Chapter one: Amplification

Architecture today, much as it did several thousand years ago, attempts to extend Earth’s outer shell—the surface on which we stand—by adding other shells of our own making. Materials of stone, steel, concrete, and glass—refinements of the existing geologic layer—form artificial masses, or buildings, that produce new pockets of space. As these built forms rise from Earth’s surface, they engage with the planet’s atmosphere. In fact, it would be more useful to say that we “live not on the summit of a solid earth, but rather at the bottom of an ocean of air.”i And so, as architecture continues to build up Earth’s outermost shell by mimicking, embellishing, and enhancing the materials that constitute that layer, the question arises: Why hasn’t architecture sought to pursue a similar approach with the materials comprising this “ocean” of air, our atmosphere, in order to further create new spaces?

Architects have not asked the various forms of energy that make up this ocean of air to do much more than reproduce and mimic an ideal climate, remaining passive when they actually have the potential to play a more active role. Much like gravity, energy behaves in particular ways that are impossible to overlook. Yet we rarely think of gravity as we do the outer environment, as merely an obstacle to be overcome. Instead, it is a design opportunity to subvert and play against, with cantilevers and slender structures. Surrounding forms of energy present similar opportunities, but when architects do look to
the environment that exists beyond their architectural envelopes for inspiration, the focus seems more on viewing biological specimens as structural and geometric models while ignoring the energy systems that influence and act on those specimens. We seem more drawn to imitate the voluptuous shape and texture of the durian fruit of Southeast Asia or the lengthy spine patterns of the pincushion cactus of western North America than in simulating the differing environmental variables these specimens live within. In adopting these biological forms via analogy and imitation, we place more value on the geometries of the vegetation than on the atmospheric and chemical properties of the context that helped inform their creation in the first place.

Architects have never been modest in the scope and ambition of their projects, taking the opportunity to design everything from entire cities to the teaspoon used to stir your sugar 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 malleable material for architects to engage. By making assumptions as to what might be beyond its purview, architects have refrained from engaging a fuller range of possible material variables. We are continuously enveloped by a wide range of energy systems touching both the exteriors and the interiors of our buildings, but we think these particles, waves, and frequencies are too faint or shaky or unwieldy to create the secure physical boundaries we associate with architecture. This has resulted in a cultivated set of blinders that characterizes architecture as an assembly of mediation devices (surfaces, walls, and inert masses) that separate individuals and activities placed on one side from the larger context beyond. These mediation devices temper both existing climates as well as man-made energy systems, including sounds from traffic and light pollution, that together create the environmental contexts architecture exists within. Such a mediating architecture is defined by its ability to decide what gets in (breezes, light) and what stays out (precipitation, cold winds). We place organizational demands and aesthetic meaning onto the surfaces, walls, and masses that mediate these energy variables, rather than seeing the energy systems themselves as available for manipulation as a building material of their own.

The starting point here is a rather naive and fundamental question: can we design the
energy systems that course in and around us every day, and use them as a material that meets the needs associated with architecture (shaping activities, security, and lifestyle)? Can the variables that we would normally mediate instead be amplified to become architectural materials and, in turn, architecture itself? What many would incorrectly dismiss as simply “air” today—thought to be homogeneous, scaleless, and vacant due in part to the limits of our human sensory system to perceive otherwise—might tomorrow be so articulated, strengthened, and layered as to become a material for building boundaries, defining individuals’ movements, and generating architectural space. The environmental context that engulfs us all, the lowest level of that vast ocean of air above us, is more than sunlight, wind, and precipitation—elements for architecture to select, reject, or recreate in our interiors. It is also the material energies of electromagnetics, thermodynamics, acoustic waves, and chemical interactions, which we know surround us constantly, yet have refrained so far from using as architectural building blocks.

