Machinic Magic: IBM at the 1964-1965 New York World's Fair

Ben Highmore

THE CONTENT OF THE FORM

This essay's fairly modest aim is to describe the way that IBM promoted computers through a display ensemble entitled the Information Machine at the New York World's Fair in 1964 and 1965. The essay's focus, then, is a relatively discrete display that formed the main attraction within the pavilion of the most powerful company in the US producing and selling computers in the mid 1960s.[1] The less modest aim is to argue that resuscitating formalist analysis allows the IBM display to be recognised as a modern version of phantasmagoria. The 'content of the form' refers to ^{Hayden White} book with that title.[2] For White 'form' refers specifically to narrative form in the writing of history, whereas for this essay 'form' is more generally mediatic, performative, and architectonic, and importantly contradicts much of the explicit narration of the display. The modern phantasmagoric is the general object lurking in the background of this essay's concentration on a specific display. And it is here where an argument animates analysis: the ideological drive of modern phantasmagoria is to be found not in its manifest and declared content but in the content of its form. It is the form of the display that addresses an audience with a 'content' aimed not at the mind or the heart but at the body's own potential for change. What connects the modern phantasmagoria to its historical antecedents in the late eighteenth and early nineteenth century is its address to an audience ambivalent and sceptical about technological change. I want to argue that phantasmagoric address is *the* address that most successfully seduces (however momentarily such seduction might last) an audience resistant to the rhetoric of progressive technological development. As such it performs powerful modern magic.

The methodological orientation of this essay, then, is formalist, but it is also historical. In his 1957 essay 'Myth Today', Roland Barthes claimed that 'a little formalism turns one away from History, but that a lot brings one back to it'.[3] Barthes recognised that a certain use of formalism tended to hypostasise the meaning of forms; abstract them, take them out of history, and downgrade the peculiar inflections that constitute forms as specific objects. The antidote to this is an excess of attention to the specificity of forms. Close-reading and thick-description are the prophylactics that guard against the de-historicising impulse of surface formalism and allow capillary connections to be made to living cultural history. This essay makes these connections by working centrifugally; out from a central thick-description

1. The story of IBM's massive dominance of the emergent computer market is recorded in Thomas J. Watson Jr (and Peter Petre), *Father, Son & Co My Life at IBM and Beyond*, New York, Bantam Books, 1990. Thomas Watson Jr was head of IBM from 1956-1971.

2. Hayden White, *The Content of the Form: Narrative Discourse and Historical Representation*, Baltimore and London, Johns Hopkins University Press, 1987.

3. Roland Barthes, 'Myth Today' in *Mythologies*, A. Lavers (trans), London: Granada Publishing, 1973, p112.

of the Information Machine towards a consideration of how this form of display connects and disconnects with other, previous and subsequent modes of display that bear both visual and performative similarities and differences. And this in turn will take us back to the historical context of the Information Machine because the essay will ask, as an excessive formalism must ask, for some explanation as to why a cultural force took *this* particular and peculiar communicative shape at *this* specific moment. But before getting to the details of the IBM pavilion it is worth briefly casting an eye over the critical and not-so-critical literature on world's fairs, if only to clarify something of the dialogic context for this essay. This will also provide a springboard for introducing some of the formal arrangements that are evident in twentieth-century world's fairs, and that are vividly set to work by the Information Machine.

In their book, *Fair America: World's Fairs in the United States*, Robert Rydell, John Findling and Kimberly Pelle start out with an audit of the various approaches that world's fairs have been subjected to. Dividing their account into six 'schools of thought' they begin by pointing to what must, by now, be the dominant interpretative approach to fairs, exhibitions and displays; 'the cultural hegemony school'.[4] This approach sees world's fairs as cultural technologies designed to 'win the hearts and minds' of their audience. Drawing on the theoretical legacies of Gramsci and Foucault, writers such as Tony Bennett see 'the exhibitionary complex' (Bennett's term for the display technologies found in museums, world's fairs, and exhibitions more generally) as 'concerned to organize a voluntarily self-regulating citizenry'.[5] Rydell, et al, describe this work as being concerned with the intentions of exhibitionary producers, and necessarily having to ignore the negotiated moments of actual commerce and contact with the display forms. Their second school is, in part, a reaction to the first school as it looks to the actuality (and occasional recalcitrance) of audiences, and the failure of some fairs to fulfil the task of winning hearts and minds. The third school is a more straightforward inversion of the first category and gets named by the authors as the 'counterhegemony school'[6] - as this school argues that some fairs have provided an opportunity for exploited and marginalised groups to re-accentuate these fairs to express their own interests. The fourth school is anthropologically oriented and privileges ritualistic aspects of fairs. One vivid example from this work is a reading of world's fairs as demonstrations of excessive wealth and waste (the transitoriness of the extravaganzas mean that fairs usually end in mass-demolition), analogous to a Native American potlatch, but played out at the level of nation states.[7] The fifth school they designate as being concerned primarily with documenting the way fairs promoted science and technology. The sixth, and probably the largest category, is the non-academic accounts provided by souvenir publications, photography books, reminiscences, and novels.

The authors of *Fair America* are committed, in the main, to the 'cultural hegemony' school of thought (which may be one reason why it heads their

4. Robert W. Rydell, John E. Findling, and Kimberly D. Pelle, *Fair America: World's Fairs in the United States*, Washington, Smithsonian Institution, 2000, p5. References to the key publications of the six schools can be found in this volume.

5. Tony Bennett, 'The Exhibitionary Complex', *new formations*, 4, 1988, p76.

6. Rydell, Findling and Pelle, *Fair America*, p6.

7. See Burton Benedict (ed), *The Anthropology of World's Fairs*, London and Berkeley, Scolar Press, 1983.

8. See chapters 1 and 15 of Clifford Geertz, *The Interpretation of Cultures*, London, Fontana Press, 1993, first published in New York in 1973.

9. Rich Hanley, *The 1964 World's Fair: Relive the Wonder*, 1996 Connecticut Public Television, 1998 Janson Video. The fair lasted for two seasons, running from April to October in the years 1964 and 1965.

10. At the 1964-5 New York World's Fair the main display in the General Motors pavilion was the uninspiringly named Futurama II. Futurama had been the name of the display in the General Motors pavilion in 1939-40 New York World's Fair.

11. For an account of Futurama II see: Smith, Michael L. 'Making Time: Representations of Technology at the 1964 World's Fair', in Richard Wightman Fox and T. J. Jackson Lears, (eds) *The Power of Culture: Critical Essays in American History*, Chicago and London, University of Chicago Press, 1993, pp222-244.

list). I want, instead, to argue that material form the sixth and final 'ragbag' of a school provides accounts more attentive to the forms of world's fairs in general, and more specifically, to the forms at work at the IBM pavilion. Popular publications, journalism and novels have, on the whole, provided keener descriptions of the experience of fairs (and if formalism is going to be critically productive it will need to be able to ride the coattails of experiential description). Not only is this material 'thicker' in the classic Geertzian sense,[8] it is also better at figuring a conundrum that seems largely absent from the more scholarly literature: namely the way that fairs can be simultaneously scorned and enjoyed, derided while also being immensely popular. How is it that people will cue for hours to visit a display whose manifest ideological message they find unpersuasive, or simply laughable?

