THE INTERSTICE

THE TERMINAL AND THE 21ST CENTURY PANDEMIC

by

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David Campbell

ABSTRACT

The Interstice: The Terminal and the 21st Century Pandemic

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We build to create desirable places, -healthy places. Architecture insulates the healthy, desirable environment of the inside from the unhealthy world of the outside. Disease has therefore served as the historical rationale to exclude, situating the unhealthy person outside and the healthy person inside. Supplanting the local epidemic of the past, the 21st century global pandemic renders all universally vulnerable. Responding to this contemporary threat, this project explores the scenario where an infectious disease carrier arrives by plane to Dulles International Airport in Washington, D.C., and a possible architectural response. The subsequent project proposes an "Interstice", an in-transit, infectious disease treatment and containment facility to be located within the airport's grounds. Purposely built for the accommodation of contagious passengers, the Interstice derives space, material, and form, from the passage of people between the outside (the realm of the unhealthy) to the inside (a place of relative health).

For Laura Campbell

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Fig i Cover Graphic: The Interstice at Dulles.

BOOK STRUCTURE

This thesis project takes the form of a fictional narrative and is comprised of three parts -a beginning, a middle and an end.

Part one, the Prologue, establishes the framework for the story to follow and describes the context and central themes.

Part two, the Interstice, is the central architectural investigation and describes the project in terms of programming, spatiality and tectonic qualities within the context of historic precedent. It is further broken into four, first-person narratives that encapsulate the experience of someone passing through the building.

Finally, part three, the *Epilogue*, serves as a reflection piece, and looks back at initial thesis ambitions and discusses its conclusions.

Fig ii Vulnerability is Universal...

PART 1:
PROLOGUE

***I GLANCED OVER AT THE ADJACENT SEAT
THAT HAD LAID EMPTY FOR THE LAST HOUR...***

The person seated there had been escorted away by the flight attendant after feeling nauseous. "Probably from the turbulence," I thought, "or claustrophobia. Sharing this cabin with five hundred other passengers for eighteen hours can make anyone sick".

I looked at the glowing screen embedded into the seat in front of me, and swiped my hand across its capacitive touch panel to locate the news. The headline read: "World Health Organization Resumes Global Pandemic Alert". It was the third such alert in five years. Unconcerned, I swiped away. Those alerts were always for other places -remote and far away from me.

Up in the air, we were between places. In-transit between invisible borders. We were outsiders. Inside of the A380's cabin, we were protected from the inhospitable atmosphere around us. A simulated environment, the aircraft's smells and sounds were of re-circulated conditioned air, it felt like composite plastic, and it was lit by colourless fluorescent light. Outside was nature -clouds, mountains and fields. In the distance a storm approached, but the pressurized cabin protected us from it.

Suddenly, my ears rang with the sound of hundreds of simultaneous popping noises, as a transparent oxygen mask snapped down from the bulkhead above me.

Fig iii *Looking out, over the city.*

Fig iv Looking out, over the airport.

A voice spoke over the intercom, "the Emergency Oxygen System on board this aircraft is now active. For your safety, it is necessary for all passengers to breathe through their oxygen masks and remain seated. More information will follow shortly." As I inhaled from my mask, the pressurized plastic tubes of the airplane began to breathe for me.

Looking forwards, I could see the flight attendants donning plastic gloves and masks. One attendant closed the curtain that separated the aircraft sections, cordoning off the passenger areas.

"Ladies and Gentlemen," said the voice over the intercom, "following the discovery of a health emergency on board, we are diverting this flight to Washington Dulles International Airport as a routine precaution. Please continue wearing your oxygen masks for the duration of the flight and refrain from any unnecessary physical contact. Please stay calm and remain seated as we begin our descent."

As if by reflex, I choked slightly as the sound of a winded cough echoed through the cabin...

The old city had walls and gates. But these have long ceased to function. Are there other types of gates, new gates to replace the gates of the past? Are the new gates those electronic warning systems installed at airports, screening passengers for weapons? (Tschumi, 1996, p. 215)

1.1 THE CONFLICT

A 'health emergency' has been identified onboard an international commercial flight. To make matters worse, the emergency occurs during a worldwide pandemic crisis, akin to the outbreak of SARS in 2002, or H1N1 in 2009. As a result, an A380 that is en route to Atlanta, has been diverted to Dulles International Airport or IAD, which serves Washington, D.C.

Fig 1.1 - 1 A thermal scanner at the international airport.

Time is of the essence. Keeping the passengers within the aircraft without medical attention will likely result in the spread of the virus amongst the other travellers. The passengers must evacuate the aircraft, but since they carry with them a dangerous and contagious infectious disease, what will happen when they arrive at Dulles?

As it so happens, the airport demarcates arrival into the capital. If the passengers were to land at any 21st century airport, they would undoubtedly pass through the "electronic warning system" described by architect Bernard Tschumi, before they enter the city. Rather than the solid wall of the medieval city, it is now Tschumi's gate; comprised of officers, cameras, metal detectors, thermal scanners and full body scanners, which serves as the boundary of human civilization. Where the walls of the old city once clearly protected a place (the inside) from its hinterland (the outside), this new gate demarcates a global network that is interconnected virtually by the miracle of flight. Rather than surveilling the landed passengers for weapons, this gate monitors them for a contagious disease.

As threats to national security and public health, what will happen when the five hundred passengers cross this gate?

Or do they?

Carriers of disease, the passengers are prevented from entering the United States. Instead, they remain stranded in-transit, until it can be certain that they pose no further medical threat to the Capital. Since Tschumi's gate demarcates entry into the country, the

passengers remain 'outside' of the country, before being permitted 'inside' of it. The gate that was once a separating boundary, has ruptured open to occupy the 500 passengers in a zone that is between the inside and the outside. A space between, rather than a boundary across. The name of this zone is the *Interstice*, and it stands between the contagious passengers and the Capital.

in·ter·stice /in'tərstis/

an intervening space (Oxford, 2010).

from the Latin word *intersistere*:

inter **"BETWEEN"** + sistere **"TO STAND"**

OUTSIDE / UNHEALTHY

INSIDE / HEALTHY

Fig 1.1 - 2 The *Interstice*, stands between the inside and the outside, between the healthy and the unhealthy.

THE HEALTHY VS. THE UNHEALTHY...

Uncertain as to whether or not they have in fact contracted a contagious virus, the passengers are neither completely healthy, nor are they completely unhealthy. Until diagnosed, each passenger's state of health is unknown. The passengers are now not only stranded in-transit, but can also be considered as being between states of health.

Philosopher Ivan Illich discusses health in terms of the discipline of medicine, and states:

"Medicine is a moral enterprise and therefore inevitably gives content to good and evil. In every society, medicine, like law and religion, defines what is normal, proper or desirable." (Illich, 1975, p. 44)

Since a moral determines the "goodness" or "badness" of something, it follows that those who are healthy must be "good", while those who are unhealthy must be threats. As one can only be either healthy, or unhealthy, then the potentially infected passengers of the A380 will all be considered unhealthy, regardless of whether they have actually been infected by the pandemic virus or not. They all pose an equal risk to the society beyond the gate.

Although it is a fact of human existence, disease has historically served as the rationale to remove the unhealthy from the healthy, in order to preserve a common good. In the absence of known causes or cures, diseases such as leprosy would be seen as punishment of the unjust by the Divine, resulting in the expulsion of those afflicted (Gensini, et al., 2004). One may return, only after being cured through divine intervention.

Anyone with such a defiling disease must wear torn clothes, let their hair be unkempt, cover the lower part of their face and cry out, 'Unclean! Unclean!' As long as they have the disease they remain unclean. They must live alone; they must live outside the camp (1, Lev. 13.45).

Within exile, the unhealthy are isolated from the healthy, who remain safe within the ancient camp. In the 21st century, the unhealthy passengers are isolated before the gates of the airport in the name of preserving the health of the city.

...THE INSIDE VS. THE OUTSIDE

Since the passengers are prevented from entering the city in the name of preserving good health, is the inside then good and the outside bad? If so, how do we then separate inside from outside?

Fig 1.1 - 3 An engraving by Charles Eisen of the *Primitive Hut*, by Marc Antoine Laugier, 1755.

Architectural theorist, Marc-Antoine Laugier suggests that it is the first duty of the building to delineate the environment of the inside from the environment of the outside. Laugier illustrates the *Primitive Hut*, which serves to protect and preserve the individual from the forces of nature "...so that neither the sun nor the rain can penetrate therein" (Laugier, 1756 p. 12). Within a constructed environment, "man is lodged" within a setting that is modified to be desirable, or good in contrast with the outside –a place of hostile environmental forces. Since Laugier (1756) claims that the Primitive Hut is "the model upon which all the magnificence's of architecture have been imagined" (p. 12), the Interstice should then also "lodge" the passengers in a place that protects them from the hazards of the environment.

Maybe the Interstice should be more like architectural historian Reyner Banham's *Tent*? A membrane, the Tent not only "deflects wind and excludes rain" but also "retain[s] internal heat, excluding solar heat" while remaining a private place (Banham, 1984, p. 18). Or should the Interstice be more like the *Tent*'s counterpart, the *Campfire*, which warms the individuals situated nearby. As stated by Banham, proximity to its warming glow determines activity, "... so that sleeping is an outer-ring activity, and pursuits requiring vision belong to the inner rings" (Banham, 1984, p. 20). If the Interstice is to define a good, desirable place, then it should also encourage qualities related to human comfort, such as privacy and warmth.

Fig 1.1 - 4 [left] The protective shelter of the *Tent*.

Fig 1.1 - 5 [right] The comforting flame of the *Camp*.

To the passengers of the A380, the Interstice must be a place of refuge. Should it be more like the *Clean Air Pod 1500*, by avant-garde architects, Ant Farm Inc? Here, occupants are sealed away from a polluted exterior environment in an airtight bubble that is equipped with an “air support system” to filter out lethal contaminants. Ant Farm warns, “those who couldn’t escape from the pollution would die”, unless they entered the pod (Lord, et al., 1973, p. 35). The landed passengers in the 21st century however, are themselves of the outside world. Is the Interstice more like the air support system’s filter then? One that filters people, just as it does “deadly pollutants”.

Fig 1.1 - 6 The life saving *Clean Air Pod 1500*,
Ant Farm Inc., 1973.

Since the Interstice controls the entry of those who would pose a health threat to the city of Washington, D.C., maybe it is more like architect Buckminster Fuller’s dome over midtown Manhattan. Surrounding a selected part of the city, Fuller’s Dome keeps in what is (and who is) desirable, and leaves out the harmful. The ancient camp brought to the contemporary world. Within an airtight dome, the lucky citizens live in paradise and breath in pure, clean air that is highly controlled and monitored.

Fig 1.1 - 7 Containment of the city. The *Dome Over Midtown Manhattan*, by Buckminster Fuller, 1965.

Perhaps the Interstice is like all of these things. Perhaps it is all just a matter of perspective...

A black and white electron micrograph showing several elongated, rod-like structures, likely bacteria or viruses, against a light gray background. The structures are oriented diagonally, with some appearing as thin, light gray lines and others as thicker, darker, more textured rods. The texture of the rods suggests internal structure or surface detail.

*The world has changed dramatically since 1951...
Since then, profound changes have occurred in
the way humanity inhabits the planet. The disease
situation is anything but stable...Vulnerability is
Universal. (Chan, 2007, p. 2)*

Fig 1.2 - 1 Transmission electron micrograph of the Marburg virus.

