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PLACE, CRAFT AND THE AMBIGUITY OF HIGH-TECH [1]

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1. An unrevised version of this paper was presented at the 1988 Annual ACSA Technology Conference, San Francisco.

Figure 1. Barcelona Pavilion interior, Mies van der Rohe (from P.Johnson, *Mies van der Rohe*. New York: The Museum of Modern Art, 1953, 1947, 73)

Figure 2. Hopkins House interior, Hampstead, London by Mike Hopkins (from *Progressive Architecture*, July 1978, 51)

This paper arose out of a frustration with the recurring tendency in twentieth century architectural culture to reduce architecture to a matter of style. From Hitchcock and Johnson's well-known 1932 MOMA exhibition when selected examples of modern architecture were presented as "International Style" (Figure 1), to the 1980's publicity of "High-Tech" as a distinct new style (Figure 2) circumstances have significantly changed. However, what is common to both is a structure of perception that tends to isolate iconography as the dominant feature of architecture and thus, by pulling the discussion to stylistic grounds, seriously distorts any meaningful analysis of work and ideas. As in Hitchcock and Johnson's enterprise to lend credibility and stylistic homogeneity to modern architecture, High-Tech stands today as a catch-word for anything employing industrial materials, bright colors and "technological looks" (Figure 3). Those displeased by the stylistic connotations of the term resort to a kind of technological determinism emphasizing concepts of efficiency, economy and rationality uncontaminated by aesthetic concerns. For others, it is precisely this stylistic aspect - this aesthetization and hence, demystification of technology which demands attention and acclaim. Both approaches undoubtedly capture important features of the kind of architecture that is embraced by the term High-Tech. However, for a characterization of its real possibilities, limits and theoretical content, both offer extremely inadequate criteria.

Before anything else, technology *alone* is not a very helpful category to define and distinguish *any* architecture. Not only is technology a precondition and integral aspect of all architecture, whether high- or low-tech, but also it would be impossible to find any building or artefact, simple or complex, the form of which is dictated solely by technological - structural/constructional - considerations alone. In an article entitled "The Fiction of Function", Stanford Anderson (1987) cogently argues how considerations of "function" - just like those of "technology" - constitute a weak concept inadequate for the characterization of any architecture and that, "no description of function, however thorough, will automatically translate into architectural form". The equation of modern architecture with "functionalism", he argues, is a polemical position lending support to Postmodernism which is typically defined not on its own principles, but in opposition to modernism. The status of High-Tech is not totally independent of this debate. Just like "functionalism is inherently a fiction" as Anderson puts it, so is technology as an exclusive determinant of form. Yet it

2. For instance, by Frank Newby in his lecture at the RIBA, London, April 3, 1984. More specifically, Nicole Pertuiset observes: "In the Renault Factory at Swindon, the detail of the attachment of the mullions to the ground slab reveals a clumsy connection from a structural point of view. However it permits the facades to achieve a visual illusion of weightlessness. Note that the perforated columns and beams are currently more expensive than the plain ones, despite savings in steel, but contribute greatly to the airy appearance of its interior" (Pertuiset, 1983).

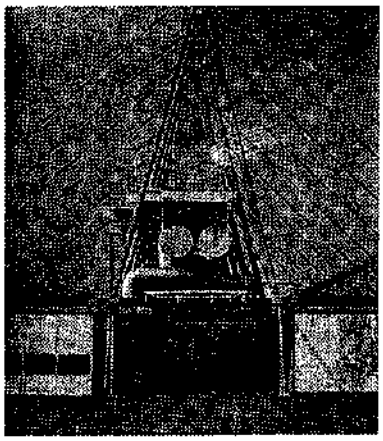


Figure 3. PA Technology-Patscenter, Princeton, New Jersey, by Richard Rogers (from *Architectural Review*, September 1985, 39)

Figure 4. Renault Factory, Swindon by Norman Foster (from *Architectural Review*, July 1983, 2)

