

Archaeology of the Digital

The Canadian Centre for Architecture, Montréal, Canada. 2013-2016.

Exhibition review by Jordan Gowanlock

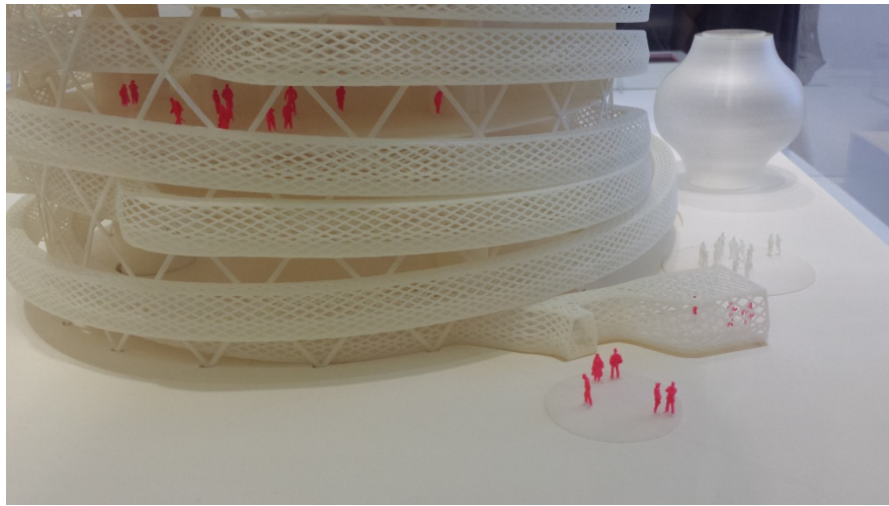


Fig. 1 Carbon Tower, 3D-Printed Model (Testa & Weiser 2006).

The Canadian Centre for Architecture’s *Archaeology of the Digital* project consisted of three yearlong exhibits, interviews, a conference, a book, multiple digital publications, and even a *Tonight Show* style “chat show” broadcasted on the internet. With the final exhibit having closed in October, it is finally time to take stock of this expansive and ambitious project. Directed by architect and influential theorist Greg Lynn, the purpose of *Archaeology of the Digital* is to document how digital tools became a part of the architectural design process between the 1980s and 2000s. While the case studies featured in this project were often the product of extensive theorization, theoretical discussions are conspicuously absent from the exhibits of *Archaeology of the Digital*. Instead, Lynn opts for a media archaeology-style approach that focuses on specific practices and technologies. While this approach provides for the inclusion of minor practices that would be neglected by expansive theories, to neglect sweeping theorization is to neglect a major activity that shaped architecture in this time period.

The exhibits of *Archaeology of the Digital* were broken into three sections over three years: an initial eponymous exhibit, a second exhibit titled *Media and Machines*, and a third titled *Complexity and Convention*. The exhibits’ focus is not early experimentation and theorization, but instead the practical and concrete ways established architects used digital

technology in their projects.¹ For this reason, *Archaeology of the Digital* is centered around twenty-five specific projects by prominent architects and designers such as Chuck Hoberman, Peter Eisenman and Frank Gehry. Following media archaeological principals set down by media theorist Wolfgang Ernst, the exhibits seek to put these architectural projects in their functioning technical context. Ernst's archaeological approach holds that if we study media as they function in their technical a priori we can resist weaving them into a genealogical narrative and better understand them in their synchronic slice of history.² Objects featured in the exhibits include original computers, iterations of models, working drawings, C&C models, CAD printouts, and functioning structural members. This archaeological frame notwithstanding, the presentation of many other forms of media were considerably compromised. As Lynn notes, many of the original data files for these projects were not archived or there no longer exists software capable of opening the files.³ Thus, the curators often had to settle for images and mpeg videos of what should have been 3D data files. These pictures and videos were displayed on tablets and projectors, which gives the observer the mistaken impression that they are seeing the original files. This is a failure from a media archaeology perspective, because these files are not being shown in their original functional technological context. But clearly the curators did the best that they could given these limitations.

Although the projects profiled in the exhibits vary greatly, one theoretical construct informs almost all of them: virtual motion. One might get the impression from *Archaeology of the Digital* that virtual motion emerged organically from experimentation with digital technology, however it is important to note that there was a substantial cultural and discursive component as well. Virtual motion allows architecture to escape from its confinement in stasis and all that stasis entails. The virtual affords forms of motion that the actual does not. A virtual architecture constructed and rendered in 3D animation can be navigated virtually and transform in ways actual architecture cannot. Design projects featured in *Archaeology of the Digital* go even further, imbuing actual physical structures with the qualities of virtual movement through specific design processes; a practice which Lynn himself theorized in the late 1990s in his book, *Animate Form*.

Lynn's theoretical work demonstrates that computer design affords the possibility of designing with continuous mathematical equations. The "Spline" for example, creates a continuous curve which describes relative positions through a single equation rather than using Cartesian "X, Y, Z" coordinates.⁴ This enables designers to work with topological shapes such as a Klein bottles or Mobius strips, shapes that consist of a single surface, which can exist theoretically or virtually but not physically. Topological description encompasses all possibilities of deformation. For example, a torus (doughnut) and a coffee mug shape are one in the same topologically because they both consist of a surface with a hole. This deformation is a kind of

¹ Greg Lynn and Mirko Zardini, *Archaeology of the Digital: Peter Eisenman, Frank Gehry, Chuck Hoberman, Shoji Yoh* (Montreal: Canadian Centre for Architecture, 2013), 1.