1.2 THE 21ST CENTURY PANDEMIC

The 21st century pandemic is a contagious virus that has spread throughout the world. It is a global health disaster, but also a contemporary reality. If such an event occurs, it will affect all, may kill millions, cripple economies, and may close national borders and routes of travel. The anticipation of such an event necessitates the construction of the Interstice, an emergency infectious disease containment and treatment facility, with the purpose of safeguarding the airport and the city from contamination.

While the disease described here is fictitious, its existence and qualities have been theorized and experienced since the turn of the century. Since then, there have been a total of three influenza pandemics. Each has resulted in illnesses of approximately 30 percent of the world population (Homeland Security Council [U.S.], 2005). The 1918 outbreak of Spanish Influenza alone would infect roughly a quarter of the population of each country that it was found in (Barry, 2010). Most recently, the world has experienced the global outbreak of severe acute respiratory syndrome (SARS), new strains of seasonal influenza and presently, the ebola virus of 2014.

The threat of diseases such as these even serves as the basis for the *National Strategy for Pandemic Influenza*. Published by the United States Department of Homeland Security (and opened with an address by the President), the strategy establishes a plan of action to defend and mitigate the damages of such a threat on U.S. soil (Homeland Security Council [U.S.], 2005).

The pandemic described here however, is considered to be unique to the 21st century, implying that it is somehow substantially different from those that have preceded it. This argument is rooted in two defining features, the disease's **universality** and its **unpredictable** nature.

Fig 1.2 - 2 An illustration depicting the theme: Vulnerability is Universal.

Director General of the World Health Organization, Dr. Margaret Chan, describes the first aspect in her introduction to the World Health Report in 2007. Dr. Chan comments on the rapid changes to disease management and containment since the first half of the 20th century. With six "quarantine-able diseases -cholera, plague, relapsing fever, smallpox, typhus and yellow fever," the spread of disease was relatively slow as "people travelled internationally by ship, and news travelled by telegram" (Chan, 2007, p. 2). At no point in history however, has the world been as connected as it is in the 21st century, and this propensity can only continue. The networked global civilization, afforded in part by the rise and reliance upon mass connectivity has thus amplified the global susceptibility to shared disease. The spread of a virus is therefore a factor of time, rather than proximity, and as put by geographer Dr. Tim Brown, "threats to health know no borders" (Brown, 2010, p. 323).

No longer centred upon a particular place or locale, states of panic ensue worldwide upon the emergence of human vulnerability to new diseases. For instance, the outbreak of SARS and forms of influenza such H1N1 and H5N1 affected areas well beyond localized areas (Chan, 2007). The epidemic –fixed within a determinate locale, has become the pandemic, of all people and places. "Vulnerability," as Dr. Chan states, "is universal" (Chan, 2007, p. 2).

The second aspect of this pandemic, its un-predictability, derives from general difficulty in anticipating its origin and severity. The pandemic could originate from anywhere in the world and is indiscriminate in the locales that it may affect. It may originate from a disease once thought eradicated such as polio, or it may be a mutation of a so-called seasonal super-bug, such as influenza. It might be a drug resistant virus like forms of tuberculosis, or it could be a new threat all together, such as SARS. The pandemic may be chemically based, stemming from "a single tainted ingredient" in a food product or mishandled pharmaceutical, or it could even be a bio-terrorist attack (Chan, 2007).

19C

21C

Fig 1.2 - 3 The 19th Century:
Point A to Point B.
The 21st Century:
Points A,B,C,D,E...

19C

21C

Fig 1.2 - 4 The 19th Century:
Less. 21st Century:
More.

The pandemic event described here is largely patterned after SARS, the first severe global pandemic of the 21st century. Like SARS, the 21st century pandemic virus "...spreads from person to person, requires no vector, displays no particular geographical affinity, incubates silently, [and] mimics the symptoms of many other diseases..." (Chan, 2007, p. 38). Likewise, it is rendered as a global crisis due to its unprecedented, sudden emergence and ambiguous origin. Difficulty identifying and containing the 21st century pandemic is why it is seen as a global security threat, whereby the slightest display of symptoms may be cause for extreme panic.

According to the authors of *Screening for Infectious Diseases at International Airports*, a virus like SARS, with a short enough incubation period, which can be spread from coughing and sneezing, is an excellent candidate to move between passengers on board a long-haul flight (Gaber, et al, 2009).

Onboard the A380, high above Washington D.C., the spread of the 21st century pandemic virus occurs in a matter of hours. With five hundred passengers on board, the onset of symptoms of the deadly virus renders the health status of all other passengers as questionable. In this instance, the index case, or the first contact is the person who had shown symptoms early on during the flight. The individual who had been seated next to the narrator in the opening prologue is this contact, and has been taken to the back of the plane and cordoned off from the rest of the cabin (Airport Cooperative Research Program, 2013). As a precautionary measure, passengers sharing the same row, and rows in front and behind are now also potential contacts of the virus. So too are family members and caregivers who are also travelling. All flight attendants who had met with these passengers are also now suspected contacts. Finally, those whom the flight attendants had served on board -virtually the remainder of the cabin may have now come into contact with the disease (Gaber, et al., 2009).

Fig 1.2 - 5 The spread of the 21st century pandemic virus on an A380 jet. Left to right: From one suspected contact, to surrounding rows, to flight attendants, to all passengers.

A single cough during the flight of the A380 described here launches the redirection of the aircraft and sets into motion a scenario requiring the containment of an entire flight of potentially contagious passengers within the Interstice at Dulles. In the context of global panic, it is not necessarily the fact that each passenger has in fact contracted the virus, but the uncertainty and suspicion that each passenger *may have* contacted it. Reiterating the sentiment by Dr. Chan, "vulnerability is universal".

OUTSIDE / UNHEALTHY

500
SUSPECTED CONTACTS

INSIDE / HEALTHY

Fig 1.2 - 6 In-transit, the five hundred contacts depart the A380 within an ambiguous state of health.

The airport is a concentrate of both the hyper-local and the hyper-global... becoming bigger and bigger, equipped with more and more facilities unconnected to travel, they are on the way to replacing the city. The in-transit condition is becoming universal. (Koolhaas, 1995, p. 1252)

1.3 THE 21ST CENTURY TERMINAL

Fig 1.3 - 1 [opposite page]
Aerial photograph
of Dulles
International
Airport, 2014.

Fig 1.3 - 2 Photograph of Dulles International
Airport's Main Terminal, 1966.

The first airport of the jet-age, Dulles International Airport is most readily identified by architect Eero Saarinen's main terminal (1962), and its inverted concrete shell roof (Pearman, 2004). The roof hangs over the main check-in area as a symbolic presence that demarcates the arrival and departure of travellers moving between aircraft and automobile. Only after transiting this space is one considered inside the airport.

Once baggage had been checked in, visitors to 1960's Dulles would be shuttled to their awaiting flight by a fleet of mobile lounges. Traversing the tarmac, passengers looked out into the distance, beyond the activities of the airport into farmland, which was then interrupted only by a two-lane country road (Pearman, 2004). This hinterland would shrink considerably in the coming decades by the growing conurbation of the Washington Metropolitan Area, as well as Dulles itself, which would reach well outside of its original boundaries. An *area of influence* would further demarcate the environmental impact of the airport and grow past Dulles' physical boundaries (EA Engineering, Science, and Technology Inc., 2002).

Patrons of the 21st century are now swallowed into Dulles' underground by a system of escalators, elevators and "travellators" and board a subway-like *Automated People Mover* (APM). This extensive system moves the passengers from the main terminal to several linear concourses where travellers board their respective flights. The piers march along on axis behind Saarinen's main terminal, south towards the vacant lands where another primary terminal is planned (Delia, J. 2005). However, the concourses that fill the space between, differ from Saarinen's landmark structure in that they are planned for obsolescence. They will be replaced as they age out of usefulness.

Fig 1.3 - 3 [left] Photograph of the check in-area of the Main Terminal.

Fig 1.3 - 4 [right] Photograph of the Main Terminal's underground APM platform.

In continual expansion, the airport is a place that is always in a state of change, whereby the maximization of capacity is the only stable aspect of its planning. In this way, the 21st century airport is a place that is conceived of for a future condition and not for the present state of things. The structures that make up the airport are therefore ephemeral –whereby new structures overtake and build onto, over and inside of the existing fabric.

Fig 1.3 - 5 [top right] Circulation diagram of the Main Terminal.

Fig 1.3 - 6 [right] Phasing diagram of Dulles' 2025 Master plan. Black: Existing Buildings. White: Proposed Buildings. Purple: Underground Connections.

Fig 1.3 - 7 [above] Current master plan of Dulles showing its surrounding area of influence. Dotted line indicates Dulles' noise pollution zone.

The 21st century terminal has also drifted significantly from its 20th century beginnings in that it is no longer purposed solely for the functions of flight. Today, the terminal is equipped with malls, hotels, private businesses, its own police forces, emergency services, and other public amenities that operate continually night and day. As architect Rem Koolhaas suggests, the airport is continually expanding, replicating many of the functions of the city (Koolhaas, 1995). In fact, the contemporary airport now rivals the scale and function of the contemporary city, and at a quarter of the physical area of Washington D.C. itself, Washington Dulles Airport is no different.

Unlike the city however, the airport accommodates its citizens for a short period of time. A brief moment occurs before the next wave of travellers pass through its gates. Within these gates, the individual is within an *International Zone* that is physically within the city, but virtually within an extraterritorial zone governed by international law (Dewey, 2013). Koolhaas conceptualizes this condition as part of his notion of *the Generic*. Here, he postulates the convergence and homogenization of local identity into a singular international one by virtue of the networked society of the 21st century and specifically illustrates this with the example of the airport (Koolhaas, 1995).

The Generic can be read as being synonymous with the condition of the in-transit International Zone as both describe a place that characteristically neutral. This neutral territory is a place of non-citizenship where the individual can be conceptualized as being neither inside their place of destination or outside of it. There are practical examples of this condition as seen in the case of Iranian refugee Mehran Karimi Nasseri who had effectively lived within Charles de Gaulle International airport for a period of eighteen years as he awaited political asylum (Berczeller, 2004). More recently, whistle-blower Edward Snowden's forty day asylum within Moscow's Sheremetyevo International Airport illustrates yet again

the apolitical dimension of the international zone (Warrick, 2013). So too do the passengers find themselves within this similar, in-transit condition as they are held, dis-placed, within the Interstice.

Fig 1.3 - 8 [left] Iranian refugee Mehran Karimi Nasseri in Charles De Gaulle International Airport.

Fig 1.3 - 9 [right] NSA whistle-blower Edward Snowden in Sheremetyevo International Airport, Moscow, 2013.

As part of this confluence of international networks, the airport is a critical form of infrastructure where a crisis at one may have severe repercussions for another. Washington Dulles International Airport is as connected to Atlanta's Hartsfield-Jackson International Airport as it is to Seoul's Incheon Airport, as it is to London's Heathrow. This is seen typically in the form of flight delays, whereby the domino effect of aircraft queuing to land or depart hold up many more flights in sequence at numerous other airports. Atypically, the spread of SARS in 2002 took merely two months to move from rural China, to Singapore, to Toronto, -predominately by commercial flight (Johanis, 2007). The airport therefore embodies Dr. Margaret Chan's notion of universal vulnerability.

