

Science and History Banham versus Rowe [Saarinen on the MIT Campus]

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1. REINHOLD, Martin (2013): 'The MIT Chapel. An Interdiscursive History', en 'A Second Modernism. MIT, Architecture, and the Techno-Social Moment', editado por Arindam Dutta, SA+P Press, ed. Department of Architecture, MIT Press, Cambridge, Mass. 2013.
 2. Ya en 1953, y de la mano de Aline B. Louchheim, Eero Saarinen había alcanzado una gran proyección mediática en los Estados Unidos y, a lo largo de la década, su oficina recibiría los mayores y mejores encargos del país (General Motors, IBM, Bell, ATT, etc.). No en vano, la revista TIME lo llevó a la portada en su número de julio de 1956 como consecuencia de la enorme trascendencia adquirida por el 'Campus Industrial de General Motors. Sirva de referencia de su proyección pública y mediática el estudio de Donald Albrecht, 'The Clients and their Architect', en 'Eero Saarinen Shaping the Future' (2006), editado por Eeva-Liisa Pelkonen y Donald Albrecht, Yale University Press, NH, EEUU.
 3. Editorial board, 'Saarinen challenges the rectangle', Architectural Forum nº 98, Enero, Boston, 1953.
 4. WITTKOWER, Henry (1901-1971) nació en Berlín. Forzado por la deriva política de Alemania, se trasladó primero a Londres en 1933 y posteriormente a los Estados Unidos para trabajar en la Universidad de Columbia, desde 1956 hasta 1969, donde ocupó el puesto de Chairman en el Departamento de Historia del Arte y Arqueología. Su impronta en esta historia se deja sentir de varias y fundamentales maneras: como director de la tesis doctoral sobre Iñigo Jones redactada por Colin Rowe en el Warburg Institute de Londres o como inspirador del modelo propugnado por Henry A. Milion tras escucharle en el verano de 1950 en una serie de conferencias en el Fogg Museum de la universidad de Harvard. Como consecuencia de este encuentro se inició una vinculación entre ambos, aceptando Wittkower dirigir la tesis de Milion sobre Guarino Guarini.
 5. ANDERSON, Stanford (1964): 'Architecture and Tradition that Isn't "Trad, Dad"', The History, Theory and Criticism of Architecture. Papers from the 1964 AIA-ASCA Teacher Seminar, Edited by M. Whiffen and B. L. Pickens. MIT Press. pág. 72.
 6. BANHAM, Reyner (1960) 'Teoría y Diseño en la Primera Era de la Máquina', Ediciones Paidós, Barcelona. pág. 322.
 8. Opus cit. 7 pág 77.
 9. Opus cit. 7 pág 78.
 10. BANHAM, Reyner (1960): '1960-Stocktaking', The Architectural Review 127, London, UK, pág 50..
 11. Opus cit 10; pag 51.
 12. Opus cit 10; pag 61.
 13. En julio de 1962 y como respuesta a la construcción de los Morse y Ezra Stiles 'colleges' en el campus de la Universidad de Yale (1958-62), Banham escribió en su columna del periódico 'The New Statesman': "Yale is a very sick place." Sin embargo, el propósito perseguido por Saarinen era congruente con las obras del MIT, así lo declara al Yale Daily News en 1959: "Our primary effort [for Morse] was to create an architecture which would recognize the individual as individual instead of an anonymous integer in a group."
 14. Capilla Sforza, Santa María la Mayor, Roma. Construida por Miguel Ángel Buonarroti en 1561.
 15. ROWE, Colin. 'Mannerism and Modern Architecture', Architectural Review, June 1950. En 'The Mathematics of the Ideal Villa and Other Essays', (1976): MIT Press, Cambridge, Mass, pág 49.
 16. PELKONEN, Eeva-Liisa, The Search for (communicative) form, en 'Eero Saarinen Shaping the Future' (2006), editado por Eeva-Liisa Pelkonen y Donald Albrecht, Yale University Press, NH, EEUU, pág 84.
 17. La bóveda es un triángulo equilátero esférico cuyos vértices apoyan en la cimentación por medio de rótulas metálicas. Debido a la geometría curva de su perímetro, tanto el cálculo como el armado resultaron complejos y, a pesar de ser una estructura laminar, su sección no es esbelta, incrementándose desde los 8,90 cm de hormigón (3,5 pulgadas) en la clave hasta los 28 cm (11 pulgadas) en los bordes del casquete esférico.
 18. SAARINEN, Eero. Transcripción de una conferencia en Dickinson College, Carlisle, Pensilvania. Diciembre de 1959.

