella Casciato

The partition of India in the wake of its independence from British Rule, gained in 1947, formed the background to Le Corbusier's involvement in the planning of Chandigarh. This event had seen the split of one of the most prosperous states of India, the Punjab, and the attribution to Pakistan of its ancient capital, Lahore. Then, the new condition prompted the first post-colonial Indian government to transform that loss into a banner for the identity of the recently freed Indian nation. Prime Minister Nehru decided to build a new capital city of outstanding and progressive architecture.

The objective of this essay is to give an account of the contribution of architect Pierre Jeanneret to the town building of the new capital of the Indian state of Punjab, later to be named Chandigarh. The city, marked by its modern buildings and neighborhoods, its housing and leisure parks, its infrastructure and landscapes, has been singularly associated with an individual western designer, known worldwide as Le Corbusier.

It is true that in such sections of the city as the Capitol complex esplanade with its modern monuments –borrowing Prime Minister Nehru's words, the "expression of the nation's faith in the future"– Corbu's signature is evident.

It is less widely known, however, that in the Chandigarh building enterprise, the famous Swiss-French architect was not the sole player, that Chandigarh's urban fabric and modern buildings were to varying degrees shaped by many actors, including other architects and their assistants. By far the most influential of this cast was another Swiss-born architect and Le Corbusier's life-long associate, Pierre Jeanneret. Having accepted Le Corbusier's offer to become city architect for the new capital in 1951, Jeanneret moved to India and for fifteen years served as the real engine of Chandigarh's development.

In order to provide a better understanding of Jeanneret's role in the construction of the capital's modern architecture and identity, I wish to begin introducing some biographical notes on Pierre Jeanneret and some comments on his personality, which had a determining effect on the nature of his relationship with Le Corbusier. I shall then look into the background of Le Corbusier commission to build Chandigarh and thus into Jeanneret's involvement in the project. Finally, I will consider the extent of Jeanneret's responsibility in the construction of the city, and his impact on the city's shape.

While I am positive that Le Corbusier's biography is well known, Pierre has, to this day, largely remained in his shadow.

Later known as Le Corbusier, Charles-Édouard Jeanneret was the first cousin of Pierre Jeanneret. The latter, born in Geneva in 1896, was nine years younger than the former. Pierre was educated at the *École des Beaux-Arts* of his native town, where, unlike his more famous cousin, he graduated in architecture. Though their cultural background showed some similarities, Pierre's education was in fact more technically oriented than that of Charles-Édouard, and his character more meticulous. Both qualities would prove to have an effective impact on their future working relationship.

In 1917 Charles-Édouard settled in Paris. One year later, upon his cousin's invitation, Pierre followed suite, leaving his native "country of cows and bankers", as he ironically portrayed Switzerland. On Charles-Édouard's advice Pierre entered the office of

the Perret brothers to complete his education in architecture. Although August Perret was keen on keeping him in his office, in 1920 Pierre eventually chose to join his cousin's practice and thereafter took part in all the activities Le Corbusier initiated. Pierre was from the very first moment involved in the production of the seminal magazine *l'Esprit Nouveau*, co-launched by Charles-Édouard and the painter Ozenfant. Pierre even designed the magazine's covers.

The year 1922 marked the birth of their architectural partnership, designated 'Le Corbusier and Pierre Jeanneret'. From then on and until 1940 they co-signed all the major designs, competition entries, and town-planning projects produced in the Parisian ateliers they shared. By mutual agreement Pierre was appointed *chef d'atelier*. In this position he was in charge of the office's daily practice. A truly construction-oriented person, he was the builder within the partnership. As one of their collaborators later recalled: "Pierre was deeply concerned with everything related to buildings, including the solution of minor details, which he knew how to solve in the most ingenious way".

In addition, Pierre participated in exhibitions and conferences and made a significant contribution to his cousin's theoretical thinking. Yet, of the two, Le Corbusier was the public figure, the esteemed intellectual, and the warrior who publicly devoted his life to the fight for modernity.

Despite the scope of their collaboration, Jeanneret's role and production have received only marginal notice in the literature on 20th-century architecture. This seems abnormally shortsighted considering, for instance, that the most comprehensive overview of Le Corbusier's work, the well-known and celebrated *Ouvre Complète* series, acknowledged their dual authorship from its very inception in 1929. Considering that Le Corbusier himself wrote the texts, this further proves how highly he valued Pierre, and how essential he considered Pierre to his production, regarding his cousin as his peer.

In June 1940, after German troops occupied Paris, the architects were forced to close their atelier. At that point, faced with the harsh circumstances of war, they broke their partnership and separated. Le Corbusier kept himself available for collaboration with the government of Vichy, where he eventually settled. Pierre Jeanneret left the occupied French territory for Grenoble where he joined a group of colleagues who were politically close to the socialists and involved in the Resistance.

The following years saw only random contacts between the two cousins. But a new season of their collaboration opened at the very end of 1950 on the occasion of Le Corbusier's involvement in the planning of the new Eastern Punjab capital.

The reunion of the two cousins was propitiated by the circumstances through which Le Corbusier was assigned the plan. Delegates of the Indian Prime Minister Nehru were on a visit to Europe to identify the most suitable designer to carry out the difficult task of building the new city. Eugène Claudius-Petit, then French Minister for Reconstruction and Urbanism and an unflagging advocate of modern architecture, received the party in November 1950. He had, a few years earlier, favored the commission of the *Unité d'habitation* in Marseilles to Le Corbusier. A fervent admirer of Le Corbusier's modernism, he firmly supported his candidacy to the Indian delegation, which already considered the Swiss-French architect an option. In fact, Petit did more. Personally acquainted with the Jeanneret cousins, he was convinced that only that team –with, in his words, "the diversity of their natures and the mutual respect of their qualities"– could face the challenge offered by the Indian government. As a matter of fact Petit acted as mediator between the cousins and favored their reunion.

According to the minutes of the first gathering held in his office on December 6, 1950, after meeting the Indian delegates Le Corbusier proposed that the Chandigarh "Planning Office will be directed by a double party, or even triple as you wish: the core group will have Jane Drew and Maxwell Fry on the one side and Pierre Jeanneret on the other side. This double party will be on site controlling the works... I will remain the Government 'adviser' with the simple mission of establishing a common working agreement and making modifications together on the Master Plan... ".

Le Corbusier teamed his cousin Pierre with the young British couple, who themselves had earlier suggested his name to the Indian delegates during their first European stop in London. Jane Drew and Maxwell Fry were well acquainted with construction in equatorial climates, having worked and built in Britain's West African colonies in the years 1944-1947. In a subsequent paragraph of this same document Le Corbusier confirmed that Jeanneret, Drew and Fry would be his partners: "*Vous aurez la signature avec moi*". (You will sign with me: all three parties will sign together). On December 19, 1950, Le Corbusier signed the formal contract with the Indian Government and two months later, on February 20, 1951, the two cousins left Geneva for their first trip to India.

It was soon established that Jeanneret would send full reports to the office in Paris every other week. From that moment onwards a constant flow of drawings, sketches, blueprints, letters and notes traveled back and forth between France and India. These letters became the diaries of a joint endeavor conducted with the "*esprit d'aventure*" (daring spirit) to which the two men referred in their correspondence. In his very first letter to Le Corbusier Jeanneret wrote:

> "Dear Corbu, these lines are late, because I wanted to let you know you how much I enjoyed the months I spent with you in India. It was the first time in ten years that we had worked together, and our reunion went smoothly. We have been working very hard ever since you left... Fry is a good chap and nothing has as yet gone awry between us. Nor do I believe it will. There will nonetheless be lots of things to clarify, since he has his routines and I have mine".

To say the truth Jeanneret and Fry did not find it easy to work together at first, their relationship being exacerbated by the fact that Jeanneret could not manage in English without Fry, and it took some time for the senior architects to establish a conflict-free working relationship. On this aspect Jeanneret returned many times, as this other letter says explicitly: "Fry has gone to London to get his daughter married and afterward will be attending to his business in Africa; in early October he will return to Simla with Jane Drew. I'm not too pleased about this and will need your support, because there will then be two against one, including one woman –and I believe a rather scheming woman at that".

Hundreds of missives were mailed on a regular basis over fifteen years and the exchange of telegrams and memos became a daily occurrence in some moments of crisis. Never hitherto systematically investigated, this correspondence is precisely the key to a thorough understanding of Jeanneret's role in the construction of the Punjab capital.

Negotiating with the Indian authorities was among Jeanneret's responsibilities right from the start and one that, according to his correspondence and reports, turned out to be very demanding. Getting plans approved or changed without sacrificing their coherence was often a battle. The underlying reasons for the many disagreements are obvious. Not only had the urban plan for the new capital been designed from a distance (both geographically and culturally); it had, above all, been implemented under the leadership of Western architects. Jeanneret's move to Chandigarh from 1951 to 1965, which could be seen as a hard choice for a European to make, allowed him to mediate between the design demands of Le Corbusier, who had total faith in Jeanneret's skill as well as his loyalty, and the requests of Indian authorities, who came to relied upon him and to appreciate his boundless devotion to the building of the capital.

The firmness with which Jeanneret defended the cause of the modern architecture he had envisioned with Le Corbusier and, at the same time, his aptitude at sharing ideas and options with his Indian colleagues in charge of financing the creation of Chandigarh, indeed allowed the miracle to happen.

Le Corbusier himself explicitly acknowledged the degree of responsibility his cousin had assumed when he remarked, "Without Pierre, Corbu's architecture in Chandigarh might never have happened" ("*l'architecture Corbu à Chandigarh ne serait peut-etre pas sans Pierre*"). The wording is revealing: he refers to his own contribution as a kind of trademark. The personality cult thus expressed and encouraged by Le Corbusier may well help us explain Pierre's relative but persistent obscurity.

As a matter of fact, under the leadership of Le Corbusier, who would work in Paris and travel to India twice a year, it was Jeanneret who remained in charge of the coordination and management of the project to a much larger extent than this official document indicates. His extended and close partnership with his cousin and their trust for each other account for Jeanneret's ultimately predominant role, which was furthermore consolidated by the departure of the British couple from Chandigarh in the course of 1954, when their contract expired. Then, the site was still occupied by scattered buildings; the sector 22 and 23 largely under construction as well as the High Court Building on the Capitol.

BUILDING CHANDIGARH

The most pressing task faced by the senior architects in the first years of the project was to define the master plan's *grid*: to apply Le Corbusier's transportation network model of the "7vs" –the seven *voies*, or routes; to finalize the layout of the residential sectors and, within it, the government housing program; and, last but not least, to commence work on Le Corbusier's plans for the Capitol complex, comprising the High Court, the Secretariat, the Assembly, and the Governor's Palace (all but the last one were built).