While historically it was believed that a disease could be contained by enclosing the infected area by *cordon sanitaire*, the seamlessness that characterizes contemporary travel exacerbates the difficulty in containing a spreading disease (Gensini, et al. 2004). According to a 2012 study by the Massachusetts Institute of Technology, Department of Civil and Environmental Engineering,

airports specifically owe their ability to function as virus spreaders to three criteria; connectivity, traffic, and geographic location (MIT, 2012). Serving 23 million passengers per year, only a fraction of the number of travellers passing through airports such as Hartsfield-Jackson, or Los Angeles International Airport, Dulles is no less interconnected to any other worldwide airport (MWAA, 2013). Further, its geographic proximity to the national capital places it at heightened national security risk.

Fig 1.3 - 10 [above] Dulles International Airport within its international flight network.

Fig 1.3 - 11 [opposite page] Aerial photograph of Dulles International and its proximity to Washington, DC.

Washington Dulles International Airport

40km

Washington, D.C. Metro Area

Fig 1.3 - 12 [left] Doors close at the North York General Hospital in Toronto, 2003.

Fig 1.3 - 13 [right] The airport remains open.

Asserting the claim that, “the city will always be at least partly sick,” architect Hilary Sample recounts the incapability of hospitals alone, to completely guarantee the public health of the city (Zardini, 2012, p. 232). Sample cites the closure of hospitals during the SARS pandemic, in which the institutions themselves became major contributing factors to the spread of the virus. She then questions the overall relevance of the hospital itself, stating, “This image of a single, central place for health is no longer relevant, as was made evident by the SARS outbreak” (p. 232).

Within the context of the travelling 21st century pandemic, the responsibility to intercept and respond to a spreading disease may in fact fall to the airport terminal, rather than the hospital. This has happened before, as passengers suspected of carrying SARS were screened for the disease, and in some cases, treated all within the airport (Johanis, 2007). It is not too extraordinary therefore to suppose that medical screening and treatment may be one of those new “facilities unconnected to travel” that Koolhaas describes as becoming part of the 21st century terminal.

Today, the Centres for Disease Control and Prevention (CDC) operates twenty outposts at major international airports throughout the United States and enforces procedures for identifying and mitigating the spread of contagious disease pathogens in transit (Centres for Disease Control and Prevention, 2013).

The Interstice is the twenty-first.

Within the confines of the “Generic”, International Zone, the Interstice takes on functions that are both of the airport, and of the hospital. The terminal’s function of facilitating the arrival, and departure of passengers, is interrupted by the medical functions of screening (to identity contagious passengers) and quarantine (to treat and isolate contagious passengers). A hybrid sequence unique to the 21st century pandemic.

As described by Bernard Tschumi (1996), it is program and event that form the basis of the architectural sequence. Tschumi uses the example of Mies Van Der Rohe’s *Barcelona Pavilion* (1929), and refers to the series of moments that informs its articulation of elements as experienced by someone processing through the pavilion. The architecture of the Interstice is similarly derived from such a sequence, -in this case one that is derived from the requirements of the pandemic emergency at the airport. The next chapter, unfolds the Interstice building itself through a recounting of this sequence, as told from the point of view of a passenger who journeys through this CDC outpost of the 21st century.

Fig 1.3 - 14 The Interstice: Part hospital, part terminal

Fig 1.3 - 15 [top] The medical sequence at the airport. [bottom] The experiential sequence at the *Barcelona Pavilion*.

Fig 1.3 - 16 An in-transit sequence of Departure (from the A380), Screening, Quarantine and Arrival (at the airport).

Fig v

Looking north passed the Interstice with
Dulles' Main Terminal in the Background.

An aerial photograph of an airport terminal and tarmac. A large, white, multi-level bridge structure with a complex steel truss roof is superimposed over the image, spanning across the terminal and connecting to other parts of the airport. The bridge has three main vertical support pillars. In the foreground, a white airplane with red and blue stripes on the tail is parked on the tarmac. The background shows the airport's main terminal building and surrounding landscape.

PART 2: ***THE INTERSTICE***

Fig vi The passengers depart the contaminated A380.

ESCAPE THROUGH THE DEPARTURE TUNNEL

As the Airbus A380 taxied along the endless tarmac, I could see the white lights of Dulles' main terminal in the distance. It was nighttime, and peering out of the cabin window, a feeling of unease overtook me as the sounds of sirens and flashing lights overwhelmed my senses. The circumstances of our arrival made the airport a fearful place, alien and unfamiliar.

As we taxied along, the main terminal remained fixed on the horizon, and instead another structure entered the corners of my eyes. Surrounded by tarmac, the ominous structure was comprised of a series of five towers, each as tall as the airport control towers. We pulled to a stop below the structure, which now stood between the main terminal and myself. The terminal was an end to a journey -and the way home, but we would now be diverting from that course. Rather than a terminal building, it was this odd building that we would proceed into.

Lit at the top by flashing lights, and at the bottom by the sirens of emergency vehicles, the structure was machine-like, -an unmistakable apparatus of the airport. Like the main terminal in the distance, it also glowed white from inside. As I looked closer, I began to make out moving shadows and silhouettes beyond its transparent skin. An illusion of human activity; the movement I could see within, softened my anxiety for a short time.

I grabbed my carry-on luggage and joined the orderly single-file line of passengers. I was standing up for the first time in eighteen hours and the sudden movement was jarring. I was abruptly out of breath, struggling for each gasp of air. I managed to compose myself and followed the line of anxious passengers as we departed the aircraft. Exiting the plane, the seemingly conventional accordion-like bridge-way became a glass tube through which I could see all around at the nighttime activities of the airport apron outside.

I stepped forward onto the track of an automated moving walkway and it propelled my body forward. The walkway began to slope gently downwards. I felt almost weightless as the machine moved for me. Slightly weak, I leaned against the moving railing for support.

Every so often, I would pass through an invisible wall of soft, blown air that was emitted from machines hung from the supporting structure of the tube. The puffs of air grew colder the further down we went until my body acclimatized to the shift in temperature.

As we went further underground, the last glimpse of the tarmac vanished and what was once a fully transparent tube, become a tunnel that was lit only by skylight above. The tunnel began to widen, and to my left, its glass and metal siding gave way to a solid wall of rock. I was able to touch the natural striations of the sandstone. Pre-historic, its features predated the incursion of the airfield above.

The descent leveled off, but the procession of travellers continued and made a one hundred and eighty degree turn around. I could now peer through glass to my left and down to a level below. I was looking upon another world –filled with moving people scattering between shops and displays. Could they see me staring down from above?

Five large formations hung above the crowd below. Light and malleable, they looked like cumulous clouds, –or were they blimps?

As the moving walkway slowed, five shorter tunnels, numbered one through five, branched off of the main artery. Each branch led directly into one of the five formations. Standing in front of these branches were figures in blue gowns and masks. As if signaling the landing of an aircraft, one of them gestured towards my section of the line.

Still able to peer down into the paradise below, I entered the branch leading to the odd room ●●●

Fig vii

The passengers proceed underground.

Fig viii

The passengers glimpse strange formations through the glass tube.

2.1 DEPARTURE

/dɪˈpɑːtʃə/

from the Latin *dispartire* meaning ‘to divide’

1) the action of leaving, especially to start a journey

2) a deviation from an accepted, prescribed, or usual course of action (Oxford, 2010).

Fig 2.1 - 1 The Departure Tunnel within the Interstice.

The first chapter follows the evacuation of the A380's passengers as they **depart the aircraft** and move into the Interstice. Just as a person would experience a series of moments as they approach a building by foot, the passengers experience a series of events as they enter the Interstice.

Assuming that the virus transfers primarily by the passing of airborne particles from coughing and sneezing, the environment of the aircraft is now host to deadly bacteria, despite the use of air filtering systems on board. The basic ability for the aircraft to support life has been compromised. As the passengers enter into what is called the **Departure Tunnel**, they are now in transition from an **unhygienic** environment to one that is **hygienic**.

The narrator describes three aspects of this unique approach sequence. First comes an impression of the surrounding site of the

airfield. Second, a description of the view of the Interstice structure from the aircraft. Lastly is a recounting of the descent into the Interstice. Each of these moments shares an analogue with history.

THE 19TH CENTURY CITY AND THE 21ST CENTURY AIRPORT

When geographer David Harvey observes that human civilization occupies a “second nature”, he calls into question the rapid changes undergone globally, as contemporary cities overtake their hinterland and natural frontier. “[T]here is now very little, if anything, left of the ‘first nature’ that existed before humans came to populate the earth” (Harvey, 2010). The notion of “the natural”, as untouched by human intervention has given way to conditions modified by human beings. The airfield at Dulles airport is no different, as it has overtaken its agricultural surroundings over time –replacing a natural surface with the human-made tarmac.

Fig 2.1 - 2 A collage of the unnatural tarmac condition.

The passengers of the 21st century land upon an expanse of concrete and tarmac dotted by airport structures all around. The natural condition is now virtually non-existent, having been replaced by an environment conditioned for the movement of vehicles and the placement of airport services. The sick passengers find themselves on approach to a machine-like object, situated in a place that is not conducive to the health of the natural organism of the human body.

A comparison between the 21st century airport and the ethos of the industrializing city of the 19th century can be made here, as both describe human civilization as irreversibly encroaching into the natural world. In the industrializing city, this infringement would ultimately be assessed through the lens of hygiene and health. The natural would be seen as hygienic, and the human-made unhygienic. The natural would be qualified as good, and the human-made as bad.

In the industrializing city, the unhygienic ills of urban life such as overcrowding, pollution, and the incursion of new industries related to mass production began to pervade into the lives of human beings like never before. The illustrations of London by Gustave Dore for instance, depict this condition and heavily emphasize the production of "miasma" or "bad-air" as a by-product of the industrialized city. Art critic John Ruskin would also describe these conditions, qualifying the use of chimneys in the city as hazardous and those of the country home as warm and pleasant (Ruskin, 1885). The rural country, as natural became desirable, and the urban city became undesirable.

Fig 2.1 - 3 Panoramic view of the airfield at Dulles.

Fig 2.1 - 4 *Over London By Rail*,
engraving by Gustave
Dore, 1872.

In his 1903 essay, *the Metropolis and Mental Life*, modern sociologist Georg Simmel reflects upon the underpinnings of this portrayal of the industrializing city, observing that the metropolis is driven by production, machinery, and technology that is largely foreign to the rural heritage of the human being. This individual, Simmel describes is rendered as a “negligible quantity” or passive observer by the chaos and machinery of the industrializing city (Simmel, 1964).

To many, urban living was an endangerment to physical and mental health and contributed to poor quality of life. Once again, the natural would be qualified as healthy or hygienic and the city as unhealthy and unhygienic. Frederick Law Olmsted sought to combat these urban ills through the articulation of natural landscape. “Openness”, as put by Olmsted, would benefit human health by offering “the lungs a bath of pure sunny air, to give the mind a suggestion of rest from the devouring eagerness and intellectual strife of town life, ...” (Olmsted, 1870, p. 184).

Fig 2.1 - 5 [left] Plan of Back Bay Fens, Boston. Designed by Frederick Law Olmsted, 1887.

Fig 2.1 - 6 [right] Photograph taken in Back Bay Fens of the Boylston Street bridge, 1892.

With the advent of mechanical systems, buildings could serve as relatively healthy artificial environments that shielded occupants from the exhalations of the city, without forcing them to leave for rural conditions. As put by architectural historian David Gissen, by-products from human and industrial waste would be addressed by insulating people further within the building and its mechanically controlled conditioned space (Gissen, 2009).