In 1950 William Wurster, the Dean of MIT's School of Architecture and Planning, decided to drive the expansion of the university campus to the west of Massachusetts Avenue with the construction of a social and meeting space for students. The University's aim was to provide the campus with a more informal, public, flexible space, away from the institutional symbolism of Killian Court [Fig 1].

In architectural terms, the western expansion towards the bank of the Charles River, which began in 1946 when Aalto was asked to design Baker Hall, represented a substantial distancing from the complex, continuous, articulated system of buildings and corridors of the original campus. This had been designed in 1910 by William Welles Bosworth and was characterized by a Beaux Arts plan, the use of classical orders and, in particular, the sail vaults that provide the MIT its iconic image. However, it also demonstrated the development and growth on which MIT had embarked.

This expansion originated in programmes to support the development of arms and communications technology during the World War II. Such programmes continued with equal or even greater intensity from 1950 onwards as collaboration between MIT, government agencies and industry intensified after the war ended.

Deeply involved in the industrial and manufacturing fabric launched and funded by military activities – the federal government entrusted the organization of the Manhattan Project to MIT's Office of Scientific Research and Development – once the war with Japan was at an end MIT was faced with the social impact of the sudden appearance of nuclear technology and its capacity for mass destruction. Equally, it could not avoid the resulting dilemma regarding the role of science and technology as engines of humankind's development. This is a dilemma that MIT tried to absorb and neutralize in its academic and architectural structure.

The purpose of this article is to highlight the impact of this controversy on the University's physical and academic space, and to signpost the tools used to assimilate it, which involve architecture in various ways.

The strategic reconfiguration of MIT's academic curriculum via the creation of a new Faculty of Humanities and Social Studies was reproduced in the School of Architecture and Planning through an increased emphasis on history and humanities courses within the study programme. We will analyse the general debate, which began at just that time, on the role assigned to technology and history in architects' education, and in this context of reflection we will highlight how the expansion of the campus via Eero Saarinen's project became instrumental as an expression symptomatic of the difficulties of this debate.

The decision to provide the campus with meeting places for spiritual reflection and for musical and drama performances must be framed within the reconceptualization of MIT's institutional profile. This transformation did not just coincide with the end of the war: it was probably caused by MIT's indirect participation through the arms and technology warfare programs.

In line with the 1947 recommendations of the Committee on Educational Survey, in 1949 MIT began the new academic year with a newly elected Dean of Humanities and Social Studies. He was responsible for organizing the new department, which was called on to bring about a balance within the syllabus between the sciences and the humanities. To express and set the scene for such a philosophical and ideological realignment and with the financial backing of the Kresge Foundation, MIT embarked on the campus expansion with such new buildings –chapel and auditorium–intended specifically to encourage human, spiritual and civic qualities within MIT's academic setting.

Not coincidentally, the Kresge Foundation was well known for its support of educational bodies and programmes orientated towards humanist and Christian education.

It is therefore true to say that the programmes of an ecumenical chapel and a performance space were strategically selected for their spiritual and reflective characteristics, the aim being to enable the visualization, in the physical space of the campus, of the rebalancing between scientific thought and humanist education with which MIT confronted the post-war scene. This was a scene in which science and technology – which had been the basis of MIT's curriculum since it was founded in 1861 – were no longer MIT's only field, and in which the new buildings were called on to act as the icons of the process of '*humanist regeneration*' and to promote the spiritual, artistic and collective activities of a '*balanced society*'.

If in expanding its campus MIT placed its trust in architecture as a tool to express its modernization and update programme, with the strategic selection of Eero Saarinen as architect it identified with the new image of the large industrial and technological corporations of the post-war economy: the industrial and laboratory campuses of General Motors in Warren, Michigan and of IBM in Rochester, Minnesota. These had recently been built by Saarinen.

The choice of programme, location and architect were the result of a carefully calibrated plan. However, what neither Saarinen nor MIT was able to foresee was the difficulty of integrating science and humanism into one architectural image in 1950.