The drawings for the Capitol complex were sent straight from Paris, in accordance with the terms of the contract, which stipulated that Le Corbusier himself would design the Capitol buildings. In the meantime, it was up to the Planning Office in Chandigarh to provide complete details. Jeanneret was more involved in the erection of these buildings than his English colleagues, and he inspected the construction work daily.

His responsibilities also included dealing with budgets, workers, and building supplies, as well as defending his cousin's design choices, one of which –the use of exposed reinforced concrete– had never before been used in India on such a large scale, although the technique was familiar to Indian civil engineers and construction companies since decades, though mostly applied in the erection of infrastructural projects. Chandigarh's Capitol thus, became the largest complex to utilize this new construction method, whereas Le Corbusier's acquaintance with that art of building was limited, especially considering that his Unité in Marseilles, which was his first real experience on a large scale in that field, was not yet completed. With their remarkable technical talent and skills, Jeanneret and the team of Indian engineers supporting him were essential to the Capitol project's success. The guidance he provided on the ground was just as decisive as Le Corbusier's remote inspiration and design. We can measure Jeanneret's achievement from two perspectives: on the one hand, he gained the necessary confidence of the project's Indian partners; on the other hand, and more specifically, he was instrumental in bringing to completion works of extraordinary constructive quality, as visitors to Chandigarh would instantly appreciate.

Their approach to the issue of government housing also deserves particular attention because it marks a watershed in the definition of an Indian post-colonial dwelling architecture, whose notion at the time was still in debt to the arrangement of the British bungalow type.

Despite Le Corbusier's limited involvement in detailing the planning of the housing sectors, the model for Chandigarh remained that of his *ville radieuse*, in accordance with his indications in terms of green areas, city center, and traffic separation. The major change was the replacement of the redent housing model with a horizontal model of one to two-storey houses. The immediate precedent of Chandigarh low income horizontal housing was to be found in the CIAM grids and in the experimental units proposed by some young French architects then working in Morocco and Algeria.

Jeanneret with Drew and Fry provided layouts for 13 different types of houses, with reference to the different social classes for which they were intended. To cut down on land use and construction costs, the less expensive categories of housing, from Type 8 to Type 13, were planned in rows, mostly laid out back-to-back with inner courtyards. This housing disposition was conceived in order allow the construction of four "villages" within each residential sector, separated by green areas. In this way the module of the horizontal village initially proposed by Le Corbusier was directly evoked albeit on a less rigid and more varied layout.

Drew and Fry were mainly involved in planning residences for senior and intermediate civil servants. In the early phase Jeanneret worked to design low cost governmental housing for the more underprivileged classes. These were mainly built in sectors 22 and 23, the first areas to be developed in Chandigarh as a whole.

The housing Type 13 designed by Jeanneret for Chandigarh's lowest class was either a single or double-storied row house, generally consisting of two rooms, a kitchen, a water-closet and a bathroom, with an average area of about 42 square meters, more or less matching the specifications of the modernist *existenz-minimum* dwelling as debated in the second CIAM Congress in Frankfurt.

All of housing built to Jeanneret's designs used locally produced bricks, left exposed or sometimes plastered and whitewashed. In an assortment of patterns, Jeanneret employed these bricks in load-bearing walls, in trelliswork or *jalis*, parapets, balustrades, sun breakers, and even in built-in furniture, echoing the amazing Indian weaving with geometric patterns of colors and fabrics. The building process, which relied upon unskilled workers and was based on the virtues of craftsmanship, made the best of the bricks' qualities. Jeanneret wrote of the constrained budget he was confronting as follows:

> "I have 4 types of houses that ought to begin, for which I have had to constantly remove and then remove again various elements that were to me of some satisfaction, and it's like that all the time. The garden walls have almost totally disappeared, the verandas too. Your minimum size houses, which I think perfect, are too expensive by 60%... One thing you should know: all prices were established by engineers before our arrival, and in spite of my hopes, there is no way can they be topped".

The use of bricks represented the unique language Jeanneret applied in his housing complexes and schools, while he designed and built in exposed reinforced concrete in sector 17, where he tackled the issue of laying out the heart of a modern city center, with office space, public facilities, and shopping arcades. In planning sector 17 he was firmly convinced that the architectural solution ought to be in line with the CIAM discussion on the concept of the city core and with the interpretation Le Corbusier was simultaneously elaborating for Bogotá. This is amply discussed in the correspondence between the two architects. In fact, this subject is merely one of many unexplored subjects on which the mostly-untouched Chandigarh archives shed light.

Jeanneret's signature in Chandigarh is just as powerful and present as that of his renowned cousin. Also, and this is far more important, it is precisely Jeanneret's input that gives Chandigarh's urban morphology that overall design quality resulting from a slow process of layering. Jeanneret introduced an oxymoron into Chandigarh: the "ordered discontinuity" that modified the Western model of the modern city, contributing to its critical evaluation and introducing the discourse of post-colonial planning.

In a way Pierre embodied the live metaphor of the Corbusian "Open Hand". This monument, eventually built to commemorate the second anniversary of Corbu's death, has become the true mark of the city. The "open hand" suggests being open both to give and to receive. What I mean here is that Jeanneret as a person readily made his skill and abilities available to the Indians, while remaining entirely devoted to his cousin. In return, Chandigarh also gave him a great deal, granted him a kind of strength, an extra independence from his cousin, who, given Pierre's enduring loyalty, accepted it.

Yet despite the quality of his work and the different figures he embodied –the designer, the planner, the construction expert, the mediator, and finally the teacher for the younger Indian generations– Jeanneret's part has been diminished to Western eyes. He has suffered the critical fate of the city that in architectural history books has received recognition for the monumental area of the Capitol alone. In a reductive synecdoche, the Capitol represents Chandigarh, although it is outside and almost unrelated to the city, and the Capitol's author, Le Corbusier, is considered the single designer of the entire city for which the Capital has come to stand in entirety. The sun of India has faded the figure of Jeanneret, Chandigarh's co-designer.

When reaching Chandigarh by train, plane or car, oversized billboards welcome the visitor to the "City Beautiful". And indeed the Capitol complex does have the aura of a modern world monument. But if you speak to the taxi driver, he will point out the charming urban scene of the initial 30 sectors, consisting of an extraordinary variety of dwellings and public facilities that combine constructive functionality with a range and wealth of solutions.

Fifty years after its foundation, the city is thriving economically and its population booming. With the process of inscribing Chandigarh in the World Heritage List well underway, the time has now come to recognize that one of the two authors at the source of the city's grace was precisely Pierre Jeanneret who, aware of the social role that architecture was taking in the new India, refined and tuned Western modernity into his own language, entirely imbued with the Indian character.

## THE UNKNOWN JOURNEY OF A FORGOTTEN ARCHITECT

Carlos de San Antonio Gómez

During the months of March and April 1947, architect Ricardo Fernández Vallespín traveled to Switzerland, Holland, Denmark, Sweden and England. This European

tour, unknown until now, could contribute with new data to the historiography of Spanish modern architecture, since it precedes the subsequent and praised journey taken by his colleague Miguel Fisac in 1949, a journey that implied a change in his architecture's path.

Firstly, we will narrate the details of Fernández Vallespín's journey placing it in the context of the Spanish postwar era, and the knowledge he could have of Nordic architecture and the one of the European countries he visited, according to the buildings he took photographs of, seeming to be the most appealing to him, be it for the reason of this trip or because they simply seemed of great value. Then, we will highlight its importance as continuing with the tradition of the study trips that, with professional goals, some architects of the Generation of 25 undertook before the spanish Civil War. And finally, we shall stress that Fernandez Vallespín's journey preceded Fisac's. In his sense it is not venturous to say that, given their close professional relationship, Fernández Vallespín could have helped Fisac to develop the route with the buildings to visit, considering that the path of both was essentially the same.

Therefore, it was not Miguel Fisac, as we believed until now, the first one to travel to Sweden, since his trip was made during 1949, two years after his studio colleage. It does not seem mere coincidence or pure fate that Fisac traveled to the same cities that Fernández Vallespín visited, considering on top of it that both worked for the CSIC (Superior Council of Scientific Investigation) which paid for the expenses. What Fisac must be undoubtedly credited for is the diffusion of that architecture in Spain and, specifically Asplund's with all his writings, conferences, and his own built work.

Ricardo Fernández Vallespín and, therefore his journey, has been obliterated from the historiography of Spanish architecture, maybe because his career spanned over only ten years, from 1940 to 1950, or perhaps because his work was totally eclipsed or mistaken by the work of his studio companion Miguel Fisac. As an example, his most prominent building, the building for Patronato Juan de la Cierva, sometimes attributed to Fisac, who was the on-site architect since Fernández Vallespín did not live in Spain during the time. Some of his other works have also been mistaken and even his name wrongly transcribed. Villespin for Vallespín, when referring to his joint authorship with Fisac of the CSIC central headquarters. In that sense is not strange that his journey, preceding Fisac's has remained unknown until now.

## THE POST-MODERN FACTS OF DIGITAL DESIGN

### Francisco González de Canales

The fact that the transition from post-modern to the digital speculations of a younger generation of architects such as Greg Lynn, Alejandro Zaera-Polo or Jesse Reiser, happened so rapidly arouses increasing suspicion today. Since this apparently neo-avant-gardism emerged from some of the most traditional schools of architecture on the American East Coast, the puzzlement seems to double. The fact that the transition from post-modern to the digital speculations of a younger generation of architects happened so rapidly arouses increasing suspicion today. Since this apparently neo-avant-gardism emerged from some of the most traditional schools of architecture on the American East Coast, the puzzlement seems to double. Up to now, only architects and educators related to the American neo-avant-gardes, such as Peter Eisenman or John Hejduk, were seen as a notable influence; this is the case, for instance, for the idea of diagram, a concept of key importance for the emerging generation of designers and normally credited to the architects mentioned above. However, as neo-avant-gardists and traditionalists became more and more polarized throughout the 1980s, the generation of architects simultaneously educated under both schools began their careers with the aim to surpass the dramatic split between the two opposing ideologies and claimed some kind of reconciliation.

Greg Lynn could well epitomize this mood by introducing his architecture as follows in the early nineties:

> "Neither the reactionary call for unity nor the avant-garde dismantling of it through the identification of internal contradictions seems adequate as a model for contemporary architecture and urbanism. Instead, an alternative smoothness is being formulated that may escape these dialectically opposed strategies. Common to the diverse sources of this post-contradictory work –topological geometry, morphology, morphogenesis, catastrophe theory or the computer technology of both the defense and Hollywood industry– are characteristics of smooth transformations involving the intensive integration of differences within a continuous yet heterogeneous system".

