

Managing Our Fear of Disaster Through Simulation

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A paper presented at the AAANZ: Art Association of Australia and New Zealand Conference, ANU, Canberra, 26 to 28 November 2009, Session 15: REAL EMERGENCY: ART AND THE CRISES OF THE CONTEMPORARY WORLD Convenor: Prof Jill Bennett (Centre for Contemporary Art & Politics COFA, UNSW)

As a forward to his work, *The Fall*, theorist and architect Lebbeus Woods wrote that “The enterprise of architecture is so heavily invested in the idea of resisting gravity that even the thought of a building falling down before its time is nothing short of a nightmare scenario.”¹ This nightmare scenario is what he was positing with his work, *The Fall*, which simulated the vectors the ceiling of the Fondation Cartier pour l'art Contemporain, Paris would take while collapsing through the floor and into its basements. It is also the basis of Simon Glaister's exhibition *Push Over*, which predicted the future collapse and abandonment of the S^T PAUL St Gallery, where I work.

Lebbeus Woods and Simon Glaister's works are representative of an area of art practice which utilises scientific language to ground their work in the real. Central to the two works I will discuss in this paper is the use of risk prediction and simulation methods derived from civil engineering, such as data analysis, mathematical modelling and tolerance testing to evaluate the conditions and likelihood of a given accident or disaster occurring or a structure failing. In the field of seismic research these tests are seeking to identify the analytical moment of failure, known as the Performance Point, the point at which the assessed structure is predicted to break. However, in the artworks this virtual or actual performance point is transformed into a performative act that resonates through the works, and is at the heart of their visual and intellectual impact.

Where in civil engineering the prediction of the performance point is used to develop prevention or minimisation systems for the effects of the accident, the artists who use and reference their methods to create their own performance point aren't studying accident and disaster prevention, instead they are exploring the immanence of the accident in our world and seeking to provoke new ways of integrating the form of the accident into our society so that its unpredictability and flexibility becomes generative as opposed to paralytically destructive. The language of civil engineering enables the artists to build plausible simulations of the future disaster instead of depending on the document of the past accident. This separates the discussion from the human tragedy of a historic disaster while making the disaster immediate through its presence in a known environment. Simulating a future disaster also opens up a possibility for the examination of the disaster without the

¹ Lebbeus Woods, *The Storm and the Fall*. (New York: Princeton Architectural Press, 2004). 105

noise of the media spectacle that usually surrounds it. In addition, transferring the disaster to the architectural and art gallery context also allows the implied collapse, failure and destruction to be shifted to the systems of architecture and art, thereby contesting their current state.

The disaster impacts on our perception of personal risk and risk to our social structures. Yet, unless we are engaged in risk analysis fields the primary time we consider the disaster is in its aftermath. As Robert Stallings wrote in his 1991 article *Media Discourse and the Social Construction of Risk* "Most of the time people ignore the risks in everyday life. However, when the taken-for-granted outcomes of routine activities fail to occur - a commercial airliner crashes rather than landing safely, the earth trembles violently rather than imperceptibly, a highway bridge collapses rather than conveying vehicles safely from one bank to another - risk and safety often become matters of public discussion ... Forces that seemed benign, under control, or nonexistent appear to be malicious, unchecked, and omnipresent in the aftermath of such dramatic events."² Post event, the accident is analysed in both the media and by the civic, corporate and research bodies associated with that specific disaster, blame is apportioned and the evidence of the event is removed, and perhaps, a monument or plaque is installed to commemorate it. In effect the disaster is thought about and discussed by the greatest number of people in its aftermath. However if the discourse does not reach a critical, self sustaining momentum its impact fades as new events occur. As Stallings further wrote "Risk is not the *outcome* of media and public discourse, but exists *in and through* processes of discourse. Hence risk is never constant. It is created and recreated in discussion of events that are seen to undermine a world taken for granted."³ In our daily lives we live secure in the knowledge that our built environment resists gravity. However, works such as *The Fall* and *Push Over* contest that security and force us to face the accident, inherent in every structure, and the fact that we take for granted something that is not guaranteed.

Paul Virilio takes the position that the potentiality for the accident is present in every thing in our world. At the heart of Virilio's theory of the accident is the idea that we are constantly inventing the accident simultaneous to our invention of new technologies. As we develop new technologies to enable us to build bigger, fly higher, and travel faster, we also continually invent that systems collapse, fall or crashing stop. Each accident more catastrophic than the last. As Lebbeus Woods wrote "Accidents, in the deterministic sense, are not designed, but simply 'happen.' They are out of control in that their what, where, or when can never be predicted exactly. But they are designed, in the

² Robert A. Stallings, "Media Discourse and the Social Construction of Risk." *Social Problems* 37, no. 1 (1990): 81.

³ *Ibid.*, 82.