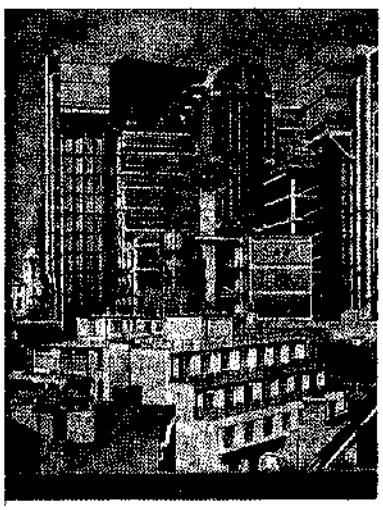


Figure 5. Lloyds Headquarters, London by Richard Rogers (from *Architectural Review*, October 1986)

is a fiction still espoused, for defensive reasons if nothing else, by architects like Norman Foster who loathes the stylistic connotations of High-Tech and prefers to designate his architecture as "appropriate-Tech", *ie.* a non-stylistic employment of technology in response to programmatic and constructional demands (Foster, 1983). It is ironic that his Renault Factory at Swindon (1983), popular with its bright yellow steel members and cables (Figure 4), is picked up by many critics and commentators as an illustration of the visual rather than structural or economic logic of High-Tech[2].

However, marking the inadequacy of technological criteria as form generators of any architecture, let alone of High-Tech, does not automatically legitimize the latter as a kind of "technological expressionism" either - perhaps best exemplified by the Lloyds Headquarters of Richard Rogers in London (Figure 5). Granting that every architecture has something to communicate, an aesthetic/symbolic statement to make or a story to tell, does not mean that what is communicated is unimportant. When technology, like history, becomes just another story in Postmodern culture - one that is simply "different, or ironic, or amusing, or calculated to sell" (borrowing the adjectives from Anderson), a critical discourse is required to pose questions in relation to how architecture is made and inhabited[3].

Based largely on a previous research on British architecture which is traditionally permeated by a strong technological discourse (Bozdoğan, 1984), the following examples intend to pull the discussion away from the "looks" to the content of architecture, thereby to articulate the critical potential of certain design explorations within the High-Tech paradigm and to mark significant differences of underlying philosophy among works too frequently lumped together under the common denominator High-Tech.

Whenever High-Tech is not celebrated or condemned on stylistic grounds, it is often delegated to a marginal position in architectural theory as the product of the ingenuity of British pragmatism - some kind of "engineers' architecture" with no significant theoretical contributions to make[4]. This largely stems from the fact that our architectural thinking is confined to the familiar - to precedents, conventional materials, techniques and forms, to the extent that they prescribe our spatial and experiential standards which need modification for a true appreciation, or critique of High-Tech works. As Peter McCleary has observed some years ago :

> What is needed in the study of the relationship between structure and architecture is not a set of precedents, but an intuition of intuitions. At one time the self-weight of structures was much greater than the applied loads. This fact led to many and particular shapes and forms - the arch, the vault and the dome in masonry; and for the small span and short height, trabeation in stone. Today when the applied or live loading is of the same order as the self-weight, we cannot depend on our "seeing" of the precedents. Tomorrow, when the loading and the use that is yet to be applied will become the major determinant of form, then our precedents will be most inappropriate. What is the shape of structures for wind, movement, change? The fact that tent structures, pneumatics *etc.* have yet to find an adequate architectural expression is in no small part due to our dependency on precedents and languages rather than on intuition and principle (McCleary, 1980, 58).

One prominent building, the Jeddah Airport of Skidmore, Owings and Merrill (1983), (Figure 6), not only explores the architectural expression of new materials and technologies, but also effectively challenges the common assumption that spatial, experiential and poetic quality in architecture is necessarily low-tech. What we associate with the spirit of place, or a phenomenologically situated architecture, is largely derived from conventional forms (walls, vaults, domes *etc.*) and crude, textured, natural materials (brick, stone, wood, exposed concrete *etc.*) flooded by light and embedded in a natural setting (Figure 7). The paradigm extends from primitive or vernacular to the work of Scarpa, Kahn, Barragan *etc.* What is common to most of these examples is the Heideggerian definition

3. In contrast to a lot of arbitrary storytelling in Postmodern culture, a project like Ian Simpson's Hang Gliding Center illustrates how the syntactics, semantics and pragmatics of an architecture can coincide: how structure, meaning and function become one and the same - even if in a unique and special case (see: Pawley, 1987, 30, 38).

4. Reinforced by the fact that architects like Foster, Rogers, Hopkins and Grimshaw do not like to write. The absence of explicitly stated theory contributes to the ambiguity of High-Tech.

