



Fig. 1. Micha Ullmann, "Bibliothek" (1995), Berlin, Bebelplatz
(work in context, and close up).
(James Young, *At Memory's Edge*)

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Richard Cavell

Architectural Memory and Acoustic Space

In an article published in 1999 in the *Harvard Design Magazine* titled "Memory and Counter-Memory," and subtitled "The End of the Monument in Germany,"¹ James E. Young describes a number of the architectural interventions in the ongoing saga of Germany's attempt to come to terms in a meaningful way with the Holocaust. The fundamental paradox of such monuments and buildings is that by declaring a historical event to be memorialized, they risk dismissing that event as an object of active intellectual and emotional engagement. The quest thus becomes one of invoking process through the static forms of built structures.

Much of the discussion raised by that paradox revolves around two notions of history; these are, in the words of Carlo Ginzburg, the notion of history as *res gestae*—a lived experience of the past—and the notion of history as *historia rerum gestarum*—a detached knowledge of the past. Ginzburg makes this distinction in an essay on "Distance and Perspective" in his recently published book *Wooden Eyes: Nine Reflections on Distance*,² and it is connections between history, perspective, and visual culture that we want to consider in the following argument. The two notions of history that Ginzburg identifies are crucial to our understanding of how the architecture which has been called "post-modern" functions, an architecture which has shown itself—to the surprise of many, and especially its critics³—to be uniquely able to address serious historical issues of the sort raised by the Holocaust and its aftermath. Here we should specify that we are using "post-modernism" as an umbrella term to identify that architecture which positions itself critically with reference to the architecture of high modernism, and to that extent foregrounds a historicist element. To anticipate our argument somewhat, let us suggest that the critical element within post-modernist architecture is directed not only at *historia rerum gestarum*—that is, at a detached knowledge of the past and at history as monolith—, but also at the visual culture that has validated linear, perspectival constructions of space as the *sine qua non* of architectural production⁴—an element of post-modernist architecture that emerges especially within deconstructivist work. The effect of that combined critique of "monumental"⁵ history and of visual culture, as we hope our examples will show, is a sense of history as *res gestae*—history as lived experience—through the agency of acoustic space.

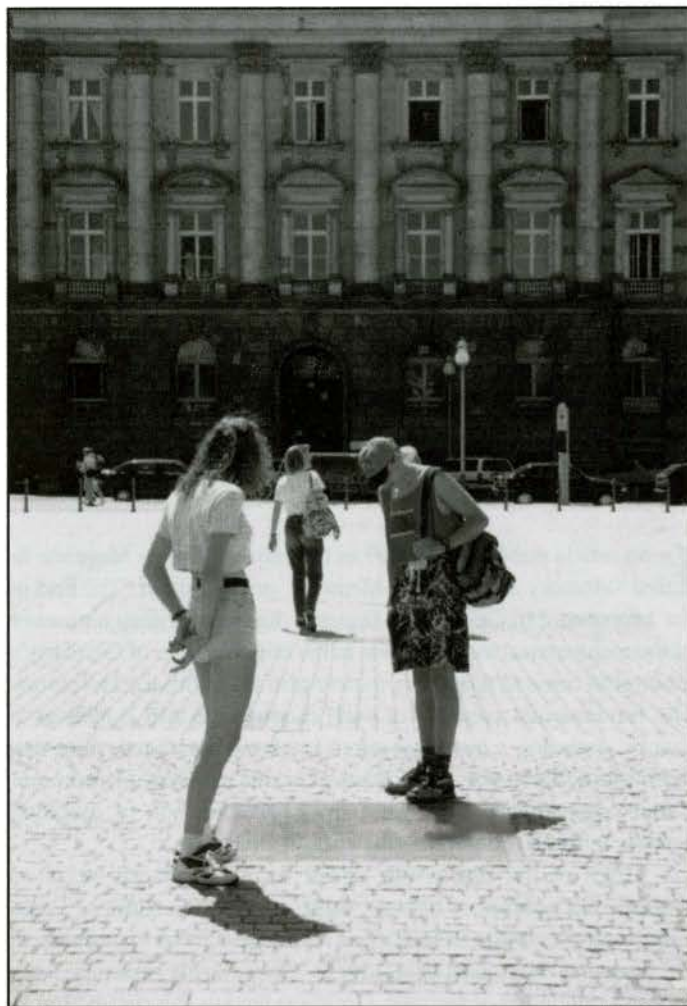


Fig. 2. Micha Ullmann, "Bibliothek" (1995), Berlin, Bebelplatz (looking down, into the work). (James Young, *At Memory's Edge*).

James Young discusses a number of monuments in his article (which now forms a chapter of his recent book *At Memory's Edge: After Images of the Holocaust in Contemporary Art and Architecture*) and we will focus on four of these that appear to raise most productively the issues we are exploring in this paper.