Something of this is caught in Rich Hanley's 1996 television documentary about the 1964-1965 World's Fair.[9] Using a familiar and populist format, whereby archive footage is interlaced with present-day reminiscences, the documentary uses the fair for its nostalgic evocation of childhood memories. The participants in the documentary look back at their, often multiple, visits to the fair with what seems like unbridled sentimentality. Yet alongside the memories of childhood visits on balmy summer days, and strawberries-and-cream-laden waffles from the Belgian pavilion, the participants recall a general scepticism about the various beliefs that the pavilions sought to foster. Of course this could be an effect of hindsight; older, wiser selves looking back with incredulity on what the corporate world of the 1960s imagined as the values to be promoted for the present-day and for the future. But there is something more than hindsight here. These middle-aged witnesses talk about their younger selves queuing for hours to experience the General Motors' display - Futurama II.[10] Remembering their teenage experience they describe how unconvinced they were by the vision of the future on offer, a vision of unrestrained technological expansion,[11] and yet they queued again for another hour or two to take 'the ride' a second time, then a third. Popular and compelling as these displays evidently were, it seems that their attraction lay somewhere else than in the messages that they promoted. The 'ride' is, of course, the pleasurable element here, the attraction that both supersedes and compensates for the energetic but uninspiring rhetoric of the pavilions. The 'ride' provides the specific and experiential form for many displays including, as we will see, the Information Machine.

The point of separating out 'content' (which often consisted of paternalistic voice-over commentary) from 'form' (the whole architectonic experience of the display) is to recognise that these aspects were often at odds with one another. It is the 'ride' itself, its performativity, that provides an exuberance missing in the literal address. For instance, another pavilion that received constant criticism for its manifest content (and for the framing of this content) was the United States pavilion. The United States pavilion presented a narrative of its past, present and future designed to verbally

invite the audience to identify with all America's achievements. Utilising a direct mode of address and setting American history in a continual present, 'Past as Prologue' (the title of the filmic presentation) announced that '*you* tamed the wilderness, then *you* invented the electric light', and so on. As one writer (who had witnessed the presentation) later put it: 'America was made personal in a way that made her sound like a smug bully'.[12] Yet the pedagogic belligerence of the presentation also needs to be set alongside the physical performance of the display. The presentation, which was 'viewed on moving grandstands, led one through American history and to the moon and Milky Way with 135 screens that rose, slid, and formed tunnels'.[13] It is this hyperactive assault on the senses, the frenzy of mobility and visuality, and the sheer superabundance of this extravaganza that also needs to be taken into account. This superabundance is a saturation of the field of vision but it is also more than this; it is an architectonic experience that submits the body to a series of movements and virtual worlds.

Walter Benjamin's 'Exposé of 1935' offers two related descriptions of world exhibitions that are invaluable for teasing out some of the issues at stake in this aspect of world's fairs. On the one hand 'phantasmagoria': 'the phantasmagoria of capitalist culture attains its most radiant unfolding in the world exhibition'.[14] On the other hand 'pilgrimage': 'world exhibitions are places of pilgrimage to the commodity fetish'.[15] I will have more to say on the subject of phantasmagoria below, but in the meantime it is worth noting the religious insistence of Benjamin's phrasing. Always attuned to the theological repercussions of modern commodity culture, Benjamin's sense of a sacred realm for the commodity gets echoed in contemporary description of the Information Machine. *Life*, for instance, suggested that: 'in this punctual *deus ex machina* the designers have hit a Dionysian button calling up emotions of awe, terror, recognition and joy that are far more religious than those which Michelangelo's *Pietà* evokes'.[16] 'Awe' and 'terror', as we shall see, might well describe something of the IBM pavilion, but they don't describe the content, nor do they describe the *manifest* intentions of IBM who claimed that the whole pavilion was designed 'to show that computer systems use simple human-scale concepts and techniques'.[17] Yet the experiential form of the IBM display, like the Christian religion, employed decidedly non-human-scale concepts and techniques.

One of the best descriptions of the effects and affects of the non-human-scale of exhibition displays is to be found in E.L. Doctorow's novel *World's Fair*, which describes the 1939-1940 New York World's Fair. The novel comes to something of a crescendo when the protagonist (a young boy) eventually visits the fair, determined to see all its wonders. The novel describes the colossal spectacle and the reaction of the boy as he careers from one pavilion to the next. Confronted by the insistent re-scaling of the world by the fair's displays, he moves from pavilions presenting the world in miniature (the General Motors pavilion and the Consolidated Edison exhibit) to those displaying gigantic versions of body parts (the Public

12. George W.S. Trow Jr, 'World's Fair' in *Within the Context of No Context*, New York, Little Brown, 1981, cited in Robert A. M. Stern, Thomas Mellins, and David Fishman, *New York 1960: Architecture and Urbanism Between the Second World War and the Bicentennial*, New York, Monacelli Press, 1995, p1034.

13. Sheldon J. Reaven, 'New Frontiers: Science and Technology at the Fair', in *Remembering the Future: The New York World's Fair From 1939-1964*, New York, The Queens Museum, 1989, p99.

14. Walter Benjamin, *The Arcades Project*, Howard Eiland and Kevin McLaughlin (trans), Cambridge, Mass. and London, Harvard University Press, 1999, p8.

15. Ibid., p7.

16. Vincent Scully, Jr, 'If This Is Architecture, God Help Us', *Life* 57, July 31, 1964, p9. Michelangelo's Pieta was being displayed in the Vatican pavilion.

17. Arnold Lerner, IBM press release April 18, 1963

18. E. L. Doctorow, *World's Fair*, London, Picador, 1985, pp239-243.

19. Ibid., p243.

20. Miles Beller, *Dream of Venus (or Living Pictures)*, Beverly Hills, California, C. M. Publishing, 2000, p17.

21. General Motors, Press Release, February 7, 1939, p2.

22. Anne Friedberg, *Window Shopping: Cinema and the Postmodern*, Berkeley, Los Angeles, and Oxford, University of California Press, 1993, p4.

23. Tony Bennett, 'A Thousand and One Pleasures: Blackpool Pleasure Beach', in *Formations* editorial board (eds), *Formations of Pleasure*, London, Routledge & Kegan Paul, p148.