Radiation and Matter
The particles and waves of the sun’s radiation that interact with all matter on this planet have the potential to become a set of materials for building new forms of architectural space.
Mark Wigley’s assertion that “all architecture is a form of radiation” throws these possibilities that architects might be overlooking into sharp relief. Starting from his statement, one can imagine that architecture has a broader bandwidth to work within than we’ve previously assumed. One kind of radiation comes from the sun; through a combination of factors (including our sun’s radiation spectrum, our planet’s distance from it, and the filtering effects of Earth’s atmosphere), the resulting sunlight that reaches our planet’s surface is within a visible spectrum from violet to red. Blue photons carry some of the strongest levels of energy, while red photons carry less energy but are more constant. Plants absorb the energy from sunlight to power photosynthesis, leaving the green wavelengths to bounce back and create the color that our eyes see. It’s no coincidence that our eyes have adapted to perceive sunlight, the strongest spectrum of radiation to reach the Earth’s surface; after all, this energy supports almost all life on the planet.

However, should any of the aforementioned variables have differed in any way—should Earth have swerved off course a few million years ago, several million miles to the “left” or a few hundred thousand miles to the “right”—the most energy-packed spectrum of the sun’s radiation reaching Earth could very well have been deep violet or maybe something near infrared. Either of these spectrums could have powered a very different type of photosynthesis, and our plant material would look altogether different, too. We could very well be touting a “red” revolution in environmental activism instead of a “green” one right now, with an architecture interested in identifying itself as environmentally sensitive assuming the mantras and slogans of “red architecture,” like one imagines would exist on the Martian territories of H. G. Wells’s War of the Worlds. Rather than green, the color that plants reflect back to us could range from what the Pantone color chart refers to as “bland” to color #EE2C55, a dark red labeled “awesome.” Who wouldn’t enjoy an “awesome” architecture or environmental revolution over a green one? It is possible that on such an Earth, the chemical compositions of the atmosphere would include a different ratio of nitrogen and oxygen, sounds would travel at a different rate, temperatures would be different, and its inhabitants’ sensory perceptions would have evolved to interact with all these new variables.
The point to be made here is that just as Earth’s mass defines the force of gravity that our buildings and bodies must stand up against, Earth’s distance from the sun dictates the spectrum of energy that informs life and how we differentiate between one microclimate or ecosystem and another. These are the rule sets we use—the laws we are tied to as they relate to behaviors. And even though Earth won’t be changing its location in the solar system anytime soon, nor will the energy from the sun that reaches its surface shift outside of the visible spectrum, this doesn’t preclude our manipulation of the material variables currently accessible. Much as in their interactions with gravity, architects can’t alter such laws, but they can work with the full range of materials that are governed by them. Like the steel, stone, or glass we manipulate to defy gravity, the material variables associated with and tied to energy (the waves, particles, and chemical compositions of our atmospheres) can each be defined as a materiality once their properties and behaviors can be controlled enough to be shaped and maintained over time. Unlike the laws that govern their behavior, these energies are malleable, not static and unwavering, and can be augmented, mutated, and designed as materials to shape our environments and architecture.

“Solid-State” Building Blocks
From left to right: transparency, Constance Perkins House by Richard Neutra (1955); increased spans through the use of steel, Art Center College of Design by Craig Ellwood (1976); malleability of forms with reinforced concrete, TWA Terminal by Eero Saarinen (1962).
Environmental Design

Geometry has long been architecture’s way of articulating material control, and the profession’s ability to manipulate geometries and surfaces has evolved in that time. Similarly, the means for understanding and manipulating our chemical and gaseous context have become increasingly sophisticated as well. The discovery and manipulation of these energies had an especially rich lineage between the seventeenth and eighteenth centuries, particularly when seen against the backdrop of what the arts and architecture were also investigating at the time. As architects experimented with fluid, highly expressive surfaces, projecting new cultural and organizational ambitions onto stone, masonry, and glass, scientific inquiry regarding the makeup of the atmospheric volumes that moved in and around these forms was simultaneously under way. The High Baroque is exemplified by Francesco Borromini’s mid-seventeenth-century San Carlo alle Quattro Fontane, which demonstrated an ability to deliver a sense of plasticity through geometry, evident in its façade, as well as on the interior surface of the dome and in its planimetric organization of space. At around roughly the same time, Johann Baptista van Helmont, a Flemish chemist sometimes referred to as the founder of pneumatic chemistry, used the word “gas” for the first time to define specific properties within atmospheric air that represented a state of matter other than solid or liquid. Even as Gian Lorenzo Bernini, in
his Ecstasy of St. Teresa, was producing in stone the lightness of clouds and a billowing of robes that obtain a near weightlessness, Pierre Petit was confirming Blaise Pascal’s theory that atmosphere has weight by carrying a barometer to the top of a mountain to show that atmospheric pressure decreases with height.vii And nearly seventy years before cast-iron and glass-frame public exhibition structures would emerge in nineteenth-century England and France to enclose exotic climates and expansive interiors of vegetation, Carl Scheele, a pharmaceutical chemist, became one of the first to synthesize oxygen in his laboratory.viii