Such an integration of opposing paradigms, characterized within architecture as the opposition between '*operational love*' and technological advance, gave rise to a long, profound debate which would not end until around 1975 with the ephemeral, temporary victory of the arguments of tradition. This was a controversy between two components of architecture that modernist discourse pitted against each other in a debate skewed on both sides. By 1955 it had become explicit in the opposing positions of Reyner Banham and Colin Rowe, both English, both critics and historians by profession and members of the same generation. Their conflicting arguments, which were contemporary to the Chapel and the Kresge Auditorium, provide the critical context for Saarinen's buildings and the international controversy that surrounded them.

This debate became not just relevant but critical to architecture and the teaching of architecture during the second half of the twentieth century. No school of architecture in the Europe or the USA could remain outside it nor disregard its topicality. Neither did MIT's School of Architecture and Planning, whose particular academic and critical position, for the sake of consistency, was in line with the '*ideological realignment*' on which the Institute had embarked.

If the paradigm of technological development and its basis in scientific advance had given wings to interwar architecture and modernist ideas in their orientation towards progress and thus the future, history would take on a leading role from the post-war period onwards and would make of the past, origins and traditions an alternative and ultimately dominant discourse. However, this was a discourse that would not be critically or consciously articulated – rooted in theory or expressed – until 1960. In fact, in 1955, as images of the Kresge Chapel and the Auditorium spread intensively and swiftly in professional and non-professional media, the terms and scope of this controversy still remained to be established and known. Thus, we sustain that Saarinen's project was the vehicle responsible for formalizing, objectivizing and visualizing this discourse, with all its consequences.

The controversial nature of the wish to incorporate this balance, superimposed on and gravitating towards the design, aim and formalization of the new buildings, contaminated the project from its very beginning.

Ultimately, the Chapel and the Auditorium became a manifestation of the conceptual dilemmas addressed in the debate. Very soon they came to be the source of heated critical controversy and journalistic debate that went beyond the professional sphere.

It would therefore be true to say that the programme of '*institutionalization of the humanities*' – the inclusion of a space for religious and spiritual reflection at the new symbolic heart of an institution dedicated to science – materialized with the construction on campus of the Chapel and the Auditorium. Furthermore, however, this occurred via a conceptually unstable architecture characterized by a conflict of differences and contradictions that not only underlie Saarinen's project but also become manifest and larger-scale in it and its differentiation between the solid, material, internal, sacred nature of the Chapel and the combination of transparency, lightness and technological resources implemented in the Auditorium.

This conflict extended, for example, to the understanding and expression of the structural technology used in the roof of the Auditorium, which in the view of many was impregnated with the symbolism of classical spherical vaults, particularly given its proximity to William Wurster's building and Killian Court, with its iconic sail vaults and central oculus.

*'At MIT, a problem that was typically formulated in architectural discourse as being one of simple opposition – abstract versus symbolic, modern versus traditional – acquired a good deal more complexity when it encountered the secular/religious conflict written into MIT's institutional realignments.'*¹

As Reinhold Martin asserts, what was initially intended in the project brief as a '*meeting house*' for the academic community, similar to the civic meeting spaces characteristic of the New England settlements, was ultimately rent in two due to a differentiation between secular culture and religious convictions. In addition, what began as a collective, shared meeting space ultimately reflected the duality between science and humanism, and in turn between spirituality and culture, that gravitated on the academic institution. In the architectural project, this duality took the form of a differentiation between an introspective space, the Chapel and its solid, enclosed architecture, and a collective meeting place, the Auditorium, based on lightness and transparency achieved through technology. Saarinen intensified this differentiation to the point of raising an unavoidable question: how can two parts of a single project, conceived not only by the same hand but at the same time, respond to such opposed disciplinary paradigms?

If the chapel, with its crude brickwork and internalized atmosphere, gives form on campus to MIT's post-war programme of rebalancing with the humanities, then the architecture of its conflicting dualities –between the Chapel and the Auditorium, between disciplinary tradition and technological innovation, between the archaic large scale of the brick wall and the laminate concrete structure supported at only three points, between spiritual introversion and institutional transparency – which are reproduced at multiple literal and symbolic levels, embody the features of the debate.