The first monument is Israeli-born Micha Ullmann's 1995 piece called *Library* (fig. 1) built for the Bebelplatz in Berlin. This "monument" is meant to commemorate the Nazi book-burning of May 10, 1933. Ullmann inverted the traditional monument (and this notion of inversion recurs throughout our examples), such that no built space appears above ground (fig. 2). Instead, Ullmann has created a room underground which resembles a library, the shelves of which are empty and the roof of which is made of glass. Through this, the monument's visitors peer into the void.

The second monument, by the British artist Rachel Whiteread (fig. 3), has been accepted as Vienna's official monument for the Judenplatz. Whiteread, like Ullmann, proposed a library theme for her monument; while Whiteread's work is above ground, it is presented as a solid white cube constructed of the cast spaces *around* books, and the whole space is inverted, so that the absent books are represented on the outside of the cube, into which it is impossible to see.

The third, and the first of the three to be built, is German artist Horst Hoheisel's Aschrott monument (fig. 4), built in Kasel in 1987. This monument takes an obelisk-style fountain donated by the Jewish Aschrott to his city, a fountain that the Nazis subsequently destroyed, rebuilds it, and then inverts it, so that it extends underground, with its waters flowing over it. It cannot be seen; it can only be heard.

The fourth monument is Daniel Liebeskind's Jewish Museum in Berlin (fig. 5).⁶ The museum pictured here is constructed as an "extension" to the Berlin Museum, and is entered through the Beaux-Arts facade of that building (fig. 6), though the connection between the two buildings is subterranean and invisible. The building's form is that of "irregular linear structures;"⁷ as Liebeskind writes, "The new extension is conceived as an emblem where the not visible has made itself apparent as a void, [...] invisible" (fig. 7). Young comments acutely that "it is not the building itself that constitutes [Liebeskind's] architecture but the spaces inside the building, the voids and absence embodied by empty spaces."⁸

Young's discussion of these works focuses insistently on that element of absence (though it should be noted that the Liebeskind museum has been full of visitors since the day it opened, without ever having housed an exhibition). Young argues that the post-modern memorials he discusses are in fact counter-monuments—monuments built in repudiation of the very idea of traditional monuments and what they represent. Yet the issues raised by these monuments are much larger than memorialization per se; as Young remarks, "the monument has necessarily reflected the aesthetic and political revolutions, as well as the wider crises of representation, following all of this century's major upheavals."⁹ Young thus sees the counter-monument (as he defines it) as reflecting the ironic posturing of post-modernism toward history, which it seeks to represent as a process, rather than as static. Yet this fluid notion of history (whereby a Roman coliseum can turn up on Robson street) has caused some critics to suggest that post-modernism cannot possibly address history with any seriousness—that, indeed, post-modernism is ahistorical; and that the memorialization of the past in post-modern architectural practice is akin to the heritage industry's creation of 'memories' as consumer products.

The problem here might lie in the term "post-modern" itself, with its implication both that modernism has been left behind,¹⁰ and, more importantly, that the critical function inherent in modernism has been abrogated. It is here that we would like to make our own intervention in the debate by turning to the history of architecture itself (about which Young is curiously

Fig. 4. Horst Hoheisel, model and memorial as built, Aschrott fountain memorial (1987). (James Young, *At Memory's Edge*)

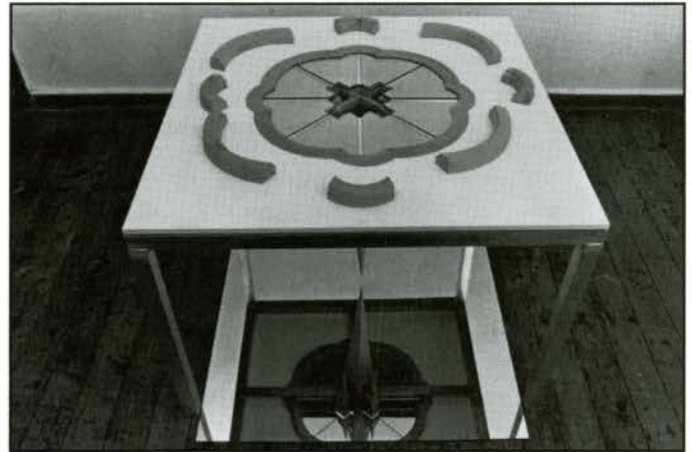
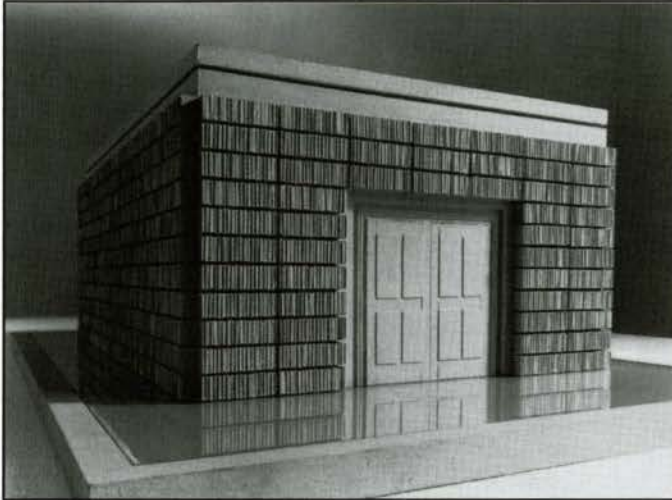


