CLOTHING AND ARCHITECTURE:
more in common

Han Xu
20107500

Clothing and buildings are becoming even more alike. Both have typically served the bodies that inhabit them by maintaining environmental control and by presenting a codified exterior to the world. But now there are new kinds of physical resemblances between architecture and clothing. Various kinds of textiles and weaves are now being exploited in landscape and building design. Vast landscapes are shaped by geotexiles while building structures and envelopes exploit tensile, textile strategies, enabled by new lighter and more flexible materials and by the assistance of digital simulations. As well as becoming lighter, buildings are also becoming increasingly more temporary. The lifespans of buildings are ever shorter as their inhabitants become more transient, moving frequently from city to city. Evidence of this nomadic lifestyle can be found in fashion. Clothing, the portable envelope worn on the body, now provides some of the functions formerly associated with architecture. Designers are exploring the possibilities of integrated lights in clothes, pockets to carry portable electronic devices as well as soft electronic devices that are embedded in technical fabrics. Through other technological advances in textiles, specialized suits offer climatic control in very extreme environments. Yet other designers are integrating structure into clothing or even reviving the primitive model of a portable textile shelter. Many designers switch between fashion and architecture. Even the manufacturing processes for clothing and architecture can now be very much alike as new, highly sophisticated weaving robots automize the manufacturing process for articles of fashion or for components of buildings.

In Gottfried Semper's 1860 *Style in the Technical and Tectonic Arts*, we find a creation myth for today's textile buildings and architectural suits. Opposing the Vitruvian notion of *firmitas* – of architecture as mass and solidity crafted to endure eternally – Semper proposes a textile origin for architecture, wherein the principle of construction originates in the primitive weaving of the first garments fabricated by humans[1]. Through linguistic analysis, Semper demonstrates the link between the German words *Wand* (wall) and *Gewand* (clothing). As well he notes the connection between the Indo-European root *tekth* or *teksala* (build) – which predates the Latin *teckton* – and the word *textile*. Architecture, according to Semper, evolved from the clothing and transportable tents of early nomadic peoples.

[1] *Exposé*, p. 249

NEW TEXTILE BUILDINGS

The modernist steel and glass curtain walls of the early twentieth century employed a tensile, textile strategy wherein thin, light panels were hung from a frame made of long thin, continuous, semi-flexible structural members. The recent pursuit of even lighter buildings – still in the modernist style – has been documented in exhibits such as Terrence Riley's *Light Construction* at the MOMA, 1995.

In the mid-century, Buckminster Fuller, who was also concerned with the weight of architecture, proposed that buildings should be judged by their efficiency in material use. Fuller made buildings that exploited tensegrity, a building system in which all structural members are interdependent and suspended in tension. His buildings also took advantage of the strength of triangles, circles, and parabolas. In Foster and Partners' Swiss Re Headquarters in London (1997-2004), we rediscover Fuller's principle of aerodynamic, tensile architecture. The Swiss Re Headquarters is an elliptical skyscraper in which a diagonal and circular matrix of structural elements suspend a triangulated curtain wall. Its distributed structure, made from continuous chains of compone such a geometrically complex building are made possible by new digital simulation technology.

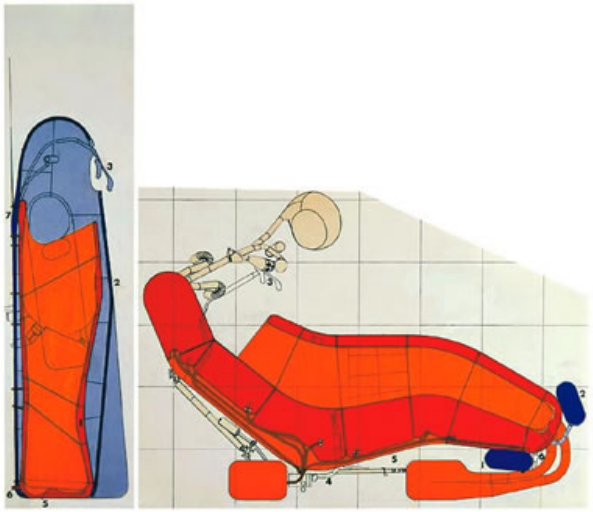
Swiss Re Tower by Foster and Partners, London, 1997-2004

Peter Testa's Carbon tower (drawn in 2004; not yet built) is 40-storey tower held up by a carbon fibre weave. It was, to an even greater extent than the Foster's Swiss Re Tower, dependent on its own custom-designed computer simulation program called Weaver. This building is also made possible by advancements in material research, carbon fibre being a new, light, strong, and flexible building material, the possibilities of which architects have only begun to apply. The exterior walls of the Carbon Tower are helical bands of carbon fibre weave. These are tied into the floor plates. Because the weave is continuous throughout the building, the need for joints replaced by unbroken, flexible, resiliant folds. The structure of the Carbon Tower will be weaved and braided by sophisticated robots.