Even prior to these scientific experiments and discoveries, the impact of “vapors” on those encountering them was well known. Volatile gases buried in the soils of swamps, bogs, mines, or quarries—these pockets of putrid air where vegetation, water, and fish carcasses had decayed often reemerged when land was drained and later plowed—were widely feared long before science could entirely understand them, because their release could strike an individual dead.ix But to see the scientific discoveries of the makeup and properties of gases like these coinciding with architectural tendencies that seem to be demanding similar performative characteristics from solid materials like stone (from the lightness and buoyancy exemplified in Bernini’s sculptures, to the malleability traced from the exterior to the interior of Baroque churches, to the artificial climates trapped within expansive iron and glass shells) is intriguing. Was it the virtuosity of the architects and artists of that era that produced such qualities in inert materials like stone and iron where others before them had not? Or did they actually invent these performative qualities in stone and iron in the first place, setting the stage for a moment when scientific understanding would allow similar atmospheric qualities to perform architecturally themselves?

As an understanding of the chemical makeup of our atmospheric surroundings progressed during the next century, it made its most striking and public debut in the development of military weaponry during the First World War, when weapons designers began engaging the very environment the human body moves through as never before. Peter Sloterdijk has stated that the real “discovery” of the environment took place as gas warfare was
waged in the trenches of World War I; instead of targeting the body of the enemy through physical projectiles (bullets, rockets, missiles), warring nations instead made the environment itself impossible for the enemy to exist in. This “targeting” of enemy soldiers’ environmental context with poison gas was utilized on such a mass scale during the second battle of Ypres on April 22, 1915, that it’s believed that nearly a third of the casualties were related to the deployment of chlorine gas.

To overcome the deadly chemical alteration to the air that our respiratory and vital organs rely on, scientists developed a means of defense—specifically, masks that protected the eyes, mouth, and nose. These enclosures surrounding the face mediated between the body and the gas around it, producing a hermetically sealed cavity that could filter and guard against the toxic context that existed on the other side of that rubberized-canvas and glass boundary. The environmental context was hostile, so the mask produced an independent context, forming a “bubble” that enclosed the body in order to protect it and allow it to move about unaffected by what was outside.

The focus here goes beyond the scientific discoveries that produced the lethal gas itself. Rather, the emphasis is on the gas’s chemical distortion of the environment that the body moves through and how the human senses can thus be targeted in a manipulated environmental context. In the fields where it was released, the gas formed geographically specific boundaries between areas of different chemical concentrations; these boundaries were less hard lines than gradient edges that marked a varying degree of enclosure, with soldiers either near the periphery of the gas or deep inside it where its effects were most strongly felt. These pockets and fronts of intensity demarcated and subdivided the battleground, influenced the movement and strategic deployment of soldiers, and at times pulled their bodies into its interior when the winds unexpectedly shifted. Carried by the winds, the particles would eventually dissipate, but for a period of time, physical territories were formed in which the body could locate itself as being inside the gas, on its periphery, or outside the gas.

So, the early twentieth century showed that we could not only chemically manipulate
the environment our bodies move in, but also provide individual bubbles for our bodies to move through that manipulated context unharmed. Given a choice between these two extremely different directions in material manipulation, it’s clear that architecture has continued in the direction of the filtering mask. In doing so, the discipline reinforced its ongoing commitment to architecture’s mediating context, choosing not to engage the possibility of explicitly designing the chemical and energy systems already coursing (like poison gas) through a site.