Fig. 3. Rachel Whiteread, model of Judenplatz Holocaust Memorial (1997), Vienna (James Young, *At Memory's Edge*)



silent) and reading it in terms of a history of spatial production. What we would like to argue is that the works discussed by Young consistently repudiate *visual* space, and we would like to emphasize that by the term *visual* we are referring to a particular regime of representation which privileges sight over the other senses and which is embodied in the production of perspectival space. It is that anti-visual and anti-perspectival dimension of counter-monuments that Young seeks—inadequately, in our view—to analyze through the notion of absence, and thus he doesn't connect the traits he observes in the counter-monument to larger issues in contemporary architectural practice—indeed, within contemporary notions of representation, especially spatial representation. If one *does* extend his comments to embrace their full architectural significance, then it appears that those counter-monuments are memorialising the end of a certain moment in architectural history—to be precise, the end of architecture's imbrication within the regime of the visual.¹¹

One has only to recall the space of the Benthamite panopticon, and Michel Foucault's comments about it, to realize the extent to which architecture has been part of a regime that privileges—indeed, hypertrophies—visual space, and, by visual we are referring to the production of continuous, linear, perspectival space. As Catherine Ingraham writes in her recent book *Architecture and the Burdens of Linearity*,¹² “the line impinges on all epochs of architecture. Even during early periods of architectural practice, ...linearity and the theoretical and cultural weight of the line influenced the shape and structure, the ethos, of architecture.”¹³ The conjunctions of linearity and architecture can be traced to the culture of the visual inaugurated by Gutenberg and his introduction into Western Europe of the techniques of printing from movable type; that conjunction was in fact noted by Giorgio Vasari in his 1570 biography of Leon Battista

Alberti: “when the very useful method of printing books was discovered by Johann Gutenberg the German, Leon Battista, working on similar lines, discovered a way of tracing natural perspectives and of effecting the diminution of figures by means of an instrument, and likewise the method of enlarging small things and reproducing them on a greater scale.”¹⁴ It is precisely the culture of visual space promised by Alberti's model and Gutenberg's press—both of them “spatializing machines,” as Ingraham notes¹⁵—that architecture has increasingly contested, and it is such a contestation that we observe in the monuments discussed by Young.

Yet it seems so obvious to say that architecture belongs to the realm of visual space that to suggest contemporary architecture is in many ways repudiating this space seems absurd; if architecture is repudiating visual space, then what is it affirming?¹⁶ We might ask that question another way, however, in keeping with the context in which Young has raised it: if architecture is itself a form of memorialization, a memory system, then what does architecture remember?

The question has been raised many times before, of course, and it has been answered with variations on the theme of history: George Hersey, for example, has suggested in *The Lost Meaning of Classical Architecture*, that classical architectural forms (fig. 8) memorialize sacrificial practices belonging to agrarian cultures.¹⁷ While we would dispute the universality, which Hersey ascribes to this system of coding, it is not to refute a

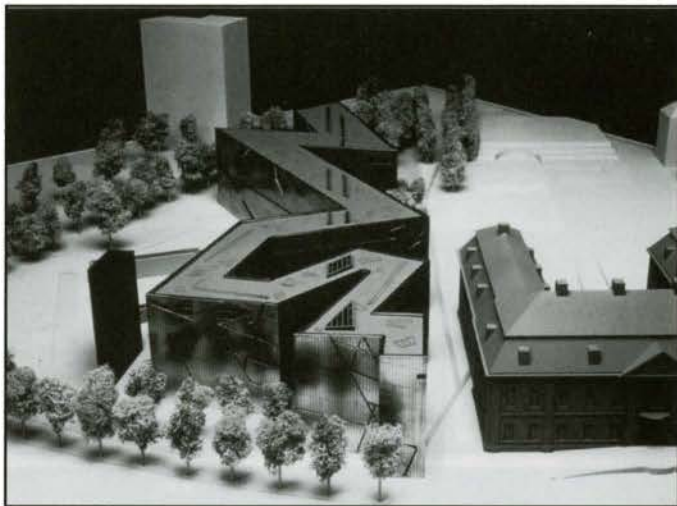


Fig. 5. Daniel Liebeskind, model, Jewish Museum, Berlin (1989).
(James Young, *At Memory's Edge*)



Fig. 6. Liebeskind, facade, Jewish Museum, under construction (1997).
(James Young, *At Memory's Edge*)

Fig. 7. Liebeskind, Jewish Museum in its Berlin context.
(James Young, *At Memory's Edge*)



historical approach to the question, but to suggest another one, one that makes a psychoanalytical rather than a historical argument.