Health Building).[18] The effect is vertiginous: 'I was made light headed by the looming and shrinking size of things'.[19] Towards evening he enters a tent where his friend's bathing-suited mother (along with other female swimmers) wrestles with an 'amorous octopus' in a tank of water. The Midway erotics of the octopus wrestlers is contrasted with the teacherly address of the medical profession or General Motors ('tomorrow will look this'), yet what characterises both types of display is the dizzying affects that they produced for this particular (imagined) visitor. In Miles Beller's novel of the same world's fair, the experience of visiting General Motors' 'Futurama' is also described in vertiginous ways: 'The future made you swoon, shaky in the knees. The future made you small and insignificant, nominal in the big picture'.[20] While the 1939 'Futurama' modelled the world in miniature it did so on a massive scale: 'The "Futurama" contains approximately 500,000 individually designed houses and buildings; more than a million trees of eighteen species, and 50,000 scale-model automobiles, 10,000 of which will be in actual operation over the superhighways, with their traffic control towers, speed lanes, multi-decked bridges and other such innovations'.[21]
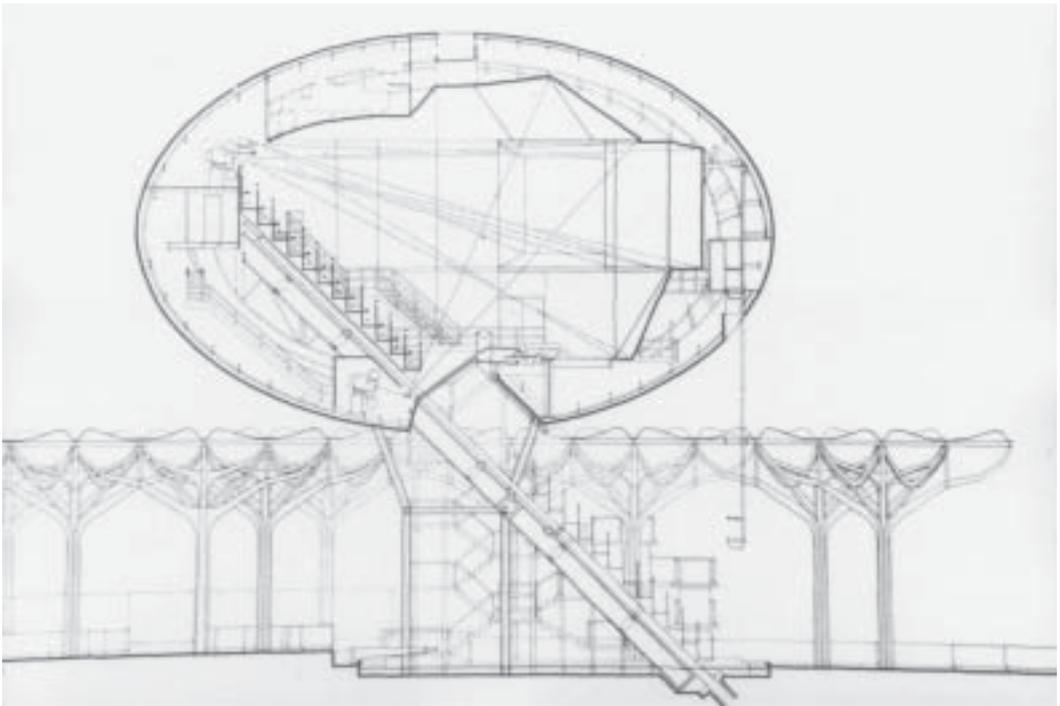
Doctorow and Beller's description suggests that the experiential effect of these non-human-scale displays is a sense of bodily vertigo. Displays like the 'Past as Prologue' and General Motors' 'Futurama' seem to suggest a form of spectatorship that Anne Friedberg has described (in another context) as 'the mobilized and virtual gaze'.[22] But while the frenetic mobility and spectacularity of these displays might well account for something of their dizzying effect, I don't think that a predominantly visual account of this explains the full extent of the body's situation in these displays. One of the speculations that this essay seeks to develop is the idea that world's fair pavilions addressed, in the form of the ride, the *creaturely*-self, as opposed to the reasoning-self, or the sentimental-self. While displays like the Information Machine might mimic some of the affects and effects of the more carnivalesque fairground rides (by 'liberating the body from normal constraints to expose it to otherwise unattainable sensations'[23]), I want to suggest that they have a more systematic and specific performativity that figures the creaturely body as machinic. They do this partly by situating the body as a machinic component within a larger assemblage and offering the creaturely-self a machinic experience. If religion invites believers to imaginatively shrug off normal, mortal, fleshy limitations, the Information Machine offered a comparative invitation. But here, in the context of the mid 1960s, to be machinic (rather than to want more machines) was a fantasy that tried to miraculously shrug off a body that was marked indelibly as a social and historical body. It is the fantastic (and phantasmagoric) overcoming of human social relations, through machinic displacement, that we can get to through close attention to the form of the Information Machine. And it is this attention that will take us to the historical moment of the fair.

THE INFORMATION MACHINE

The IBM pavilion was designed by Eero Saarinen and Associates. Eero Saarinen designed the pavilion but died before it was erected. He had previously worked for IBM, designing a factory in Rochester, Minnesota and a research centre in Yorktown Heights, New York. Saarinen was one of the most critically acclaimed architects at the time. The choice of Charles and Ray Eames as the designers for the display was also a conscious choice of picking highly prominent designers to work on IBM promotion, infrastructure, and product design. The catalogue to the pavilion was designed by perhaps the most famous graphic designers at the time - Paul Rand (who also designed the multiple versions of the IBM logo).

The pavilion consisted of a 'grove of man-made steel trees', a rusted forest of 32-foot-high, tree-shaped supports that provided a canopy that housed a number of different exhibits (see fig. 1). Arranged beneath the canopy were; small puppet theatres designed by Ray Eames and featuring Sherlock Holmes and Dr Watson; probability displays; and data processing systems. The main element of the pavilion was a gigantic ovoid structure consisting of a concrete shell overlaying a steel frame and mesh that was perched on top of the canopy's roof. The outer surface of the 'egg' was covered with the letters IBM repeated nearly 3,000 times. The ovoid dome was part of the Information Machine; a multi-media theatre which presented a film and slide-show called 'Think' designed by Charles and Ray Eames.

Fig. 1, Diagrammatic representation of IBM Pavilion, New York World's Fair 1964-5

According to an IBM press release of 1963 the aim of the pavilion was simply; 'to tell the story of modern information handling devises in an interesting, informative and educational manner'.[24] The educational idea of the pavilion, and of 'Think' in particular, was to demystify computers: 'they help solve the most complex problems with the simple principles of logic, similar to those we all use in making decisions everyday'.[25] To this end the content of the display was determinedly work-a-day and domestic. For instance in offering examples of how closely aligned everyday life and computer operations are 'Think' offered spectators an image of a male football coach working on team strategies. The computations of the possible moves he works on are similar (according to 'Think') to the computations performed by the IBM processor. Switching genders 'Think' suggested forms of computation appropriate to women's everyday life. IBM and Charles Eames pictured a woman busily working out a seating plan for a dinner party (fig. 2):

> The hostess faces the challenge of seeing that the guests sit next to people they enjoy and at a distance from those they might not get along with. […] As she shifts people around to find the best arrangement, the hostess makes notes and finally draws a rough diagram of the seating plan - her personal model - until she finds the right combination. Later, a glance down the table as the dinner is under way tells her that her chosen model was the right one - the quests are chatting happily - the party is a success.[26]

The gendered address of this material is a recognisable aspect of its historical moment and is, I would guess, part of the project of making computers as 'normal' as possible. Everyday life, in its most normative form, is the insistent referent for the manifest content of the display: football, weather, dinner

24. Arnold Lerner, IBM press release April 18, 1963

25. IBM press release (From/IBM) April 21, 1965

26. *The IBM Pavilion: New York World's Fair 1964-5* (IBM Catalogue to Pavilion), p25.

Fig. 2, Images of 'Think': dinner party computation

parties and so on. Yet the everydayness of the display, while constantly stressed in the supporting catalogue, seem entirely absent from the experiential form that the display took.

The everydayness of the content is propped onto a display technique that conjures up the exact opposite of demystification: awe and terror. While this might not sit easily with the declared intention of IBM, Charles and Ray Eames had for some time been fashioning an approach to exhibitioning that employed a pedagogy based as much in magic as in reasoned explanation. Magic is the term used by Charles Eames to describe his relationship with science:

> I was raised in a nineteenth-century mode, where my first experience with science involved minor physics experiments done almost as parlour tricks, mathematics through magic squares and electricity by way of a 'shocking machine' which was reputed to have some therapeutic value. All this had an aura of magic about it.[27]

And while the Eameses had been employed as a design team to promote the *understanding* of science (by IBM, but also by other commercial and state agencies) their approach seems characterised by immersion, saturation, and 'information overload'.[28] Indeed they would later be criticised for producing 'propaganda designed to overwhelm rather than convince'.[29]

Life magazine's pronouncement of the display as akin to a religious performance is only apparent when the whole display event is taken into account. To experience the Information Machine you first took your seat (along with about 500 others) on the 'People Wall' (fig. 3). This was a 45-degree rack of seating that was positioned so that the occupants looked out at the World's Fair crowds, while at the same time those crowds could view the wall of people as a spectacle.[30] Once everyone was seated the entire wall of people was hydraulically lifted some 53 feet into the belly of the Information Machine (fig. 4). But while this description can be interpreted simply in spectatorial terms of 'being looked at, while looking at', the Information Machine also enacts a specific machinic relation for the audience. By taking their place as one of the 500 in the human wall, a visitor or a group of visitors become part of a mass (however demarcated that mass is). And this mass becomes a unit as it is hydraulically moved into the 'egg' of the information machine. In terms of machinic relations, and in terms of the specificity of computer technology, this unit becomes a unit of memory, to be written on by the computational machine. Indeed the uploading wall (of 500 'human-bites') uncannily predicts the drive units that were just about to revolutionise computer technology. To see this display technology simply in terms of visuality would miss the performativity of the Information Machine.