By the time the gas mask was put into use in military battles, over a half century of experimentation had already occurred in building technology seeking a similar type of control. In this case, it was control over the moisture and air quality in factories needed to help stabilize and increase production levels. Willis Carrier coined the term “air-conditioning” in 1914, giving a name that we use still to this day to the augmentation of the air within the interiors of buildings. It was common practice in factories prior to this work, whether they refined cotton or chocolate, to stop production if the existing humidity and temperature began affecting the product or the machinery producing it.
Much like the gas mask that separated a soldier’s respiratory system and eyes from a poisoned context, a filtration system was developed for factories that could manage these variables and prevent work stoppages and losses of quality control. To maintain the artificial climates thus produced, architects sealed the perimeters of buildings to maximize this control and minimize any potential interference by exterior variables. This also prevented the escape of the cooled and dehumidified air that had taken so much effort to create in the first place. Although the political, moral, and economic considerations behind these two examples are widely different, their shared logic makes both of them representative of technological forays into environmental mediation.

As architects and engineers followed the directives of environmental separation and control, building envelopes and mechanical systems became the hallmarks of the profession. Innovation was understood to take place in envelope technology (rain screens, waterproof membranes, glazing, insulation) and in the systems for producing climatic control, rather than in the engineering and architectural control of the material variables that existed on the other side of the surface envelope. The gas mask that protected the eyes and nose from a poisoned environment became an appropriate analogy for homes and public buildings that would seal themselves off so as to heat and cool their interiors and filter the variables—sun, winds, and odor—of the outside world.

Mediation Took Control
Mediation is a long-running trajectory in the architectural profession, and although it certainly intensifies with the advent of air-conditioning, it did not originate in the early twentieth century. Mediation is an act that by its nature selects and rejects variables within the environmental context, picking and choosing which qualities can be used for the benefit of the activities occurring on the other side of the mediating surface and which need to be rejected and protected against. Manifestations include not only the building envelope but also the use of vegetation on the exteriors of buildings, as in the case of tree canopies in gardens that create shade. Architecture in which an “interior” space directly opens to the context beyond it only exists when that exterior climate or context is neutral enough to accommodate such an attempt. Some of the most well-known examples of this
are the Case Study Houses of Southern California, designed during the mid-twentieth century with sliding-glass exterior walls and floor materials that extend from the interior to the exterior so as to provide seamless transitions between the two states. But even in the temperate weather of Southern California, closed glass doors provided a thermal boundary, and eaves extended beyond the rooflines to provide shade and protection from rain. The use of steel and glass only saw to it that the materials that provided mediation were less visible, allowing for a transparency that further reinforced the impression of seamlessness from one side of the mediating envelope to the other. The surfaces of a building, whether made of brick, concrete, glass, mesh, or any form of perforated surface material including apertures, form the outlines of an array of building typologies set to mediate the environmental context and define the spaces for activities inside.

Such surfaces, there to temper the climatic variables that affect our bodies and activities, fall within what Reyner Banham has categorized as three main areas of performance: conservative, selective, and generative.xii The conservative performance requires a wall and its materials to provide a thermal lag that limits heat from entering during the day yet radiates absorbed heat at night to warm the interior. Think of adobe structures or a concrete parking garage in Las Vegas at two in the morning that is warmer inside than the surrounding sidewalks as the concrete slowly releases the heat collected from absorbing the sun’s energy all day. The selective performance derives from adapting exterior walls, roofs, and floors to filter existing breezes and provide shade from the sun, all in an attempt to mediate existing conditions within the interior or beyond that surface. Examples of selective surfaces include porches, brise soleil, and canopies of building overhangs or trees. And thirdly, the generative performance relies on the sealing and closing of these surfaces to permit artificial heating and cooling systems to mechanically provide the desired level of comfort on the interior.xiii Each of these performances prioritizes the physical, built surface, with the possible exception of the generative, where mechanical equipment plays a primary role, though even in this case the surface is the line of demarcation for what stays in and what gets out as it seals the building off from its surroundings.
Further, given advancements in curtain wall construction that mean the outer surfaces no longer provide the structural support of the building, today many such surfaces are solely mediation devices for defining interior space. Contemporary design culture in particular, which focuses on form-finding strategies and scripting logics for designing complex surfaces, and which believes that innovation exists only within geometry, has resulted in reinforcing an architecture defined by mediation. The quest for more complex walls has been taken up with such maniacal attention that discussions of the energy found between and around these walls have been largely avoided. This trajectory of mediation hasn’t wavered, even as techniques for visualizing a wider array of these energy systems have become available thanks to software simulation; as of now, little is asked from these energies and their software simulations beyond help in reproducing and imitating “ideal” climates to supply a rather subjective level of comfort to our bodies.