What leads us to that reading is the longstanding connection between architecture and memory established by the memory theatres (fig. 9) that flourished during the Italian Renaissance, and which have been the object of brilliant accounts by Paolo Rossi and Frances Yates.¹⁸ These theatres are inseparable from the rhetorical tradition and the need it created for the orator to recall vast amounts of information. The orator would imagine a theatre filled with statues, each of which represented both a central tenet of the argument to be delivered, as well as the order of presentation; the theatre itself can be understood as representing the performative nature of oral delivery.

That particular conjunction of architecture and memory allows one to ask not only, "What does architecture remember?" which is the question that Hersey poses, but also, and more importantly for our argument, "What is it that architecture

forgets?" Indeed, adopting a psychoanalytical discourse, one can go further, and ask, "What memory has architecture repressed?"

When posing this question, it is useful to remind ourselves that Freud's notion of the uncanny is worked out in a specifically architectural context, that of the home, and hence Freud's term, *unheimlich*, meaning the un-homely, that experience whereby the most familiar of surroundings takes on a strange quality of otherness. It is possible, in these terms, to speak of an architectural unconscious, in the same way that Walter Benjamin spoke of an "optical unconscious" in the photographic work of Eadward Muybridge and Etienne-Jules Marey, work that conveyed aspects of motion, which were invisible to the eye. Rosalind Krauss has extended this notion to the critique of modernist art she makes in her book *The Optical Unconscious*,¹⁹ whereby she suggests that Modern art has always been accompanied by its other, these artistic modes which challenge modernism, but from within its own practices, and especially with reference to the hegemony of the visual, or the "retinal," as Marcel Duchamp called it. Similarly invoking Benjamin, Yve-Alain Bois, in the book *Formless*²⁰ co-written with Krauss, states that

[...] visual art, especially painting, addresses itself uniquely to the sense of sight. [...] The exclusion that proceeds from this [...] bears on the temporality within the visual and on the body of the perceiving subject: pictures reveal themselves in an instant and are addressed only to the eye of the viewer. [Another] ...postulate, based on a repression analyzed by Freud in *Three Essays on the Theory of Sexuality* (1905) and above all in *Civilization and its Discontents* (1930), is this: being "purely visual," art is addressed to the subject as an erect

Fig. 9. Robert Fludd, "The Theatre," *Ars Memoriae* (1619).
(Frances Yates, *Art of Memory*)

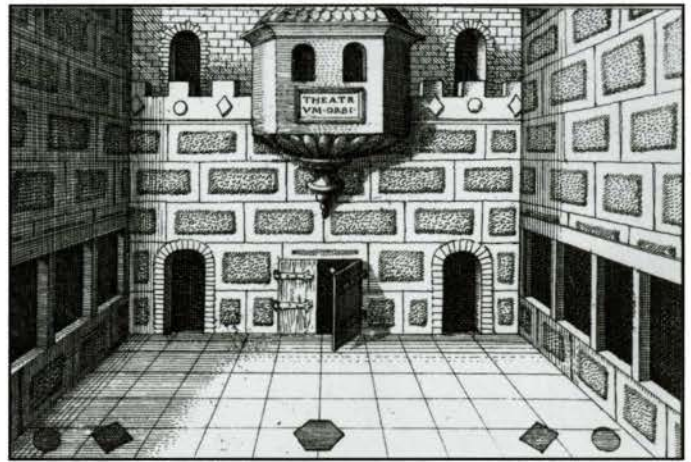
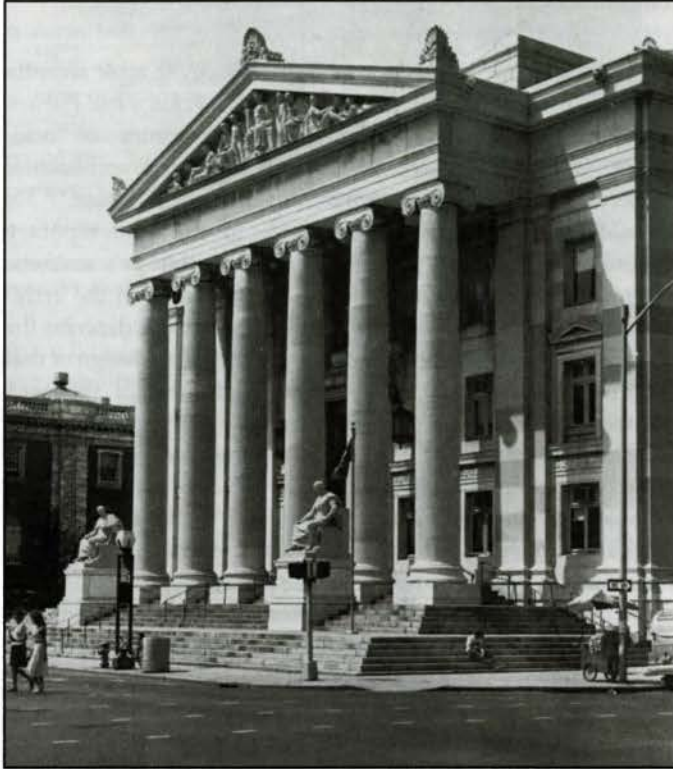