Prior to this, though, a dinner-suited compère descended from inside the egg to relay some introductory and 'everyday' information. Once you

27. Charles Eames, 'Language of Vision: The Nuts and Bolts', *Bulletin of the American Academy of Arts and Sciences*, October 1974, pp18-19, cited in Pat Kirkham, *Charles and Ray Eames: Designers of the Twentieth Century*, Cambridge and London, MIT Press, 1995, p264.

28. 'Information overload' is a consistent description of the Eameses exhibition techniques and seems to be used irrespective of whether it is to condone or condemn.

29. This was in response to another IBM funded exhibition 'The World of Franklin and Jefferson' (1975), see Kirkham, 1995, p264.

30. Tony Bennett suggests that this was a common feature of expositions and fairs. See Tony Bennett, 'The Exhibitionary Complex', *new formations*, 4, 1988, p81.
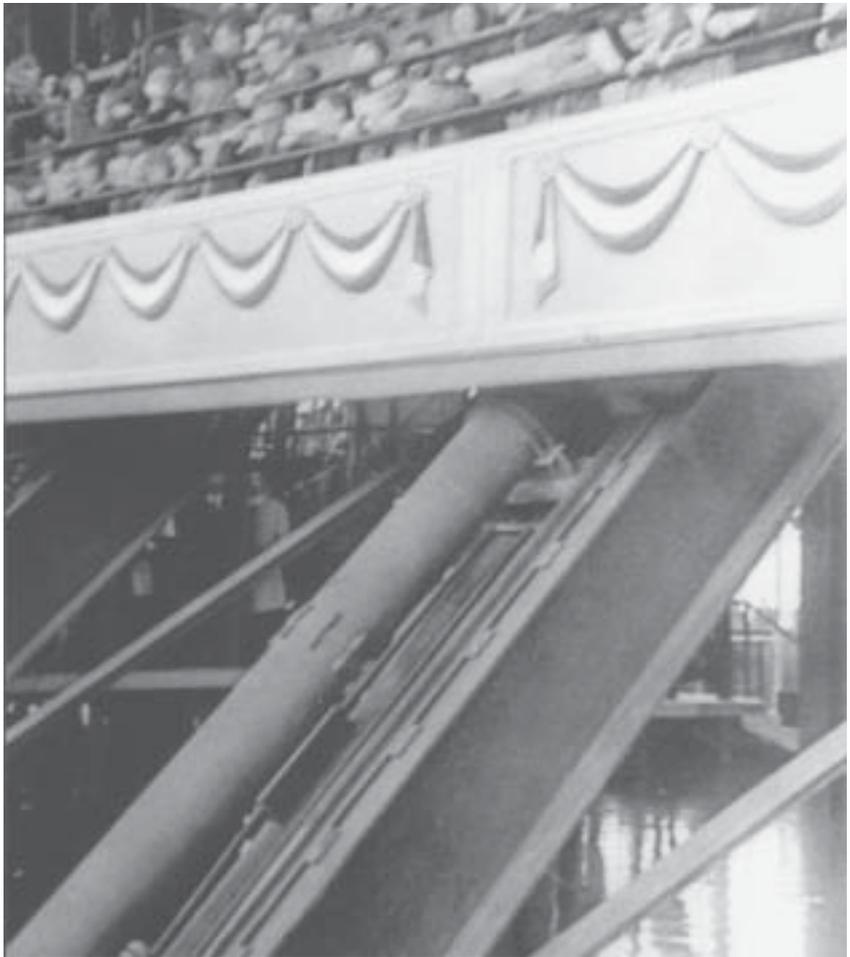
Fig. 3, ' People
Wall': IBM
Pavilion, New
York World's Fair
1964-5

Fig. 4, Hydraulic
lifting of 'People
Wall'

had ascended into the interior of the Machine you were left suspended above a pool of water, which would be at least 50 feet below (much more, of course, if you are near the top of the People Wall).[31] Suspended above the water, the spectators were confronted with fifteen irregularly sized screens, projected onto by seven 35mm film projectors and seven slide projectors. What followed was a barrage of visual information simultaneously spread across the various screens (fig. 5 and 6). Eight stereo speakers supplied the spectators with Glen Fleck's narrative commentary and Elmer Bernstein's musical score. Leaving aside what was pictured on the screens, the actuality of the display *mise-en-scène* presents a vertiginous spectacle, experienced by an audience suspended in mid-air. Virtuality is also an aspect of this that is emphatically foregrounded by what Beatrice Colomina describes as the experience of being 'enclosed by images'.[32] What this 'culture machine' is effecting so vividly is a virtual world, where the spectators are displaced from a here and now to an elsewhere and an elsewhen. Of course such virtuality is the effect of many kinds of cultural machines (including cinema of course) yet it is the extent to which the IBM pavilion performed virtuality that needs to be noticed. This removal of the spectator from an earthly realm into another world is carried out so systematically that the IBM visitors are quite simply lifted out of the world. Virtuality here is not the performance of disembodying, rather it unsettles everyday embodied experience. The body becomes a more fragile, a more tentative component in the audio-

32. Beatriz Colomina, 'Enclosed by Images: The Eameses' Multimedia Architecture', *Grey Room*, 2, 2001, pp6-29.
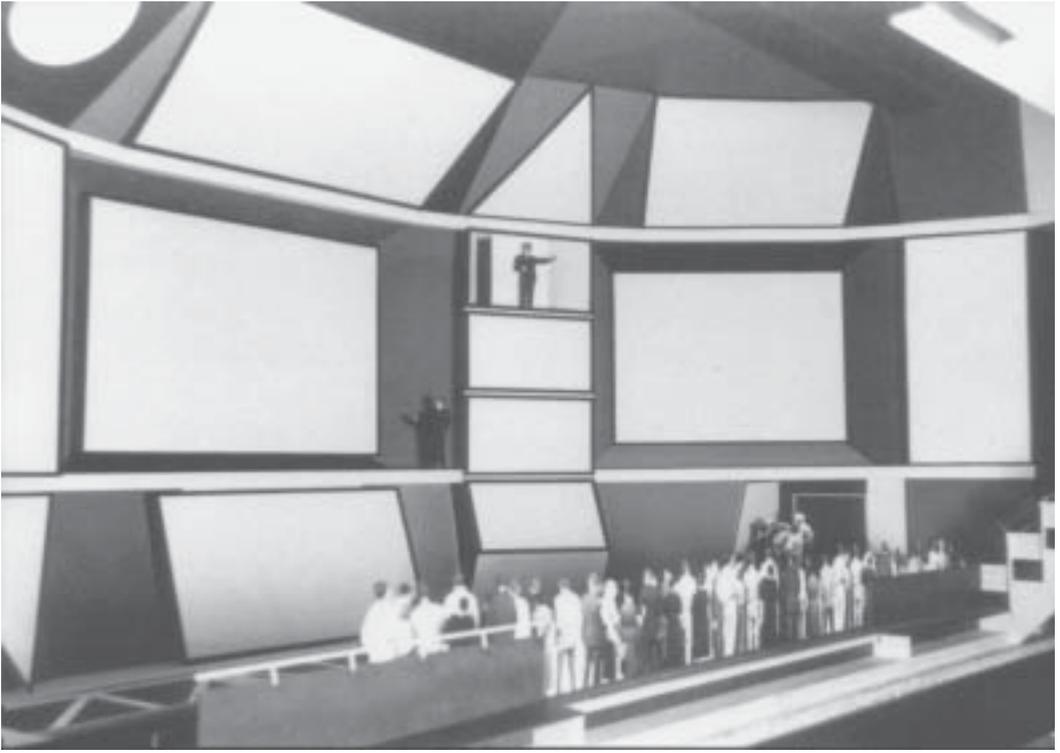
Fig. 5, Images from 'Think': binary logic