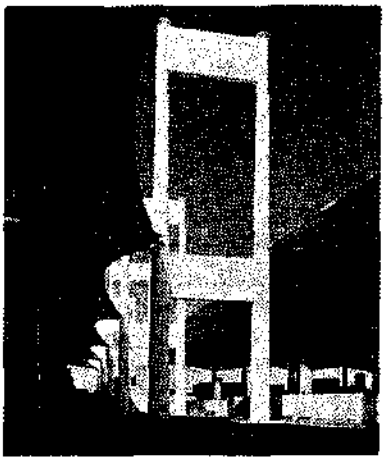


Figure 6. *Hadj Airport Terminal*, Jeddah by Skidmore, Owings and Merrill (Cantacuzino, 1985, 127)

Figure 7.*The Church of Paraporthiani*, Mykonos, Greece (photograph by S.Bozdoğan)

Figure 8. Inflatable Tennis Court, Portsmouth Polytechnic Campus, Portsmouth (photograph by S.Bozdoğan)

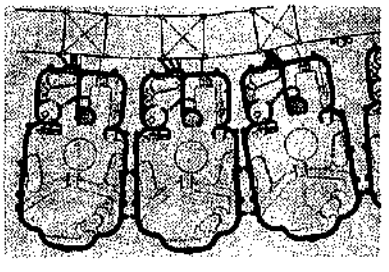


Figure 9. *Plug-in-City* by Peter Cook (Landau, 1968, 92)

of technology as a form of revealing, of "bringing forth into unconcealment", not only of the nature of materials and the act of making, but also how the artefact/building is phenomenologically situated in the world, *ie.* how it meets "the earth and the sky, the mortals and the divinities" (Heidegger, 1954). Jeddah Airport, which captures in its tent structure, the spirit of the desert (its sun, wind, sand) and of nomadic culture (of Arab tribes) suggests a potential reconciliation of high technologies with *place-making:* that essential and primordial aspect of architecture.

On the other hand, the inflatable tennis court on the campus of Portsmouth Polytechnic (Figure 8) stands in radical contrast to Jeddah Airport in spite of the "technological looks" of both. This pneumatic enclosure claims no place and no identity and embraces instead, ideas of efficiency, shelter, speed of construction and transportability. Whether in Portsmouth or anywhere else in the world, it is the same inflatable structure with no aspiration other than keeping nature out. As such, it is conceptually an offshoot of what Don Ihde, the prominent philosopher of technology calls a "technological cocoon". Ihde explains how in our modern predicament, since Cartesian subjectivism has separated the self-knowing subject from an objectified nature "out-there", "standing reserve" for his domination, we live in a technologically transformed nature:

> Nature is, at best, a background, often spectacular but not itself a force to be reckoned with. Its limits have been conquered. What is foreground is totalized culture. Life takes shape within and often literally inside various forms of technological cocoons. Home is a spaceship. Outside one must wear a miniaturized spaceship in the form of a spacesuit ... The spaceship as "home" is a projection of the present ideal of the totally self-contained and hence totally controlled environment (Ihde, 1983, 21).

It should be noted that what is here subject to a powerful phenomenological critique is precisely what was celebrated in the 1960's experimentalism and technological imagery as the promise of mobility, freedom and social utopia. Man was going to be the master over nature capable to survive *anywhere:* on the moon, underwater or in instant cities as Archigram envisioned. Projects like Peter Cook's Plug-in City (Figure 9) or Ron Herron's Walking City, Mike Fisher's cellular, collapsable, flexible, inflatable "Automats" and "Dynomats" and even more literally associated with the words of Don Ihde, Mike Webb's cushicles and survival suits are some of the well-known manifestations of this cultural climate.

The legacy of these ideas continues in Kaplicky and Nixon's Future Systems Inc. based in London and Los Angeles where they persistently experiment with habitable space to be suspended, dug into the ground or submerged underwater like a survival kit (Figure 10). Natural "monocoque" structures, like sea urchins, where the skin also constitutes the structure, offer a source of fascination and inspiration for their work, literally justifying a number of their projects as technological cocoons - as in the case of their scheme for the Kew Gardens competition (Figure 11). Whatever their achievements in the transfer of technologies from aerospace industry (Pawley, 1987), such undermining of the feeling of the terrain under one's foot or of the sky above the head, is a most haunting statement of the negation of place and of man's being-in-the-world. It is the embodiment of a technically mediated reality in which nature is simulated by environmental systems design - heat, cold, wind and rain kept out or simulated by advanced HVAC (Heating, Ventilation, Air Conditioning) systems.

