The symposium described previously provoked a new set of questions concerning design research models, transdisciplinarity, collaboration, next steps, and most importantly, the cultural realm within Hennessy’s call for a nonanthropocentric architectural agenda for sustainability. Similar to these primary mandates, the greenhouse attempts to interface and foster the culture of environment. John Martzloff’s message is simple: “in order to sustain connections between humans and nature, we need to put a face on biodiversity by making it personal.” For Martzloff, deep ecology is also cultural. We need to place importance upon recalibrating our relationship with nature in order to address next steps in sustainable design. Sustainable architecture should therefore be less concerned with issues of optimization and energy manipulation and more emphatic about facilitating built interfaces between humans and nature. The greenhouse and lab spectacles of 19th-century France were sites of technological innovation in materials design, building construction, and fabrication. Importantly, these structures also celebrated the culture of environment. Material intensities in greenhouse architecture foster unique settings for relational calibrations between humans and nature. The Greenhouse and Cabinet of Future Fossils is a contemporary text on such an interface, a new syntax in the built environment.

CREDITS

REFERENCES

ARCHITECTURE OF AN ACTIVE CONTEXT

ABSTRACT
As we stand with our feet on earth’s outermost surface we build an architecture today that is much like it was several thousand years earlier, in an attempt to extend that outer shell with one of our own making. Artificial masses are built from a refinement of this existing geologic layer into materials of stone, steel, concrete, and glass that assemble to produce new pockets of space through the buildings they create. However, the sixth century BC writer Thales of Miletus put a different perspective on this, as he insisted that we live, in reality, not on the summit of a solid earth but at the bottom of an ocean of air (Holmyard 1931). And so, as architecture continues to build up the outermost layer of earth’s surface through a remodeling, embellishing, and enhancing of the materials which it comes from, it raises the question of why we have not brought a similar relationship to the materialities at the bottom of this “ocean” of air to create the space we call architecture. If you were looking to level a complaint with the architectural profession, stating that it has not been ambitious enough in scope would not be one. Architects have never shied away from the opportunity to design everything from the building’s shell to the landscape used to stir your anger in its matching cup. But it would seem that the profession has developed a rather large blind spot in terms of what it sees as a malleable material with which to engage. Architects have made assumptions as to what is beyond our scope of action, refreshing from engaging a range of material variables due to a belief that the task would be too great or simply beyond our physical control. So even though we are enveloped by them continuously, both on the exterior as well as the interior of our buildings, it must be assumed that the particles, waves, and frequencies of energy that move around us are thought by architects to be too faint and shaky to unload upon them any heavy obligations, that they are too unruly for us to control to create the physical boundaries of separation, security, and movement required of architecture. This has resulted in a cultivated set of blinders that essentially defines architecture as a set of mediation devices (surfaces, walls, and inert masses) for tempering the environmental context it is situated in from the individuals and activities within. The spaces we inhabit are defined by their ability to decide what gets in and what stays out (light, perception, sound). We place our organizational demands and aesthetic opinions on the surfaces that mediate these variables rather than seeing them as available for manipulation as a building material on their own. The intention here is to recalibrate the materialities that make up that environmental context to build architecture. The starting point is a rather naive question: can we design the energy systems that course in and around us daily as an architectural material so as to take on the needs of activities, securities, and lifestyles associated with architecture? Can the variables that we would normally mediate against instead be heightened and amplified so as to become the architecture itself? That which many would normally dismiss as simply “air” today—thought to be homogeneous, scale-less, and hence due in part to the limits of our human sensory system to perceive more fully otherwise—might tomorrow be further articulated, populated, and layered so as to become a materiality that will build spatial boundaries, define activities of individuals and movement, and act as architectural space. Our environmental context consists of a diverse range of materials (particles and waves of energy, spectrum of light, sound waves, and chemical particles) that can be manipulated and forced to meet our needs. The opportunity before us today is to embrace the needs of organizational structures and aesthetics by designing the active context that surrounds us through the material energies that define it.
Looking back across the accomplishments in the field of architecture within the last two to three millennia, do we see gravity simply as a structural responsibility that had to be overcome, or did it grow as an opportunity to subvert and play against through the advent of new materials? These materials facilitate a reciprocal role between the growing spans of distance, thinness of structures or transparency, and the social activities and demands that could emerge or emerge under them. The development of reinforced concrete gave us structural shells, glass and iron expanses gave us the ability to capture exotic vegetation for growth all year round. Steel frames produced the tower and stacking of discrete programs, placed one on top of the other almost endlessly. These materials demonstrate how such advancements provoke opportunities not only in form and shape but also in the activities and events that exist within these expansive spaces, transparent facades, or waterproofed structural skins. These material investigations—which increased the spans of interiors or the stacking of floor plates as buildings towered—are not neutral in their deployment. Their consequences are so immense as to go almost unnoticed by the general public, having become common and conventional.