Virilian sense, because the creation of any working system insures their probability, thus their inevitability.”⁴

Virilio argues that to ignore the accident inherent in the invention, or to become habituated to its inevitability is to embrace the “madness of voluntary blindness to the fatal consequences of our actions and inventions.”⁵ However by creating a museum of the accident, which documents “all accidents from the most commonplace to the most tragic, from natural catastrophes to industrial and scientific disasters, including also the kind that is too often neglected, the happy accident, the stroke of luck, the coup de foudre or even the coup de grace!”⁶ Virilio believes we will be able to make the immanence of the accident in our world visible, the harm done undeniable. From this position he curated the exhibition *Unknown Quantity* and accompanying book of the same title for the Fondation Cartier pour l'art contemporain in Paris. The exhibition represented “a pilot project, or more exactly a prefiguration of, the future Museum of the Accident.”⁷

It is not surprising that Virilio would invite to Lebbeus Woods to exhibit in the show as he works extensively with the results of the natural and man made disaster and war in contemporary society, arguing that “Where ever buildings are broken by the explosion of bombs or artillery shells, by lack of maintenance or repair, by fire or structural collapse, their form must be respected in its integrity, embodying a history that must not be denied.”⁸ Woods condemns the practice of erasing the disaster, believing that evidence of the past should be retained, proposing that in rebuilding architectural scabs should be formed over damage, new structures injected inside of the old, and the scars of a site incorporated into its rebuilt body. This belief that the wound of the disaster should not be erased, but instead integrated into the built environment resonates with Virilio’s idea of the museum of the accident.

Where the majority of Woods’ work focuses on conceiving new ways of building and rebuilding after disaster, to reveal the disaster while healing its damage, his work for *The Unknown Quantity*, *The Fall*, instead focused on realising and capturing the moment of disaster as it occurs where it has not yet occurred. In doing this Woods continues his argument for new ways of responding to the disaster into the moment it is performed. The work is a hypothetical proposition, manifested physically, that the ceiling of the main exhibition space in the Fondation Cartier building has or will collapse into itself. The reason for the collapse could be anything, a defect in construction

⁴ Woods, *The Storm and the Fall*. 117

⁵ Paul Virilio. *Unknown Quantity*. (London: Thames & Hudson, Fondation Cartier pour l'art contemporain, 2003). 7

⁶ *Ibid.*, 5

⁷ *Ibid.*, 8

⁸ Lebbeus Woods. *Radical Reconstruction*. (New York: Princeton Architectural Press, 1997). 15

or design, a terrorist bomb, the effects of a natural disaster on the building, but the outcome is the moment of the fall.

In conceptualising the fall Woods references the language of mathematical modelling used in the computer simulation of a buildings performance under stress. This is often used in the design process, especially in the development of new engineering solutions to architects ideas, or when modelling the destruction of a building. An existing or proposed structure is mathematically modelled and then variables amended to simulate the application of force or the failure of a structural element and the simulation is then run to predict the outcome, tracking the vectors of movement. *The Fall* takes this idea of the mathematical or virtual model of collapse and makes it physical.

The main exhibition space, where the fall is visualised is on the ground floor of the Fondation Cartier building, a glass and metal structure designed by architect Jean Nouvel. It is approximately 16 metres wide by 20 metres deep and 7 and a half metres high. Woods dramatically reshaped this main gallery through mapping the possible vectors of the collapsing gallery ceiling using metal poles that rise out of a series of grids on the floor to fill the space. The vectors show the ceiling falling down through the floor into the basements, taking 2 seconds to cover a distance of 12 - 13 metres. In capturing this fall he transforms the gallery from an vast unobstructed room to a space filled with the moment of disaster. Yet this disaster exists within the intact building. In causing the disaster to coexist with the stable form of the building Woods is showing us the potential disaster inherent within the building, asking us to make a mental projection into the future fall of both this building and any other.

In exploring the immanent disaster within the built environment Woods is arguing that architects in particular and society in general, fail to respond to the disaster adequately. For Woods this failure is embodied in our practice of erasing of disaster to rebuild in exactly the same manner as before. Our rebuilding strategies return over and over again to known structures based on a goal of stability and functionality to which the unpredictability of the accident in an anathema.

In a blog text referencing *The Fall* posted on the 20th of February 2009 Woods wrote "Architects are the most controlling of creators, who want to see the final result of their work in advance and then do all they can to see it realized. They are, accordingly, the least spontaneous of people. ... A newer generation of architects will certainly take up the challenges of complex and confusing new systems of order by engaging the fragmentation and randomness with new principles of design that do not insist on controlling outcomes, and integrate their own spontaneity with that of the many who

build—and inhabit—our emerging worlds.”⁹ In *The Fall* itself Woods embraced the unpredictable by leaving the final installation of the vector poles that he designed to local artists and installers. According to architectural theorist Jimmy Stamp, “By setting up a system of rules and guidelines, but not explicitly dictating the construction of the piece, Wood’s is recruiting co-conspirators in his plot to undermine the traditional understanding of architecture. The architect doesn’t dictate every aspect of the design.”¹⁰

The Fall operates as a call for change. Instead of living in the before and after Woods is seeking a way of embracing the unpredictable yet always immanent disaster and through that reconfiguring traditional approaches to architecture and other social, physical and political systems. The simulation of a dynamic vectored and changing space is an argument for a shift in approach to the design of the built environment, one that acknowledges incorporates the unpredictable vector of the accident into its very structure.