The focus, then, is on interior climatic homogeneity. So it is not surprising that the idea of context is generally understood within architecture practice as something to respond to, whether that means tying a project back to infrastructural systems (e.g., roads), or tapping an existing resource, or relating the project to a building near its site, or mediating the environmental conditions associated with solar orientation, optimal views, or existing climate. As in the example of gas warfare, however, we can and do intentionally influence our environmental context; we simply don’t do it under the guise of architectural (spatial and organizational) design. Instead, the ways that architecture already affects our environmental context every day is viewed as a by-product condition, often unintentional, and certainly not in any way controlled for architecture’s benefit. We only need to look to the heat island effect in cities like Atlanta and Houston, created by large expanses of materials with low albedo levels (like asphalt) that absorb energy from the sun, or the microclimates that form outside buildings as a result of exhausted excess heat from mechanical systems, computers, and human bodies, to see that we actually do shape these local climates. Even the most passive building exceeds its formal constructs once you consider the shadows cast from its volume, the winds it produces or blocks, and the solar radiation reflected from its glass surfaces. But these are accidental conditions, fallout of the built environment, with no real intention to dictate organizational and spatial
Architects have argued that architecture requires walls and surfaces in order to provide for the needs of the human body and its activities. Questioning this assumption is not only to open a discussion of what types of materials can construct architecture, but also to ask what opportunities and implications might arise for the very activities and social interactions that are propelled and controlled by this change in material boundaries, including our bodies’ relationships to these environmental materials. Mediation of environmental energies controls their relationship to the body, or a desired activity beyond, but it does not alter the energies’ makeup. If, however, those environmental energies could be amplified and strengthened, they themselves could become the materials used to build architecture. Being able to amplify energy to control a spatial boundary or provide a resource so an activity can occur makes that type of energy a material, one that the architect can design with. Amplification is the act of working the various forms of energy available into materials that can build architecture.

Amplification
Some of the most interesting and unexpected illustrations of the idea of amplifying the environmental context to form architecture can be found in the buildings of the 2008 Summer Olympics in Beijing. At first, the colossal collection of stadiums produced for the event seemed to be a showcase for façade design and curtain wall construction more than anything else. As the Games approached, however, discussion turned to the air quality within the venues (and the notoriously polluted city overall) and the potential impact this would have on the performance of the athletes. (In fact, the city strictly prevented the use of cars and vehicles for several days leading up to the Games in order to reduce particulates in the air.)

So many aspects of Olympic sports are meticulously monitored and controlled, from the chemical supplements that athletes consume to the equipment they use (whether swimsuits or bikes). Yet the environmental parameters that athletes’ bodies move through are often left to be determined by the existing conditions of a specified calendar day.
and geographic location. Issues of environmental context are addressed only in the broadest sense when choosing where to locate the Olympics for a particular year (and then primarily in hoping for good weather). On the other hand, knowledge that the environmental context plays a role in affecting competitive sports is widespread: runners, for instance, know that their performance is tied to the air’s oxygen content, making it common practice to train in the days leading up to a race at higher elevations, where oxygen levels are lower, hence increasing their endurance when they return to lower elevations with higher concentrations of oxygen.

Competitive swimming is the event where the relationship between the context and the body that moves through it is most clearly foregrounded. As always, there were discussions at the 2008 Olympics regarding the potential to gain unfair advantage from the technologies and gear used by 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 even wore more than one suit so as to create buoyancy from the air pockets that formed between the two layers. Evidence suggests that these concerns were valid: in 2008 alone, seventy swimming world records were broken, sixty-six records were broken in the Olympic games, and there were races in which the first five finishers were ahead of the existing Olympic record.xiv By 2010, regulations had been passed stating that “men swimsuits [sic] shall not extend above the navel or below the knee” in an attempt to bring an element of fair play back to the sport.xv

Regardless of the suits swimmers wear, the actual medium that each moves through is equal to all, giving no one competitor an unfair advantage. Improving upon this neutral medium—in other words, introducing changes that provide equal benefit to all swimmers—is referred to in swimming as creating “faster pools.” A “faster pool” results from deploying a series of techniques in the design of a pool to lessen resistance for swimmers as they move through the water, leading to faster times. The depth of the pool, the extra swimming lanes and overflow gutters on the sides of the pool, and the line ropes that separate the swim lanes (known as wave eaters) are design elements that can be manipulated to reduce the interference and turbulence given off by the swimmers, making
the pool faster for all.