As recalled by Reyner Banham in his book *the Architecture of the Well-Tempered Environment*, it would ultimately be hygiene that served as the initial impetus for the widespread use of air-conditioning. It is significant therefore that in his discussion of this paradigm shift, Banham cites Konrad Meier -a heating and air conditioning consultant who describes the many hazards that air conditioning would combat.

...excessive amounts of water vapour, sickly odours from respiratory organs, unclear teeth, perspiration, untidy clothing, the presence of microbes due to various conditions, stuffy air from dusty carpets and draperies ... cause greater discomfort and greater ill health. (Banham, 1984)

Despite these advancements, with the advent of air travel, the airport or aerodrome would be depicted in a similar manner to how Simmel describes the Metropolis. Here, Rex Warner's 1941 novel, "the Aerodrome", shows the airport as a monster, devouring a scenic hinterland and engulfing rural human settlements. The aerodrome or airport as a component of the city, and producer of odour, pollution, waste and noise, overtakes and devours the natural.

Fig 2.1 - 7 The monstrous Aerodrome devours a nearby village on the cover of Rex Warner's 1941 novel, *the Aerodrome*.

In their 1958 animated short film, *the Expanding Airport* (1958), architects Charles and Ray Eames similarly illustrate the jet-age airport as one that is hostile to the individual, but must inevitably expand into its fringes in order to accommodate a growing travelling public. The question of preserving human hygiene in this environment becomes the underlying motivation for the Eames' recommendation that sealed mobile lounges ferry passengers between the aircraft and the terminal building. This recommendation is stated in the film's voice-over:

As the lounge moves from terminal to aircraft, the passengers find themselves in a spacious room isolated from fumes and noise, and those interested in operations can sit forward in the observation section... the approach is made under controlled conditions, the pneumatic contact unit moves out and forms a sealed passage, doors of lounge and plane are opened and the transfer effected (Eames, C; Eames, R. 1958).

As afforded by the conditioning of space by mechanical means, the mobile lounges can be hermetically sealed from the fumes and noises of the airport. In addition, by driving, rather than walking to awaiting aircraft, the airport was now uninhibited by the distance that patrons could travel, which afforded the airport the ability to grow further into its fringes as luxurious mobile lounges brought its passengers over the tarmac to the departing plane.

Fig 2.1 - 8 The Mobile Lounge crosses the tarmac in the film *the Expanding Airport* by Charles and Ray Eames, 1958.

In the 21st century, the passengers of the contaminated A380 also traverse the unhygienic, inhospitable tarmac. A mobile apparatus like the Mobile Lounge, the Departure Tunnel stretches out to mate with the fuselage of the landed aircraft. The passengers depart through a single door, maintaining the order that they had been seated in throughout the flight –a containment measure, allowing for basic isolation of the virus to controlled passenger sections. Propelled by moving walkway towards the Interstice, the passengers are sealed off from the fumes and pollutants of the airport grounds and move out from the contaminated air of the aircraft into a new clean environment.

Fig 2.1 - 9 [top] Master plan of Dulles showing the location of the proposed Interstice.

Fig 2.1 - 10 [bottom] Plan of the Interstice at tarmac level, showing the A380 attached to the Departure Tunnel.

Fig 2.1 - 11 The Departure Tunnel of the Interstice mates with the Airbus A380.

THE FUTURIST ETHOS AND THE INTERSTICE

While the Eames' observe that the aircraft tarmac is obviously an undesirable place for a human being, their inclusion of an observation deck within the mobile lounge is a telling remark alluding to an overall fascination of this inhospitable, "alien" place. Rather than being shuttled in by vehicle however, the passengers of the 21st century are drawn into the Interstice via a single automated moving walkway and maintain a predetermined order and speed. Protected by the Departure Tunnel, the passengers experience the view of the Interstice in motion.

The fact that the passengers experience the process of departing the plane in a state of constant motion invokes comparison yet again to past. This time, to the Futurist Movement of the 20th century. Unlike Simmel and his contemporaries who resist the incursion of the modern world, the Futurists would fanatically embrace the promises of the new century. Its modern technologies, new means

of production and transportation methods were seen as heralding in a new world order. In particular, the founders of the Futurist Movement, Antonio Sant'Elia and Fillipo Tomasa Marinetti would become enthralled by the notion of movement and the imagery of speed and dynamism, which they saw as embodying the ethos of the new century. The language used by the Futurists to describe this ethos is recounted by Reyner Banham in *Theory and Design of the First Machine Age*:

We will sing the midnight fervor of arsenals and shipyards blazing with electric moons; insatiable stations swallowing the smoking serpents of their trains; factories hung from the clouds by the twisted threats of their smoke bridges flashing like knives in the sun, giant gymnasts that leap over rivers; adventurous steamers that scent the horizon deep-chested locomotives that paw the ground with their wheels, like stallions harnessed with steel tubing; the easy flight of aeroplanes, their propellers beating the wind like banners, with a sound like the applause of a mighty crowd.
(Banham, 1980, p. 104)

The aesthetic that emerged from this language would first appear in the world of the fine arts. The Cubists for instance would utilize compositional tools such as layering, scattering, fragmentation and collage to represent time and motion within the still image. To Banham, these themes produced an effect that he calls an "X-Ray as an analogue for normal vision" and is best represented by Marcel Duchamp's painting *Coffee Mill* (1911) which utilizes a cut-away section of the mill to reveal its mechanical function (Banham, R. 1980).

Fig 2.1 - 12 [left] Motion represented through collage in *Man with a Violin* by Pablo Picasso, 1911-12.

Fig 2.1 - 13 [right] Motion revealed through cutaway section in *Coffee Mill* by Marcel Duchamp, 1911.

This compositional tradition would inform the development of a 'machine aesthetic' unique to the developments of the 20th century and would be articulated early on by the un-built architectural work of Sant'Elia. His 1912 renderings of the *Aeroplani Treni* (1912) and the later *Citta Nuova* (1913-14) both specifically allude to the spirit of motion as part of the Futurist vision of 20th century civic transportation. The use of layering that had been a compositional device to painterly effect by Picasso and Duchamp becomes an architectural device to organize the new infrastructural systems of the city. The *Citta Nuova*, in particular, would begin at its base

as a regional railway station with elevators transporting people to towers where tunnels for automobiles could be found. On its highest terraces, landing and takeoff platforms for aircraft were placed (Hawkins, et al. 2005).

Fig 2.1 - 14 Trains below meet aircraft above in the layered infrastructural system of the Citta Nuova, by Sant'Elia, 1913-14.

Reyner Banham describes Sant'Elia's transportation interchange as a construct of "bodies" interconnected by "fields of force", or masses connected by circulatory systems of lanes, bridges and elevators (Banham, 1980). Likewise, the Interstice is intended to read like a mass or body that is part of the circulation of the airport. Upon ground approach, the visual image of the Interstice is that of a machine or apparatus and the passengers see a structure that is visually similar to the existing buildings that populate the tarmac. What is not seen from above is the underground components of the structure. The Interstice is actually a satellite that punctures through the tarmac and links the Departure Tunnel to the underground network of the airport below.

In a state of crisis and emergency, the form of the Interstice as seen by the passengers, may appear as striking as the imagery described by the Futurists, however, compositionally, the use of light and transparency, serves to render the inner workings of the facility visible to the passengers about to enter –in the same vein as the cut-away section employed by Duchamp. As the Interstice is approached, it is seen as a machine that is humanized somewhat through its transparent metal screen, which offers clues of the human activity within.

Fig 2.1 - 15 A view of the approach towards the Interstice from the A380 cabin.

THE PASSENGER AS BATHER

As the A380's passengers move through the Departure Tunnel, they are transiting from the unclean, contaminated space of the aircraft into the sanitized refuge of the Interstice. The passengers can be considered to be undergoing a process of cleansing as they make this transition. For this reason, the Departure Tunnel draws comparison with the building type of the communal bath. Historically, baths such as the Roman *thermae* or Turkish *hummams* have served to preserve public health and hygiene under the guise of cultural ritual. For ailments ranging from fevers to eye complaints, a trip to the Roman *Thermae* would be prescribed to individuals (Fagan, 1999).

Synonymous with good health and hygiene, the ritual of visiting the public bath is one that is premised upon a sequence of events within a building that is comprised of a series of differing climates. In the case of the *thermae*, the bather entered through an open atrium or courtyard to encourage sweating through exercise. The bather moved from the change room to a *tepidarium* (a medium heated room) to the *caladarium* (the hottest room) back into the *tepidarium* and finally to the *frigidarium* (the coldest room) which were all controlled by steam afforded by the buildings thermally massive envelope (Fagan, 1999). Visiting these spaces in series, the bather experiences varying degrees of openness, light, temperature, humidity and moisture.

Fig 2.1 - 16 [left to right]
Descending the
Departure Tunnel.

Fig 2.1 - 17 The sequence of bathing in the Roman Thermae.

Propelled from the contaminated A380 into the Departure Tunnel, the passengers also engage in a bath-like procession. The Tunnel's overall sanitation is preserved through the use thermal zones that are separated by pressurized air-curtains, which regulate the temperature of successive segments without impeding the continual flow of the passengers. The drafting of air blown down by the air curtains attempts to limit the infiltration dirt, debris, and cabin air from entering the next segment (Krueger, n.d.) Each segment is also made progressively cooler to prevent the growth of new bacteria. While the Roman bather processes into warmer temperatures, the passenger of the Interstice proceeds through into cooler zones. Since the human body discerns only changes in temperature, the gradient is perceived slowly as the passengers acclimatize to the new temperature (Addington, 2003).

The tunnel is initially only as wide as the single moving walkway and an adjacent service walk, but continually widens as it breaks the threshold of the tarmac. Just as the Roman *thermae* offers moments of exposure to light and view, the Departure Tunnel opens up to a skylight as it moves underground. The field of view also widens, exposing the passengers to the geological surfaces underground. An exhibition of the “natural” conditions of the airport as-found. At the base of the descent, the tunnel reveals a view to the underground network of the Washington Dulles Lower Mall, an in-transit cultural space that links the Interstice to the underground network. Before the passengers may enter the Lower Mall however, they must first enter into one of five infectious disease screening areas or Screening Lounges for medical inspection. The Departure Tunnel has led the passengers to one of these five areas.

Fig 2.1 - 18 [above] The passengers enter a screening area.

Fig 2.1 - 19 [top right] Elevation of the Departure Tunnel.

Fig 2.1 - 20 [right] Perspective of the Departure Tunnel as it attaches to the A380 at the top, and the screening area at the bottom.

Fig ix Inside the Screening Lounge

A DAY IN THE SCREENING LOUNGE

I stared towards the brightly lit entryway of room number 4 as a CDC staff member checked my Travelling Contact Declaration Card. Each passenger was given this yellow card with his or her seat numbers printed on the front. On the back were three questions and a check box next to each. "Do you have a fever? Do you have one or more of the following symptoms: coughing, shortness of breath, nausea? Have you been in contact with an ill person in the last 12 hours?"

I thought for a moment -and left each box blank.

Families were waiting for loved ones at the sides of the queuing line but I was alone, surrounded by strangers. I was aware of their every cough, sneeze or slight touch. What had happened to the person I was sitting next to on board? Could they have spread something to me? Every itch, change in breathing pattern, and elevated heart rate made me question my own wellbeing.