Under such a spirit of conciliation, it does not seem too out of the question to mention that if there was a transfer in tools and ideas from the neo-avant-gardes to digital architecture, there should also have been another transfer from the denigrated Po-Mo to the digital emergence in the 1990s. The question would be: how personalities a priori who were so distanced from the digital, such as Michael Graves or Leon Krier –crucial in the development of the traditionalist ideology in the US–, could feed the development of this new trend? As time is fixing post-modern architecture in the timelines history, this till now inconvenient question reoccurs today as strong as ever, namely: how indebted is the research on topological geometry, morphogenesis, and computer-based design to the legacy of post-modern architecture?

During the last forty years, from Diana Agrest and Mario Gandelsonas to Charles Jenks, we have understood post-modern architecture by examining it through the lens of semiotics, language and mass communication. Although it is true that semiotics have in many ways helped the development of computation in architecture –as long as it is reduced to particular signs that architecture is ready to be digitally processed– this reading of post-modern architecture appears to be insufficient in terms of understanding any social or cultural linkage between the post-modern and the digital. As a matter of fact, the semiotic link seems to be the weakest connection, since the new digital generation has gained public notoriety by rejecting any interest in language and meaning. Abstract machine, diagram, minor practice, and basically quoting Deleuze instead of Chomsky, Eco and later Derrida became the scattered references of a generation not yet knowing with certainty the end of their speculations, but wanting to make really clear that architecture was not about linguistics anymore.

As an alternative to linguistic readings, a younger generation of critics has tried to find some other explanation for post-modern production. One of the most commendable efforts was that of Jeffrey Kipnis, who sought the possibility of reading part of post-modern production as the elaboration of a kind of "catalogue of incidental effects" in architecture, and crediting this tradition, not to the leading figures of Po-Mo architecture, such as Robert A.M. Stern, Charles Moore or Michael Graves, but to the difficult figure of Philip Johnson. Through Kipnis' ideas, the reading of Johnson's eclectic personality can be traced back to a continuous and coherent investigation of the idea of effect in architecture, going from the Glass House to the AT&T building, to the Torres Kio in Madrid. As a result, the current aim to define a purely atmospheric architecture (not a linguistic one, but rather a pure sensation that is produced by architectural effects that do not hold any architectural structure at all), should be considered –according to Kipnis– to be the legacy of Philip Johnson. However, although this hypothesis is fairly ingenious, and it helps us grasp the link between specific post-modern production and some avant-garde positions (Kipnis here likes to relate Johnson to Koolhaas), this particular theory does not seem to help us to find any relation between digital production and other postmodern personalities mentioned earlier –specifically influential in the most prestigious universities of the American East Coast–, such as Michael Graves or Leon Krier.

More recently, new pondering of the emergence of digital architecture by some of its leading figures may shed light on this debate. It has become recurrent that Lynn, Zaera-Polo et al. begin their lectures and talks by admitting that their early claims of a panacea of smoothness, continuity of the field, and other corporeal freedoms have to be played down. Those who were then young architects-theorists have begun to focus on their own practice, and from within that practice they now want to propose an alternative framework for their recent production. This new framework could be broadly summarized by explaining that the emergence of digital architecture cannot be understood as an isolated technological revolution, but rather should be comprehended as part of a general generational shift from a discursive paradigm –as described by the official post-modern criticism– to a new material-performative paradigm. It is worthwhile also to remark that this new account of the transit from neo-avant-garde and post-modernism to digital architecture is precisely related to an apparent internal shift in digital production. During the last several years, we have witnessed how digital architecture has left the early pan-utopians anxieties behind –with the exception of Karl Chu, who still stubbornly works in megalomaniac scales– and directed itself to product driven design and fabrication processes.

Although this shift from discursive to the material sounds a bit post-rationalized –in the most fair tradition of instrumental history highlighted by Tafuri–, what is relevant here is that this new focus on material practices re-opens the debate on how to relate the post-modern to the digital. In fact, one could ask: was not post-modern architecture one of the greatest achievements in material culture development? The reassessment of the digital as a shift from discursive to material practices not only pushes aside the legacy of neo-avant-gardes in the development of digital architecture, but also suddenly approaches the view of connecting more and more digital architecture to the post-modern legacy. The question would be: is this new determination a clarification of what digital always has been or it is just a deviation from the original sources?

MATERIAL PRACTICES

> "If I break a cup, I am left with fragments. I can re-create the cup by gluing the pieces together again. You would say that that is going back. That is absolutely correct, and that is what I am doing with architecture". Leon Krier.

In order to understand the implications of this new scenario, I would use a particular example of two individuals, Michael Graves and Greg Lynn. In my view, a certain connection between Graves and Lynn is going to be of key importance in the transition from post-modern to digital in the late 1980s and early 1990s, and as a matter of fact, it might reasonable to think that a personality such as Michael Graves at Princeton University could leave an imprint on a very young Lynn, who was not very well shaped in the discipline and still too obsessed by his studies in philosophy.

When Lynn arrived at Princeton, Graves shift from neo-Corbusian speculation to anthropomorphic and classicizing collages had been established a decade ago, thus definitively separating his work from that of the neo-avant-gardes and his former partner Peter Eisenman. However, the actual meaning of Graves' work after this shift is still difficult to grasp. In the early 1970s, Mario Gandelsonas defined Michael Graves's architecture as semantic, as opposed to Peter Eisenman's "syntactic operations", and in fact, the use of a language of allusion and metaphor was to be continuous through Graves' career, be it neo-avangardist or classical. In 1978, when Graves's internal turning point to classical language had already happened, Alan Colquhoun was able to separate his use of classical language from that of Venturi's, "as Graves showed no interest in what seems to have been Venturi's chief concern: the problem of communication in modern democratic societies". Further, as Graves developed his architecture up until the 1980s through commissions for private houses and additions, Colquhoun found in his work a special idyll between language and a particular structural system –the balloon frame–, a system that allowed him to solve structural concerns in a quite ad hoc way. In the hands of Graves, the limit between structure and semantic value become blurred as the balloon frame became a pure metaphor, free of any instrumental or utilitarian value, and indeed achieving a kind of mythical character according to Roland Barthes definition.

However, following his work in the 1980s, Graves linguistic drift does not stop in this liberation of the signifier from the signified –remarked by Colquhoun– implied by the appropriation of the balloon frame as a Barthian myth. The final fulfillment of this process is not only de-historization and resignification of architectural language –something so praised by Colin Rowe–, but rather a whole process of de-signification of language itself. More in his drawings and paintings than in his realizations, Graves alludes to that pleasure in materiality, where the fragments that the architect is living behind are not referring back to anything else. In this case, we are not talking about the liberation of free-floating signifiers, as announced by Barthes and suggested in Colquhoun's interpretation, but a circumstance where meaning has literally vanished to leave behind a-signified pieces of flesh without a body –understood as a proportional and organic entity–, able to hold them. In fact, in Graves's drawing, shapes are not only unarticulated and free floating but do not seem to relate to anything in particular. As they don't refer back to any previous reference, they can only refer to the very moment of its present, and in this present the architectural flesh do not re-present but instead present itself in an extremely situated human-artifact relation, ultimating at best Colin Rowe's predicament of taking the "flesh" and leaving the "word" of architecture. By de-signifying architecture as pure materiality, Graves puts on the same level bare nature and architecture –both just becoming flesh or pure materiality. However, he would never transgress the limits of nature-artifact. In this sense, after renouncing to use proportion and organicity, Graves remains himself in the classical ontological tradition, whereby architecture is architecture and nature is nature.

Something similar can be found in Charles Gwathmey 's houses of that same period that Greg Lynn praised in the early 1990s. According to Lynn, in Gwathmey projects architectural flesh was liberated from language, history, organicity and proportion for the sake of free performance.

Using Gilles Deleuze philosophy, what Lynn is going to posit in the early 1990s is to transgress these limits between nature and artifice. For Lynn, a totally a-signified architecture does not distinguish itself –by socio-cultural adscription– from whatever that surrounds it. According to him, "form can be shaped by the collaboration between an envelope and the active context in which it is situated". Hence, the context as a material reality may construct the building in its totality. This is clear if we take, for instance, the New York Port Authority project. Certainly, this project takes Eisenman indexical processes of the eighties, in which architecture became the notation of indexes found in the project site. If we consider that Lynn drew the diagrams for the Aronoff centre in 1988 at Eisenman's office we understand why the appropriation of these design process is so straightforward. However, contrary to Eisenman indexes, Lynn is not taking pieces of information from the context –the notation system of floating tiny balls does not signify anything at all. Instead, he is taking a-signified flows of material particles from the context, which in fact are the ones actually shaping the architecture. These particules configure a diagram as a secretion of materiality in the most radical Deluzian sense, that is to say, as "a-signifying and non-representative brushstrokes and daubs of color". The material secretions are reunited as possibilities of fact, transforming a fragmented urban environment into a smooth single surface which becomes the building.

Informed by Lynn's NY Port Authority project, Alejandro Zaera-Polo and Farshid Moussavi entry to the Yokohama port terminal competition follows a similar logic, parametricizing material flows within a particular field as the morphogenetic process for the development of the smooth single surface that shapes the building. Thus, if Graves and Gwathmey achieved the a-signification of architecture, which became unarticulated and a-proportional material fragments (but where architecture and its milieu were still in different stances), Lynn and Zaera-Polo aimed to fix together these scattered fragments claiming a new paradigm of smoothness between architecture and its environment. As such, Lynn and Zaera-Polo first proposals seem be regressing to a kind of primitive –and quite naïve– state of total coincidence, expressed in different forms of continuity, smoothness, inside-out biomorphism, and other similar metaphors. Hence, the myth of the possibility of coming back to a golden age sustained by technological reason is thereby reenacted at its best.

CONCLUSION

In the early 1990s, Greg Lynn and Zaera-Polo epitomized the transit from discursive to material practices where architecture became purely a-signified materiality. Architecture was definitively de-historicized and de-signified, but above all, it was consciously de-politicized for the sake of individual enjoyment of the new socio-natural freedoms. Two decades after the emergence of the digital architecture on the American East Coast, the promises of socio-natural continuity have totally disappeared. However, the notion of architecture as a material practice, and further, as an a-signified and de-politicized material practice, still persists quite extensively. As such, architecture has lost its critical power to become a mere lubricant of the system in which it is inscribed. Interestingly, Greg Lynn recent production, including the Blob Wall or the Ravioli Chair, seems to ratify this version: a-critical popish furniture which completes the process of de-politicization and disarticulation of the social initiated some decades earlier. To the contrary, the recent essays and some of the latest designs by Alejandro Zaera-Polo seem to have taken the opposite path: how to try to recharge politically the architectural materiality that has lost its criticality and signification more than two decades ago.