The consequent environment is nothing but a homogenization of experience and a blunting of discrimination whereby the home, the office, the airplane cabin and the moon capsule are all the same.

While the "technological cocoon" constitutes a popular image of High-Tech (its extension into the culture industry in science fiction, comics, films and TV programs), another High-Tech building, Ian Ritchie's Eagle Rock House in Sussex (1983) stands as its philosophical anti-thesis (Figure 12). Embedded in

Figure 10. Office Building in Trafalgar Square, Project 135 by Future Systems Inc. (from *Architectural Review*, September 1987, 37)

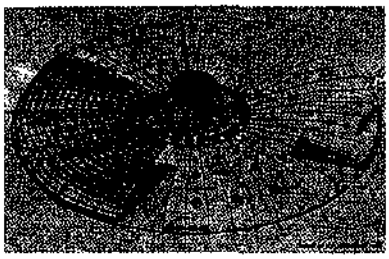
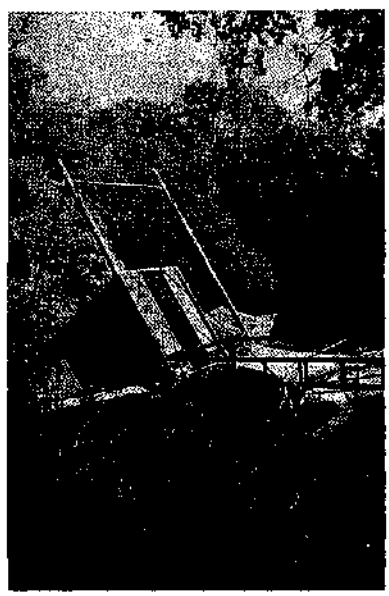


Figure 11. *Kew Gardens Competition Project* by Future Systems Inc. (Architectural Association, 1982)

its site rather than resting on it, it effectively illustrates the contextualist possibility within the High-Tech paradigm. Designed in collaboration with engineer Antony Hunt, the house is suspended by cables and is constructed cheaply with unskilled labor. It exhibits a rough technology in its details and an overall "home-built" flavor. Yet it has a romantic concern for site, evoking the image of a great bird nestled in the rocks (Figure 13), or as Peter Cook puts it, "spanning the territory between figuration, symbolism, structural invention and pragmatic building" (Cook, 1983, 74). As in the case of Jeddah Airport, its power rests in its ambiguity: its exploration of that precarious edge between novelty and timelessness, between technological innovation and place-making - or between the utopia of Archigram and the arcadia of Stonehedge.

On the other hand, the concept, if not the utopian aspect of the technological cocoon permeates Norman Foster's highly acclaimed idea of a "serviced container": a hermetically sealed box of uninterrupted space with mechanical equipment and services installed in the ceiling (as in the IBM Offices, Cosham, 1971 - Figure 14) or inside the enveloping skin (as in the Sainsbury Center for Visual Arts, 1978 - Figure 15) or inside the floor (as in Hong Kong Shanghai Bank, 1985 - Figure 16). The IBM building, for instance, clears itself a site but remains indifferent to it in its aspiration to create the optimum environment *inside* the box, the outside being a mere reflective envelope. By contrast, the Cricket Stand of Mike Hopkins in London (1987), designed in collaboration with Arup Associates and engineer Peter Rice, is contextually situated as an informed response to site, circumstance, remnants of earlier structures and the imagery of festival tents in collective consciousness (Figure 17). Unlike the purity of Norman Foster's "glass box", the Cricket Stand is a carefully crafted composite structure with a heavy brick arcade on the lower level, a steel plate and glass block facade on the upper level and a light tent structure of woven polyester fabric as roof (Figure 18). Thus the mainstream perception of High-Tech as a homogeneous synthetic skin stretched over or behind a structural framework (and made possible by neoprane gasketing techniques) (Pertuiset, 1985, 11) is undone by this juxtaposition of low-, intermediary - and high-technologies in the same building. The structure of thought which always needs a clear Gestalt is effectively challenged. As such the building illustrates a different direction in Hopkins' preoccupations away from his earlier Patera systems emphasizing production and assembly processes (an ingenious kit of parts to be assembled anywhere for any programmatic requirement) to a more place and craft conscious, more situated architecture.