As early as January 1953, the controversy surrounding the project had become public and filled professional journals.² In issue 98 of Architectural Forum, the article '*Saarinen Challenges the Rectangle*' made this clear even before construction:

"In the brick cylinder chapel Saarinen and his associates have out-traditionalized today's traditionalists just as conclusively as they out-modernized today's modernists in using a dome instead of a familiar wedge shape for the

auditorium. More specifically, the chapel is as timeless as the dome is timely."³

Framed in this way, the conflict between categories is settled as a simplified confrontation between tradition and modernity, highlighting Saarinen's skill at displacing the significance of forms and construction systems between the two historical and disciplinary spheres, even challenging them to differentiate from each other. Thus according to Architectural Forum Saarinen manages to make the concrete sheeting of the Auditorium roof part of a 'chain of meanings' that originates in tradition, associated with the lowered vault. Similarly, in the Chapel he shows commitment to a timeless quality –timelessness being a characteristic of the classical tradition – and at the same time shows commitment to the opposing characteristic in the Auditorium by using the latest, up-to-date technology [*the chapel is as timeless... as the dome is timely*].

This duality, manifested in buildings that were nevertheless designed not only by the same hand but at the same time and for the same place, is a symptom of a broader conflict contained in the 1950 debate on the role of history, tradition and disciplinary knowledge in architecture and in architects' education. This was a discussion of how technology should transform architecture, or how it had in fact already done so.

With the arrival of the art and architectural historian Henry A. Millon at MIT's School of Architecture and Planning, returning history to the curriculum became a priority. He rejected the 'critical historiography' proposed by Zevi and proposed the work of Wittkower⁴ as an alternative model. Millon advocated the figure of Wittkower and his distancing of himself from both contemporary architecture and the figure of the critic directly involved in the controversies of his time.

Like his British colleagues, Millon's most important point of reference was the book *Architectural Principles in the Age of Humanism* (1949). His interest arose from the ability Wittkower had shown to identify disciplinary problems and construct an analytical and operative discourse that by its nature and origin extracted knowledge valid for an understanding of contemporary architecture from a meticulous study of Renaissance and Baroque architecture. In short, he chose to show the timeless nature of disciplinary principles, defending the existence of a body of knowledge that was truly architectural and independent of time, place and style. This was knowledge to which one could gain access only by acting as a historian, not as a critic who was involved and interested in contemporary controversies.

Admiration for Wittkower and his 'disciplinary principles' introduced a definitive bias into the controversy on the role of history and tradition; a controversy that was not restricted to historians and academics, infiltrating into the professional debates. In the words of Alison and Peter Smithson, for example, 'Doctor Wittkower is regarded by the younger architects as the only art historian working in England capable of describing and analysing buildings in spatial and plastic terms.'

Architects' interest comes from the operative potential of formal and spatial analysis elevated to the status of principles and above stylistic, functional or ideological contextualization.

The integration of the history of architecture into MIT's curriculum was reinforced by the arrival of Stanford Anderson as professor of History of Architecture. The distinction between 'historicism' and 'history' proposed by Anderson was intended to oppose the rather lengthy continuation of Bauhaus educational principles in American schools, but also, essentially, to oppose the emerging figure of Reyner Banham. Addressing the latter directly at the AIA-ACSA Teacher Seminar held at Cranbrook in 1964, Anderson laid claim to recognition of the past as a source of disciplinary knowledge:

*'[We ought] to establish an interpretation of tradition in architecture theory that will recognize our debt to the past without establishing the past as an authority.'*⁵

In the face of Banham's statements – 'It may well be that what we have understood as architecture until now and what we are beginning to understand of technology are incompatible disciplines. The architect who decides to follow the march of technology now knows that he will have a swift companion, and that if he wishes to remain alongside her and not fall behind, he will have to emulate the futurists and leave aside all his cultural baggage, including the professional apparel that allows the rest of the world to recognize him.'⁶ – Anderson insisted that science, the foundation of technological development, also has a history, and for reasons of efficiency and procedure value past knowledge as a functional reference source, and critical memory as an epistemological and methodological basis.

*'Even if we were to accept that such a thing as a qualitative change distinguished modern architecture from that which preceded it, does this liberate us from the past? Is the traditional operational lore of architecture categorically superseded? Or is the situation of architecture similar to that of physics, where older hypotheses – Democritean atomism or Newtonian physics, for example – remain theoretically suggestive or pragmatically operative?'*⁷

In short, for Anderson, 'the operational lore of architecture' – the concept proposed by Charles Eames at RIBA's annual conference in 1960 and repeated insistently by Banham – formed the epistemological basis which acted as the repository of the memory of earlier successes and failures and so would allow architecture, like science, to advance more efficiently.