The focus here is on those energies that currently course around our bodies and architecture. These energies have not been asked to do much more than be reproduced to mimic their current state, remaining passive when they actually have the potential to play a more active role. These energies are currently relegated to the status of a resource to be conserved and managed, a resource that are currently relegated to the status of a resource to be conserved and managed, a resource that should also be seen as an amenity for design innovation in architecture—much like gravity, never overlooked but also rarely thought of as not merely an obstacle to be overcome, but a design opportunity to subvert and play against.  

1 ENVIRONMENTAL CONTROLS  

Geometry has remained our profession’s architectural translation for materiality, though the manipulation of our chemical, gaseous context—known as simply air—has seen immense growth alongside the geometries and surfaces of architecture that are more traditionally aware of it. It is important to keep in mind that this continuous discovery and manipulation of “air” has an intriguing lineage between the 17th and 18th centuries, particularly when seen against the backdrop of what the arts and architecture—whose medium of choice had been solid-state construction (stone and masonry)—were also trying to produce. Though the architect has continually turned to geometries and surfaces for experimentation and placed cultural and organizational ambitions onto stone, masonry, and glass, the scientific knowledge regarding the manipulation of the substances and volumes that moved in and around these forms was simultaneously underway, just not yet in the hands of architects. The high Baroque is exemplified by Francesco Barozzino’s mid-17th-century San Carlo alle Quattro Fontane (Figure 3), which exemplified an ability to deliver plasticity through the geometry along the façade as well as the interior surface of the dome and its planaristic organization of space. At roughly the same time, Johann Baptista van Helmont, a Flemish chemist referred to as the founder of pneumatic chemistry (Witsmer 1931) was using the word “gases” for the first time when defining specific properties within atmospheric air that defined a state of matter other than solid or liquid. While Berolin, in his Essay of St. Teresa (Figure 3), was producing lightness of clouds and a following of birds that obtain a near-weightlessness of this subject matter in stone, intermixed with paint and natural light from a hidden source to illuminate the entire space, Pierre Petit confirmed Blaise Pascal’s theory that air is present only by carrying a barometer to the top of a mountain to show the atmospheric pressure decreases with height (Kuhn). And nearly 70 years prior to the cast iron and glass frame public exhibition structures that would emerge in England and France during the nineteenth century for reproducing exotic climates and expansive interiors of vegetation from distant lands (Figure 3), Carl Schiebel, a pharmaceutical chemist, and others within the same time frame synthesized oxygen for the first time in their laboratories (Scheele).

As the understanding of the chemical makeup of our atmospheric surroundings progressed during the next century, it made its most striking and public debut in the form of military weaponry during the First World War, engaging the very environment the human body moves through as never before. Peter Sloterdijk makes the argument that the discovery of the environment took place in the trenches of World War I through gas warfare and that the 20th century will be remembered as the age of warfare that chose not to target the body of the enemy through projectiles—bullets, rockets, missiles—but by making the environment itself impossible to exist in (Figure 3). Gas warfare of World War I saw to it that poisoning the context that the soldier’s bodies operated in would secure their demise. This targeting of context (so opposed to targeting the individual body) was utilized on such a massive scale during the Second Battle of Ypres on April 22, 1915, with the deployment of chlorine gas (Sloterdijk 2009), that it is believed that nearly one-third of the casualties were gas related. To overcome the chemical alteration of the context that our respiratory and vital organs have become so adapted to, defenses were designed through the use of a mask that protected the eyes, mouth, and nose. This enclosure surrounding the face protected a filter between the body and the gas surrounding it, producing a hermetically sealed cavity that could then filter and compensate against the poisonous context that existed on the other side of that rubberized canvas and glass boundary. The body’s relationship to its context was hostile, and so that act of sealing it off from that environment formed a bubble that enclosed the body in an independent context in order to protect it so that it could move about unscathed.  