I was in control of my movement again after getting off of the moving walkway and entered a threshold leading to the massive room. A thermal scanning apparatus was mounted to the structural rings that surrounded the anteroom and a short chime would play as each person moved through, which indicated normal readings. A CDC staff member sat in a separate compartment and looked down at the readings from behind a glass wall. Sweating, I passed the camera, but no sound played as it had for the others before me. Suddenly the person behind the glass looked up and motioned for me to walk through the camera again. The second time, the chime played. My sweating and elevated body temperature must have interfered with their readings. I proceeded into the room.

The glass and metal tube gave way to a large open space that appeared soft and plastic -malleable even. Some of the passengers who had

entered were already sitting down and others were walking around an elliptical path that framed its edges. I walked around as well and could hear soft, barely audible sounds emitted from speakers along the perimeter. The sounds of water droplets, blowing breezes and crunching leaves that came from the speakers were a contrast to its sterile plastic walls.

Dome-like, I couldn't tell where the walls ended and the ceiling began. The only visual cue was that the membrane containing us was opaque at the bottom, but gradually became transparent as one looked up and saw the midnight sky.

The room felt more like an airport lounge than an emergency screening area. The platform that we walked above was demarcated with posts tagged with numbers coinciding with the seat number where we sat on the A380. I walked over to the post with my seat number listed, and lifted a handle embedded into the floor. The sound of air rang, and up from the floor inflated an air-filled, seat. I placed my carry-on luggage on the post next to me and sat down. The post also had mechanical arms—one with a small LCD monitor and another with a meal tray. I felt as if I was once again back in the aircraft cabin.

Like a flight attendant bringing around a food cart on a plane, a nurse from the CDC came around to each passenger and carried out an individual medical inspection. Waiting for results could take hours so I shut my eyes and slipped into sleep.

As the morning sun filtered into the lounge, I awoke to a now empty space, and a polyethylene glove on my shoulder ●●●

Fig x Awaiting medical inspection in the Screening Lounge.

2.2 SCREENING

/ˈskriːnɪŋ/

1) the testing of a person or group of people for the presence of a disease or other condition (Oxford, 2010).

Synonym: filter

/ˈfɪltə/

1) [to] process or assess in order to reject those that are unwanted.

2) (of light or sound) [to] enter a place slowly or in small quantities (Oxford, 2010).

Fig 2.2 - 1 The Screening Lounges within the Interstice.

Brought here through the Departure Tunnel, the passengers are now within the body of the Interstice. The level that they occupy is situated between the tarmac above and the Lower Mall concourse below. The purpose of this level is to identify those passengers that are confirmed to have contracted the pandemic virus, and those who have not. Ultimately, this is the area where those passengers deemed healthy and unhealthy part ways. The healthy may proceed into the Lower Mall, further underground and continue on their various voyages, while the unhealthy passengers remain within the Interstice for treatment.

Prior to entering the screening areas proper, the line of passengers proceed via moving walkway to a row of entrances numbered one through five. As the passengers queue to enter their respective screening areas, staff from the CDC follow a procedure similar to the exit screening process followed at Toronto Pearson Airport during the outbreak of SARS in 2002. Here, passengers answer questions specific to the disease symptoms on a yellow card as a superficial form of screening. Passengers who had identified themselves as having symptoms will then be further assessed by staff. Thermal image scanners are then utilized to detect all others with elevated body temperatures (Johanis, 2007). A more extensive medical inspection of the skin, eyes, throat and general bodily condition and an examination of specific symptoms identify those confirmed to carry a virus. These individuals are then accommodated in short-term isolation (Gaber, et al., 2009).

Fig 2.2 - 2 Exit screening of a passenger at Jommo Kenyatta International Airport in Kenya during the 2014 ebola outbreak.

This chapter describes the area of the Interstice that houses this programmatic scenario. The qualities of these five Screening Lounges are both derived from the **screening of people** and the **screening of matter** -waves and particles of light, air, and sound. The first is a programmatic requirement, and the second, a tectonic one.

SCREENING PEOPLE

Fig 2.2 - 3 An eye inspection at Ellis Island in the late 1800's.

At Ellis Island between 1892 and 1954, the uncertainty of a landed immigrant's health would also serve as the impetus to sort or screen people. During this period, the immigration station at Ellis Island saw the passage of about sixteen million immigrants, all disembarking at New York Harbour and often from the steerage section of a ship (Tifft, Dunne, 1971). It was not just good health however that would determine whether one could enter the country, as the officers stationed at Ellis Island were tasked with sorting out "[i]diots, insane persons, paupers or persons likely to become a public charge" (Yew. 1980, p. 489). The preservation of the common good of the United States would serve as the rationale to cross-examine and determine whether an immigrant could enter the country, or would have to be sent back to their harbour of origin. In the 21st century, the nurse replaces the flight attendant as the unhealthy from the healthy are sorted. In New York Harbour at the turn of the 20th century however, a cross-examiner replaces the nurse.

As the migrants departed their vessel, all would be assigned a number in groups of thirty based on where their name appeared on the ships manifest. An interpreter was then assigned to the

Fig 2.2 - 4 [above] Landed immigrants view the back of the Statue of Liberty from Ellis Island.

Fig 2.2 - 5 [right] Diagram of the routes taken by landed immigrants at New York Harbour at the turn of the 20th century.

Fig 2.2 - 6 [below] A possible sequence of events for someone being screened at Ellis Island.

ARRIVAL AT NEW YORK HARBOUR

ARRIVAL AT ELLIS ISLAND

VISUAL MEDICAL INSPECTION

ISOLATION

PROCESSING

passengers who proceeded through the immigration centre's Great Hall, and up to medical examination areas on the higher levels. As passengers walked up the staircase to examination areas, officers would look from below for any signs of disease, such as limping or physical disabilities (Tifft, Dunne, 1971).

Fig 2.2 - 7 Immigrants are queued for screening in the Great Hall of the Ellis Island immigration station.

Physicians of the Public Health Service would now visually inspect the hands, neck, scalp, and throat for signs of the "immigrant diseases" -trachoma, tuberculosis, small pox, syphilis, gonorrhoea, and ringworm as well as for typhus, cholera and yellow fever. From start to finish, this inspection would take approximately six seconds as a person passed the stationed officer (Yew, E. 1980). Those with signs of having an infectious disease were sent to a detention area for isolation and further examination. Passing the final medical test of an eye examination, passengers would be sent on with their interpreter to the registry station for cross examination by a border officer. Here they would face entry into America as one outcome, or deportation or detention as the other.

Following the preliminary health inspection of questionnaires and thermal scanning, the Interstice passengers of the 21st century enter into a large area with seating for one hundred -the approximate size of an aircraft section. Rather than being herded through a series of checkpoints, the passengers are seated in a lounge-like setting. One by one, each passenger is met by a CDC staff member for an examination of symptoms that may have been undetected initially. Rather than standing in queue to meet an inspection officer, the passengers are met by a CDC member who comes around to them. Still, the scenario depicted in the 21st century is strikingly similar to the scenario of Ellis Island. What may differ substantially however are the formal characteristics of these places. In particular, the form of the Screening Lounge of the 21st century is derived and shaped by a sequence of human flow and movement.

Fig 2.2 - 8 A time-lapse of the motion of passengers entering the screening lounge. Yellow: Suspected Contacts. Blue: CDC Staff. Red: Known Contacts. Green: Cleared Contacts.

This sequence begins upon the passengers entry. First, one hundred passengers scatter into each of the Screening Lounges. The people shuffle about -unorganized, as they locate their assigned seats. The CDC staff then follow in, moving between rows of passengers and proceed to carry out the individual assessments.

Some passengers are informed that they may leave immediately. They have been deemed healthy and may enter the public Lower Mall concourse below. Others, are asked to remain for while. Family members of the persons who have not been cleared may also remain in the Lounge. Attendants enter occasionally with food, blankets and other particulars, while an “in-screening” film is shown. Some, passengers, in their anxiousness stand up, stretch and meander around -killing time as they wait. Others get up to use the self-cleaning washroom and change stations. One by one, the passengers leave the Screening Lounge, either on their own, or escorted by CDC staff.

The axially ordered, rigid queuing lines within the Beaux-Arts plan of Ellis Island’s Great Hall gives way to a place shaped by the coming and goings of passengers and caregivers. Chaos and flux, rather than order and control shape the space here. The Screening Lounge takes on the form of an ellipsoid, whereby the crowd may circulate around its perimeter freely, or scatter about fluidly in its uninterrupted floor area.

While the Ellis Island inspection scenario may have lasted for only six seconds, the passengers in the Screening Lounge remain here for hours, a time period comparable to the duration of a flight. The Screening Lounge shares many characteristics then with the artificial environment of an aircraft. An enclosed environment sealed from the exterior, that supports and occupies the existence of its occupants.

Fig 2.2 - 9 Deriving form from human flow. These iterative models explored the shape of spaces that would become the Screening Lounges.

Fig 2.2 - 10 The activities occurring within the Screening Lounges.

Top left: Suspected contacts (yellow) enter.
 Top right: Suspected contacts await inspection by CDC staff (blue). Bottom left: Suspected contacts scatter while awaiting diagnosis, and receive food and other amenities (purple).
 Bottom right: Cleared passengers (green) exit, known contacts (red) remain.

Fig 2.2 - 11 Early diagram of the Screening Lounge space emphasizing its mechanical and tectonic qualities.

SCREENING MATTER

During their stay within the lounge, the passengers remain seated in inflatable lounge seats that are equipped with personalized lighting, heating and cooling, a computer terminal, call button for assistance, and of course a fold out meal tray. While the Screening Lounge chair can be likened to those found in an aircraft cabin, it also draws comparison to Alvar Aalto's *Scroll Chair* designed for patients of his 1932 *Paimio Sanatoria* building in Finland. Both are purposed for sanitation in mind and just as Aalto's version utilized a laminated birch plywood structure that could be easily wiped and sterilized, the Screening Lounge Chair is made of a single membrane that can be cleaned in a similar manner.

Fig 2.2 - 12 The Aalto Chair:
purpose built for
patients of tuberculosis

Aalto's chair however is specific to the needs of tuberculosis patients and is equipped with ventilation holes behind the neck area that would allow the rapid evaporation of sweat, and prevent contamination upon the surface of the seat (Warren, P. 2006). The holes themselves are physical screens. Screening, as in "filter" becomes a term that alludes to the removal of matter itself, in this case preserving hygiene through the removal of contaminants. Screening may also mean the reverse, implying the selective admission of particular physical qualities that are seen as desirable. Isolating those infected with tuberculosis for months and even years, the sanatoria buildings from the beginning of the 20th century, encapsulate both meanings of the word screening due to the emphasis on removing unhygienic matter and permitting qualities seen as hygienic.

Facilities such as Aalto's sanatoria would be sited in mountainous Alpine Regions, far from the city, to both isolate and treat patients (Warren, 2006). Ultimately however, the success of the sanatoria would not be in developing a cure for tuberculosis, but in executing

the *Sanatoria Regiment*, which occupied patients during their lengthy stay. Since tuberculosis attacked the respiratory system, the *Regiment*, embraced rigorous programs with an emphasis on air quality, even requiring periods of mandatory silences that were conjectured to mitigate the transfer of diseased air (Warren, 2006).

Fig 2.2 - 13 The *Paimio Sanatoria* by Alvar Aalto, 1932.