*'I accept Professor Karl Popper's non-absolutist analysis of society which denies that there are any independent criteria or that there is an absolute authority or dogma which can serve as the basis for our actions. The advocacy of this paper is that a critical understanding of our tradition is a necessary aspect of any rational and fruitful context for decision-making.'*⁸

Or, expressed more directly, 'What we call 'science' is differentiated from other guesses not by being something distinct from other guesses but by the attitude of the scientist towards their guesses. Furthermore, such guesses or theories lead us to observe things which we would not otherwise have observed; that is, our theories are predictive.'⁹

Appropriating the methods of the social sciences, tradition and history become less distinct as models or references of stability and are reconfigured as operational tools ('theories that are predictive'), applicable equally to theory, criticism or design.

However, Anderson's willingness to integrate scientific epistemology into knowledge of the history of architecture, using Karl Popper's theories, entered into a risky compromise by trying to be reasonable: his aim was to construct an inclusive theory that included the paradigms and positions under discussion, however contradictory these were. This was precisely the same aim that MIT had set itself: updating, in a balanced scenario, a post-war institutional and academic discourse capable of uniting the paradigms of scientific progress and use of humanist knowledge.

This would be the integrative discourse outside the opposition between future and past, or tradition and technology, that Saarinen adopts as his conceptual and formal strategy in the Kresge project, either because he shares it or because it is his client's 'ideological programme'. Thus between the integrative discourse and the divided project – split in a chapel and a performance space – there emerges a synergy and a complementary nature, not without conflict, between the two opposing positions that set the limits of theoretical discussion in

the 1950s. This conflict was inevitable and latent, and encouraged criticism of Saarinen from both sides: not without a certain irony, he was reproached for having followed simultaneously and with no remorse the paths of historicist nostalgia and technological banality.

The line of argument on one side of this controversy is that of Reyner Banham; the other side, in this author's view, is represented better by Colin Rowe than by anyone else. Between the use of technology advocated by Banham and the use of history that characterizes Rowe's arguments there emerges the structure of this debate between extremes, represented, perhaps not coincidentally, by two people of the same generation, origins and English nationality.

The form and content of Banham's position are reflected in '1960-Stocktaking', an article published in issue 127 of *Architectural Review* in February 1960. It is formatted in two parallel columns, with arguments of 'tradition' presented on the left and those of 'technology' on the right. His reading, discontinuous and inclined towards dialectic confrontation between diametrically opposed alternatives, is as blunt and clear as it is dichotomous.

As in his earlier writings, Banham rejects both the historicist derivation he detects in those around him (see the confrontation between Banham and Ernesto Rogers in CIAM '59, Otterlo) and the banal use made of technology by Bauhaus in favouring a symbolic formalization divorced from its true content. In Banham's eyes, the first modernity (1920–30) had wasted the potential of technological development as an agent for transforming a discipline, specifically architecture, that was gradually distancing itself from real progress and therefore becoming more and more irrelevant.

*'In spite of the much-debated 'revolution' in architecture in our time, the roles of architects have not been significantly extended, and certain extensions of role – into product design, for instance – seem to have been tacitly abandoned since the nineteen-thirties.'*¹⁰

Using mass automobile production, among other models, as a paradigm, Banham reproached architects for their cowardice, accusing them of being afraid to compromise or weaken their professional authority and control over the object by opening the door to collaboration with those 'other specialists' who dominate the fields of real progress: lighting, environmental control, manufacture of new materials and uses of prefab. Insistently criticizing Le Corbusier for reducing the potential of the machine to its formal and symbolic components, Banham demands that the aura of architecture should not be protected, and that altering the nature of the architectural object by integrating it into the mechanisms of industrial manufacture, with all attendant consequences, must be accepted as something necessary and positive.

In Banham's own words, '[...] the profession (architecture) tolerates a few peripheral radicals, whose ideas call the whole professional apparatus into question.'¹¹

The operational lore of architecture, now denounced as the core of professional power and authority, is inclined to use technology as a tool, with the sole aim of perpetuating itself and resisting, but of course not to put it in the hands of 'a few peripheral radicals'.

According to Banham's reasoning, Mies van der Rohe was an emblematic example of resistance to losing the support of tradition, the rational formalism of which was the manifestation of a preconceived system of order. Whether the foundation for his work was the principles of classical equilibrium, the problems of construction or an abstract formal stability, his search was always separate from and independent

of real technological advances. He had adopted these technological advances in appearance only, for example in the use of curtain walls, transparency and laminated steel, etc. The presence of technology in Mies van der Rohe's architecture was, according to Banham, an effective subterfuge to protect an operational corpus whose origins dated back to the past and tradition.