The focus here goes beyond the scientific discoveries that would produce the malicious gas itself. It stands as an example of chemically augmenting the surrounding environment that the body moves through, targeting the human senses to produce an active context. Geographically specific boundaries were created that produced degrees of intensity of the gaseous concentration, a gradient edge that positioned the soldiers in a varying degree of enclosure, either near the periphery or deep inside.  

Figure 1  

Radiation. Much like steel and concrete masonry that have been tied to spans and gravity. There is another material all around us that comes from the radiation of the sun. Particles, waves and chemical components tied to energy. But energy in architecture is tied primarily to technological devices, machines and widgets that represent conservation and efficiency (green roof, solar panels, windmills). Energy has not been brought to play against the activities and events that exist within these expansive spaces, transparent facades, or waterproofed structural skins. These material investigations—which increased the spans of interiors or the stacking of floor plates as buildings towered—were not neutral in their deployment. Their consequences are so immense as to go almost unnoticed by the general public, having become common and conventional.

Figure 2  

“Solid-state” building blocks. From left to right: glass/transparency, by Richard Neutra; steel / spans and cantilevers, reinforced, Art Center College of Design, by Craig Ellwood; concrete/malleable, TWA terminal, by Eero Saarinen.
inside where the effects of the gas were most strongly felt. These pockets and fronts of intensely dematerialized matter could be seen to move and strangle the buildings, influence the movement of soldiers, and at times enveloped their bodies into its interwar when the winds unexpectedly shifted.

The gas produced geographically defined areas within the fields where it was released. Carried by the winds, the particles would eventually dissipate; but for a period of time, physical territories were defined in which the body could locate itself as being either enveloped and inside of, or on the periphery (with a varying degree of intensity), or outside of the gas.

If, as Slobodin says, the environment was discovered in 1915 with the chemical manipulation of air, then it is clear that architecture chose to continue in the direction of the filtered mask. In doing so, architecture defined itself as an act of ‘mediating context’ and not as an act of designing the variables of chemical and energy systems that would make up an active context, refraining from engaging these designed materials of the active context as the architecture that would envelop you and not simply mediate them. Architecture took to the technologies and material advancements for mediating its surroundings rather than working with the material properties of the context itself to produce an architecture. A mediation of context is a choice; it keeps the variables of reaching the body or desired activity, but does not alter its makeup. On the other hand, an active context is one that has had those same variables reconstituted so as to meet the needs of the body or activities desired.

Mediation is a long-running trajectory of the architectural profession—and not one that just emerges in the late 20th century with the advent of air conditioning, though it certainly intensifies because of it. This discussion is well covered by Gail Coopers Air Conditioning of America, as well as writing by Michelle Addington, and therefore will not be covered in further detail here.

Mediation is an act that by its nature selects and rejects variables from the environmental context offered, pointing and choosing which can be used for the benefit of the activities occurring on the other side of the wall and which need to be rejected and protected against. This includes the building envelope as well as the use of vegetation on the exterior of buildings and the trees canopies in gardens that create shade. The surfaces of subdividing, whether made of brick, glass, metal, or any form of perforated surface or aperture, are the outlines of building topologies set to mediate the environmental context. And when the surface is not mediating exterior climatic contexts, it acts as a hermatically sealed membrane around internally generated climates, operating in collusion with industry standards to maintain and provide common settings of comfort zones, sealing within the energies that produce these homogenous interiors.

The sealed masks around the face became emblematic of the directions that architects and engineers would take as building envelopes and mechanical systems became the hallmark of the profession. Innovation would be understood to take place in envelope technology (front screens, waterproof membranes, glazing, insulation) and the mechanical systems for producing climatic control, rather than the engineering and architectural controls of the material variables that exist on the other side of the envelope. An of rare, little is asked from these energies other than to reproduce it. (This discussion is well covered by Gail Coopers Air Conditioning of America, as well as writing by Michelle Addington, and therefore will not be covered in further detail here.)