## THE ALTAR AND THE DOOR OF THE PARISH CHURCH AT SAINT-PIERRE DE FIRMINY-VERT

Luis Burriel Bielza

The current article studies the evolution of the design for the parish church at Saint-Pierre de Firminy-Vert (1960-1965) focusing on the relation established between the

access to the nave and the position of the main altar. Towards the end of his career, Le Corbusier took Firminy-Vert as a true enhancement of the altar. It would not only mark a virtual plane separating two confronted areas, but it would communicate two spaces linked vertically. In a conceptual path linking the primitive temple from 1921, Le Tremblay church (1929) and the last project dating December 23, 1963, Le Corbusier would keep on adding complexity and significance to the aforementioned relationship. *L'Art Sacré*, *La Maison-Dieu*, and the Dominican priests became a new information source that the architect was able to assimilate due to his inborn spatial and evocative capacity. The careful attention poised on the origin and the true significance of the catholic cult elements allow him to discover in them a clear relationship with the most primitive and ancestral human rituals. In the first sketches, the architect had rejected the axis composed by door and altar in favor of an exacerbated prominence of the great pillar supporting the children's choir. A pillar drawn as expressive materialization of the force tying us to the earth's surface, gravity, finding its exterior repetition in the bell tower. An obsession the architect had dragged since his youth. In order to adapt to the changing religious situation unleashed by the inevitable II Vatican Council, the chancel acquires an organic complexity where every element will be set according to a scheme of forces finding their epicenter at the altar. This will recuperate the place and importance it deserves. The architecture, led by light and structure, portrays a series of mechanisms that emphasize and guarantee that reality. As usual in Le Corbusier's synthesizing vision, the final project is transformed due to a number of stimuli, most of them belonging to the architect's most intimate conceptual strata. This include vital experiences, failed projects, recurrent obsessions, fortuitous encounters, and design toing and froing, that will allow us to recognize the parish church in many other of his projects and vice versa. The end result, as we announced at the beginning of this article, the close cooperation between man and architecture to establish the communication between the earth and the sky, the high and low, the tangible and the intangible.

## *MAT BUILDING*: THE PROMISE OF SPATIAL ASSOCIATION

Lucía Nuria Álvarez Lombardero

In 1974, after the completion of Georges Candilis, Alexis Josic, Shadrach Woods and Manfred Schiedhelm's building for the Free University of Berlin, Allison Smithson wrote the canonical text "How to Recognize and Read *Mat-buildings*". For the first time, after years of intense discussions on city planning, the concept of *mat-building* has been identified as such. According to Smithson, "mat-architecture" appears as a common effort, as a major recipient of diverse proposals, projects and theories that Team 10 members had developed up until that date. Tracing back the genealogy of this new design strategy as parallel to the development of Team 10's theoretical interests, and including in this account buildings such as Le Corbusier's Venice hospital, Smithson stated that it is finally the Free University that "makes the *mat-architecture* recognizable".

The challenge of this essay is to unravel the origin of the *mat-building* concept as a result of Team 10´s desire for a more associative urbanism in the design of new strategies of urban planning. By examining different design strategies developed in the 1950s and 60s, and with special attention to the Berlin Free University and the Venice Hospital, this essay revises the characteristics and possibilities of this building concept, and reassesses the limits and achievements of the design strategy that promised an ultimate spatial association.

### THE DISCUSSION AROUND CIAM ABOUT THE URBAN PUBLIC

After several congresses, the CIAM VIII (1951) in Hoddenson (England) caused a clear shift in the modern thinking on urban planning. For the first time, the notion of a place that physically expressed the "sense of community" was presented as a central subject in the reconstruction of the city centres and the development of new towns. As the architect Jaap Bakema explained in this meeting:

When the isolation of man from things becomes destroyed: in that moment, we discover the wonder of relationship between men and things. That is the moment of the CORE: the moment that we become aware of the fullness of life by cooperative action.

These words reflected a general mood of existential sensibility in young post-war architects who believed in the need for an urban solution capable of reconstructing both the physical potential of devastated cities and the social human qualities that the new massive urban developments were lacking. Therefore, this congress became their opportunity to establish the basis of a new concern in architecture for the social aspects of the city –the urban public– establishing the concept of the "core" as its essence.

Subsequently, in CIAM IX (1953), in Aix en Provence, France, these ideas about the urban public were taken up again to challenge the main aspects of urban research. Thus, in this congress, the typical "CIAM grid", which had been broadly used since the Charter of Athens, changed its content drastically and stopped being an objective matrix that organized the four principal activities for an urban study –*travailler, habiter, cultiver le corps et le sprit* and *circuler*– to become a framework of new categories that were based on the study of everyday life. Following this new configuration, some of these young architects created their own *grids*, such as Alison and Peter Smithson´s "Urban Re-identification Grid" (UR Grid), which analyzed, through images and basic urban diagrams, the everyday life of working class people in the Bethnal Green neighbourhood of London. For the first time, anthropological and sociologic studies appeared together with architectural work.

Furthermore, this concern of the architecture about the urban public was accompanied by a general cultural preoccupation with the dehumanization of the city in other disciplines, such as sociology and anthropology, which had intensively studied the planning of post-war housing developments. Thus, during those years, the massive urban planning of the French received harsh criticism from sociologists such as Henry Lefebvre, who, in an attempt to redirect the urbanism towards a study of historical city characteristics, referred to it as a "well-elaborated state-capitalism". As he stated, Urbanism has to repair the streets, not only in a functional sense but also as a form with aesthetic and symbolic significations.

Similarly, the anthropologist Paul Henry Chombart de Lauwe made an important critical analysis of this massive planning of Paris, proposing in his book *Parisienne: L´espace social dans une grande cite* a reconsideration of the city from a socio-morphological perspective. Like Lefebvre, De Lauwe´s starting point was the city streets as the place where everyday life occurred. From the streets, he identified different physical entities (i.e., building, urban block and neighbourhood) in which the planning should guarantee the development of everyday activities. Paradigmatically, these same entities were chosen by the Smithsons to exemplify the different hierarchies of associational elements expressed in the UR Grid:

> This Grille is concerned with the problem of identity. It proposes that a community should be built up from a hierarchy of associational elements and tries to express these various levels of association (THE HOUSE, THE STREET, THE DISTRICT, THE CITY) algebraically. It is important to realize that the terms used [...] are not to be taken as the reality but as the idea, and that it is our task to find new equivalents for these forms of association in our new, non-demonstrative society.

Influenced by this set of ideas that link the physical characteristics of the built environment and the development of the social experience, an emerging generation of architects showed different urban proposals in the last two CIAMs. All of the proposals presented in both congresses, CIAM X (1956) and XI (1959), had in common not only the use of the Charter of Habitat as their design guide for a new Urbanism, while abandoning the old Charter of Athens, but also the same interest in traditional typologies and urban pre-existences.

However, a division of opinions among participants highlighted a split between these architects on two main issues. On the one hand, a group of Italian architects who were close to the ideas defended by Ernesto N. Rogers, stressed a new urban design focused on finding affinities between the new architectural form and the existing urban fabric. The procedure for this new urban design would be based on the extraction of typologies and formal references from the existing urban fabric to be directly applied to new designs. On the other hand, the budding Team 10, led by Alison and Peter Smithson, defended the creation of association scales and new infrastructures as univocal solutions for urban design, while paying attention to urban traces as the elements capable of structuring change and growth in the city. As Robert Smithson commented:

> [...] a new thing is to be thought through in the context of the existing patterns. Thought through in the context of the patterns of association, the patterns of use, the patterns of movement, the patterns of stillness, quiet, noise, and so on, and the patterns of form, in so far as we can uncover them.

## THE DEVELOPMENT OF TEAM 10'S CONCEPTS

After CIAM XI in Otterlo, Holanda (1959), Team 10 started their own meetings in which all of these primitive ideas for a new urban design were freely discussed. The main starting point was the question of the streets as a basis for urban design, a subject already presented in the UR Grid by the Smithsons. Contrary to Le Corbusier's proposals, who valued the street from a spatial and formal perspective, Team 10 considered streets as not only a physical organizing unit but a spatially and socially meaningful entity. As the Smithsons remarked:

It is the idea of street not the reality of street that is important –the creation of effective group-spaces fulfilling the vital function of identification and enclosure, making the socially vital life-of-the-streets possible.

The first attempt to recreate city street activity in a new urban design was the Smithsons' proposal for the Golden Lane Estate (1952). In this project, the Smithsons designed a series of "streets in the air", corridors at different levels of a building block that tried to create associational meetings between different housing residents. However, what initially seemed like a new solution ended up being simply a variation of Le Corbusier´s design for the *Unité d'Habitation* corridors, including the same failures. Despite the fact that Smithsons' corridors were facing the outside streets, as an attempt to connect them with the urban realm, the lack of continuity between the "streets in the air" and the pre-existing pattern of the streets, as well as the absence of any specific function other than housing along these corridors, made it impossible to recreate street life.

In the second Team 10 meeting in London, 1961, Candilis-Josic-Woods presented a proposal in Caen Herouville, which tried to introduce a more dynamic dimension to the initial design for the "streets in the air" by putting together social and physical dimensions of traditional city streets into a principal form, the *stem*. Thus, services and activities (commercial, cultural, educational and leisure activities, as well as roads and walkways) for the surrounding housing blocks were placed along the *stem*, transforming the new street not only into a social condenser, but also into the main structure for the whole new urban development.

After the *stem* idea, Candilis-Josic-Woods developed the concept of the *cluster*. These architects, based on a reading of historical European cities, distinguished certain autonomous structures composed of a group of buildings and street systems which accommodated different degrees of privacy in a whole community structure. Under this system, the city would function as a combination of self-sufficient structures, or "clusters", leaving behind the traditional monocentric urban scheme. Thus, the growth and change of a new urban pattern would not compromise the rest of the development. As the Smithsons explained:

> In the *Cluster* concept, there is not one "centre" but many. Areas of high intensity of use, related to industry, to commerce, to shopping, to entertainment, would be distributed throughout the community, and connected to each other [...].