'The few breaks in this uncompromising situation appear to derive from lighting engineers and acousticians with architectural training, and from a few liberated spirits, notably Louis Kahn with his 'topological' science blocks for the University of Pennsylvania, or Marco Zanuso with his integrated structure-and-air-conditioned schemes.

*This may be a bull-dozer solution for a problem that Mies van der Rohe, for instance, believes should be solved in secret. But it is a solution that brings us to the point of fusion of the technological and traditional aspects in architecture today.'*¹²

The inclination towards Kahn rather than Mies van der Rohe that Banham reveals here would seem to open up more possibilities for Saarinen and his architecture on the MIT campus. However, this was not the case. Banham maintained an attitude alternating between highly critical of Saarinen, due to what Banham considered obvious inconsistencies, and condescending towards him. This latter was the result of Saarinen's huge professional success in the corporate world, of which Banham was suspicious.

The reunification of wall and structure, the return to materials' appearance and texture in surface construction, pictorial articulation and the submission of the ground plan to geometric order and clear-cut figures; all these mechanisms, which are present at the Richards Laboratories (1957-1964), are certainly close to the MIT Chapel rather than distant from it. Also not alien to Kahn is the use of structures whose shape is highly symbolic, as is also the case with the spherical dome of the Kresge Auditorium.

The line separating Saarinen's works from those of Kahn is actually rather fine. In particular, regarding the debate between tradition and technology both expressed intense admiration for the architecture of the past and as a result dared to experiment with a new formal and symbolic monumentality. However, Banham demonstrated a systematic, idiosyncratic difficulty with Saarinen's work that contrasted with his unconditional admiration for Kahn. At times his criticism was moderated, but at others it was fierce.¹³

In the same year that MIT contracted the Kresge project to Saarinen (1950), Colin Rowe published the article 'Mannerism and Modern Architecture' in *Architectural Review*. Though it did not become popular or prestigious until 1970, it represents the position diametrically opposed to that of Banham. In fact, Colin Rowe's use of an analytical method and the identification of the formal and conceptual principles that recurrently underlie various moments in the history of architecture in this and other publications is precisely what differentiates him from and even opposes him to Banham. To a great extent, the leading characters of both writings are the same: Gropius, Le Corbusier and Mies van der Rohe. However Rowe's argument is more academic, it touches a level of speculation completely alien to Wittkower, who supervised his doctoral thesis on Iñigo Jones at London's Warburg Institute. Firstly, Rowe provides a sophisticated analysis of the two currents that he believes characterize the architecture of the nineteenth century, the inconsistencies and ambiguities of which were reflected in Modernist architecture. Rowe identifies and characterizes these currents by their greater or lesser degree of pictorialism versus mental order as a guiding principle. Next, he builds a timeless, ahistorical relationship that allows him to identify formal and visual principles shared by Mannerism and Modernist architecture.

An emblematic example of this is the proposed analogy between the Sforza Chapel¹⁴ built by Michelangelo Buonarroti in 1560 and Mies van der Rohe's 1923 drawing for a Brick Country House.

In the Sforza Chapel, says Rowe, Michelangelo works simultaneously with a central scheme and a system of centrifugal and peripheral forces. This gives rise to a constant spatial and formal conflict in which multiple individual episodes contradict the centripetal scheme and its focal point: diagonal columns, deformations of the dome, etc.

According to Rowe's thinking, in the Sforza Chapel contradiction prevails over coherence and peripheral distractions prevail over harmonious unity. These qualities distance Michelangelo from Classicism and make him a prototype of Mannerism.

He then asserts that the complexity of the configuration of space and plan of Mies van der Rohe's Brick Country House share similar mechanisms to those used in the Sforza Chapel.

*'This house is without conclusion or focus; and, if here Mies is operating not within the tradition of the centralized building but, ultimately, in that of the irregular and freely disposed Romantic plan, the disintegration of prototype is as complete as with Michelangelo. In both cases, forms are precise, volumes competitive and undefined; but, while an effect of studied incoherence is apparently an ideal in both cases, with Michelangelo the use of the Composite order and its accessories offers a statement of conventional legibility; whereas Mies can intrude no such directly recognizable material. Mies's means are both less and less public; and, with him, the involuted clarity of his intention is, primarily, registered in the private abstraction of the plan.'*¹⁵

Rowe undertakes to identify architectural principles common to both projects in terms of a dual spatial, centripetal and centrifugal matrix operating simultaneously. This causes the promised central focus to disintegrate, resulting in loss of unity and fragmentation into multiple individual episodes that gravitate towards the periphery. It is precisely this disintegration and fragmentation of unity that suggest to Rowe the possibility of considering Mies van der Rohe's work as part of the lineage of Romantic tradition and its principles; a tradition characterized by giving the layout an artful irregularity and apparent freedom. However, the layout is also illegible and abstract, alien to any shared code.