As an example of gas warfare, we do intentionally influence our context; we simply do not do it under the guise of architectural (spatial and organizational) design. We already influence our environmental context daily, only as a by-product condition, often unintentionally and certainly not through a designer’s controlled intention for architecture’s benefit. We only need to look to the heat island effect in cities like Atlanta and Houston, and to the resultant microclimates outside buildings as they exhaust heat and energy, to see that we actually do augment and influence these local climates. Even the most passive building exceeds its formal constraints, there are shadows cast from the buildings, winds produced or blocked, and solar radiation reflected from the glass surfaces. It just so happens that these are accidental conditions, completely unintentional by-products of the built environment with no real design intentions for garnering the responsibility of dictating organizational and spatial strategies. Architecture’s self-diagnosis in identifying itself as a profession that mediates the context to provide for the human body and its activities denies many of the very actions it already carries out. Architecture has yet to lay its burdens of providing for the body, its collected objects and the activities it shares in, onto an architecture that defines its creation and existence as the active context. The shift in less about a technological rift and more about an ideological one. This ‘requires an awareness that this is not a substitution of one over another, but that opportunities exist within an active context that are not available in an architecture of mediation.

2 ARCHITECTURE AS THE ACTIVE CONTEXT

Although it may not be obvious at first glance, some of the most interesting examples regarding this active context can be found in the buildings of the 2008 Summer Olympics in Beijing, even though the colonial collection of stadiums seemed to be more of a showcase for curtain wall and facade design than anything else. As the project designs focused primarily on the structures that would house the Olympic events, discussions began to turn to the air quality of the venues and the potential implications this would have on the performance of the athletes. So many aspects of the sports are meticulously monitored and controlled, from the chemical supplements consumed by the athletes to the equipment (swimmers, bikes), yet the environmental parameters that the bodies move through are often left to existing conditions that the specified calendar day and geographic location provide. These issues of environmental context are only addressed in the broadest sense when choosing where to locate the Olympics for that particular year, or in the case of Beijing, preventing the use of cars and vehicles for several days leading up to the games to alleviate the particulates in the air; that the environmental context plays a role in affecting competitive sports is common knowledge, but the control of these variables is generally left to the host city and hoping for good weather. Runners, for instance, know that their performance is tied to the oxygen content in the air, making it common practice to train at higher elevations in the days leading up to a race, which can increase their endurance when they return to compete at lower elevations. This can have a major effect on their race times.

Competitive swimming is the event where the relationship between the context and the body that moves through it is brought most clearly to the fore. Not surprisingly, there were discussions at the 2008 Olympics regarding the potential for unfair advantages resulting from technologies and gear available to the athletes. In the case of swimming, the issue was the use of one-piece swimsuits that covered the body from the ankle to the neck. Some swimmers were more than one suit to use to create buoyancy from air pockets between the two layers. In 2008 alone, 70 swimming world records were broken, 46 records were broken in the Olympics, and there were races in which the and isolate ideal climates is to supply a rather subjective level of comfort to our bodies. A trajectory was defined for designing the products that would mediate our context over the design and control of the energy systems themselves, the larger environmental context within which these envelopes exist. This assumption that architecture’s fundamental act prior to all others is that of mediating context is a choice; it keeps the variables from reaching the body or desired activity, but does not alter its makeup. On the other hand, an active context is one that has had those same variables reconstituted so as to meet the needs of the body or activities desired.

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One of the questions raised during the Olympics by former Olympic medalist and swimming commentator Rydell Gaines during the broadcast was if this particular Pool—the Beijing National
relationship to the athlete's movement through it. The active context the athletes move through in competition—not the cleaning and temperature control of the water that we see now, but fills the pool (Berkes 2008). This would be the design of the active context that the body moves and currents within the pool water by dissipating or absorbing them but also on the water that continually be broken, the focus might not be solely on the surfaces that mediate the turbulence that hold the pool water. Gaines stated that if pools are going to get faster, if records are going to be recalibrated of the properties that will increase the body's performance when moving through it.