In contrast to Lebbeus Woods’ reference to the virtual simulation of disaster, Simon Glaister, in his exhibition *Push Over*, physically replicated and broke the 4.3 metres high, 8.5 tonne central supporting beam/column of S^T PAUL St Gallery One, and the School of Art and Design building. This whole process was simultaneously an artwork and an engineering experiment conducted in the Structures Laboratory at the University of Auckland in collaboration with civil engineering students Jedediah Martin and Sumit Anand. The reproduced beam/column was subjected to maximum earthquake simulations and load testing in excess of its Performance Point, or capacity to withstand seismic force, in other words until it broke.

Interestingly, while the resulting column broke it did not lose its structural integrity, a fact that I found very reassuring as I have to work in the building. As the artist put it “The building has been designed not to fall over no matter what and that is evident in the fact that it pretty much holds its shape when we fail it (...) in a way that simulates, quite specifically simulates, the kind of motion, the kind of earthquake that exceeds its capacity.”¹¹ Once the seismic experiment had been performed on the replicated beam-column it was transferred from the engineering research context to the gallery, transforming it from test subject to both a site specific sculpture and the detritus of a performance.

⁹ Lebbeus Woods. “Worlds Apart”. In *Lebbeus Woods*, <http://lebbeuswoods.wordpress.com/2009/02/20/worlds-apart/>. (Published 20 February 2009; accessed 18 November, 2009).

¹⁰ Jimmy Stamp, “Lecture review: Lebbeus Woods” *In Life Without Buildings* <http://lifewithoutbuildings.net/2006/09/lecture-review-lebbeus-woods.html> (published 17 September, 2006; accessed 18 November, 2009)

¹¹ Simon Glaister, “Artist Talk” (presentation given at Gallery One, S^T PAUL St in conjunction with the exhibition *Push Over*, 28 August, 2009).

By placing the failed beam column next to the original beam-column that is still fulfilling its task of supporting the building Glaister created what he called a historical short circuit between the creation and collapse of the building, between the top and bottom of its entropic cycle. This short circuit was then reinforced through the systematic emptying out everything from the gallery's storage, office and exhibition spaces. False walls were removed, floors were polished and windows cleaned to return the gallery spaces to as close to the condition they were in when the building was first built. The spaces were then thrown open to the outside between 7 am and 7 pm and left to deteriorate over the period of the exhibition.

This deterioration was most obvious in the second gallery space which, at the beginning of the show, held two precisely stacked towers of folded newsprint. The newsprint publication linked the disaster the exhibition forecast to the broader spectrum of natural and man made disaster and reflects on the spectacularisation of disaster in the media. It contained four small found images, one per A3 page. These images all referenced periods of social and physical failure, though natural disaster or human agency. By association the future collapse of this building became part of the ongoing evolution until failure of societies and their built environments. Over the course of the exhibition the stacks fell apart until the entire gallery floor was covered with blown publications further reinforcing the suggested collapse of our current society.

While the suggested collapse of society through an unexpected and violent event is the dominant metaphor of the artwork, it was the actual removal of all the administrative and preparatory elements of the art gallery or museum, the computers, desks, tools, stored equipment and so forth, that transferred the suggested collapse from society to the systems of contemporary art. In effect Glaister rendered the gallery static, its momentum lost and subject to entropy and decay. With the spaces emptied out no forward planning could occur at the gallery, and it was presented as abandoned, the system of the gallery itself collapsed and with it the contextual meaning it gives to objects within it.

The artist himself discussed the historical construction of the art object through the agency of the museum or gallery in a presentation he gave to the New Zealand Concrete Industry about the experiment at their 2009 conference in Rotorua.¹² In it he argues that objects in museums are remnants of lost moments in time and often lost or collapsed civilisations. To return to his idea of the historical short circuit, his artwork is an artefact of the future ruin of our society, its functional purpose lost, and replaced by the cultural imaginings of a future society. He is presenting us with the potential failure of contemporary art to hold its meaning outside of the gallery while

¹² Simon Glaister, *Push Over*, (Paper delivered at the annual NZ Concrete Industry Conference, 2009)

simultaneously arguing that the contemporary artwork can have critical value in the world outside of art

As can be seen, Woods and Glaister's work, are linked through their positing of the failure of their context, architecture and art as well as revealing the potentiality of the collapse of the built environment and society. They both achieve this through accessing the language of civil engineering. This melding of disaster research with the artistic intent transforms the virtual or actual experiment into a performative action. Woods and Glaister performed and contained the moment in two different ways. Woods actualised it by giving its trajectory concrete form, a visible trail of mapping the hypothesised path of the disaster. Glaister performed the actual breaking of the structure, demonstrating how the hypothesised break could occur. These actions, the active seeking of the performance point of a built environment reveals the potentiality for failure within the Fondation Cartier pour l'art contemporain and the S^T PAUL St Gallery, and by extension any built environment, or social structure.