Although the similarities that Rowe proposed are obviously conceptual and operational rather than literal, and are resolved in the field of the organizational principles of space, layout or movement, inevitably they were also interpreted literally. This provided an excuse to validate the existence of similarities or direct connections that compromised the differentiation between tradition and modernity and sustained historical continuity as an inescapable, demonstrated principle of architecture.

Saarinen's project on the MIT campus lies at the vortex of the conflict between technological progress and disciplinary tradition that characterizes post-war architecture, made explicit in the attitudes of Banham and Rowe.

Neither the Chapel or the Kresge Auditorium come out of this controversy well, as their willingness to unite the two arguments and integrate them into their architecture with no apparent conflict led to their being criticized from both sides of the table.

'Nowhere else was the link between Saarinen's stylistic diversity and loss of linear temporal narrative more apparent than in the two buildings he completed on the MIT campus in 1955. The auditorium was a billowing reinforced-concrete thin-shell structure, one of the first

*of its kind, and the chapel a brick cylinder reminiscent of Roman architecture – the Pantheon and Hadrian's Tomb come to mind. These buildings challenged the linear narrative of architectural history in two ways: the auditorium by applying new technologies and the chapel by appropriating historical precedents.'*¹⁶

In the case of the Auditorium, Saarinen's aim of covering the span of the space with no intermediate structure, using thin-shell, double-curved reinforced concrete that worked by compression, as the latest-generation technological tool, was compromised by unresolved difficulties in moving this decision forward.¹⁷

The curved geometry of its edges, which was imposed by Saarinen for plastic and formal reasons, causes the spherical roof to lose its lightness and structural integrity, because it does not work under compression alone; in other words, because it is not structurally coherent. In addition, its curved shape is not acoustically appropriate inside. There are therefore acoustic panels in the interior, which calls into question the promised geometrical reciprocity between interior and exterior.

In short, both avant-garde structural technology and acoustic function lose control of the project. And the vacuum created by its weakening role as instruments and criteria was replaced by the formal and geometric characterization of the symmetry and axial nature of the ground plan, or the powerful iconography of the spherical vault and its resonance with those of the original campus.

It is in this context of manipulation of elements – which appear predicated on technical and structural logic but compromise their coherence for reasons of plasticity, context or symbolism – that Saarinen's few declarations of principles should be considered:

*'The principle of structure has moved in a curious way over this century from being 'structural honesty' to 'expression of structure' and finally to 'structural expressionism'. Structural integrity is a potent and lasting principle and I would never want to get far away from it. To express structure, however, is not an end in itself. It is only when structure can contribute to the total and to the other principles that it is important.'*¹⁸

It is therefore unsurprising that Banham felt disappointed once again by the use of technology in the service of 'other principles' obviously associated with an idea of unity and totality related to tradition. From the point of view of Banham's discourse, Saarinen chose 'structural expressionism' for its plastic and expressive possibilities, highlighting the TWA Terminal Building at John F. Kennedy Airport as the true 'canon' of his work, the General Motors and IBM campuses as the exceptions, and his affinity for Mies van der Rohe as a misunderstanding even by Saarinen himself.

If we now turn to the resonances with the past and the history of the discipline that are present in the massive, geometric brick cylinder of the Chapel and its introverted space, it is certainly true that, despite the sobriety and beauty of the internal space, the powerful centrality imposed by the lighting of the zenith, emphasized by the axial nature of the linear entrance or narthex, competes with and dwarfs the light reflected in the layer of water and the waves of the indoor surface. Centrality and axiality are imposed on the fluidity of the double brick layer and its plasticity, displacing the contrast beside a Euclidean, unitary geometric order. Unlike the Sforza Chapel, according to Rowe, in the MIT Chapel there is no conflict between contrasting principles of organization and order that can make the space and perception of it dynamic. The nod to historicism cannot compensate for the simplification of a single regulating principle, a single, dominant geometrical shape, that seems to move us away from the subtle contradictions of the Mannerist Classicism that Rowe so admired.