The most elemental version of one of these pools that we can each recognize would be the results of a composition of materials around us, charged with the chemical and electrical compositions that become materials as architectural responsibility is moved from the surfaces that mediate context to the building up of the materials to make architecture the active context. This active context becomes a composition of materials around us, charged with the chemical and electrical compositions that the body moves through. Like a body of water with currents, thermoclines of demarcations are often sudden and striking in their contrasts in temperature change from one inch to another. The intensification of the environmental context creates a flow of oddities that the body comes in contact with and moves within. Currents course through sites at varying frequencies and intensities, overlaid upon one another, each engaging the sensory perceptions of the body differently.

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would advance to absorb the responsibilities and demands we associate with architectural discipline. These accidental focusses on the grassy patches outside buildings are only a glimmer of the diverse constructs and worlds to be devised.

These pools are chemical particles and waves of frequencies that produce a viscous volume of disparate materializations, designed to work in parallel with each other. They are designed pockets of coursing energy fields that structure and organize space as well as create and hold their own aesthetic properties. The characteristics of pools differ from our association of interiority and rooms in which geometric form and surface are used to demarcate on which side of that condition the body resides. The creation of an architectural pool is formed from gradient intensities that do not produce the same dichotomy. The physical properties of the material energies that construct these spaces consist of their own strengths and limitations, which inform their abilities, size, shape, and aesthetics of the spaces they produce. The extent of a room’s size is no longer defined by the extent of spans, shaped enclosure, or spurtures in surfaces that provide access and light. Lines and surfaces therefore do not act as the primary means for defining spatial edges; instead, currents and points of intensity overlap to demarcate edges and thresholds that redefine architecture’s existence.

The attempt here is to do more than simply ‘condition’ interior spaces, or produce recognizable climates. Engaging these ‘active contexts’ as pools is not a reconstruction of an understood climatic ideal. These pools of design seek not simply to move activities and events associated to the interior and displace them to the ‘outside,’ but also to acknowledge that such a discussion will have fundamental repercussions on the social experiences as well as the definitions of these programs. The intention is to seek new territories of design, texture, and social interaction—to tease out the spatial and social implications that arise when ‘walls’ and ‘geometry’ are no longer our primary means of spatial organization. The context that our bodies move through daily is material ready for our design engagement, a site of action, of nuanced materialities that are now only lumped into a single category of energy, not recognized for the opportunities they present.

An approach architecture as an active context, we enable projections and speculations of how these typologies of space will become the catalysts for seeking new spatial boundaries that inform organizational activity and social engagement. Our architectural spaces will consist of these active contexts that our bodies will experience, ensconced within gradient energy boundaries that course around us directing and informing our spatial surroundings. They need only to be embedded with the responsibilities we now associate with geometries. To do this, the active context needs to amplify the existing energy systems we are already commonly aware of, heightening them to become technological and social. As material energies, they will construct an active context into architecture, define the boundaries of movement, and absorb the spatial loads that currently rely solely on geometries and surfaces.

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This paper is an excerpt from a chapter of the same title in a forthcoming book called The Air on Other Planets.

REFERENCES


SMART DISASSEMBLIES: OR, HOW I LEARNED TO TAKE THINGS APART

ABSTRACT

Taking things apart is easy. How something works, or even what it is, is irrelevant to its dismantling. If assembly can be perceived as a rational act, then disassembly is certainly its counterpart: an intuitive, foolproof, and mindless errand of the seemingly curious subject. It is in this unflattering description, however, that disassembly warrants an analysis of its smart potential.

Smart Disassemblies locate the exploded view drawing, a representation that conveys the instructions for assembly, within its architectural legacy. From its origins in the Renaissance to its more contemporary appropriation by Thom Mayne and Daniel Libeskind. The categorical rules, and the part-to-whole relationships they imply, gleaned from these precedents are then subverted toward the end of disassembling an object. The proposed rule sets (Point of Explosion, Point of View, and Explosion Sequence) and their variants are tested through their application to a complex assembly of objects, a jazz quintet.