Faster pools represent an enhancement of context that allows the sport to evolve, generating new excitement for viewers (and sponsors) by extending the limits of what has been previously possible—take the attention garnered by swimmer Michael Phelps in both 2008 and 2012, for example. Knowing that controversy arises when individuals are suspected of pursuing unfair advantages through the gear they have access to and/or by chemically enhancing their bodies, Olympic officials prefer to look toward the playing fields that the sports take place on to meet these pressures for advancement.

However, one of the questions raised during the 2008 Games by former Olympic medalist and swimming commentator Rowdy Gaines was whether this particular pool—The Beijing National Aquatic Center—had reached the apex of pool design through these techniques, which were based, as all pool designs are, in shaping the geometries that hold the pool water. Gaines suggested that if pools are going to get faster, if records are going to continually be broken, the focus of pool design might move beyond molding the surfaces that mediate the turbulence and currents within the water by dissipation or absorption to augmenting the water itself that fills the shape! He proposed, in other words, a focus on the design of the water. The architectural opportunity no longer is in the shell that caps the space (i.e., the swimming pool edges), but in the physical context through which the athletes move. A new frontier in swimming performance might exist in the evaluation of the chemical makeup of the water itself, in the salinity, buoyancy, and chemical components of the water and its feedback relationship to the athlete’s movements. The environmental context the athletes move through thus becomes a focus of design attention, just like the structures that shape the pool’s outer forms or the equipment that the athletes currently use in competition. Looking to strengthen the chemical composition of the water to accommodate the needs of open athletic competition is a promising option and an immense incentive that can’t help but spark the imagination of the architect.

Pool water now is treated much as architecture treats its interiors: as something to merely
be tempered and kept sanitary. Setting the temperature of Olympic pool water at 77–82 degrees Fahrenheit, and using filtration and chlorine to prevent algae infections and keep the water clean, is not much different from maintaining a building’s internal air temperature at 68–72 degrees Fahrenheit with 45 percent relative humidity and filtering out undesirable air particles. The temperature control and cleaning that occur now in pool water represent an elimination (or mediation) of variables, not a creation of new ones. Much like our climatic interior controls, these interventions are specified to create a baseline that has been formulated from ideas of an existing ideal condition—in this case, a clean, temperate, and waveless open body of water. But unlike the surface of running tracks or the artificial turf of soccer and football fields, pool water is something that the body moves through. Pool water is a step beyond. It deals with more than engineering a product that increases the performance of the human body or relocating an event from one oxygen-specific altitude to another. Changing the properties of the space through which athletes move is designing their environmental context. To do this, architects must engage the materialities associated with the environmental context, amplifying and controlling them with the same fervor they have applied to the construction of the surfaces used to mediate against that same environmental context for so many millennia.

We can all recognize one of the most elemental versions of such an amplification: the results of the heat released from a city’s infrastructure systems or a building’s mechanical system running under an outdoor expanse during the winter months. As exhaust grates release excess energy onto grassy patches outside, the micro-local temperature builds up with the expended heat, warming the soil and surrounding air. Where snow and ice cover the surrounding region, plants have gone dormant, but this little swatch of area shows contrasting signs of growing grass, along with melted snow and the gathering of people to stay warm. This anomalous pocket defines a local geography within a broader context. Such contrasting microclimates exist nearly everywhere, from the geothermal pools of Iceland to the oases formed by underground rivers and aquifers in deserts from the Sahara to Peru. Energy dumps at the exteriors of buildings are not much different from these natural examples, though the dumps are singular and simplistic in their deployment since
they are essentially a defect condition, unplanned by anyone. They rarely have intricacies with nested subsets; instead, they act under binary “on” and “off” conditions. But they do point us in the direction of how a primitive example might be intensified and layered with multiple material energies and specified design intentions, providing more than a pocket of heat on a cold day. These accidental hiccups on grassy patches outside buildings are only a glimmer of the diverse constructs and worlds to be devised.