Fig. 8. Allen and Williams, State Circuit Court, New Haven CT (1909)
(George Hersey, *The Lost Meaning of Classical Architecture*)



being, far from the horizontal axis that governs the life of animals. Even if one no longer speaks of painting as a "window opened onto the world," the modernist picture is still conceived as a vertical section that presupposes the viewer's having forgotten that his or her feet are in the dirt. Art, according to this view, is a sublimatory activity that separates the perceiver from his or her own body.

Applying such insights to architecture, we would like to suggest that the otherness within architecture, the repressed memory within the architectural unconscious, is that of acoustic space.²¹ And again, as we did when speaking of visual space, let us specify that by "acoustic," we mean that space which contests linear, sequential, continuous, perspectival space. It is thus not only a space that can be heard; it is also a space that can be seen, as in a cathedral, or a piazza, or in the arcade of the Vancouver Public Library, or in a building such as Frank Gehry's *Experience Music Project*. We are thus making a distinction between the visual—that which can be seen—and visual space, which is a particular sort of space (though far from universal) that has been constructed according to the norms of linearity and perspective, on the one hand, and between the acoustic—that which can be heard—and acoustic space, which is a particular construction of space that is discontinuous, non-linear, and non-perspectival, on the other hand.

As we have documented in our recently published book, *McLuhan in Space: A Cultural Geography*,²² Marshall McLuhan uniquely developed the notion of acoustic space into a powerful heuristic, which he employed in his critique of visual culture. Writing in the fourth issue (1955) of the journal *Explorations*, which he co-edited with Edmund Carpenter, McLuhan defines acoustic space as having

[...] no point of favored focus. It's a [...] space made by the thing itself, not space containing the thing. It is not pictorial space, boxed in, but dynamic, always in flux, creating its own dimensions moment by moment. It has no fixed boundaries; it is indifferent to background. The eye focuses, pinpoints, abstracts, locating each object in physical space, against a background; the ear, however, favors sound from any direction. We hear equally well from right or left, front or back, above or below. If we lie down, it makes no difference, whereas in visual space the entire spectacle is altered. We can shut out the visual field by simply closing our eyes, but we are always triggered to respond to sound. [...] There is nothing in [acoustic] space corresponding to the vanishing point in visual perspective.²³

McLuhan elaborated in a myriad of ways on that notion of acoustic space throughout his career, and on two occasions he did so in architectural journals, publishing "Inside the Five Sense Sensorium"²⁴ in *The Canadian Architect* in 1961 and "Environment: The Future of an Erosion"²⁵ in *Perspecta* (the Yale Journal of Architecture) in 1965, that article being reprinted more than any other during his lifetime.

"Inside the Five Sense Sensorium" elaborates McLuhan's central thematic, and in many ways is the direct antecedent to *The Gutenberg Galaxy* (one of the books, along with *Understanding Media*, on which his reputation is founded). McLuhan argues that visual (linear) space is the product of print culture, and that after five hundred years of the book, we are entering into a new phase that is being created by electronic media and their tendency to collapse space and time into a space-time that is at once local and global, thus breaking down the distancing characteristic of perspectival space. It is this new space that McLuhan dubs "acoustic;" unlike visual space, which privileges sight, acoustic space involves the other senses as well, re-invigorating the five-sense sensorium in the production of a space



Fig.10. Le Corbusier, Philips Pavilion (1958), Brussels World's Fair.
(Marc Treib, *Space Calculated in Seconds*)

that is much more interactive and involving than visual space. McLuhan suggests that this new space will have a dramatic influence on architecture and on the way in which we construct cities, and he adjures architects to take acoustic space seriously: "It seems quite obvious that the lineality that invaded every kind of spatial organization from the sixteenth century onward had as its archetype and matrix the metal lines of Gutenberg's uniform and repeatable types."²⁶ He then asks: "How to breathe life into the lineal forms of the past five centuries while admitting the relevance of the new organic forms of spatial organization (what we have explained as '[acoustic] space')—is this not the task of the architect at present?"