This research on recreating city streets in new developments was enriched when the concepts of identity, change and growth were added to the Team 10 discussion in Royaumont (1962). In this meeting, explorations of a possible oversimplification of city complexity to design new urban development were initiated by some of the new proposals presented. The innovation of these proposals lay in their search for an urban design capable not only of assimilating growth and future modifications without altering its own structure, but also making possible the individual appropriation of the whole by its inhabitants. Following these reflections, there was a proposal by Piet Bloom, called 'Noah´s Ark', in which a pattern of repetition was used to solve the reciprocity between the house and the city. Despite of the radical expression of this project provoked a profound discussion in this meeting, being refused by some of the members; this proposal initiated a series of experiments in search of tools to enable the reproduction of the existing urban fabric into larger developments without losing social charge. Both of the case studies analyzed in this text (i.e., the Venice Hospital proposal by Le Corbusier and the Berlin Free University by Candilis-Josic-Woods) are clear examples of these investigations.

## TOWARDS THE *MAT-BUILDING* CONCEPT IN THE FREE BERLIN UNIVERSITY

In conjunction with these Team 10 investigations, the group of French architects Candilis, Josic and Woods started their urban studies analyzing the structure of the traditional patio-house typology and the organization of privacy levels in the city streets of Morocco. The structures gradually recognized in the historical way to organise the North African cities were orderly placed into a new grid, the GAMMA grid. This grid became a summary of the different formal organizations that had enabled changes and growth in the urban fabric over time. According to this grid, Candilis-Josic-Woods enunciated the concept of the matrix as a basic structure that disposes a big urban development through intermediate elements such as streets, squares, alleys, at the same time resisted growth and changes in functions and densities over the time without altering the whole urban fabric.

The first design opportunity for Candillis-Josic-Woods to introduce this concept of the matrix was the competition for a new University in Dahlem, a suburban area in the outskirts of Berlin. In fact, this group of architects found in the competition brief and site conditions the necessary conditions between architecture and urban design to apply the concept of the matrix. Their winning entry, presented in the Team 10 meeting of 1963, consisted of a new university complex for 3,600 students on a big isolated plot surrounded by the typical detached housing developments of a suburban area, to which they applied the matrix, an entirely new system of public and private spaces capable of being used to create either a city or a university.

Furthermore, within this application of the matrix Candilis-Josic-Woods tried to develop the Team 10 idea of collective spaces, as environments where inhabitants would play an active role. Thus, the matrix of spaces in the building were designed in such a way that students and professors were able not only to develop different practices and forms of appropriation in its collective spaces, but also to modify, transform and reconstruct some of its parts through time. These collective spaces would be developed as a place where not only new spatial practices were constantly allowed, but also different and varied relationships between the individual and the collective could be possible.

In addition, a series of open spaces were superimposed on top of the matrix. These voids were understood by the designers as a complement of both the entire building and the system of corridors that connected the whole development. Therefore, the final result became a composition of two layers. The first layer was a matrix composed of pathways and corridors that loosely followed the *stem* scheme, previously proposed by the Team 10. This matrix was composed of four principal horizontal pedestrian ways where the main buildings were located, and various secondary paths were perpendicular to them. The second layer consisted on a succession of interrelated open spaces which were superimposed on the other layer. The layers together formed a web, which was later recognized by Allison Smithson as the *Mat-building* design strategy was being presented at the Free University of Berlin as the principal example.

Finally, Team 10´s interest in the social pattern of the traditional urban fabric led them to recreate the spatial and functional density of European cities into the project. This interest in urban density emerged as a reaction against CIAM's functionalist ideal for post-war reconstruction, by which each different urban function was separated into a particular building, room or floor. Thus, contrary to the CIAM ideal isolation of activities by means of vertically stacking different floors, as in a skyscraper, Candilis-Josic-Woods proposed a building section where all the activities were continually related, according to a "ground-scraper" organization. As Shandrach Woods commented, "in 'ground-scraper' organisation, greater possibilities of communication and exchange are present".

Consequently, the dense web was designed as a low-rise building where two floors were constantly communicated by stairs and ramps. This section, which continuously interwove different programmatic elements, provided users with a possibility of free individual appropriation of the space.

## VENICE HOSPITAL: ANOTHER MAT-BUILDING SOLUTION

Although Candilis-Josic-Woods´ mat-building design for the Free University building was considered the most elaborate and sophisticated response to Team 10's investigations about free appropriation and association, the built complex did not fulfil the Team 10 expectations. Its disconnected condition, "as a patch of urban tissue" inside a suburban area, did not allow it to develop the constant overall intensity of activity desirable for a mat-building. This failure was already anticipated by the Italian architect Giancarlo de Carlo in his critique of the built project at the Team 10 meeting in Berlin (1973). After the project presentation, De Carlo started his critique by remark-

ing on the introspection of the building design system. For him, the complex just attended to its internal logic of relationships between different activities, without having any relation to external conditions.

Unlike the Berlin Free University design, De Carlo presented in the same meeting a study for the restructuration of Rimini, a seaside city in Italy. In his proposal, De Carlo used, in the Team 10 manner, an abstract matrix pattern, but this time, it was aligned with the already existing directions of the urban structure. Although it could be thought that paying attention to the existing urban fabric may limit the mat-building capacities for growth and change, the De Carlo proposal to connect the new matrix with the existing urban fabric ensured the necessary functional density for the new area. This proposal created a channel wide enough to ensure variations and possible future growth of the city by means of a flexible matrix or *griglia* aligned with the existent street pattern.

In the middle of this discussion, between Giancarlo de Carlo´s proposal for the mat building and that of Candillis-Josic-Woods, there appeared Le Corbusier and Guillermo Jullian de la Fuente´s project for the Venice Hospital in 1962. This building design took into account not only most of Team 10´s investigations mentioned before, but also the principles of a mat building as defined by Allison Smithson (1974) in her article "How to recognize and read Mat-buildings". It was Piet Boom´s proposal, though, presented and highly criticised in the Team 10 Royaumont meeting in 1962, which finally inspired the Venice Hospital design. Contrarily to Team 10 rejection of his proposal, Jullian de la Fuente, who had been present in the discussion, was so impressed by Bloom´s proposal that he established it as the basis for the Venice Hospital design.

The Hospital building was placed in a large area near to the northwest end of the Grand Canal, extending its structure over the lagoon that separates Venice from Mestre. The project had in common with the Berlin University project an isolated site and a big plot, which practically became a city in itself. However, what differentiates the Venice Hospital design from the Free University and the Team 10´s mat-building experiments were both its pattern of relation "between spatial flexibility and programmatic determination" and its relation with the historical context of the city, since the hospital was rendered as an enlargement of the channel city pattern. According to Dr. Hashim Sarkis:

> The program´s internal networks are related to external, non-programatic urban networks. The corridors of the hospital and its courtyards literally extend the alleys and courtyards of the surrounding neighbourhoods. The connection is also established formally, with the attic floor carrying over the heights of the surrounding neighbourhoods.

Following Sarkis´s words, the Venice Hospital building could be considered a city in itself, a city that repeats not only the pattern of the city with its overall texture, like a solid mass of buildings penetrated by canals with a superimposed web of patios and gardens, but also the atmosphere of the city streets, squares and hanging gardens in a poetical manner. Therefore, the "replication of Venice" in the Hospital design was more related to a symbolic understanding of the city than to a structural understanding of the urban fabric.

On the other hand, following Candilis-Josic-Woods´ "ground-scraper" diagram, the Venice Hospital compressed the density of all programmatic activities in a low-rise building. Inside the three-storey high building, the activities in each floor were related by a structural matrix, but differently than in the "ground-scraper" since each level served a different program. Therefore, each cross-section made at any point of the building presented the organization of the whole: a ground floor with the public functions, a first floor with the different wards of the hospital and a second floor with the patient's rooms. Finally, the last floor was structured according to Team 10´s cluster organization, allowing for any possible future addition of more rooms. Each cluster consisted of a number of care units with 28 beds in each and a staircase and elevator; and this pattern was endlessly repeated following biological analogies. In addition, each *cluster* was designed according to the same principle but different arrangements, which produced in the user a necessary sense of orientation within endless repetition.

### CONCLUSION

The non-conformist argument developed by the Team 10 architects follows the new set of existential, social and anthropological ideas that bloomed after WWII, which claim for a reinforcement of human and social interactions. As a response to that question, the mat-building interventions, with their considerable size that placed them almost between architecture and urbanism, became in itself an alternative to the post-WWII "massive" and "alienating" plans developed by the first and second generation of CIAM architects. Contrary to the analytical segregation of pre-war CIAMs, either in the reconstruction of the city centers or in the new suburban areas, the structures of the Team 10 proposals tried to connect and to keep the collective together. For them, the idea of the low-rise building put into a horizontal orientation all of the individuals and activities, representing the promise of total fluidity of human interactions. Thus, the mat, as a social tapestry of human connections and actions, strives to be like a folding of the social and anthropological ground which becomes a single intervention, either in a city or building scale.

According to Allison and Peter Smithson as the main spokespeople of the Team 10 ideas, the Free University of Berlin epitomizes all of these aims, acting as the paradigm of the mat-building. The building was designed in a totally new urban area, which gave the architects an opportunity not only to test their research on the replication of the fabric as a way of supporting social interaction but also to lead it towards urban development. However, this social interaction never managed to work. On the one hand, the aim of promoting social interaction through a succession of open spaces which could be freely appropriated have failed precisely because of the scarcity of activity or concrete functions for these spaces. On the other hand, the total disconnection of this mat-building from the city and rest of the urban fabric prevented it from reaching the critical mass of activities needed for the spontaneous interaction of people.

Paradoxically, getting into contact with the Team 10 ideas almost by chance, Le Corbusier Venice Hospital seems to have a more successful layout. The building was thought as a metaphoric recreation of the urban environment of Venice, with its bridges, courts and alleys replicated inside of it. But this is not its main success. The fact that the hospital is developed in continuity with the main infrastructures of the city, the channel, the road, and the urban fabric, gives to it more credibility in its possibility of subsistence.

The continuity with the existing fabric is not the only advantage of Le Corbusier's hospital over Candilis-Josic-Woods´ University. The lack of hierarchy in the matrix pattern of the latter gives to its inhabitants a sense of disorientation which ends up short-cutting the managing of their own freedom. Consequently, the spatial homogeneity which was supposed to allow free spatial appropriation, change and growth, produces instead a feeling of confusion. To solve this problem, on the contrary, the Venice Hospital makes use of a *cluster* system in its upper floors that ensures not only the possibility of a future growth without compromising the whole, but also the possibility of orientation inside the group of rooms around the stair.