Screening, primarily through the removal of bad air would render the sanatoria buildings themselves as the physical manifestation of the pseudo-scientific Regiment program. Consequently, buildings of this type employed a pavilion style plan, laid out in an axial arrangement and utilized operable windows near each patients bed to capture natural breezes and expel infectious exhalations from ones quarters (Adams, A. 2008). A first for institutional medical buildings of this nature, such developments would be seen as supplementing the Regiment, by not only drawing out bad air, but by permitting the infiltration of cool, dry alpine air, which was seen as assisting the development of a patient's lung capacity.

Since exercise played an important role in the Sanatoria Regiment, the provision of open space in the form of flat roofs, solaria, balconies and terraces were prioritized in the design of the institutions. These building elements would emphasize not only access to clean air for patients, but also afforded them natural daylight. Such developments would influence even Le Corbusier, who would remark that these spatial solutions “proved so successful in the United States in combating tuberculosis” (Zardini, et al., 2012, p. 139). Le Corbusier would employ many of these tactics in his Five Points of Architecture -specifically the use of the flat roof terrace or garden, which could now be used for therapeutic, and recreational purposes as seen in his terrace for the prototypical Unite d’Habitation in Marseille (1952).

Fig 2.2 - 14 [top] The balcony of the Paimio Sanatorium by Alvar Aalto, 1932.

Fig 2.2 - 15 [bottom] The roof terrace of the Unite d’Habitation by Le Corbusier, 1952.

With the discovery of its vaccination, streptomycin in 1943 by Selman Waksman, the Sanatoria Regiment and the buildings themselves would largely fall out of favour as treatment facilities (Warren, P. 2006). Medical institutions would also begin to employ technological systems such as air conditioning to modify interior climate and remove contaminated air (Adams, 2008). Prior to these advancements however, the regiment of air, light, solitude and exercise was seen as a form of therapy nonetheless and would contribute at the very least to a patient's quality of life. Admittance to the sanatoria would then ultimately serve as a life sentence, not intended to cure disease, but to occupy patients during their illness –a form of diversion.

As the passengers wait throughout the day in the Screening Lounge, they are similarly offered the amenities (and distractions) that one would be provided with on board a lengthy flight, namely an "in-flight" meal and forms of entertainment. Like the Regiment of the sanatoria, the passengers are preoccupied while waiting to be screened. Rather than being envisioned as a means of treatment, the use of light, sound and air within the Screening Lounge is intended to calm and ease the minds of the passengers. As a filter, the tectonic resolution of this space is premised upon the selective admission of matter such as light, air, and sounds as part of creating an environment that offers stimulations to divert the attention the passengers during the pandemic crisis.

The Lounge itself is filled with a diffused light as afforded by its translucent membrane envelope, opaque at the bottom and transparent at the top. Light permeates through the envelope as a gradient by virtue of a large skylight under which the Screening Lounge suspends. The Lounge is therefore coloured by the sky, so while the passengers are underground, they are exposed to the condition of the world outside. Further, an "in-Screening" film is projected onto the membrane periodically, colouring the space with imagery.

Fig 2.2 - 16 The Screening Lounge illuminated underneath a skylight.

The five Screening Lounges must remain sterile environments externally, and as such are separate from each other. Each is fitted with independent air circulation, filtration, and plumbing systems, ensuring that an infectious disease is contained. The air-filled skin is also an acoustic barrier isolating the Screening Lounge from the noise pollution of the Lower Mall below. Additionally, a sound bar encircles the perimeter of the space and emits computer-generated sounds as a form of white noise.

Below, the travellers of the Lower Mall are unaware of its contents. Filled with technologies that occupy the passengers for a series of hours –projectors, sound bars, digital displays and computer controlled lighting; it can be likened to Reyner Banham’s *Environment Bubble*. Banham conceptualizes his “standard-of-living” package in the form of a membrane, in which an artificial environment of “objects, services and technologies” define the use of an otherwise empty space (Sadler, 1999). Likened to a mobile home, the consumption of goods and energy by its occupants power this space and since the exhaust of mechanical equipment produced by its occupants inflate its Mylar skin, the structure only takes form when occupied.

Fig 2.2 - 17 François Dallegret's illustration of *The Environment Bubble*, by Reynier Banham, 1965.

Like the Environment Bubble, the Screening Lounges also lie dormant unless they are in use during a health emergency. Since the Screening Lounges only take form when in use, the screening of air into its membrane skin -inflation, becomes the means by which the Lounges take shape. What the passengers do not experience during their stay within the Screening Lounges is this function, whereby the entire structure grows to accommodate them prior to their arrival. When all of the passengers have passed through the screening process and have left, the Lounge deflates. Pulled by the forces of gravity, the membrane skin of the Screening Lounge hangs back down when it is not in use and becomes an amorphous mass suspended over the Lower Mall concourse as an artefact that alludes to the potentiality of an impending crisis.

Fig 2.2 - 18 The Screening Lounge as seen from the Lower Mall
concourse.

[above] A formal sequence powered by inflation.

[lower left] The Lounge if occupied.

[lower right] The Lounge if unoccupied.

Fig 2.2 - 19 [top] Early diagram showing a Screening Lounge hung beneath a skylight and above the people moving through the Lower Mall.

Fig 2.2 - 20 [bottom] Section through the Screening Lounge's powered inflatable skin.

Fig xi A CDC nurse enters the Quarantine Raft.

A WEEK ON THE QUARANTINE WING

The coughing, night sweats and shortness of breath progressed continually for the next six days. It was now the morning of the seventh. I experienced the pandemic virus in the form of severe bouts of symptoms, followed by moments of numbness. By now though, the worst of the disease seemed to have passed.

Aside from a nurse who would come by regularly with antibiotics, I was alone and isolated. The substances that I needed to survive though, -clean air, food, water, and a connection to the Internet, were continually piped into my room.

The room itself could not really be described as such. It was bubble-like, with plastic walls that transmitted a soft, diffused light. The membrane skin that surrounded me was stretched tight, as if by some invisible force, while the low, barely audible hum of machinery reverberated throughout the space.

Through a small round oculi at my eye level, I could see out over the tarmac and into the distance -atop trees, hills and landscape. Even further beyond, was the Capital. I was now floating high above the activities of the airport apron within a machine that kept me alive. Under mandatory quarantine, I would remain here, isolated in a hospital in the least likely of places, above the airfield.

Suddenly, the ripping of Velcro interrupted the non-stop hissing noises of the pressurized space that contained me. The membrane-like entryway into my room peeled up as a nurse wearing a mask and rubber gloves entered.

Through the mask the nurse announced, "We've just received your results from the laboratory downstairs". Time itself seemed to stand still as I ran through all of the possible scenarios in my head. What did the tests say? Would I have to remain here any longer?

The virus, as I understood, had spread rapidly throughout the world. It seemed unstoppable as international borders closed out of fear of permitting its further spread. By virtue of this strange facility, Washington Dulles Airport would remain as one of the few places where one could be admitted into the country.

There would undoubtedly be others though who remained in a similar condition to myself. Perhaps the passenger who had been seated next to me on the aircraft was here as well.

Removing the face mask, the nurse smiled, and said, "You're free to go as soon as you're ready. You will be required to check in with the CDC over the next few weeks however as we continue to monitor your health status". The nurse then handed me a prescription for antibiotics. Promptly, the nurse put on the mask once again and left through the small anteroom.

I stood there in shock and relief, and began to mentally retrace the steps that I had taken days earlier to arrive here. Days ago, officers of the CDC had escorted me to my isolation unit, but now I was free to walk back on my own.

As I slowly made my way through the corridor, I walked in front of dozens of other rooms just like my own. I passed through a series of vestibules and depressurization spaces until finally an elevator stood in front of me. As I entered, I could smell the sterilization chemicals that had been sprayed remotely inside its cabin and had evaporated just seconds before.

The elevator took me back down the towers that I had gazed upon from the aircraft windows a week earlier. Now that I was within the towers I could see out and up at the rest of this facility above the airport. Hanging between each tower were hundreds of the cell-like units, one of which had been my home for the past week.

While some hung stationary, others appeared to be shrinking and were carried up out of view. I imagined other passengers, like myself vacating

their isolation areas -emptying this immense structure and leaving only a frame that suggested its true purpose.

I descended once more through the tarmac. A survivor, I was now healthy –made so by my week long isolation and medical treatment within the Quarantine Wing ●●●

Fig xii [right] The Raft is disinfected as it is vacated.

Fig xiii [below] Descending the Quarantine Wing by elevator.

2.3 QUARANTINE

/ˈkwɒrəntiːn/

from the Italian 'quarantina' meaning forty days.

1) a state, period, or place of isolation in which people or animals that have arrived from elsewhere or been exposed to infectious or contagious disease are placed.

2) [to] put (a person or animal) in quarantine (Oxford, 2010).

Fig 2.3 - 1 The Quarantine Wing and Quarantine Rafts within the Interstice.

The climax of the story of the 21st century pandemic takes place upon the **Quarantine Wing**, a superstructure that contains individual isolation units or **Quarantine Rafts** that each house a single passenger. The A380's passengers confirmed to carry the virus are lifted by elevator from the underground Screening Lounges into this Quarantine Wing. The Wing is suspended over the tarmac by five service towers and is able to accommodate all five hundred passengers in private treatment rooms over a number of days for medical care.

The practice of quarantine and isolation is found throughout the history of human disease. From the immigration station at Ellis Island to the sanatoria, building facilities have served to physically separate those with confirmed cases of infectious diseases from

the public. The term quarantine itself is rooted in the Latin word *quarantina* or 40 days, which was the approximate time it took for the Bubonic Plague to show symptoms. During the plague, ships seeking to dock at the Venetian port of Ragusa would be placed under quarantine, out into the harbour until it was certain that the vessel posed no threat to the city and could enter (Gensini, G. et al. 2004). Quarantine is therefore not only a spatial condition, but a temporal one that is representative of the time period that it takes for there to be certainty that an infectious disease can no longer be spread.

Fig 2.3 - 2 Residential apartment complex, Amoy Gardens in Hong Kong under mandatory quarantine during the SARS crisis, 2003.

Within their individual Quarantine Rafts, the passengers are isolated from each other and the rest of the airport. The length of stay will undoubtedly vary amongst the quarantined passengers. Some will be cleared for entry into the Lower Mall immediately following a more extensive medical examination. Others may be required to remain in quarantine for intensive antibiotic treatment before being cleared for entry. During this period, the Quarantine Wing and their single Quarantine Raft is their home. The Interstice must then function like an in-transit hospital and provide all patients with medical care and basic necessities within isolated quarters.

Fig 2.3 - 3 The Quarantine Wing seen from the tarmac level.

THE QUARANTINE WING

Standing dormant over the tarmac, the Quarantine Wing anticipates a worst-case scenario, where after screening it has been discovered that not just some, but all five hundred passengers require medical care through quarantine. While the previous chapters have described parts of the Interstice that can be considered reactionary, since they are only experienced when the landed passengers enter them, the Quarantine Wing is conceived of as being a pre-emptive or defensive measure awaiting a pandemic scenario such as this.

Since the underground zones of the Interstice remain within fixed boundaries, it is actually the above ground area of the tarmac that becomes more conducive to occupying this indeterminate number

of people. A flat and largely uninterrupted open surface, the tarmac area that surrounds the Interstice is cordoned off for the purpose of becoming an emergency quarantine zone. However, as it has been established in *Departure*, the siting of the Interstice upon the tarmac is one of the least desirable places imaginable for medical care. The Interstice is therefore more like a military hospital, valued not for their distance away from the battlefield, but for their close proximity to it.