Figure 12. Eagle Rock House, Sussex by Ian Ritchie (from *Architects' Journal*, n.178, October 1983, 63)



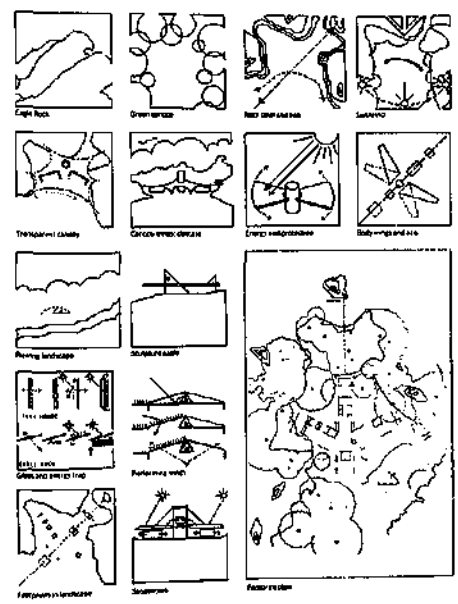


Figure 13. Eagle Rock House, Sussex by Ian Ritchie, conceptual diagrams (from *Architects' Journal*, n.178, October 1983, 67)

Figure 14. *IBM Offices*, Cosham by Norman Foster (photograph by S.Bozdoğan)

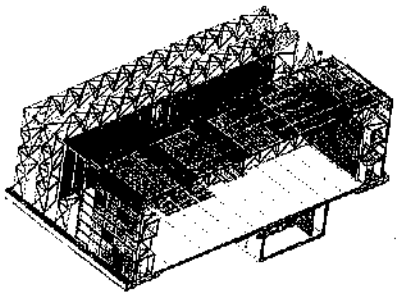


Figure 15. Sainsbury Center for Visual Arts by Norman Foster (from *Progressive Architecture*, February 1979, 54)

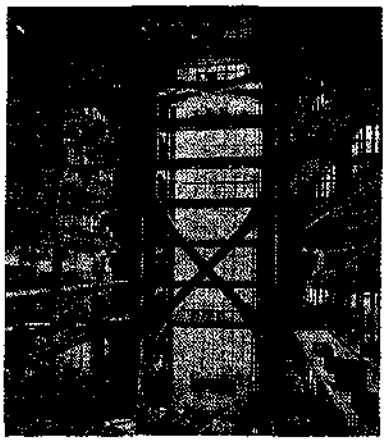


Figure 16. Hong Kong Shanghai Bank, Hong Kong by Norman Foster (from *Progressive Architecture*, March 1986, 89)

The meticulously designed joints and custom-designed detailing of the Hopkins building help undo another myth about High-Tech - that it is a direct expression of production and assembly processes leaving little room for the designer in the making of the artefact. Before anything else, our understanding of craft and detail is, once again, so limited by precedents and familiar, non-industrial materials that we rarely perceive and discuss the steel joints of Mike Hopkins or Richard Rogers (Figure 19) on the same theoretical terrain with a Scarpa detail. Furthermore, the indiscriminate characterization of High-Tech as a totally industrialized process picking up its components and details from manufacturers' catalogs, obscures a significant distinction within the ranks of High-Tech. In terms of a philosophy of making, standardized, rationalized, optimized and factory-based solutions, as in the case of Foster's serviced container, are very different from individually designed, job-specific details and on-site solutions successfully employed by architects like Mike Hopkins or Nick Grimshaw. While the former concept is suggestive of reproducibility and repetition undermining the individuality and the uniqueness of the architectural product, the latter is permeated by some kind of "industrial crafts" (Kent and Ahranov, 1984).

Innovative explorations with new materials (GRP, nylon, carbon, fiber, superplastics, fabrics, teflon *etc.*) and with concomitant industrial skills (welding, cladding, bolting together, neoprane gasketing *etc.*) are comparable, in the hands of a number of High-Tech architects, to cutting wood, laying brick or molding concrete (Figure 20). It is possible to designate these architects as "custom-tailors working in metal" (Rosenberg, 1976, 159), representative of the characteristic British concern for individual detailing and product-oriented technologies (as opposed to the American tendency for mass production and process-orientation).