Finally, although the history of the mat-building has been canonically accounted as the story of a big failure, some of the discussion raised above could still be considered as crucial in the development of new urban ideas. We does not know the real effect that could have had the construction of the Venice Hospital, but once we have understood, analyzing the Berlin Free University, the importance of keeping the continuity with the preexisting fabrics and the need of a critical mass of set activities and functions in order to make the matrix work, we can still think about dense and compact habitats as the most suitable for human cohabitation.

## ORIENTALISM AND MODERN ARCHITECTURE: THE DEBATE ON THE FLAT ROOF

Jorge Francisco Liernur

In one of Ludwig Mies van der Rohe's most influential biographies, Franz Schulze displays the famous photo collage of Stuttgart's *Weissenhof Siedlung* where instead of the lonely couple staring at the camera of the original image, the inhabitants are dark-skinned peoples dressed with the typical middle-east *dishdashas*, their heads covered by turbans, hoods, or *keffiyehs* and *agals*. To eliminate doubts about where the authors of the collage suggest that the building should be placed, a camel crosses the foreground, watched by two lions sitting in one of the dwelling's courtyard. In the cor-

responding footnote, Schulze explains it is a pseudo "Arab town, an anonymous transformed picture of the Weissenhof Siedlung project. 1934". Schulze adds that two of the most celebrated personalities of Stuttgart's architectural culture –Paul Bonatz and Paul Schmitthenner– considered this new architecture as "a bunch of piled flat cubes on horizontal terraces (…) resembling a suburb from Jerusalem". The author understands it as an inappropriate analogy and an attack towards Mies who, instead, would have only been trying to reduce buildings to "cubic masses (…) as a way to purify the architectural shape". For Schulze Mies search was based on deep philosophical, technical and economic matters, and had nothing to do with extra European topics, as the anonymous photograph implied.

This interpretation is a common ground for modern architecture's historiography. We must observe that regardless of their obvious political differences, Schulze and Bonatz/Schimthenner agree to consider that the identification of the *Weissenhof Siedlung* with an Arabic village would imply the author's discredit.

Moreover, parting from the supposition of an alleged purity of its European basis (Euro American at most) is what has supported the idea that the modern movement's architecture –that is the Bauhaus' architecture or that of the great masters of the rationalism of the 20s– is an abstract, international architecture (…). And (on the contrary) "Mediterraneity" is an attitude towards architecture that appeared as a reaction to that fact".

Against this statement, I would try to show that Bonatz/Schmitthenner's assertion was correct, that is that the references to the semi oriental buildings –Mediterranean from the North of Africa– constituted one of the characteristics of modern architecture according to its formulation in German speaking Europe. I do not pretend to deny other reasons for the origin of that architecture. I am committed to portray how the case contributes to demonstrate that cross-breeding processes create the dynamic basis for the construction of modern architecture, as in human creativity in general, accelerated by the expansion of capitalism worldwide. Only a provincial vision of historic (self-centered in the North Atlantic) can explain the fact that the unavoidable global interweaving of modernization processes has been ignored.

## CHANGING PARADIGMS: SUSTAINABILITY'S CHALLENGE TO ARCHITECTURE

Wilfried Wang

How will architecture have to change to meet the sustainability challenge? Following the definition of the concept of sustainability, the factors that determine our way of thinking about architecture will be discussed. Placed in a larger context, architecture's historical role in the ever increasing independence of civilization from environmental conditions will be illuminated to give a concrete example of civilization's teleological process of autonomization. Analogously, looking at the building types of the villa and the skyscraper, the complementary notion to the ecological footprint is the cultural footprint. Its deep-rooted and long-lasting effect is discussed. In summary, a number of steps that need to be taken by architects, educators and society in general with regard to the notion of quality in architecture are outlined. A key demand will be the ubiquitous institution of design review boards to ensure transparent, public processes for the discussion of architectural quality ahead of the realization of any building: better to review over and over again than to build badly once.

The notion of sustainability in architecture is an old one, at least as old as the construction of tombs and monuments and discussed in theoretical terms already by Vitruvius.

Sustainability requires that human activity only uses nature's resources at a rate at which these resources can be replenished naturally. This could be modified to "replenished without diminishing resources elsewhere", thereby including the possibility of anthropogenic replenishing processes. A more extended definition of the term sustainability is given by the Brundtland Commission: "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts:

> the concept of 'needs', in particular the essential needs of the world's poor, to which overriding priority should be given; and
>
> the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs".

In the current discussion on sustainability, the complexities of our life styles and therefore of our way of thinking about architecture have been allowed to be reduced to a few simple indices, such as $CO_2$ emissions into the atmosphere or the ecological footprint. Before criticizing these indices, it is fair to say that they have helped to create a common framework for international discussions on sustainability. Nevertheless, these indices are reductive and only serve to reinforce the technocratic perception of the issue, which is one that sees the obvious and easy way of solving the challenge that a renewed revaluation of the principles of sustainability could have on our lives in general, as well as on our way of looking after buildings and designing new ones in particular.

The technocratic approach could equally be reduced to the characterization, that it is an end-of-pipe approach to sustainability's challenge. By this is meant solving the problem by dealing with the consequences, the products, the emissions at the end of the behavioural process. This means, applying technology at the end of the line, without in the first place altering the way the unwanted side-effects have been produced. It is probably true that some of these technological solutions will have to be applied at the end of the pipes, especially if we look at the existing built fabric that cannot simply be demolished or abandoned. This applies first and foremost to the ever expanding suburbia across the world.

The current dominant and alas erroneous paradigm could therefore be summarized by the widely held belief that the application of "new" technologies will to a large part meet the challenge of sustainability. Such technology need only be applied at the end of the pipe, or on top of the roof in the case of photovoltaic and solarthermal panels, or in the ground in the case of geothermal systems.

The current paradigm includes also the fixing of $CO_2$ emission levels, the allocation of carbon credits and their trade; the continued production of cars, albeit with reduced $CO_2$ emissions or even hybrid engines; the continued acceptance of construction development even if there is no clear demand for it, that is to say, the continued acceptance of speculative development; in short, the essential continuation of our pattern of life with a little green technology added to make everyone feel less guilty.

The continued pattern of life is surely also in the interest of those who develop, produce and market new technologies, which includes all of those who are also interested to gain from the general idea of innovation, new product placement, new developments and new styles, specifically as applied to those eager to participate in the marketing discourse of contemporary architecture.

All of this is indicative of the current dominant and alas erroneous paradigm. And it is unsustainable. But how do we get out of this paradigm? And which should our new paradigm be?

What is necessary is an analysis of our current pattern of life as seen through the sustainability lens. This reveals that our pattern of life, our life style, is deeply entrenched, deeply set in its course. We have become deeply accustomed to our pattern of life. What we wear, what we eat, how we travel and the buildings we inhabit have literally become our deeply entrenched habits. These habits offer us unprecedented levels of comfort. And, like any habit, giving it up will be very difficult for most of us.

So this is the hardest part: while we may recognize that the current paradigm is no longer sustainable, we may be able to outline the sustainable paradigm, but beginning to live this paradigm will surely take a long time, time that we do not really have. Habits are hard to kick, but they determine our future, as already the Talmud knew.

Beware of your thoughts for they become words, Beware of your words for they become actions, Beware of your actions for they become habits, Beware of your habits for they become character, Beware of your character as it seals your fate destiny.

These words and lines can be considered as a condensation of a development that has led to our current way of living. Thus, before we can change this pattern of behavior, we need to analyze and understand this development. Nevertheless, even if knowledge of the genesis and the current state of our life styles will have been gained at the end of such a analytical process, all this knowledge will not motivate anyone to actually alter indivdual behaviour unless there is a sense of discipline, better, self-discipline to reinforce the change in the pattern of behaviour.

While the principle of sustainability informs this essay, there should be no misunderstanding about the underlying thesis: the change in paradigm is considered necessary in order to ensure that once again a holistic approach to the way we live and the way we treat our natural and built environment is put in place. We need this holistic approach in order to avoid the mistakes of the past, when we put to much emphasis on economic rationalism, mechanization and technocracy.

We need this holistic approach to reign in the clear preference that politicians and industry have for large scale industrial complexes and corporations as well as technological programs to seemingly solve the challenge posed by the principle of sustainability.

We need a holistic approach to finally include the socio-cultural dimension. We should not allow new sustainability certification in architecture to ignore the dimension of design quality.

The principle of sustainability embraces the long view. Until recently, this long view has been mostly directed into the future. However, in order to understand why we are in the current situation, we cannot just take the long view into the future, we need to take the long view back and analyze the processes that brought us into the current state.

The paradigm that is current in architecture today has a long period of formation, and it is this length of formation that is a measure of the depth of the problem in which we find ourselves, as architects as much as socalled advanced civilization.

So, for which changes do we have to prepare ourselves? Or, put in another way, how can we prepare ourselves as architects if we do not just want to follow general trends, but perhaps, for once, even have an active input in the shaping of the future developments?

How quickly could these changes be implemented? How much time will the transformation process from the one paradigm to the other take?

For all those skeptics that change is at all necessary: you can rest assured. We do not have to prepare for change. We can continue to follow the same pattern as we have done in the last deceade, the last century, indeed the last millenia. We are currently living in the free part of the world, in which we can do as it suits us, or as long as it suits us.

However, if the architectural profession wants to have a say in the transformation process, the changes in our patterns of life would affect all aspects of our social and cultural life, including the self-understanding of our profession.

## ASSUMPTIONS

These are the assumptions on which the subsequent arguments for a change in paradigm are based:

1. *Limits of growth, limits of life style.* As outlined in the introduction, the life styles in the post-industrialized regions of the world are unsustainable. Climate change is merely a gradually noticeable consequence of this life style. Climate change is merely a reminder to these regions that they will have to say good-bye to this life style.

2. *Criticism of the post-industrialized life style.* Post-industrialized societies are desparately in need of an intellectual, philosophical conscience that paves the way for a critique of economic rationalism, mechanization and technocracy. Without such a criticism, post-industrialized societies will commit the same mistake as the first phase of modernization, classical modernism. Innovative technology alone will not abate the extremes of climate change. Innovative technology will merely suppress the need for a change in paradigm.

3. *Ecological footprint not enough.* In order to understand how our living conditions have developed, we need a thorough analysis of the underlying desires, subconscious goals which have been formulated by post-industrialized societies. We need to gain an understanding as to when these desires came into the world, how they were shared by an ever wider population and how they continue to shape our destinies, in order to act on them, to diffuse them, to deconstruct them.