Facilities such as the field hospitals of the Second World War for example, were used to provide basic medical services to front line soldiers and would be situated adjacent to allied airfields close by. During the Korean War, the Mobile Army Surgical Hospital or MASH would even be equipped to follow the front line itself, offering rapid deployment of surgical services, triage, blood storage and trauma care (Booker, 2005). MASH units such as the 8076th army unit are described as being never further than 10 miles away from the front (Office of Medical History. 1953). The use of the MASH would later serve as evacuation hospitals in addition to their original surgical functions, and were even equipped to process as much as five thousand patients over a twenty-four hour period (Office of Medical History, 1953).

Fig 2.3 - 4 [left] Aerial of the Mobile Army Surgical Hospital, unit 8063 during the Korean War.

Fig 2.3 - 5 [right] Operating room of the 44th MASH, Korea, 1954.

While the Quarantine Wing differs from the MASH, since it stands stationary and is itself not mobile, it must all the same rapidly deploy medical functions when needed. The Quarantine Wing instead frames the mobile aspects of the in-transit hospital. These aspects are infrastructural in nature, and include not only the transit of staff and patients, but also the mechanical systems and equipment necessary for the hospital to remain functional. The Quarantine Wing's most important role then is to organize the systems that will contain the individual isolation spaces above the tarmac.

The discussion of how the Quarantine Wing fulfills this function of containment begins with Buckminster Fuller's exploration of the domed city. Here, Fuller's three-kilometer geodesic dome is illustrated as enclosing the entirety of mid-town Manhattan. As mentioned previously however, the airtight domed-city is part of a larger agenda that explores the creation of artificial climates suitable for the human being (Fuller, B. 1965). It is notable then that Buckminster chooses to depict this dome over an urban environment, occupied by people, rather than its intended context of Antarctica. It is possible to imagine that this area contained within the dome would be a sort of utopia, where the framing of the city by a sealed dome affords the creation of an ideal climate for the society within.

The utopian implication of Buckminster's theoretical dome would recall many of the Futurist ideals as laid out by Sant'Elia, but also echo Fuller's own contemporaries and their notion of the city as *megastructure*. Described by Reyner Banham as 'urban structures of the future', concepts for megastructures continually allude to the Futurist notion that the new world exists in opposition to the old one (Banham, 1976). Fuller's own proposition for instance, trails architect Yona Friedman's depiction of *Urbanisme spatiale* (1960-62) where a new city is organized by a three-dimensional grid lifted above the disorganized city. Artist and architect Constant Nieuwenhuys would later propose *Neo-Babylon* (1962)

Fig 2.3 - 6 [top left] Aerial of the enclosing *Dome Over midtown Manhattan*.

Fig 2.3 - 7 [top right] view from inside of the Dome.

Fig 2.3 - 8 [right] The gridded construct of Yona Friedman's *Urbanism Spatiale* rises distinctly above the city.

and disregard the context of the old city entirely, by floating his expansive sectors overtop. Nieuwenhuys, describes his New Babylon as an “extension of the Earths surface, a new skin that covers the earth and multiplies its living space,” He goes on to describe his intended use of the ground plane, which would now be freed for “agriculture, wild nature and historical monuments” (Nieuwenhuys, 1974). Such conditions were unsuited for the needs of a contemporary society that may now enjoy a life of leisure and recreation away from the old society.

Similar work, such as architect Joseph Weber’s high-density city strip development (1965) is also illustrated as ignoring existing topography, and again lifts a megastructural form up above landscape. Archigram member, Ron Herron takes this idea towards the extreme with his *Walking City* proposal (1964), whereby the new city block would be contained within a moving megastructure, capable of simply ‘walking away’ from the old city to tread over new frontier (Cook, 1970).

Fig 2.3 - 9 The *Walking City* in New York, illustration by Ron Herron, 1964.

The Quarantine Wing likewise “floats” as a container that is above the world of the tarmac, but rather than serving as a symbol for a new order of things, the Wing delineates a world that is isolated from its hazardous surroundings. It is a literal place of quarantine that is virtually separate from the flows of the airport that it serves to protect. Despite these differences, the Wing shares many formal and organizational similarities with the work of the megastructuralists, especially as documented by Reyner Banham in his book, *Megastructure: Urban Futures of the Recent Past*. Citing the Japanese architect Fumihiko Maki, Reyner Banham traces the basic definition of the term.

The megastructure is a large frame in which all the functions of a city or part of a city are housed. It has been made possible by present day technology. In a sense it is a man-made feature of the landscape. (Banham, Megastructure p. 217)

While the Quarantine Wing is not a city itself, it is a container that houses functions that are similar to one, such as numerous dwelling spaces (in the form of patient isolation rooms) and infrastructures (in the form of horizontal and vertical circulation and mechanical services). It also relies on technology to the utmost degree in order to condition its hermetically sealed, sterile areas. Finally, the Quarantine Wing punctures the landscape of the tarmac –which itself is a man-made feature within the region, becoming part of the airport landscape itself. Under this definition, the Quarantine Wing can be considered a form of megastructure itself, akin to the work described previously.

Fig 2.3 - 10 [above & opposite] Early models visualizing the presence of the Quarantine Wing above the flat tarmac.

Fig 2.3 - 11 [below] The layers and parts that comprise the Interstice. The components above tarmac area would become the Quarantine Wing.

STRUCTURAL FRAME "BRIDGE"

VERTICAL CIRCULATION ELEMENTS

TARMAC

LOWER MALL & SCREENING AREAS

CONNECTIONS TO AIRPORT NETWORK

According to Banham, the megastructure as a system, is made up of "a kit of parts" and speaks to this by citing Kenzo Tange, who describes the form as "[a] mass-human scale form, which includes a Mega-form, and discrete, rapidly-changing functional units that fit within the larger framework." (Banham, 1976, p. 8). Here, the superstructure of the Wing might be considered the larger framework of the "Mega-form" while the many "Rafts" that house the patient areas are those "rapidly-changing functional units".

This definition also speaks to the notion of permanence and transience that is also present in the combination of Quarantine Wing and Quarantine Raft. While the megastructures of Nieuwenhuys and Weber are illustrated as being capable of infinite growth, expanding in surface area over the earth, the Quarantine Wing grows through a form of contained growth that occurs volumetrically whereby the capacity of the Wing is built by being "filled-in" by transitional elements. Peter Cook of Archigram

illustrates this in his *Plug-In City* (1964), which builds capacity through the addition of interchangeable living capsules to be lifted into place by crane in order to be part of the overall megastructure form. To Cook, motion, as afforded by technology becomes key to realizing the vision of the megastructure as a flexible form.

The building can now really become an animal, with inflatables and hydraulics and the cheap, localized electric motor. It can grow: not only larger, but now smaller, different, better. (Cook, 1970, n.p.)

Fig 2.3 - 12 Section showing the crane as the means of growth for *Plug-In City* by Peter Cook, 1964.

Fig 2.3 - 13 [top] The Quarantine Wing growing capacity by “filling-in” with Rafts.

Fig 2.3 - 14 [bottom] A possible scenario where the Wing only deploys some of the Quarantine Rafts.

Decades later, the Quarantine Wing stands as a fixed element above the tarmac and is made up of five service towers that are connected at the top by a bridging structure. From underneath this bridge, the many Quarantine Rafts fill in the space between the service towers as necessary. At the press of a button, the Rafts are lowered from underneath the bridge and descend simultaneously or individually. When not in use, the Rafts compress and retract back up. Like the Plug-in City, the Wing is operational whether it is fully deployed with all five hundred rafts, or if it carries only a few.

The service towers of the Quarantine Wing become much like Peter Cook’s un-built *Montreal Experiments Tower* for Expo ‘67 (1963). Described as both ‘skin and guts’, the tower contains a large radio antenna and entertainment services in a single concrete core (Cook, 1972). Distributed over the five service towers, the Quarantine Wing contains ‘guts’ that are comprised of a core for a self-disinfecting elevator as well as circulation and mechanical connections for each level of Quarantine Rafts. Surrounding each tower is a ‘skin’ of perforated metal, offering a degree of protective transparency to the outside.

Fig 2.3 - 15 Sectional model of the Interstice.

The Quarantine Wing stands over the tarmac as well as the Departure Tunnel, Screening Lounge, and underground Lower Mall.

The Quarantine Rafts hang from the bridging structure or *Wing*, in preparation for deployment.

Since the five hundred Quarantine Rafts deploy only when necessary, the Quarantine Wing is afforded a degree of flexibility -a theme that is embraced by many of the megastucturalists described previously. The system is thus only as big as it is required to be and is based on the severity of the virus outbreak.

Fig 2.3 - 16 [above] View from underneath of the Quarantine Wing.

Fig 2.3 - 17 [opposite page] Section through the Quarantine Wing at partial deployment.

THE QUARANTINE RAFTS

Poised to deploy when necessary, a single Quarantine Raft occupies one contagious passenger each and is linked to the overall structure of the Quarantine Wing by service corridors and anterooms. Each Raft is capable of providing its occupants with life supporting systems such as filtered air, water, and electricity, which are continually cycled in and out of the space. The Rafts simultaneously block all inbound contaminants from the outside. In this manner, the Quarantine Rafts may be comparable to emergency structures like the “domestic nuclear bunkers” that were promoted during the cold war and of which historian Simon Sadler describes as offering occupants with a form of “bare-minimum” existence (Sadler, 1999).

The means through which the Quarantine Rafts deploy from underneath the Quarantine Wing is through the process of inflation and may be compared to the emergency inflatable slides that deploy from the undercarriage of an aircraft, or even the Emergency Oxygen System that drop down from an aircraft’s bulkhead when under depressurization. Through inflation, these emergency devices are capable of changing state from compressed objects that lay flat when at rest, into occupiable forms when required.

Fig 2.3 - 18 A Quarantine Raft insulates patients from the contaminants of the outside.

Fig 2.3 - 19 Like an Air-Cruiser's inflatable slide, the Quarantine Raft has a compressed and inflated mode.

As illustrated by Ant Farm, in their 1973 *Inflatocookbook*, the inflatable is capable of occupying the fourth dimension -time, in addition to the Cartesian planes. It may for instance, occupy an minute space at one moment and a larger one at another. To Ant Farm, this would mean that the inflatable could serve as an alternative to traditional fixed building systems and enclosures as one could now inflate a membrane to suit their own individual requirements (Dessauce, 1999). This is best put by the members of Ant Farm themselves:

The freedom and instability of an environment where the walls are constantly becoming the ceilings and ceiling the floor and the door is rolling around the ceiling somewhere releases a lot of energy that is usually confined by the xyz planes of the normal box-room (Lord, et al., 1973, p. 6).

Fig 2.3 - 20 The inflatable-as-environment. [top] *Cushicle* by Michael Webb (1966). [bottom left] *Living Pod* by David Greene (1965). [bottom right] *Dyodon* by Jean-Paul Jungmann.(1967)

Reyner Banham builds on this idea, describing the inflatable as organism-like, a dynamic characteristic that is achieved by filling the membrane with air. Banham states:

"Inflatables move and are so nearly living and breathing that is no surprise that they have to be fed (with amps...). Like a neurotic bullfrog pulling itself up, straining, creaking, wrinkling along the seams, trying to lift itself off of the floor"
(Dessauce, 1999, p. 33).