Carbon Tower by Peter Testa, 2004 (from *Extreme Textiles*)

BETWEEN ARCHITECTURE AND CLOTHING

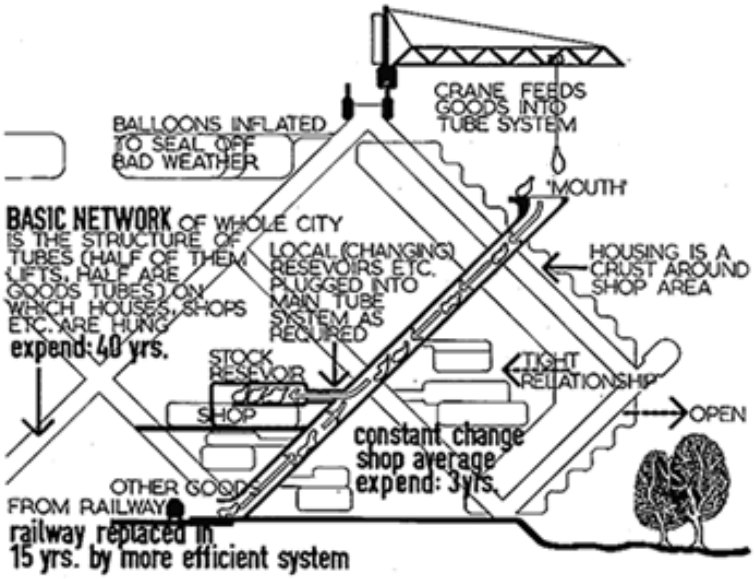
Archigram's *Cushicle* contains apparati ressembling medical instruments which attend to the body's needs through technological means. However, these instruments are not arranged as a floating landscape but are instead contained within a shell fitted to the shape of a human body. *Cushicle* belongs to a series of Archigram projects in which architecture was shaped to fit the body and small enough to be transportable, all the while containing technological devices to attend to the wearer's bodily needs.



Cushicle by Michael Webb of Archigram, 1966 (from Archigram.net)

ROOTLESS LIFESTYLE

The nomadic lifestyle for which Archigram's wearable architecture was designed is defined on an urban scale in Peter Cook's 1964 *Plug-In City.* A large-scale structure accommodates a rapidly evolving city obsessed with novelty. There are moving and replaceable parts (like in Cedric Price's *Fun Palace*) and *Plug-In City* is equipped with cranes for the easy displacement of these parts. Cook's idea of ephemeral, expendable architecture reinterprets the real trend, which has existed since the Second World War, of an incredible rate of construction and demolition, of buildings which are built with short life expectancies to accommodate the rapidly changing needs of their inhabitants. However, in Cook's version, the idea of the expiry of each of the parts of the city is very consciously taken into account. For example: "railway replaced in 15 yrs. by more efficient system."



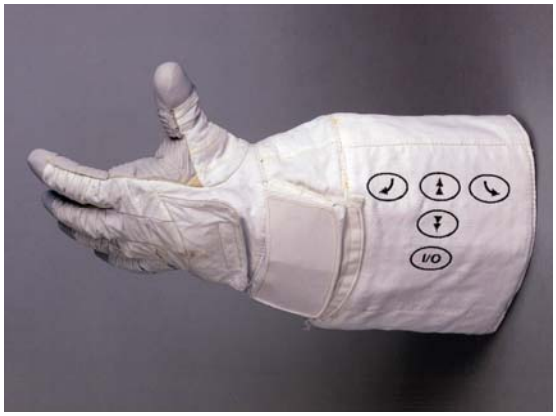
Plug-In City by Peter Cook of Archigram, 1964 (from Archigram.net)

While Archigram's nomadic architecture is depedent on technological advances, artist Lucie Orta's mobile shelter suits explore the minimal, low-tech, primitive side of nomadism. Though made of contemporary technical fabrics, Orta's wearable shelters are strikingly simple and functional. For instance, a poncho folds out to become a tent with a hood to protect the head. In *Nexus architecture* (1994) and *Architecture modulaire* (1997), Orta describes a nomadic society walking the earth with a body suit is that is joined at the waist to another, which is joined to another, et cetera.