It is after all at the cultural level at which our behaviour, our life style is based. Therefore there will not be a long term change in our life styles as long as culture's primacy on the shaping of living conditions is not recognized.

## VALUE SYSTEM UNDERLYING POST-INDUSTRIALIZED LIFE STYLES

1. *Ubiquitous availability.* Post-industrialized societies assume that all services and products are available everywhere and at any time. The dimension of infrastructure is based on maximum need and are maintained accordingly.

For example, in post-industrialized societies there are more car parking spaces than there are cars. In post-industrialized societies more food is offered than can ever be sold or consumed. The basis for this waste is the concept of producer subsidies in what otherwise pretends to be a free market, and the consequence of this calculated oversupply is the destruction of food products in order to ensure market price levels.

We need a broader discussion on this topic: on the deliberate production of waste.

In view of the short life expectancy of some building components and their toxic emissions, buildings of the last decades can no longer be regarded as static objects, but, as Uta Hassler, a German architect and conservationist has coined the phrase, modern buildings have become temporary waste dumps.

However, the principle of ubitquitous availability of products and services is older than a few decades. In housing design, the assumption persists that different rooms are needed to satisfy the variety of uses, and that therefore there cannot be a reduction in the number of rooms or in the surface area. Similarly regarding the level of thermal comfort: for the last six decades there is the assumption that every space needs to be heated/cooled to the same temperature.

2. *Independence and freedom of the individual.* The principle of the independence and freedom of the individual counts a lot in post-industrialized societies. It is the corollary to the principle of ubiquitous availability of products and services.

3. *Freedom of movement.* The principle of ubiquitous availability has been applied beyond national boundaries, which implies the principle of freedom of movement of people, services and products. This is essentially the dream of the European Union. Barriers to movement should not exist, at least not in the direction that the more powerful economic entity would like to export its people, products and services.

4. *Independence of a society and the process of autonomization of mankind.* The desire within post-industrialized societies to have everything at its disposal if and when products and services are needed is a parallel to the pursuit for independence both of the individual as well as of society as a whole from need and other limiting circumstances. Seen within a larger period of time, this pursuit for independence can be understood as part of the process of autonomization of mankind from all limitations and adverse conditions that stand in the way of the collective or the individual. Of course nature itself has been counted amongst the adverse factors.

And it is this process of autonomization of mankind that could be recognized as a kind of superior purpose, as a human telos, which ultimately gives evidence of the apparent power relationship between man and nature, including the habitat of other creatures, place, topography, space, time and climate.

However, this process of autonomization only appears to have reproduced nature in the form of the built environment and technology so as to effectively colonialize yet another part of nature with each innovation and extension of technological protheses and to uphold the period of comfort enjoyed by the user of these protheses. As we are witnessing, these periods of colonialization and comfort are gradually but surely coming to an end.

Post-industrialized societies need to come to terms with the power and the persistence of this teleological pursuit of autonomization before counter-measures can be taken.

Nowhere has this pursuit for autonomization been documented with greater objectivity than in the built environment. Architecture's impressive achievements across time shows that the discipline has assisted civilization's strife for this autonomy: we can now live and work anywhere, we can pursue any activity at any time of day and during any season, from inhospitable deserts and polar regions to crowded conurbations.

Take the case of the theatre and its development over time. The building type of the theatre clearly exemplifies the gradual but persistent pursuit of autonomization.

The theatre at Epidauros in parts takes advantage of the site's topography. Thanks to the relatively mild climate of Greece performances can be given almost throughout the year. The use of torches allows for evening and night performances. A few centuries later, the Romans construct free-standing, urban theatres in their cities and across the colonies. Theatres are no longer constrained to a particular hill side, they become independent of topography. By spanning ropes and textile sails, so-called vela, across the enclosed volume of the theatre, the audience is kept in the shade during the day. There is also a slight improvement in the acoustics. Water vapour enhanced with perfume is sprayed underneath the vela, adding to the sense of comfort for the public. The first theatre machine is developed by the Romans.

During the Renaissance the first completely roofed theatres are built. Together with highly volatile candle light, evening performances become institutionalized. In the middle of the 19th century the first slow velocity ventilation systems are installed in theatres. A significant boost was provided by gas lighting, only to be replaced a few decades later by electric lights. While new means of image projection –slides and films– enriched the synthetic nature of performance practice, especially those of Erwin Piscator and his colleagues, Walter Gropius Total Theatre for the same Erwin Piscator already marked a deep *caesura* in the potential for further development of this building type.

Finally, in the development of the theatre type there is the "Black Box" of the 1970s. Here everything and anything has become possible. There is the maximum ubiquity of accommodating any performance with any people and objects at any time, at the same time the Black Box theatre is the logical termination of a building typological development. The theatre's shape has become amorphous and irrelevant.

Architecture, if it is at all still considered to be present in this Black Box, has made itself completely superfluous by the very concept of the Black Box. As a result of servility, it has eliminated its own *raison d'etre* in this building type. Furthermore, in the last two decades there have been avant-garde theatre directors who do not even want to perform in such black boxes, preferring instead to stage their shows in disused railway stations and factoires.

Technology has made this possible; technology has displaced architecture, at least in the domain of theatre building. However, the increase in technology is by no means a guarantee for complete independence from topography, time, space or climate. Temporary performance installations at music festivals have become ever more sophisticated and resource intensive. The longer this and any other practices last, the more deeply engrained the roots of habit become.

## THE DREAM OF TECHNOLOGY AND THE CULTURAL FOOTPRINT

François Dallegret and Reyner Banham's image of the high-energy driven space bubble of 1965 –a form of "well-tempered environment"– has become the idealized icon of civilization's seeming hegemony over the environment, only, we are beginning to realize that the environment is slowly getting even with the dominant form of civilization.

From François Dallegret's bubble of 1965 to Werner Sobek's house "R 128" of 2003, there is an uninterrupted line of desire.

Parallel to this strife for autonomy, there has been the strife for hegemony, or control of those in power over those at their mercy. Slavery of fellow human beings; caging of chickens in multi-storey cages; pharmacological-agri-industry producing obesity and associated health problems; unchecked extraction of resources from any place around the globe, here with toxic waste from the cyanide leaching process, all these practices have left deep marks, if not to say scars on entire communities, on species, on individuals, on the environment.

The apogee of this strife for autonomy might be said to have been achieved in suburbia. Here, it is unclear whether the indviduals are truly able to live a life free from all external vicissitudes. Suburbia today across the globe is in such a finely balanced state of existence that the autonomy once promised by the free-standing, single family house has now been severely questioned by the very logic that brought it into existence: the speculative finance industry and the repercussions of using socalled "real estate" as the surrogate for the creation of real long term values.

The excess of space in and surrounding the suburban house, the redundancy of suburban infrastructure –that is from the impervious driveway to the dead end road to the entire road system– to the lack of communal specificity or identity represent serious and unresolved, long term problems for suburban culture. How did we, the western world, get here?

Of course the dream of life in the countryside is older than modernist icons. It is also older than Renaissance icons. The dream of life in the countryside can be traced back to Roman and Greek anti-urbanism and beyond. It is a deeply rooted dream. Some would argue that it has been carried forward by the "American Dream", the American enshrined right of the pursuit of happiness. This dream has deep conscious and subconscious roots in the history of civilization. There are other, just as powerful dreams. The dream of creating icons, the dream of building the tallest structure that would touch the heavens.

All of these elements of the current paradigm –autonomy from external vicissitudes with the simultaneous hegemony over others and the outward demonstration of this autonomous singularity through an iconic aloofness– have their roots a long way back in history. However, not only are these paradigms deeply rooted in time, they are also spread widely across the world. For example, the race to construct the tallest building has moved to Dubai, where an 828 m skyscarper was opened in 2009.

We need to confront how deeply the roots of our habits are embedded in time and how this depth of time has made any adjustment in the pattern of behaviour, in our habits, that much more difficult. These habits have been profoundly shaped by gender-based, social, religious and economic ideologies. They have become engrained in our way of thinking to mould our attitudes towards the exploitation of things: people, animals, resources, the environment. The wider the dissemination of such ideologies, the greater the domain of such habits. In differentiation to the idea of the ecological footprint of a set of habits (more a synchronic measure), the depth of time and the breadth of dissemination define the cultural footprint (more a diachronic and geographic measure).

The notion of the cultural footprint can help to explain some of the motivations underlying western lifestyle: the dream of life in a freestanding, single-family house in the countryside. Its origin reaches far back to the anti-urban sentiments of ancient societies, including early Greek and Roman civilizations; finding a high point in the Renaissance with the villas of the Veneto and another with Modernist counterpoints such as the Villa Savoie, the Usonian Houses and the Farnsworth House. Today, glancing across the globe, from Chile to China, from Dubai to Dublin, millions of freestanding houses can be found as versions that complete the spectrum of possibilities that was once opened by these classical and modernist icons.

In disseminating such icons, the western architectural discourse has followed well-trodden paths over the last five hundred years. Two-dimensional representations in different media have been multiplied and deposited in the eager and absorbing minds of architectural students and professionals alike. They have become deeply entrenched icons.

## CHANGING PARADIGM

Given the notion of the cultural footprint, its depth and breadth of influence on specific habits also determines their projective cast into the future. On this basis, the breaking of a habit will only succeed if we firstly realize that there are such deeply engrained origins and if we secondly seek and develop a therapy to overcome the habit.

Step 1: Forget the search for new icons and new styles, because this is a fundamental part of the broader pattern of consumption.

Instead: perceive architecture in its real mode; that is, as a time-based, three-dimensional phenomenon with haptic sculptural and spatial qualities, not as a static, two-dimensional composition that is merely to be viewed from a distance, as a pixelated representation. Such a time-based phenomenon involves the understanding of buildings as leading individual lives: from inception to construction, from use to maintenance, from adaptation to recycling.

Understanding architecture more in terms of a building's long-term life, its capacity to be adapted, the manner in which it is part of a changing context, opens up a different way of perceiving architecture, of telling the real history of architecture.

Rather than the rapid kaleidoscopic passage across the nomenclatura of outstanding examples of architecture by dead white males, it will become more important to recount the individual complex stories of the fate of a building, from its inception, gestation, construction, adaptation and demise.

Step 2: The writing of architectural history needs to shift its paradigm from idolizing the individual architects to the critical exposure of their achievements as a team. It needs to stop idealizing the nature of the profession and reveal the realities of daily practice. It should show the logical dead-ends of the object fetishism into which students and professionals alike have moved. It should reveal the fact that most buildings have experienced one or another form of adaptation in their lives, from airports to hospitals, from parliamentary buildings to speculative offices, from individual houses to garages.