Finally, the assumption that High-Tech is feasible and meaningful only in the exclusive territory of large scales and complex programs (airports, stadia, factories *etc.*) obscures the fact that the kind of knowledge and skills involved in such industrial crafts is an accumulative one that constitutes a growing research program starting with smaller experimental structures and architectural commissions. The career of Mike Hopkins, for instance, bears testimony to how his interest in tension structures with light-weight synthetic fabrics was gradually developed and successfully transplanted from smaller, simpler buildings (like the small cafe/pub he has designed for the Milton Keynes Golf Course - Figure 21) to larger more complex ones (like his Schlumberger Research Center in Cambridge - Figure 22). Undoubtedly the greatest potential of a strong technological discourse in architecture rests in programs of large spans, great heights or complex structural

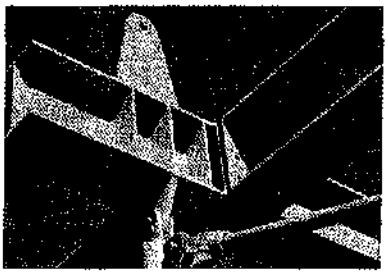
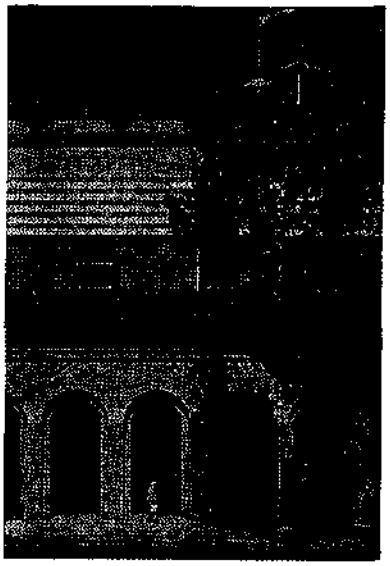


Figure 17. Cricket Stand, Marylebone, London by Mike Hopkins (from *Architectural Review*, September 1987, 44)

Figure 18. Cricket Stand, Marylebone, London by Mike Hopkins, facade (from *Architectural Review*, September 1987, 44)

Figure 19. Detail from PA Technology-Patscenter, Princeton, New Jersey by Richard Rogers (from *Architectural Review*, July 1984, 18)



demands which consequently require a tight collaboration between the architect and the engineer. In fact, the best examples of British High-Tech are indebted to the parts played by Arup Engineers, Antony Hunt, Peter Rice, Ted Happold *etc.* However to label *all* High-Tech as an "engineers' architecture" and to overemphasize their role as designers[5] does not adequately capture the reciprocity and creative exchange necessary in most cases. Paraphrasing Frank Newby, the most prominent engineer in the British scene after the death of Felix Samuely, the architect of today no longer has the knowledge of and mastery over his materials and techniques as did the medieval mason or carpenter. His tools are his consultants and he needs to learn how to use them without allowing them to make their own mark.

5. Frank Newby argues that in many cases of High-Tech work, the engineers' role is limited to a structural calculation, rationalization and realization of the architects' pre-conceived notions of technology (Newby, 1984).

Figure 20. Construction process of PA Technology-Patscenter, Princeton, New Jersey by Richard Rogers (from *Architectural Review*, July 1984, 20)

Figure 21. Golf Course Pub, Milton Keynes by Mike Hopkins (photograph by S.Bozdoğan)

This brief reassessment, in terms of a philosophy of place and a philosophy of making, of what is often categorically unified under the term High-Tech, challenges the latter's alleged homogeneity, stylistic unity and/or technological rationality all of which have been employed as rhetorical devices rather than explanatory categories. Both stylistic and deterministic readings of technology fall short of revealing the architectural possibilities contained in working with new materials and technologies, *ie.* the possibilities of exploring in steel, GRP and synthetic fabric, not only what brick, stone and wood can do in terms of space, light, texture, craft and detail, but also what they cannot do given larger spans, more complex programs and unprecedented situations. When at its best, the so-called High-Tech can make, "in the specificity of architectural making, places that make a world for those who inhabit them ... following the spirit of Loos, Le Corbusier, Kahn and Aalto" (Anderson, 1987, 29). And such work arises neither of technology alone, nor a technological aesthetics, but both and many more.