Fig. 6, Model of the interior of the Information Machine

visual-haptic environment. At the same time however such fragility is replaced, or at least countered, by the viewer's integration into the apparatus, which renders the spectator as an informational component within a larger machine.

The religious dimension of this performativity is difficult to ignore. It significantly plays on a number of religious tropes: most particularly, ascent and descent (of both spectators and compère) as symbolic actions. The analogies to the Christian story are palpable; a man descends from above into the midst of the mass, he then rises up into the egg, to be rejoined by the mass whose ascension follows his. Of course such analogies don't deserve too much scrutiny. More important though is the sense of leaving an earth-bound existence, and experiencing what might be called the 'technological sublime' designed to physically defy the usual mortal limits of the body. This address to the body needs to be understood within a range of display traditions.

A PROVISIONAL GENEALOGY OF THE INFORMATION MACHINE

Tracing the sources, even provisionally, for such a complex display apparatus will necessarily need to draw attention to a range of different practices, to assess their similarities and differences. Formalism however needs to steer clear of only recognising visible similarities: performative similarities will

need to be given as much attention. First of all, though, we need to identify what it is about the display that would be worth tracing. It seems to me that the characteristics of the Information Machine would include: the idea of a total sensory environment that is both animated and overwhelming; the incorporation of the spectator into the mechanism of a machine; and lastly (but perhaps most importantly) the lack of fit between a rational and everyday content (or declared intention) and an experiential form designed to produce its opposite (awe and terror).

In recent studies of the Eameses' display practice a genealogy has been mapped that suggests a route from the exhibitionary avant-gardism of the Soviet artist El Lissitzky through the work of Herbert Bayer and on to the Eameses displays.[33] This, to some extent, fills out much of the material sources for the idea of a visually saturated and animated environment. However the links do not form a linear sequence of development. For instance in getting from Lissitzky to Bayer an amount of refashioning takes place. In the 1920s and 30s El Lissitzky reconfigured the very ground of display practices. In 1929 Lissitzky declares that the overarching aim of his exhibitionary project is the production of an active viewer: 'while passing along the picture-studded walls of the conventional art exhibition setup, the viewer is lulled into a numb state of *passivity*. It is our intention to make man *active* by means of design. This is the purpose of space'.[34] Initially this took the form of finding a radical environment adequate for the project of

33. Kirkham, op cit., and Colomina, ibid.

34. El Lissitzky, 'Exhibition Rooms' [circa 1929] in *Russia: An Architecture for World Revolution*, Cambridge, MIT Press, 1970, p149.

Fig. 7, El Lissitzky, Soviet Pavilion at the International Press Exhibition in Cologne in 1928

35. The best accounts of Lissitzky's exhibition design practice are: Benjamin H D Buchloh, 'From Faktura to Factography', in A. Michelson, R. Douglas Crimp, and J. Copjec (eds), *October: The First Decade 1976-1986*, Cambridge, MIT Press, 1987, pp76-113, and Ulrich Pohlmann, 'El Lissitzky's Exhibition Designs: The Influence of His Work in Germany,

Fig. 8, El Lissitzky, Soviet Pavilion at the International Hygiene Exhibition in Dresden in 1930

revolutionary abstract art. In his 'Room for Constructivist Art' (Dresden 1926) and again in 'Cabinet of Abstract Art' (Hanover 1930) the walls changed colour as the viewer moves through the gallery (this was achieved by using wooden slats painted different colours on either side). Paintings could be arranged and rearranged by the viewer who was invited to take part in the production of visual space.[35] But it was in designing information-driven exhibitions that Lissitzky fabricated an environment that was image-saturated. In the Soviet pavilion at the International Press Exhibition in Cologne in 1928, Lissitzky used conveyor-belt constructions to animate the space (fig. 7). In the Soviet pavilion at the International Hygiene Exhibition in Dresden in 1930 the display environment reaches saturation point and we could describe the space as both enveloped and overloaded with images (fig. 8).

It was Herbert Bayer who brought the form of such exhibitionary avant-gardism to the USA in a number of exhibitions at New York's Museum of Modern Art (MoMA). Bayer in collaboration with MoMA curator Edward Steichen fabricated a visual environment similar to Lissitzky's for exhibitions such as 'Road to Victory' (1942) and 'Airways To Peace' (1943) and it was Bayer's exhibitionary panache that would have been most familiar to the Eameses. Yet while Bayer certainly mimics the exhibitionary environment developed by Lissitzky (fig. 9), his was a production that crucially reconfigured the main aims and objectives of Lissitzky's Soviet pavilions.
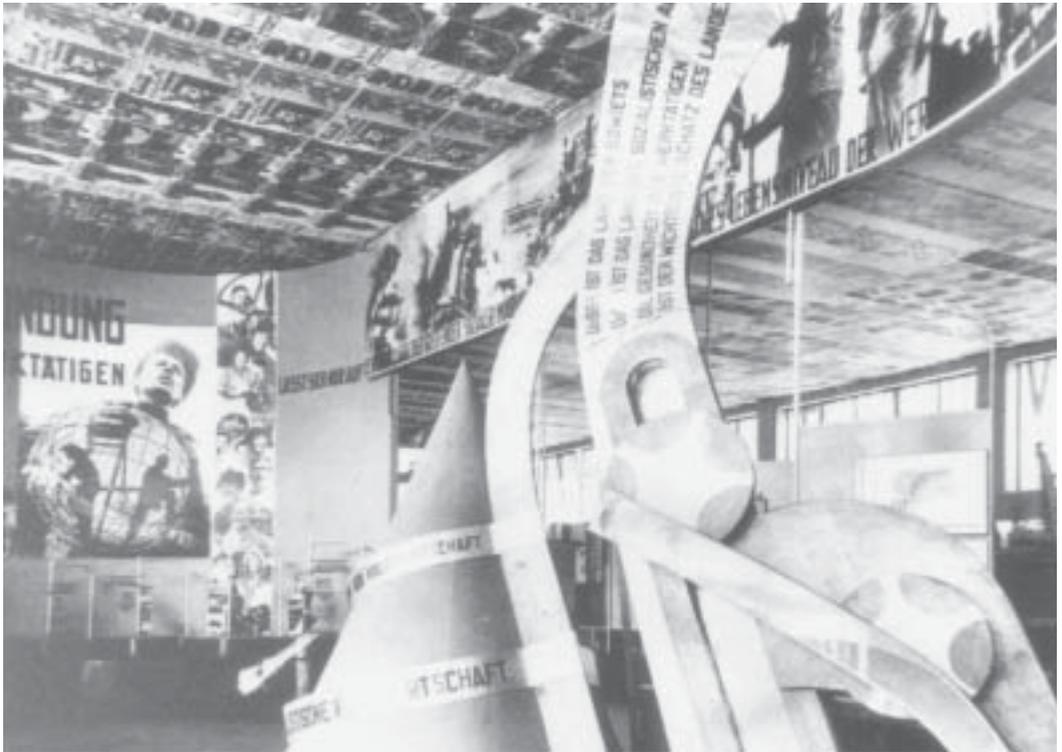
For Bayer the exhibitionary project wasn't to provide the viewer with agency but to provide a persuasive form closer to advertising in its pedagogic seductions:

> The modern exhibition should not retain its distance form the spectator, it should be brought close to him, penetrate and leave an impression on him, should explain, demonstrate and even persuade and lead him to a planned and direct reaction. Therefore we may say that the exhibition design runs parallel with the psychology of advertising.[36]

Such intentions are directly opposed to El Lissitzky's and yet both Lissitzky and Bayer produce similarly overloaded exhibitionary forms. The work of the Eameses in the Information Machine similarly overloads the visual environment and the question of whether this is designed to bamboozle or to activate and animate the spectator is an open one. According to Pat Kirkham the 'information overload' characteristic of the Eameses' display practice was premised on a belief 'that viewers were sufficiently intelligent, discriminating and skilled'[37] in reading visual information that such displays would stimulate rather than overwhelm. Yet the central contradictions between edifying demystification and magical conjuring of the Information Machine suggests a practice much closer to Bayer's than to Lissitzky's.

Fig. 9, Herbert Bayer, 1930, Diagram of Field of Vision
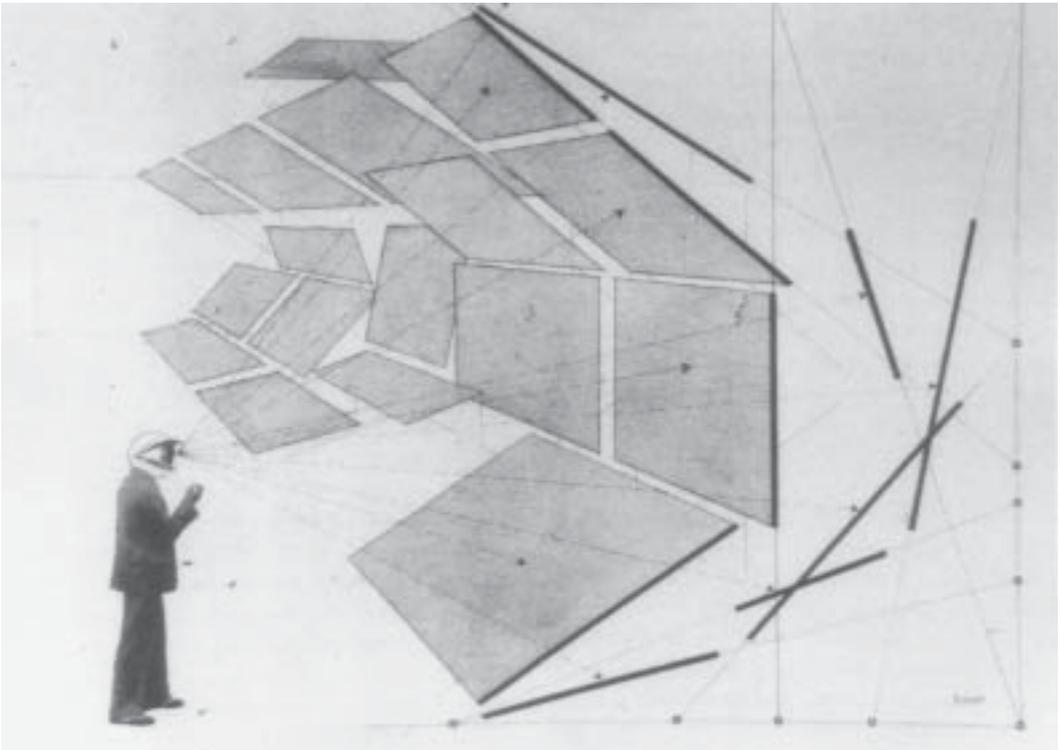
Missing from this genealogy though is an account of the phenomenal aspect of the spectator's situation. Instead of walking around an exhibition, visitors to the Information Machine where both mobile and stationary, both hydraulically moved and sitting. Anne Frieberg has alerted us to the predominance of a spectatorship in modernity in which mobility and virtuality becomes a dominant form in a number of display experiences including those related to world's fairs:

> The exhibition also debuted devices and mechanical rides that uniquely 'mobilized' the gaze: the (seven feet per second) elevator ascension of the Eiffel Tower in 1889, the 'Ferris Wheel' and *kinetoscope* in Chicago in 1893, the moving walkway (*trottoir roulant*) in the 1900 Paris Exposition.[38]

In world's fair displays the most spectacular forerunner to the virtual and mobilised aspect of the Information Machine was the General Motors display 'Futurama', shown at the 1939-40 New York World's Fair (and explicitly referenced in Doctorow and Beller's novels). 'Futurama' was a vision of what the US might look like in 1960 and consisted of a ride over and through an environment newly networked by motorways. Designed by Norman Bel Geddes, Futurama used the technology of the assembly-line to carry spectators rather than cars. As Roland Marchand has suggested 'the fair visitors had been emancipated from the relative tediousness of the old "tour-of-the-factory" display, only to find themselves being carried along on an assembly-line (the moving-chair conveyor belt) while General Motors constructed their vision of the future'.[39] Marchand's account is excellent, yet little is made of this last point apart from as a final irony of the display. There is more that can be said here about how this extension of the assembly-line can be read as indicative of a more general shift from production to consumption. After all if companies like General Motors and Ford needed to sell the deluge of varied products that were spilling out of Detroit and elsewhere they had to solicit buyers who would want more than a reliable vehicle.[40] To use an assembly-line to assemble consumers as well as cars suggests a historical shift that sees modern production technologies used for the production of human desire, vividly concretising Henri Lefebvre's claim that 'the manufacturers of consumer goods do all they can to manufacture consumers'.[41] But by replacing the skeletal car with a human body something else is at stake here too.

'Fordism' according to Peter Wollen (and Wollen of course sees the assembly-line as the central device of Fordism) 'turned the factory into a kind of super-machine in its own right, with both human and mechanical parts'.[42] This machine was dedicated to continual movement (the line didn't stop) and ceaseless production. At the same time, though, the worker became a fixed yet moving part with the assembly-line-machine: 'a continuous, sequential assembly line, with a tempo determined by time and work studies, which transferred the parts through the whole process, designed so that the

38. Friedberg, op. cit., p82.

39. Roland Marchand, 'The Designers go to the Fair, II: Norman Bel Geddes, The General Motors "Futurama", and the Visit to the Factory Transformed', in Dennis P. Doordan (ed), *Design History: An Anthology*, Cambridge, Mass. and London, MIT Press, p121.

40. On this see David Gartman, *Auto Opium: A Social History of American Automobile Design*, London and New York, Routledge, 1994 (particularly chapters 4 and 5).

41. Henri Lefebvre, *Critique of Everyday Life, Volume II: Foundations for a Sociology of the Everyday*, John Moore (trans), London, Verso, 2002, p10. First published in France in 1961.