Although magazines such as *Vanity Fair* contributed to Saarinen's extremely high media profile during those years by describing him as a 'Mannerist' architect able to bend the rigid rules of modern architecture, Colin Rowe felt inclined only to describe the MIT project as an example of a 'broad, popular and dubiously classicizing movement'.¹⁹

Undeniably, even before it had been built the MIT project was received as the certain example of an architecture in which material and formal stability had been fixed not by utility, economy or structural principles but by a priori abstract criteria that related to geometric reasoning and ideal figures. For better or worse, the consensus was that at MIT geometry provided a universal, timeless language, able to transcend time, space and cultural differences and giving rise to an architecture that made recourse to essential, visually manifest forms.

Thus, for example, at the ceremony organized by Architectural Forum in March 1956 the editors brought together three heavyweights of modern criticism (Bruno Zevi, J.M. Richards and Sigfried Gideon) specifically to discuss the Kresge Auditorium and Chapel, under the title 'Three Critics Discuss MIT's New Buildings'. The controversy surrounding these had gone beyond the professional world and aroused complex debate in the general press.

MIT's Chapel and Auditorium had certainly been not only at the centre of the controversy on the function of history and tradition in architects' education, and by extension in architecture as a discipline; they also acted as catalysts of this controversy, the theorization and construction of which as a critical, conscious discourse used their forms and images to articulate and visualize its arguments. This occurred only from 1960 onwards. In short, the Chapel and the Kresge Auditorium anticipated the controversy and made it visible in the professional and public spheres before it was articulated in theoretic terms.

The subject under discussion concerned formal decisions and the reasons behind them. The general suspicion was that at MIT Saarinen must have abandoned the principles of modern architecture, including those he himself advocated (in particular those relating to the primacy of function and the compromise with structural rationality), in order to consider more deeply the problems of ideal form, geometric reasoning and unity.

Gideon identifies in MIT's Chapel and Auditorium certain constituent factors that can transcend the specific problems of one place or programme. As examples he cites the curved brick façade of Aalto's hall of residence and its relationship with the Baroque wall, or the affiliation between the Kresge Auditorium and the historical use of vaulted spaces.

Expanding on this idea, Richards sees the project as part of the contemporary debate of 'New Monumentality'.

'We are supposed to be searching for a new monumentality in architecture,' says Richards, 'which will enable it to create viable social symbols. This means thinking in terms of psychology as well as technology.' Richards, like the studies by Kepes and the Center for Advanced Visual Studies (CAVS), emphasizes the importance of 'social symbols' and their recognition, opening up the field of technology to the psychology of perception and therefore abstract analysis of forms. All this results from critical analysis of the Chapel and the Kresge Auditorium, in the architecture of which he identifies the presence of recognizable 'symbolic forms' which have meaning of their own, independent of their circumstances.

Lastly, Zevi is the most critical of the three. He reproaches Saarinen for his confusion in the handling

of the principles of both modern and historical architecture. In his opinion, Saarinen had dissociated form from function and construction from technology in what seemed to him a form of contemporary 'mannerism', loss of orientation and control.

Distanced from the sophistication of the critical and academic arguments of Banham and Rowe, Saarinen's strategy is simpler and more direct. As at MIT, he is committed to rejecting conflict. His architecture aims not to manifest conceptual conflicts but to build forms able to express themselves, to communicate effectively. This is an architecture more concerned with its effectiveness as a synthetic visual language than with its conceptual coherence, and therefore closer to the teachings of György Kepes at MIT's Center for Advanced Visual Studies than to the academic controversies of the School of Architecture and Planning.

The general debate between the sciences and the humanities that began in 1950 is diluted and blurred in the face of the more specific research of the CAVS, where laboratory experiments were subordinated to the scientific construction of a visual language that does not distinguish between the arts and the sciences. Technology was applied to developing a theory not of form but of the perception and experiencing of form. The ultimate aim of such a theory was the relationship between object and subject, the norms of configuration of the former in relation to the visual cognitive mechanisms of the latter.

Ultimately, all the evidence seems to indicate that Banham was right when he stated that '*[t]he architect who decides to follow the march of technology now knows that he will have a swift companion.*' A companion whose logic will itself be subject to, and thus distorted by, another paradigm even more contemporary than technology itself: the paradigm of communication.



SCIENCE
TECHNOLOGICAL DEVELOPMENT
HISTORY
HUMANISM
EERO SAARINEN
REYNER BANHAM
COLIN ROWE