In his *Perspecta* article, "Environment: The Future of an Erosion," the title refers to the erosion of visual space under the onslaught of acoustic space as promoted by the increasing influence of electronic media. The allusion to Freud's 1927 article, "The Future of an Illusion," invokes Freud's comment there that "Human creations are easily destroyed, and science and technology, which have built them up, can also be used for their annihilation."²⁷ McLuhan called those scientific and technological domains "environments" and argued that we were largely unconscious of them, since they constituted our total experience of the world around us. As an unconscious domain, the environment thus took on the guise of a vast dream world, and McLuhan constantly urged that we acknowledge that element of the irrational to be fundamental to the environments that we built for ourselves. In urging a counter-intuitive approach to built structures, McLuhan was likewise urging that we critique the assumptions of rational, visual space, proposing, in its stead, the "ear-rational"²⁸ domain of acoustic space.

It is important for the present discussion to note that McLuhan was highly influenced by the writings of Le Corbusier in formulating his notion of acoustic space. Although McLuhan rejected rationalist modernism as belonging uncritically to the world of the book, he was nevertheless aware of another sort of space within modernism, "*l'espace indicible*" or "ineffable space," as Le Corbusier put it.²⁹

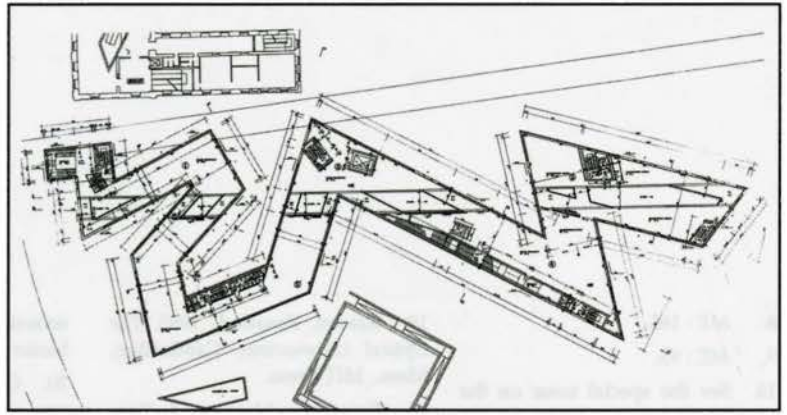
McLuhan refers to Le Corbusier a number of times in the article "Inside the Five Sense Sensorium." Writing about the

effects of mass media on the contemporary city (a topic recently taken up by Beatrice Colomina in her book *Privacy and Publicity*),³⁰ McLuhan invokes Le Corbusier in the context of "resonance," the sort of acoustic that characterized architecture "when the cathedrals were white, in Corbusier's phrase."³¹ He parallels that resonating experience to the contemporary synesthesia induced by mass media. Le Corbusier's aesthetic program was tellingly summed up for McLuhan in the architect's phrase "visual acoustics,"³² which he used to describe the chapel at Ronchamp; contemporaneously with his design of that building, Le Corbusier was making sculptures of the ear.³³ Stephen Gardiner notes that Le Corbusier's "struggle for space" led him to propose "the possibility of being able to sense—if not entirely *to see*—a building from every point, whether inside or outside or both." Le Corbusier gave voice to that notion in his 1946 article "*Espace indicible*," where the architectural achievement of ineffable space was linked to synesthesia. Thus, in the perfectly designed building, a "phenomenon of concordance takes place, as exact as mathematics, a true manifestation of plastic acoustics." In a note to one of his drawings accompanying the article, Le Corbusier writes that it represents "architectural walls poised to echo, to bring to life this acoustic time-space phenomenon."³⁴

Le Corbusier sought to realize that notion of "visual acoustics" in the Philips Pavilion (fig. 10), a hyperbolic paraboloid structure he designed in 1958 for the Brussels World Fair. Edgard Varese wrote a "spatialized" composition for the building, the *Poème électronique*, which had been scored for delivery from a number of different points within the structure. Le Corbusier sought to achieve in that building the goal he had set out in "ineffable space" of "a release of aesthetic emotion" as "a special function of space."³⁵

It is this acoustic space, we are arguing, that constitutes the architectural unconscious and is the architectural "other," and it is this space that is invoked, we think, by the works that James Young discusses—indeed, one such project by Jochen Gerz is called the "Ear" monument and has provision to house oral histories of the holocaust.³⁶ Young states in his book that the traditional monument is "vanishing" as we enter into the era of the counter-monument with its polemic that is "directed against actually building any ...design."³⁷ Yet the fact that these monuments *are* being built, often against almost impossible odds, would suggest that Young's argument could be more profitably reformulated in terms of a polemic against *visual space* and its accompanying ideology of perspectival representation with its isolation of the viewer and its fixed positionality. Indeed, Young

Fig. 11. Liebeskind, first-floor plan, Jewish Museum, Berlin (1988).
(James Young, *At Memory's Edge*)



devotes a section of his book to the “invisible” monument,³⁸ though, as we have suggested, it is visual *space*, which is contested here, as opposed to visibility.