42. Peter Wollen, 'Cinema/Americanism/The Robot', *new formations* 8, 1989, 8.

worker never had to move, even to stoop to pick something up'.[43] It is the mirroring of this in the Futurama display whereby the viewer becomes a (temporarily) fixed unit (a component) within the continual movement of the super-machine that suggest that what the display performs is an incorporation of the human viewer as a machinic element within the factory-machine. Rather than simply providing an ideological representation to persuade the viewer of the wonders that General Motors could perform, Futurama provides a taste of what it might be like to give yourself over to machinic relations (without the emphatic alienation of having to wield a rivet gun for eight hours a day). While the image presented to the viewer of Futurama is one driven by social human relations, the experience performed by the display displaces human relations with machinic ones. Something similar takes place in the IBM pavilion. Here though it isn't the factory-machine that is doing the incorporating but the product-machine itself: the Information Machine. The Information Machine doesn't simply represent computers, it is designed to act as one, to process data, and the data being processed is the visitor to the IBM pavilion.

As already mentioned there is another display form that the IBM's pavilion suggests - the phantasmagoria. Walter Benjamin's description of world's fairs and exhibitions as phantasmagoric is, in the main, indebted to Marx's characterisation of commodity culture, as a culture where human social relations have been replaced by 'the fantastic [or phantasmagoric] form of a relation between things'.[44] Phantasmagoria as a description of the world dominated by the commodity articulates a condition where individuals tend towards thing-ness, while things tend towards being perceived as enlivened by magical properties. Commodities (inorganic things) deceive by taking on a spectral and spectacular shape; or as Benjamin puts it, 'the fetishism that succumbs to the sex appeal of the inorganic is its [fashion's, commodity culture's] vital nerve'.[45] For the most part Benjamin recognises the phantasmagoric as a particular kind of spectacular visuality that animates the inorganic realm, but there are clues that he has in mind a much more embodied sense of phantasmagoric display when he describes this as a process that 'couples the living body to the inorganic world'.[46]

Benjamin is not merely concerned with the way capitalist modernity seduces us and dupes us; his main concern is the way that it gets under our skin - literally. In a *feuilleton* written for the *Frankfurter Zeitung* in 1928, Benjamin reviews a Berlin Food exhibition, claiming that an exhibition display, potentially, 'nails down inwardly what has been experienced'.[47] This, for Benjamin, is the other side to 'instruction' and uses a 'traumatic energy' to deliver a shock that welds the object displayed to a bodily experience of it. Benjamin suggests that this 'traumatic energy' is found in all sorts of popular entertainments and claims that the 'masses' receive:

> Their education is a series of catastrophes that befall them at fairs, in darkened tents, where anatomical discoveries enter their very bones, or

43. Ibid., p8.

44. Karl Marx, *Capital: Volume 1*, Ben Fowkes (trans), Harmondsworth, Penguin, 1976, p165.

45. Walter Benjamin, *The Arcades Project*, p8.

46. Ibid.

47. Walter Benjamin, 'Food Fair: Epilogue to the Berlin Food Exhibition', Rodney Livingstone (trans), in *Selected Writings: Volume 2, 1927-1934*, Cambridge, Mass. and London, Harvard University Press, 1999, p136. First published in *Frankfurter Zeitung*, September 1928.

48. Ibid.

in the circus ring, where the sight of their first lion is inseparable from the image of the lion tamer putting his fist between its jaws.[48]

Benjamin is talking about a form of display that is addressed to the affective register of the body, that produces shudders of anticipation, sets the nerves jangling, and skin crawling. This form of display imprints affect (a chilling feeling of human fragility, say) with a shocking bodily situation (the potential for the huge jaw to start crunching its way through bone and flesh). He was also, no doubt, thinking of the actual magic lantern displays that featured the illusionistic conjuring of phantoms, which were exhibited in Europe at the end of the eighteenth century and the beginning of the nineteenth, under the name 'phantasmagoria'. These displays were often promoted under the guise of the latest in both art and science, and existed in a strange contradiction, caught between scientific demystification and illusionistic enchantment. Terry Castle's description of phantasmagoric display evidences some vivid performative similarities to the Information Machine:

> The early magic-lantern shows developed as mock exercises in scientific demystification, complete with preliminary lectures on the fallacy of ghost-belief and the various cheats perpetrated by conjurers and necromancers over the centuries. But the pretense of pedagogy quickly gave way when the phantasmagoria itself began, for clever illusionists were careful never to reveal exactly how their own bizarre, sometimes frightening apparitions were produced. Everything was done, quite shamelessly, to intensify the supernatural effect. Plunged into darkness and assailed by unearthly sounds, spectators were subjected to an eerie, estranging, and ultimately baffling spectral parade.[49]

49. Terry Castle, *The Female Thermometer: Eighteenth-Century Culture and the Invention of the Uncanny*, New York and Oxford, Oxford University Press, 1995, p143. See also: Simon During, *Modern Enchantments: The Cultural Power of Secular Magic*, Cambridge, Mass., and London, Harvard University Press, 2002; and Laurent Mannoni, *The Great Art of Light and Shadow: Archaeology of the Cinema*, Exeter, University of Exeter Press, 2000.

Phantasmagoric affects (in this case fear) were produced by conjuring-up phantoms using lantern technology and mirrors, and providing an environment that was often smoky, always dark, and used sound-effects to enhance the unworldlyness of the event. And, importantly, this was done in the name of demystification, rationalism and science.

On the face of it the Information Machine might claim to address an earthly 'rational' consciousness, sceptical, perhaps even critical, and given the circumstances, most likely anxious. While it is this earthly consciousness that the Information Machine manifestly addresses with all its talk of demystification, of everydayness and reason (the same language as used in the publicity of eighteenth century phantasmagorias) it is also this consciousness that gets suspended by the operations of the display technology. In its place the address is given over to the 'traumatic energies' marshalled by the Information Machine and aimed at the affective register of the body. Here the frail body is plunged into a virtual reality of capitalism's phantasmagoria and enters the dreamworld (and dream-being) of its promise of a new machinic tomorrow. Like the eighteenth and nineteenth-century

phantasmagoria the Information Machine asks us to divest ourselves of irrational beliefs while at the same time hot-wiring us with the power of magic. Unlike these ghostly sideshows, though, the Information Machine is more thoroughly directed to solicit acquiescence to technological expansion. It is here in this phantasmagoric affect that we should locate the child of Doctorow's novel, made light-headed by the world's fair of 1939-40. And it is here, phantasmagorically, that the Information Machine of 1964 attempts to 'couple the living body' to the machinic world of computers.

THE INFORMATION MACHINE IN THE CONTEXT OF 1964-5

The New York World's Fair of 1964-5 opened on April 22, 1964 in New York City's Flushing Meadow (the site of the 1939-40 World's Fair). It opened amidst torrential rain and disappointingly small turnstile receipts. Journalists were generally agreed about the fair's lack of coherence and the paucity of its futuristic vision (seen as particularly meagre when compared to the 1939-40 Fair).[50] For the *New York Times* writing on the opening day, 'the New York World's Fair is an architectural happening, in the sense that happening is a currently popular art form in which the objective is unpremeditated chaos achieved through a series of unplanned acts with unrelated consequences'.[51] Yet the fair was, perhaps surprisingly, a popular success with a recorded 51 million visitors during its two six month seasons.[52] The theme of relentless progress through technology was, no doubt, already looking shop-worn in 1964, and the Fair's motto of 'Peace through Understanding' must have seemed vividly ideological when juxtaposed with the pervasive frost of the Cold War. But while the uncertainty of Cold War politics might well claim a role as background noise for the first season of the fair, by the beginning of the second the United States' government under Lyndon Johnson had embarked on a catastrophic anti-communist war against North Vietnam. Protests against US involvement in Vietnam and fears that nuclear arms would be used against a mainly agrarian enemy fuelled a number of demonstrations within the fair, and of course many more elsewhere.