Available to be purchased by the general public in retail stores are many portable electronic devices. Electronic devices have decreased in size to the point of being wearable – for instance, Apple's iPod – and clothing and accessories have also evolved to integrate these devices. Pants, for instance Docker's *Equipment for Legs* pants (1999) contain pockets made to the size of a Palm Pilot.[2] Like one of Orta's nomads, a person can thus travel the earth carrying his work, his entertainment and his communications network, all in portable computers contained within the clothing envelope.

As well, in many sectors of blue-collar work, wearable computers are being attached to workers. For instance, Bell Canada, the telecommunications company attached various computers to employees dispatched to repair telephone lines in a program called *Virtual Nodes.*[3] With devices attached to vests, arms and hard hats, workers become sort of cyborgs – part machine, part man.

Soft and flexible forms of electronics may provide even more comfortable means of attaching technology attached to body. Electric filaments have been woven into fabric for such applications as the space suit glove with robotic controls by NASA, ILC Dover Inc., and Softswitch Ltd. There is a promising future for the development of more commercially available soft electronics, as wearable soft electronics would provide a more comfortable alternative to hard electronics.



Space suit glove with robotic controls by NASA, ILC Dover Inc., and Softswitch Ltd, 2004

The advent of soft electronics has allowed the integration of electric lights in fabrics. Formerly part of the architectural domain, electric lights have been attached

[2] Slatalla
[3] Guernsey

to clothing by Sheila Kennedy to bring artificial light to remote villages in South America. The fashion potential of fabric with integrated light has also been demonstrated in Maggie Orth's *Electric plaid* (2004).

Light Suits, Sheila Kennedy, 2004

Fashion designer Issey Miyake has experimented with the incorporation of structure and the idea of shelter in clothing, often comparing his clothing to architecture. He recently began to use the new weaving technology for his line called *A-POC* (*A Piece of Cloth*) in which cloth can be cut in any sense without unravelling. This allows entire garments to be woven by a machine without

A-POC clothing line by Issey Miyake, 2004

requiring any sewing. Like Testa's Carbon Tower, the A-POC process eliminates the need for joints (and therefore also the need for skilled labourers) and automizes the

manufacturing process. The A-POC process can be used with any material that can be turned into a fibre. Miyake's studio developed a resin blend that a University of Tokyo lab found to be as strong as steel.[4] Toshi Mori of the Harvard Graduate School of Design claims that the A-POC method of fabrication can be used to make houses and building parts "in a way that will be both economical and offer enormous design possibilities", calling it "a high tech, high design, low-cost solution."[5] Miyake Design Studio would like to explore the potential of its weaving techniques to make micro-architecture, boats, furniture and building components.

The most impressive and sophisticated of high tech wearable suits, the space suit, was been developed by scientists. The space suit supplies astronauts with climate-controlled environments in the vacuum of space. It also provides structure against the enormous pressure of space, offers mechanical means of movement, and incorporates communications devices. Space suits, as well as greatly advancing the technology of winter coats, have provided much inspiration for architects exploring wearables.

I-Suit Mars by ILC Dover Inc., 2000

From the other end, clothing is taking on roles formerly associated with buildings. Fashion provides more support for a roving lifestyle than it ever has. Indeed, architecture and clothing are sometimes hard to distinguish.

[4] Scanlon
[5] Scanlon

References

Archigram.net

Berzowska, Joanna. www.berzowska.com.

Diller, Elizabeth and Georges Teyssot. *Flesh: Architectural Probes.* New York: Princeton Architectural Press, 1994.

Guernsey, Lisa. “Hard Hat, Lunchbox, Keyboard”. *New York Times.* December 14, 2000.

Herrmann, Wolfgang. *Gottfried Semper: In Search of Architecture.* Cambridge: MIT Press, 1984. p. 189-203.

Kennedy, Sheila and Christoph Grunenberg. *Material Misuse.* London: AA Publications, 2001.

Kennedy, Sheila and Violich. www.kvarch.net (Portable Light Project website)

Lupton, Ellen. *Skin*. New York: Princeton Architectural Press, 2002.

Palumbo, Maria Luisa. *New Wombs.* New York: Princeton Architectural Press, 2000.

Picon, Antoine and Alessandra Ponte, eds. *Architecture and the Sciences: Exchanging Metaphors.* New York: Princeton Architectural Press, 2003.

Scanlon, Jessie. “Seamless.” *Wired*, April 2004.

Semper, Gottfried. *Style in the Technical and Tectonic Arts; or, Practical Aesthetics.* Los Angeles: Getty Research Institute, 2004.

Slatalla, Michelle. “Cell Phone in the Corner Pocket”. *New York Times.* June 24, 1999.

Teyssot, Georges. *Hybrid Architecture: An Environment for the Prosthetic Body*. London: Sage Publications, 2005.