In that context, let us revisit Horst Hoheisel’s Aschrott Monument. Hoheisel proceeded, we recall, in two phases: he first rebuilt the monument, which was exhibited publicly adjacent to the site chosen for the final version of the work; then, he inverted the monument and sank it below the surface, removing it completely from visual space and invoking acoustic space through the sound of rushing water which now constitutes its presence at the site. Young argues that such a space is “negative” and represents “absence.” We don’t think he would refer to a piazza or platz as an absence, however, yet it too is a space waiting to be produced interactively by an assembly of people and has consistently been the site of important historical events. Indeed, the works Young discusses could not fulfil their function—as they do—if they were able to convey only negativity and absence. Young is here constrained both by the notion that non-visual space must represent an absence and thus must be a negative space, and by the notion that post-modernism cannot gesture meaningfully to history. But as we have suggested, visual space is only one kind of space, and post-modernism may be supplementary to modernism rather than a clean break from it³⁹—and in this context it is important to note how all of the structures we have discussed here present themselves as supplementary rather than as original or originary. These works gesture toward a history from below, a history that is not a grand narrative but a story, or “open narrative,” which is the phrase Liebeskind uses to describe his museum (quoted in *ME* 175).⁴⁰

Interestingly, works such as Rachel Whiteread’s and Micha Ullmann’s are framed in terms of the book and the absent spaces produced by the linearity associated with book culture. The straight void-line running through the plan for Liebeskind’s museum (fig. 11) similarly “violates every space through which it passes, turning otherwise uniform rooms and halls into misshapen anomalies, some too small to hold anything, others so oblique as to estrange anything housed within them.”⁴¹ The persons experiencing these structures are not given a fixed positionality, as with perspectival space, but a participant one that is associated with acoustic space, which is similarly interactive (and hence, in our view, the enormous popularity of Liebeskind’s museum even before it has staged an exhibition).

Those architects’ invocations of the book and its attendant culture of visibility also serve to remind us that architecture is a signifying system—a medium, as McLuhan argued. That is cru-

cial to our understanding of how post-modernist architecture has been able to speak to some of the most important historical events of the century, though it has done so in terms of lived history rather than in terms of the historical monolith. By reminding us that architecture is a signifying system, post-modernist architecture has been able to deconstruct the built structure as a universal monolith having validity, as with the Palladian style, at once in Vancouver and Sri Lanka, and reconstruct it as local and particular, resituating the viewer of perspectival space as the producer of acoustic space—local story, as opposed to grand narrative. The Marxist critique of post-modernist architecture as endlessly self-referring—and here we are thinking of Jean Baudrillard’s essay, written some twenty years ago, on the simulacral qualities of the World Trade Centre⁴²—was tragically controverted by the events of September eleventh. If contemporary architecture appears to be turning traditional forms upside down, it is perhaps to reassert a much older architectural memory than can be invoked by pillars and pediments.

Notes

1. Young, James E., 1999, “Memory and Counter-Memory”, *Harvard Design Magazine*, p. 4-13.
2. Ginzburg, Carlo, 2001, “Distance and Perspective”, in *Wooden Eyes: Nine Reflections on Distance*, N.Y., Columbia University Press.
3. Among those critics of architectural post-modernism we have in mind, particularly: Fredric Jameson, whose *Postmodernism, or The Cultural Logic of Late Capitalism* (1991, Durham, Duke University Press), is a scathing critique of the post-historical as manifest in a number of built structures; and Andreas Huyssen, whose “Monuments and Holocaust Memory in a Media Age” (in *Twilight Memories: Marking Time in a Culture of Amnesia*, 1995, N.Y., Routledge, p. 249-260) sees the post-modern memorial as merely one more example of the memory industry.
4. See particularly on that topic Perez-Gomez, Alberto, and Louise Pelletier, 1997, *Architecture and the Perspective Hinge*, Cambridge, Mass., MIT Press.
5. Young, James E. glosses the Nietzschean overtones that this term bears (2000, *At Memory's Edge: After-Images of the Holocaust in Contemporary Art and Architecture*, New Haven, Yale University Press; specifically p. 94). (Cited in the text as *ME*.)
6. Liebeskind is also the architect for the proposed addition to Toronto’s Royal Ontario Museum, which appears to take the Berlin Museum design, turn it ninety degrees, and place it atop the current structure. In the context of the present paper, this turn from the horizontal to the vertical is not without interest.
7. *ME* : 163.