But if the US were at war in Vietnam, a newly minted civil war looked like it was about to erupt across America - and the signs for fair goers were inescapable. To enter the fair meant negotiating Civil Rights demonstrators campaigning about the lack of African-Americans employed in anything other than menial roles in the fair, and about the total absence of any black presence in the endless representations of an American future. The years 1964 and 1965 mark a moment when African-American politics exploded: in July 1964 riots were sparked when a 15 year-old unarmed African-American boy was shot dead in Harlem; in August 1965 six days of rioting tore apart the Watts district of Los Angeles. The following year some forty-three urban ghettos were caught in racial conflict; the year after, 167 cities witnessed riots. The gradual emergence of what must have looked like the start of a fully-fledged African-American revolution would have been

50. *Time* magazine, for instance, titled its assessment of the fair 'The World of Already' [*Time* 83, 5 June, 1964, p40-52] in direct reference to the 1939-40 fair whose theme was 'The World of Tomorrow'.

51. Ada Louise Huxtable, *The New York Times* 22 April, 1964, p25.

52. This is the figure for ticket admissions, not the number of individuals who visited the Fair, some of whom would have made repeated visits.

inescapable to visitors to the Flushing Meadow site.

At the same time, another radical challenge was being voiced. Hitting the bestseller list as the fair opened was a book that many had already read, in part, in magazine articles and in the papers. Betty Friedan's recently published *The Feminine Mystique* set about describing the 'problem that has no name':

> The problem lay buried, unspoken, for many years in the minds of American women. It was a strange stirring, a sense of dissatisfaction, a yearning that women suffered in the middle of the twentieth century in the United States. Each suburban wife struggled with it alone. As she made the beds, shopped for groceries, matched slipcover material, ate peanut butter sandwiches with her children, chauffeured Cub Scouts and Brownies, lay beside her husband at night …
> She was afraid to ask even herself the silent question: 'Is this all?'[53]

53. Betty Friedan, *The Feminine Mystique*, Harmondsworth, Penguin, 1992, p13. First published in 1963.

54. Rosemarie Haag Bletter, 'The "Laissez-Fair", Good Taste, and Money Trees: Architecture at the Fair', in *Remembering the Future: The New York World's Fair From 1939-1964*, New York, The Queens Museum, 1989, p121.

Armed with the contents of Friedan's book women could find an image of themselves at the fair articulating a truly dreadful poverty of ambition. For instance, the General Motors' pavilion exhibited a prototype three-wheel car aimed specifically at housewives and featuring 'a built-in removable shopping cart'.[54] Friedan's 'problem that has no name' almost sounds like it had been written as a rejoinder to the Information Machines' evocation of dinner party seating plan computations.

World's Fairs are dreamworlds, and dreamworlds avoid anxiety-producing materials by either erasing them or recoding them. The Information Machine sets itself up to show that complex problems can be solved by logic. Yet of course any real social problems are entirely absent from the content of the display. But the content of the display provide mere examples of micro-processing - the real macro-processing of the computational machine is to be found in the experiential form of the whole architectonic display ensemble. The asinine future staked out in visions of the computer-solved seating plan, or in General Motors' visions of cities given over to parking requirements, need to be seen alongside a 'taste' of machinic transubstantiation. It is social relations that are so evidently problematic in New York in 1964. The fair systematically fails to even address the problem of social relations. Instead a phenomenal taste of new ways of being is offered. This was no doubt designed to help fashion new desires for these commodities (computers and cars), but at the same time, though perhaps only momentarily, it sets about erasing the need to confront the social and material conditions of the present. It is the virtual spatiality of the display, the removal from the everyday (even if this is done in the name of the everyday) that is the active agent here. If we are looking at such pavilions for the workings of what might be called 'capitalist ideology' (if such a thing exists) then we might find it (as an effective and affective tool) in the formal arrangements of display rather than in the explicit content of the display.

CONCLUSION: THE AFFECTIVE ADDRESS OF TECHNOLOGICAL CULTURE

A reinvigorated formalist criticism might take some sustenance from Slavoj Zizek's reconfiguring of ideology critique as an investigation of forms. For Zizek:

> There is a fundamental homology between the interpretative procedures of Marx and Freud - more precisely, between their analysis of commodity and of dreams. In both cases the point is to avoid the properly fetishistic fascination of the 'content' supposedly hidden behind the form: the 'secret' to be unveiled through analysis is not the content hidden by the form (the form of commodities, the form of dreams) but, on the contrary, *the 'secret' of this form itself*.[55]

For Zizek, cultural analysis, following in the wake of Marx and Freud (and Lacan), starts out with a formalist mission. Its job is not to collect information about what dreams really mean or how much labour is furtively squirreled away in commodities; its job is to ask (and seek to answer) how and why it is that certain thoughts got worked into the rebuses of dreams, or 'why work assumed the form of the value of a commodity'.[56]

Following Zizek (thus far at least) might require that we try and explain why it is that the Information Machine went about its seductive purposes, went about hailing subjects, in such phantasmagoric ways. Why did it offer the lure of transubstantiation or the invitation to submit to machinic relations? History provides us with something of the answer here, but only if we think of history as an interplay of different temporalities. On the one hand then is the immediate context of 1964 and 1965, a moment of social upheaval refracted across global, national, and local terrains (from the kitchen to the world). Here the address to an affective register of the creaturely body holds out the promise of swapping social, cultural bodies (intensively marked by ethnicity and gender) for machinic ones that magically (and momentarily) cast social anxiety into oblivion. This is primarily the lure of avoidance, of trading in the difficulties of fleshy, socially differentiated existence, for a place on the circuit board.

But the temporality suggested by the phantasmagoric is the longer reach of modernity. Here the question of the changes brought about by technology and commodification are staked on the body. The possibility of transforming the creaturely species-being of humans is part of the fantasy of modernity. Benjamin recognised the reality of it in such everyday things as crossing busy roads, using cameras and telephones, and lighting matches.[57] There seems to me to be no doubt that the car driver of Benjamin's day posses a different sensorium to the car drivers of our own day. Yet it also seems clear that when hit by either car, pedestrians, and sometimes drivers, crumple into a flesh and bone amalgam that seems to posit a necessary limit on our

55. Slavoj Zizek, *The Sublime Object of Ideology*, London, Verso, 1989, p11.

56. Ibid.

57. Walter Benjamin, 'Some Motifs in Baudelaire', in *Charles Baudelaire: A Lyric Poet in the Era of High Capitalism*, London, Verso, 1983, pp131-2.

capacity to change. It is at this limit, and passed it, where the fantasies of capitalism and modernity are spun.

It might just be then that the phantasmagoric mode of address is only just beginning. Modern culture often seems to address us by pressing 'traumatic energies' into the business of coupling living bodies to machinic ones, or at least to bodies with new physical properties. The pleasure and pain of films like *The Matrix* are the new ways of being and becoming on offer, for instance, through an almost liquid mobility, a virtual body with untold and seemingly limitless capabilities. A recent advert by Levi seems to suggest something similar. A traditional commodity (jeans) is accompanied by the phantasmagoric spectacle of two young adults running almost effortlessly through the solid brick walls of a disused building, crashing out into a wood where they run up the side of trees to be shot out into the starry sky, still running. Computer games provide a new immortality, and new, endlessly expanding machinic capabilities. Here again it is not the content that holds much interest but the phantasmagoric form. In many ways these forms are nothing but a series of shocks, nothing but impact, nothing but 'traumatic energies'.