At the least, architectural history should tell the story of what happened to the icons of modern house design: Adolf Loos' Müller House in Prague, Frank Lloyd Wright's Falling Water, Le Corbusier's Villa Roche, Ludwig Mies van der Rohe's Farnsworth House, and so forth, all of them museums today.

Step 3: Architectural historiography combined with a reformed architectural theory would take on the task to provide a holistic perception of the long-term life of the built environment. Life-cycle analysis of buildings thus needs to be extended to qualitative dimensions: what does a building contribute to the communal environment on the one hand, and on the other, how does a building contribute to the well-being of its users, both in its relative static existence and in its ability to change and adapt to new requirements?

In this way, it will become clear that buildings of the appropriate quality will significantly and lastingly add to the social and cultural capital of a place.

Life-cycle analysis should therefore also cover to what extent a building's typological and tectonic constitution allows for certain degrees of adaptation and how its character and ambience are achieved, and how these qualities contribute to a building's cultural status.

Step 4: Architectural theory needs to deal at last with the evaluation of design quality, how this design quality contributes or hinders the fulfilment of everyday life of societies.

If the profession is unable to achieve this, then the qualitative aspect of a building will once again be relegated to the "artistic" domain; the dominant technocrats will continue to control the direction of the broad discourse in the building industry and design quality, the way most architects like to understand it, will remain beyond the bounds of rational dispute. The failure to develop a comprehensible method for the analysis of design quality will thus weaken the architectural profession even further.

Step 5: We need design review boards everywhere to vet each design. Better to design and review over and over again than to build badly once.

For it is a bitter truth that of one hundred buildings realized only a very small number of these are of the appropriate level of design quality, a fact that relegates the rest to the realm of neglect and therefore premature demolition.

Buildings that are not appreciated and indeed loved by their owners, users and the general public are more prone to being knocked down at the earliest opportunity than those that are appreciated and respected. Without a generally accessible method of evaluating building designs, the building industry will quite understandably focus on the quantifiable, objectifiable, rationally describable aspects of an architectural design.

In this way, the resource flows, emissions, toxins, costs, etc. will be measurable and will form the exclusive means of assessment. This will lead to the renewed overemphasis of the non-haptic, non-sensual, economic-rationalist dimension of construction. The last time that a renewal in building culture was attempted in a wholesale mode was a century ago. It was then that the social aim of providing high-design standards for everyday needs in the service of a broad public was pursued, only to end in disaster, as countless analysts and critics have noted in the past decades.

So, after the disaster of the first enlightenment, the second enlightenment must set an end to the selective understanding of habitats of species, including that of *homo sapiens*. It can no longer be "to each his own", but must build on John Dunne's dictum "no man is an island" to expand to "no species is an island", that all are involved in this world. It must transcend Charles Darwin's insight of the survival of the fittest to the survival of the whole.

For if civilization does not have the intelligence to deduce from the current state of the globe that it is *homo sapiens* that needs to adapt in such a way as to give more space to other species, not to continue with the removal of the basis of other species' ecosystems, but to fundamentally challenge our habits, to change the paradigm controlling the construction of our habitations, then we will fail all species, all communities.

The second enlightenment must broaden the basis of understanding of our world beyond the quantifiable to include the qualifiable. If sustainability as a principle is to be established as a basis for a new paradigm, the associated lifestyle must be defined in quantitative and qualitative terms as global goals and standards.

The second enlightenment must acknowledge the rights of disadvantaged groups around the globe and enable them reach the global goals and standards, while the advantaged groups must be prepared to renounce their title to resources that would otherwise prevent the disadvantaged groups to achieve the globally acknowledged goals. Without such a rebalancing of the use of resources, all talk of sustainability and controlling climate change will remain just that.

The alternative paradigm will not simply rely on resource-intensive technology to increase the harvesting of renewable energy, but will be concerned with the holistic assessment of architecture across the spectrum from life-cycle analysis to qualitative evaluation of architectural design in terms of their appropriateness to the socio-cultural task, their public reception and their flexibility potential.

This holistic view will as a matter of course involve a synchronic and diachronic assessment of patterns of life, their origin and intensity and expansion of validity. There will thus be a combined assessment model looking at the ecological and the cultural footprint. This broader assessment model will put an end to self-certification methods such as LEED and require of the life-cycle analysis to be fused with an evaluative method for architectural design quality.

The alternative paradigm will mean an end to the inner circle discourse, the *l'architecture pour l'architectes*, and will imply the beginning of an opening of the architectural discourse to the wider interested public. There will be a kind of *perestroika* that will welcome public involvement in the debate on architecture.

Such a paradigm will bring an end to the media hype of the lonely activist architect, who is fighting a single handed battle against all the many enemies of ingenious design, and the beginning of recognizing that the making of architecture of a high design quality has always been achieved only by great teamwork.

The corollary to the image of the lonely architect is the fixation on the object, the object fetishism, and the related preference that most architects have for the designing of new buildings, rather than having to confront the renovation or alteration of existing fabric.

Significantly, if we truly believe that a respected and appreciated building is more likely to be looked after, well maintained and therefore have a high life expectancy, then we must improve the level of design quality across the board, for every single project. This means that the alternative paradigm to our current one will spell an end to criticism after the fact and the beginning of design review boards for each and every proposed building project, whether new build, extension or renovation.

The alternative paradigm will finally acknowledge that it has always been true that in any one period of civilization, there have been many concurrent architectural styles and that the search for a single new style is simply neither interesting, nor relevant, nor true.

There will be a lot of work to be done, even for architects. However, architecture's future will be more heterogeneous, more varied, more specific to their sites and cultures, less prefigured by formalist concepts, will take longer to be realized, will be more widely appreciated and will therefore last longer than most buildings constructed in the last five decades.

All this knowledge is of no use if it is not also applied in reality. For that, it requires a tremendous amount of self-discipline in order for life styles to fundamentally change to the new paradigm. Will we have this self-discipline?

## "GOD WERKT GEOMETRISCH"-"DUTCHMEN" DO IT OTHER WAY: COSMOLOGICAL-MATHEMATICAL, THEOSOPHICAL AND ARCHITECTURAL

Werner Oechslin

It is true that the great importance of Dutch development to the construction of modern architecture has been recognized for a long time; nevertheless, it is quite often diminished in the description of the complete process. According to this extended vision and the situation described most of the times in an abbreviated manner, more complex connections remain hidden, leaving matters veiled and unsure. The erudite Dutch researchers have been meticulously revising the historical evolution since the middle of the 19th century, clearly exposing the necessary previous conditions for the later development. The consequences of this examination, however, have been rarely known outside of this relatively small circle. The big picture of an autonomous or further developed international modern architecture and art prevails, dominating the general assessment and blocks a wider point of view. The preconceptions prevail consigning the new analysis to a secondary frame.

## CIRPAC-BCN-1932. JOSÉ MANUEL AIZPURUA'S POSTAL DESCRIPTION OF THE CIRPAC DELEGATE MEETING AT BARCELONA

José Ángel Medina

The thread of the GATEPAC internal correspondence reconstructs one of the most relevant episodes in the history of this vanguard group, that is, the CIRPAC delegate meeting that took place in Barcelona, March 1932. The documents portray shades of meaning that open up different interpretations.

In that sense, the existing letters from Barcelona's *Arxiu Historic del Col-legi de Arquitectes de Catalunya* (COAC) or the ones that were later on added from the architects' personal archives or from the CIAM archive in Zurich's ETH's GTA Institute, turned into one of those chronicles, building up a context that suggested relationships, discourses or interests of great complexity, capable of enriching what was known until then. Putting together this correspondence allows us to examine the different events that build up the context for the "adventures" of these pioneers of Spanish architecture, placing them, for once, on a less mythifiable realm.

Regarding the meeting in Barcelona, the peculiarities of the organization can be seen in the different letters confirming the scope of the gathering beyond the purely philanthropical. The interest in involving President Maciá in Le Corbusier's ambitious urban plans, the different positions of international members on aspects such as the Mediterranean or the *objective* poetics as well as the animosity among some of its members, depict a picture that offers greater richness to the reality of the budding European vanguard.

## THE CROWN HALL IS NOT TRANSPARENT. MIES VAN DER ROHE AND THE IMPREGNABLE ENCLOSURE

Juan Coll-Barreu

The Farnsworth house had been his first clear span building, a single room building with no intermediate pillars, and became in the universal modern paradigm of the transparent pavilion. Six years later, Mies van der Rohe finished the Crown Hall, another pillar less glass pavilion, enclosing this time a giant 120 by 220 feet hall, 18 feet tall destined to host Chicago's Illinois Institute of Technology Architecture School.

Nevertheless, the structure, its interior perception, the building's connection to the ground, the singular relationship between interior and exterior, the identification of the glazing… warn us that the new IIT hall is essentially different not only to the small Plano house but also to the great open-plan pavilions to come in Mies career, headed by the Chicago Federal Center post office, the Toronto Dominion Bank and Berlin's *Neue Nationalgalerie*.

The lack of transparency stands out among the many difference. Despite its character of glass pavilion standing on the campus' continuous garden, of the large flat glass panels making ups its four thin façades, despite being considered transparent, the interior of the Crown Hall and the urban day to day of the exterior are mutually inaccessible.

Strangely enough, this circumstances have been unnoticed to the master's historiography –which has brought together a large part of the best modern critique to produce a prestigious and coherent doctrine, the conclusions of which have been sometimes interpreted in a reductionist manner, probably motivated by the overwhelming presence of a Miesian remembrance unanimously framed by minimalism–, which has recognized in the IIT's Architecture School a clear example of the paradigmatic transparent open plan pavilions built by Mies van der Rohe, rational constructions of the modern ideal of a glass urn carelessly open to the exterior, having even praised the supposed transparency of the building.

Another one of Mies success. The architect built a group of meanings transcending the apparent buildings.

## ARCHITECTS' JOURNEY

Rubén A. Alcolea

The VII International Congress of Modern Spanish Architecture History, celebrated in Pamplona from the 5th to the 7th of May 2010, was entitled "Journeys in the transition of Spanish architecture towards modernity", and both the gathering in Pamplona as well as the preliminary workshop developed the previous year in New York's Columbia University GSAPP, demonstrated the event's maturity, not only because of the high academic level displayed, but also for its repercussion abroad. The wise choice of the topic allowed for the contribution of many researchers, not only Spanish ones, as reflected by the wide publication collecting selected lectures. Although the topic is endless, results were displayed portraying very different but complementary approximations, that, as a whole, offer a wide and rich scope of the relationship between architects and their journeys, both mithyfied and real.