8. ME : 165.
9. ME : 93.
10. See the special issue on the Vancouver Public Library of *Architecture in Canada* (2000, vol. 25, No. 1) and, in particular, Rhodri Windsor-Liscombe's "Conditions of Modernity: si[gh]tings from Vancouver", p. 3-15.
11. *Something* has certainly come to an end in architecture; witness not only the deconstructivist tendencies of the last two decades, but also, on the theoretical front, the demise of the journal *Assemblage*, whose 41st and last issue (April 2000) was accompanied by a plethora of non-perspectival images.
12. Ingraham, Catherine, 1998, *Architecture and the Burdens of Linearity*, New Haven, Yale University Press).
13. *Ibid.* : 4.
14. Quoted from volume one of Vasari's *Lives* by Friedrich Kittler, 2001, in "Perspective and the Book", trans. Sara Ogger, in *Grey Room* vol. 1, No. 5, p. 38-53.
15. Ingraham : 48.
16. That is an especially difficult question for North Americans, we think, because the North American city is so largely a product of the grid system that reflects the origins of colonialism within print culture; yet spend an hour in one of Europe's piazzas or in one of its cathedrals, and quite another element of architecture and the production of space unquestionably emerges.
17. Hersey, George, 1988, *The Lost Meaning of Classical Architecture*, Cambridge, Mass., MIT Press.
18. Rossi, Paolo, 1960, *Clavis Universalis: arti mnemoniche e logica combinatoria da Lullo a Leibniz*, Milano, Ricciardi; Frances Yates, 1966, *Art of Memory*, London, Routledge and Kegan Paul.
19. Krauss, Rosalind, 1993, *The Optical Unconscious*, Cambridge, Mass., MIT Press.
20. Bois, Yve-Alain, and Rosalind Krauss, 1997, *Formless: A User's Guide*, N.Y., Zone.
21. "The architecture-of-stasis always harbors the lament for an architecture-of-motion" (Ingraham : 142).
22. Cavell, Richard, 2002, *McLuhan in Space: A Cultural Geography*, Toronto, University of Toronto Press.
23. We are quoting from the version of this essay published in *Explorations in Communication*, ed. Edmund Carpenter and Marshall McLuhan, 1960, Boston, Beacon Press, p. 65-70; this quote p. 67. As Friedrich Kittler notes in the article cited above, it was Marshall McLuhan who first articulated the connections between printing, perspective, and the culture of the visual in *The Gutenberg Galaxy*, published in 1962.
24. McLuhan, Marshall, 1961, "Inside the Five Sense Sensorium", *The Canadian Architect* vol. 6, No. 6, p. 49-54.
25. McLuhan, Marshall, 1965, "Environment: The Future of an Erosion", *Perspecta*, 11, p. 164-167.
26. McLuhan : 54.
27. Freud, Sigmund, 1989, "The Future of an Illusion", in Peter Gay, ed. *The Freud Reader*, N.Y., Norton, p. 685-722; this quote p. 687.
28. The term "ear-rational" was coined by Canadian poet bpNichol, who was profoundly influenced by McLuhan, as we argue in *McLuhan in Space*; see particularly p. 151.
29. See Anthony Vidler's discussion of "ineffable space" in his recent *Warped Space: Art, Architecture, and Anxiety in Modern Culture* (2000, Cambridge, Mass., MIT Press); Vidler makes little of the acoustic element within Le Corbusier's formulation.
30. Colomina, Beatriz, 1994, *Privacy and Publicity: Modern Architecture as Mass Media*, Cambridge, Mass., MIT Press.
31. McLuhan : 54.
32. Gardiner, Stephen, 1974, *Le Corbusier*, N.Y., Viking, p. 27.
33. *Ibid.* : 91.
34. Le Corbusier, "Ineffable Space," originally published as "L'Espace indicible" in *L'Architecture d'aujourd'hui* (January 1946) and in English in 1948 in *New World of Space*; reprinted in *Architecture Culture 1943-1968: A Documentary Anthology*, ed. Joan Ockham, with Edward Eigen, N.Y., Columbia University Press, p. 66-67.
35. Quoted by Marc Treib, 1996, in *Space Calculated in Seconds: The Philips Pavilion, Le Corbusier, Edgard Varèse*, Princeton, Princeton University Press, p. xvi.
36. ME : 149.
37. *Ibid.* : 5.
38. ME : 140-144.
39. This is the conclusion of Rhodri Windsor-Liscombe in the article cited above.
40. It is noteworthy that Liebeskind is a professionally-trained musician and that he closely inter-relates that training with his architectural practices.
41. See as well on Liebeskind *Architectural Design* vol. 70, No. 5 (October 2000), special issue on "The Tragic in Architecture", ed. Richard Patterson, esp. p. 66-75; Elke Grenzer, "Setting the Stage for a New Germany: Architecture and the Scene of Berlin", *Public* 22/23 "Cities / Scenes", ed. Janine Marchessault and Will Straw, p. 219-243; and Neil Leach, "Erasing the Traces: the 'denazification' of post-revolutionary Berlin and Bucharest", in Neil Leach, ed., *The Hieroglyphics of Space: Reading and Experiencing the Modern Metropolis*, London, Routledge, 2002, p. 80-91. See also ME : 163-164.
42. Baudrillard, Jean, 1983, *Simulations*, N.Y., Semiotext[e] inc.