² Wolfgang Ernst, "Media Archaeography," in *Digital Memory and the Archive*, 55-73. Ed. Jussi Parikka, accessed July 25, 2016, <http://www.upress.umn.edu/book-division/books/digital-memory-and-the-archive>.

³ Greg Lynn, "Archaeology of the Digital: Complexity and Convention," *The Canadian Centre for Architecture*, accessed July 25, 2016, <http://www.cca.qc.ca/en/calendar>.

⁴ Greg Lynn, "Animate Form," in *Animate Form* (New York: Princeton Architectural Press, 1999), 20.

motion that is informed by a processual way of thinking, in the vein of Bergson or Whitehead: motion as change, as duration. From this perspective motion is not a spatial course from “a” to “b” over linear time, but the total potential for change of any kind. For example, the H2Oexpo by NOX seems to consist of a single curving surface, rather than a structure with in an interior and exterior. While this transformation is frozen in the final design, its form still contains the shape of this topological design process. These techniques allow designers to imbue shapes with transformations, processes, changes, or movements.

Another example of “animate form,” as Lynn theorized it, is the use of virtual “forces” to form a shape. As Lynn writes, working in a virtual space allows forces to be “stored as information in the shape of the form.”⁵ For example, the *Complexity and Convention* exhibit features a room full of cases where architects used computation fluid dynamics (CFD) to create a design. One example is the roof of the *Odawara / Galaxy Sport Complex* by Shoei Yoh, which was designed by simulating wind forces. This can be an engineering-oriented process, but it is not necessarily about making a building aerodynamic. These processes can simply be used to achieve a certain look or to embody a certain concept of design.

Simulation processes need not even be based in real physics. They can simply be a way to use the creative potential of algorithmic processes. A simulation can produce a shape entirely on its own, as is the case with Karl Chu's *Xphylum* project. An architect can provide a set of inputs that will, through non-linear processes of complexity or stochastics, produce an output that exceeds its input. With a few simple equations one can produce exquisitely complex or unpredictable shapes. Another example of this is *Carbon Tower* by Testa & Weiser. This design team developed a plugin for Alias 3D graphics software, called *Weaver*, which automatically generated complex interlinking shapes (Fig. 1). In cases such as *Carbon Tower* and *Xphylum*, the architects share creative agency with the algorithm, and the forms they produce contain the processual virtual motion involved in their creation.

The *Archaeology of the Digital* prompts us to think about virtual motion, or animate form, as something that sprouted from both the affordances provided by digital technology and the way designers conceptualized what digital technologies could do. While this may be true, it is important to remember that there were more discourses impinging on these designs than just “the digital.” Indeed, the use of these techniques seems rather forced in some cases. Sometimes virtual motion is a fundamental and necessary principal of design, such as Asymptote’s entirely digital *New York Stock Exchange Virtual Trading Floor*. Other times deformation is built into physical structures, such as dECOi Architects' *HypoSurface*. But why use complicated processual techniques to design an otherwise static building? Actual architecture seems rather a bad fit for these concepts. Clearly, then, there are motivations shaping these design approaches that are not practical and technical but cultural and conceptual. Virtual motion is a way of taking architecture beyond the things which defined it in modernity. Modern architecture was concrete and static, it was organized and it put up barriers and shaped visibilities. Theories about society, economics, politics and human behaviour were built into static, simple, abrupt shapes. But modern architecture sometimes acts as a monument to the naivety of modern thought. The simplicity of their shapes represents the simplicity of the theories behind them. The High-minded “béton brut” public housing blocs of the post-war period were designed with the greatest of confidence, but the many factors that their designers failed to account for became all too obvious

⁵ Ibid, 11.

once the residents moved in. The modernist paradigm of design came up short against the messy and unpredictable complexity of reality.

The design projects featured in *Archaeology of the Digital* use virtual motion to try to move past the definition of architecture in modernity. Simulation provides the opportunity to test designs for how they will function in an unpredictable world. Finite Element Analysis allows the design of intricately detailed structures of any shape. Complex and curvy forms of geometry seem to communicate an end to square, solid barriers. People move through these shapes unimpeded, like flowing water. Buildings are no longer “enclosures” but instead “modulations,” as Gilles Deleuze puts it.⁶ The virtual movement built into the form of these structures suggests their ability to respond to the world in a cybernetic fashion; something the pneumatic moving structures and the structures that incorporate “augmented reality” are literally capable of doing. Lynn does his best to avoid theoretical discussions about these topics in the voluminous literature produced by *Archaeology of the Digital*. Instead he focuses on the practicalities of the design process, how digital tools were actually used. While this is certainly a worthwhile activity, and one which is supported by Ernst's archaeological methodology, it does not provide a complete picture of architectural design in this period. There is a historical a priori at work here that is discursive, that exceeds the technical and material. These architects were theorizing more than just the digital.

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⁶ Gilles Deleuze, “Postscript on the Societies of Control,” *October* 59 (1992).

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