Architecture Through Amplification
Top: Under construction with an empty pool; the geometries of construction hold the activities inside. Bottom: Manipulating the properties of water that the bodies move through is the next medium for design.
Architecture formed through amplification engages the existing energy systems within our surrounding environment, intensifying and fortifying them to become architectural materials. In doing so, those new material energies absorb the spatial and organizational responsibilities that currently reside in architectural surfaces. The spaces thus created are compositions of materials already around us that are charged with chemical and electrical properties. The intensification of the environmental context that the body moves through creates a layered makeup of particulates working together in parallel, overlapping with and integrated into one another. Like a body of water with currents, an amplified surrounding environment would be defined by thermoclines that would often be sudden and striking in their contrasts with one another and their surroundings, producing new edges and boundaries in space. As currents of energies course through sites at varying frequencies and intensities, each would engage the sensory perceptions of the body differently.

This Is Not Weather Control
Unlike the image of a snowstorm in a forest on a summer’s day, the attempt here is not to condition exterior spaces as we currently do our interiors, but to produce architectural shapes and spaces free from comparisons to existing weather or ecological systems. Image: Midsummer Snow Storm by Peter Liversidge (2009).
Amplification of the existing energies of our surrounding context shouldn’t be confused with reconstructing a climatic ideal. It is more than simply “conditioning” exterior spaces or producing recognizable climates. History can point us to numerous architectural “weather control” strategies, but what is sought here isn’t the culling of recognizable climates to achieve preconceived specifications associated with existing lifestyles, as in climate-controlled interiors. Instead, amplification allows architecture to explore new territories of design, aesthetic proclivities, and social interaction. When a wall is no longer the standard organizational device, it takes very little imagination to see that new organizational strategies might also be put into play, even when they are not always immediately apparent.

A false duality persists behind our actions as they pertain to our surroundings that limits us either to poisoning the environment or to conserving it—a belief that if you are not involved in reducing energy consumption or in remediating the environment around you in some fashion, you are complicit in its destruction. What this perspective ignores is the constant immediacy of our environment, the fact that we are always interacting with our surroundings in subtle ways that are also rife with potential for manipulation. The context that our bodies move through daily is a material ready for our design engagement. As humans, we have never lived in an elevated position somehow disengaged from our environmental context. Producing an architecture through the amplification of the energy systems already surrounding us is more than displacing activities and events associated with our interiors (sheltered behind mediating surfaces) to the “outside.” It’s also a reconfiguration of the physical boundaries that organize these activities, a shift that will have fundamental repercussions on the very definitions of the activities we design for and the environments within which our architecture exists.
1. “Torricelli a Michelangelo Ricci in Roma, Firenze, 11 Giugno 1644,” in Opere dei Discepoli di Galileo, Carteggio 1642-1648, eds. P. Galluzzi e M. Torrini, vol. 1 (Florence: Giunti-Barbera, 1975), 122, 123. This quote is often associated with the sixth-century BC writer Thales of Miletus, but it seems more likely to have come from Torricelli in a letter to Michelangelo Ricci. Thanks to Jackie Murray for this help.


3. Nancy Y. Kiang, “The Color of Plants on Other Worlds,” Scientific American (April 2008), 50. Kiang discusses how distance correlates to the strength of radiation as it travels from the sun. If plants were to exist on other planets, they would likely require different forms of photosynthesis and energy frequencies from one planet to another.

4. Ibid., 55.

5. Ibid., 50.


8. See Thomas S. Kuhn, The Structure of Scientific Revolutions, 3rd ed. (Chicago: University of Chicago Press: 1996), 52–55, for a discussion of the multiple people working on this discovery separately over several years. This has made it difficult to specify one individual for the discovery. Kuhn describes in these pages the difficulty of pinpointing specific dates and people responsible for a given scientific discovery due to the scientific process.


10. Peter Sloterdijk, Terror from the Air, trans. Amy Patton and Steve Corcoran (Los Angeles: Semiotext(e), 2009), 18, 14.

11. Ibid., 29.


13. This discussion is well covered by Gail Cooper’s Air-Conditioning America (Baltimore: Johns Hopkins University Press, 1998), as well as in writing by Michelle Addington, and therefore won’t be covered in further detail here.


15. Ibid.


17. Ibid