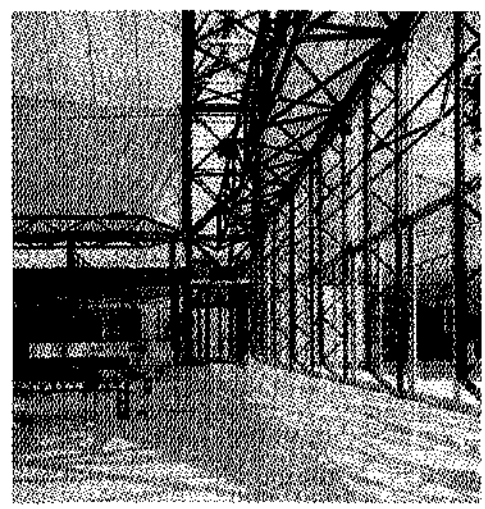


Figure 22. Schlumberger Research Laboratories, Cambridge by Mike Hopkins (from *Architecture + Urbanism*, n.192, September 1986, 19)

MİMARİ MEKAN KALİTELERİ VE YAPIM SÜRECİ AÇISINDAN İLERİ TEKNOLOJİ (HIGH-TECH)

Alındı : 6.2.1989;
Anahtar Sözcükler : Mimarlık Kuramları, Mimari Eleştiri, İleri Teknoloji

ÖZET

Bu yazı, endüstriyel malzemeler ve parlak renkler kullanarak teknolojik bir estetik sergileyen her yapının kolayca "High-Tech" kategorisine sokulup bir stil meselesine indirgenmesinin eleştirisinden yola çıkmaktadır. Günümüz mimarlık ortamında bu stilistik bakış açısı öylesine hakimdir ki, kimileri buna bir tepki olarak "High-Tech"i sadece rasyonellik ve ekonomiklik düzeyinde tanımlayıp estetik boyutu tümüyle red ederken, kimileri de özellikle bu boyutu alkışlayıp,

teknolojinin estetize edilmesini, post-modern ortamın bir başarısı olarak görmektedir. Sonuçta her ikisi de "High-Tech"in gerçek mimari potensiyelini, mekân ve işçilik açısından gösterebileceği çeşitlilikleri irdelemekte yetersiz kalmaktadır.

Herşeyden önce, fiziksel ve kültürel çevresiyle bütünleşmiş, anlamlı bir mimarinin, bir ileri ya da basit teknoloji meselesi olmadığı, teknolojik açıdan aynı oranda "High-Tech" sayılabilecek iki yapının, çevreye ve doğaya karşı birbirinin tam tersi bir felsefi tutum içinde olabileceği yadsınamaz. Yazıda bu nokta örneklerle açıklanmaktadır. Öte yandan "High-Tech"in tamamen endüstriyel bir süreç sonunda ortaya çıktığı, standard ve fabrika yapımı parçaların montajından ibaret olduğu genel kanısı da yanıltıcı olmakta, yaratıcı bir mimarın elinde "High-Tech"in bir zenaat olabileceği göz ardı edilmektedir. Yazıda, "High-Tech" görünümlü pek çok yapının aslında tek tek tasarlanmış çok özel detayları içerdiği, bu sürecin, vidalama, kaynaklama vb. geleneksel ötesi yetenek ve işçiliğe bizzat inşaat sırasında gerek duyduğu örneklerle belirtilmektedir. Nihayet, "High-Tech"in sadecehavaalanı, stadyum, fabrika gibi çok büyük ve kompleks programlar için geçerli olduğu yargısı da sorgulanmakta, geleneksel olmayan malzeme ve teknolojilerle çalışmanın gerektirdiği bilgi ve becerinin, pekalâ mimarların ufku dahilinde yavaş yavaş gelişen deneysel ve yaratıcı bir program olabileceği öne sürülmektedir.

Sonuçta vurgulanmasına çalışılan nokta, "High-Tech"in ne bir "kozmetik" problem, ne de sadece bir mühendislik meselesi olmadığı, mekân, ışık, detay vb. gibi mimarları en yakından ilgilendiren kavramlarla ele alındığında, geleneksel olarak ahşap, taş, tuğla vb.de aradığımız mimari kaliteleri belki de çelikte, sentetik malzemelerde ve alışılmışın dışındaki strüktürlerde bulabileceğimiz düşüncesidir. Mimari kavramlarımız çoğu kez geleneksel malzemeler ve yapı yöntemleriyle sınırlı olduğundan, bu pek kolay değildir ama hem önümüze sereceği yeni olanaklar açısından, hem de yaratıcı ve dönüştürücü bir mimari tavır olarak ciddi biçimde ele alınmaya değer.

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