In Banham's comparison of the inflatable with an organism, he alludes to the human skin-like quality of the inflatable membrane, which is able to mimic the body and its movements. At the scale of the body the inflatable becomes a new skin, around the body, and can contort itself to the motions and unique requirements of the human being.

Archigram member, Michael Webb's inventions of the *Cushicles* (1966) and *Suitaloon* (1968), illustrate Banham's observation that the inflatable is a form that is most suited for containing the human being. In the case of the Cushicle, the nomadic human being carries an inflatable environment upon their back. The "building (or environment)-as-suit" may emerge when necessary and inflate into an occupy-able conditioned space that is sized for one person (Cook, 1970). Utopie member and architect, Jean-Paul Jungmann's *Dyodon* (1967) further emphasizes this individualistic notion in his drawings of the inflatable retreat, which is complete with solarium, observatory, 'rest-bubble', pool, and winter garden (Sadler, 1999). David Greene's *Living Pod* (1965) takes this further still, reducing the various spaces provided by Jungmann into an automated system within a single enclosure.

The Ant Farm's 1972 experimental *Clean Air Pod* introduces yet another theme, which is that of refuge. The 'Air Emergency' that was staged at University of California, Berkeley, imagined the inflatable as rapidly deployed emergency shelters that were the sole place for someone to find safety from a disaster that compromised breathable air.

A monotone loudspeaker voice informed them that an "air failure" had occurred and those who couldn't escape from the pollution would die within 15 minutes...the voice invited onlookers to take shelter in the CAP 1500...the air system inflating CAP 1500 also screens out deadly pollutants, the voice said...Those who didn't go into CAP 1500 were given 'negative census forms' to fill out before dying. (Lord, et al., 1973 p. 35)

Ant Farm's 40 x 40 foot inflatable domes are conceptualized as being capable of maintaining a complete hermetic seal from the hazardous exterior. The inflatable is both a second skin and life support system that supplies filtered air and functionally breathes for the people contained within. The use of the inflatable as a life support system for sufferers of Severe Combined Immunodeficiency (SCID) shows how the inflatable is able to be completely sealed from the exterior environment to protect the human immune system (Dottinga, 2006). Further still, the use of pressurized plastic membranes in both the Emergency Oxygen Masks or the Air-Cruisers inflatable slides that emerge from an aircraft's undercarriage build the case of "life-saving" inflatable devices that are compressed and dormant until required by an emergency.

Fig 2.3 - 21 [left] A photograph of David Vetter, a sufferer of SCID within a sterile plastic environment.

Fig 2.3 - 22 Time-lapse of the Quarantine Raft being inflated compared to the inflation of an aircraft's emergency oxygen system.

Likewise, the inflatable Quarantine Rafts serve as places of refuge and life support systems for one single occupant. The Quarantine Rafts must protect its passenger from both the fumes and hazards of the airfield as well as from contamination from other sick passengers. The skin of the each Quarantine Raft is comprised of insulated Ethylene tetrafluoroethylene (ETFE) cushions; a partial translucency allows the enclosure to transmit a diffused natural light into the space that remains a private environment. An inflatable anteroom then separates each Raft from the corridor, keeping the room protected from inbound bacteria and keeping the connecting corridor safe from outbound bacteria. Further, flexible plastic ducts pull exhaust air from the unit and pump fresh air into the space.

The ETFE skin of the Quarantine Raft is also a multi-layered system, with air continually blown through its cavity as a means of neutralizing pressure, air and sound. The aerogel filled ETFE cushions are made up of honeycomb baffles, functioning as high-density sound attenuation blankets that buffer the noises of the airport. Nested layers of inflatable ETFE cushions create an inflatable system whereby the ceilings and sides, including ducting and cabling lay virtually flat at rest, while metal platforms carrying fans, air-handing requirements and refuse basins, accordion out

when required and are held in place by pneumatic pistons akin to an airplanes landing gear.

Flex-nozzles on the inside spray the interior with a chemical bath after each use for sanitization. Each Raft is therefore a complex network of nozzles, folding elements and inflatable membranes, serving as a life support system for the occupant who may stay here isolated for hours, days or even weeks.

Fig 2.3 - 23 [above] A Quarantine Raft inflated and held in place.

Fig 2.3 - 24 [opposite page] Detailed section of the Quarantine Raft and its mechanical undercarriage.

Fig xiv Entering the crowded Lower Mall.

ARRIVAL AT THE LOWER MALL

I removed my baggage from the carousel at the base of the elevator. Underground again, my odyssey was coming to an end.

I moved through yet another thermal scanning apparatus and it chimed with a light bell sound, indicating that my body temperature was normal. I looked up at a glowing green and white sign above that welcomed me into to the Lower Mall. This place would be the last area that I would encounter within the structure that had been my home for the past week.

Through a vestibule, I could see crowds scattering in all directions and before me, the underground world of the Lower Mall revealed itself. The view of the crowd was overwhelming as they bounced between displays and shops. In sickness, my life had been placed on hold, but now able to do as I pleased, I was unsure how to proceed and began to wander.

Straight and narrow, the Mall appeared cave-like, as though it were carved out of the ground that it was sited. The walls and floor were made of sandstone and granite and the sound of flowing water could be heard below the noise of the chattering crowd.

Light filtered down through circular voids in the ceiling, bathing the Lower Mall in light. Hanging directly underneath the saucer-like skylights where five shapeless masses that partially obscured the view of the sky above.

I recognized that the amorphous shapes were the deflated Screening Lounges that were filled with sick passengers just days earlier. Empty, the masses were formless, hanging down by the pull of gravity. Above, the masses were practical examination rooms, but down here, they were spectacles. Glimmers of colour sparkled upon the white membrane skin as they reflected the activity that occurred beneath. These once solid forms now seemed light and ephemeral.

I stood underneath the fourth shapeless mass and looked towards the first as they hung in series. Underneath, an unbroken line of water rippled

in the ground and reflected the form of the masses above against a backdrop of clouds zooming overhead in the sky.

The crowds were still shuffling about; shopping, sitting, eating, waiting. Did they even notice what had occurred before? Did they care? The World Health Organization had not yet lifted the global pandemic alert and we were all still in danger. But underground, it didn't seem to matter. While people moved through the chasm formed by the structure above, I was one of the few who would have seen it in its entirety.

Suddenly, out of the corner of my eye, I could see the Passenger, the one who had been seated next to me on the flight. Met by friends and family, he strolled with them carefree, pointing at the boutiques, pressing hands against the glass displays, sharing drinks, laughing, embracing. All the while, the Pandemic of the 21st Century raged on.

I walked towards the end of the Lower mall and cautiously placed my hand upon a continuously moving handrail. Slowly stepping onto the moving track, I let the automated walkway sweep my feet away once more, and at long last, entered the airport •

Fig xv Looking down at the activity below from the shopping concourse.

2.4 ARRIVAL

arrive /əˈrɪv/

origin: Latin ad- “ to’ ‘ + ripa “ shore’ ‘.

1) [to] reach a place at the end of a journey
(Oxford, 2010).

Fig 2.4 - 1 The Lower Mall within the Interstice.

The story of the Interstice concludes in the Lower Mall. The place itself is situated underground, beneath the tarmac level and immediately underneath the Screening Lounges. The Lower Mall is also located at the intersection of the north to south and east to west underground connector tunnels and links the various concourses to the main terminal. The Mall is accessible to all persons walking through Dulles but separate from the medical functions of the Interstice above. Here, **the passenger finally arrives at Washington Dulles International Airport.**

As the concluding chapter, the Lower Mall can be thought of as culminating the overall theme of the Interstice as an in-transit place between the inside and the outside. The first section, **The Outside In**, discusses the qualities that are drawn in and serve as inspiration for the Lower Mall’s tectonic realization. The second section, **The Inside Out**, describes the activities that occur there as the passengers move from inside of the Lower Mall and out into the airport.

Fig 2.4 - 2 Section through the Lower Mall at its connection to the base of the Quarantine Wing.

THE OUTSIDE IN...

Like much of the existing underground network at Dulles, the Lower Mall is constructed by open-cut excavation, down from the tarmac above. As such, the Lower Mall can be thought of as an underground cavity, or negative space that has been subtracted from the solid tarmac condition above –a void. The passengers have already experienced some parts of this void previously. In *Departure*, the passengers move down into the Mall somewhat via the Departure Tunnel. They view its wall material of sandstone, which is the natural geological condition as found beneath the airport. Even further below, they can see the activities of people walking through the connector tunnels at the foot of the sandstone wall. Then, in *Screening*, the passengers stay within the spaces of the Screening Lounges, -massive forms that suspend from the top of the void itself. In *Quarantine*, they are removed from the void completely, and now that the passengers have been treated for illnesses above, they are able to join the crowds at its base.

Symbolically, the void represents absence, which has, in many ways, found its way into the design of the Interstice from a formal point of view. The Screening Lounges for instance remain deflated and empty unless filled by evacuated passengers. Likewise, the Quarantine Rafts deflate into a packaged form unless they host an ill passenger. The void of the Lower Mall, reverses this theme and is itself constructed by the removal or absence of matter below the tarmac. However, since it operates 24/7 as a connector tunnel, it is always filled with travellers moving throughout the airport.

The work of architect Daniel Libeskind has often engaged the notion of the physical construction of the void. Here, the void is representative of themes of cultural absence and forgotten history, which is evident in his *City Edge* (1987) competition entry for Berlin. In his proposal, historic fabric that has been destroyed by the construction of the Berlin Wall, is represented by a physical solid that is lifted above the Tiergarten District (Libeskind, 1987). Though Libeskind's proposal is a form of addition, rather than subtraction, the solid that he builds is claimed to be inscribed with cultural meaning associated with lost history. The absence of a cultural heritage is re-made physically.

Fig 2.4 - 3 Plan and model of Daniel Libeskind's *City Edge* proposal.

Fig 2.4 - 4 [left] The inaccessible void in the Jewish Museum Berlin, 1999.

Fig 2.4 - 5 [right] Reflecting Absence by Michael Arad, 2011.

Another example is Libeskind's *Jewish Museum* (1999), also in Berlin. Here, Libeskind physically constructs a "void" within the building's massing by tracing historically significant axes throughout the city which then cut into the solid mass of museum. A space that is inaccessible by visitors, the void becomes a physical presence for symbolic effect. The same technique is utilized by architect Michael Arad in his memorial in New York City, *Reflecting Absence* (2013). Here, the downpour of water into the two voids are representative of the physical presence of the World Trade Centre (Gendall, n.d.).

The Lower Mall however is a void within the "generic" global condition of the airport that is otherwise, characteristically homogenous. Rather than imbuing the Mall with abstract cultural meaning, like the approach taken by Libeskind or Arad, the Lower Mall aims to represent a local *physical geography*, filling the Lower Mall with remnants of a regional history. Here, the physical world of the outside is brought in as a retreat or oasis within the underground network of the airport.

Fig 2.4 - 6 [top] Plan view of a conceptual model that “fills” in the void of the underground.

Fig 2.4 - 7 [bottom] Early sectional visualization of the Lower Mall and the five forms that would become the inflatable Screening Lounges.

As the passenger’s enter the Lower Mall, they are met by a cave-like space that is constructed of the exposed sandstone formations that exist underneath the airport. It is therefore a place within the underground network of Dulles where the region’s geology and hydrology are reconstructed and made visible. Light from above also infiltrates the underground space through the use of large skylights. Fitted with heated mullions, the skylights melt snow in the wintertime and afford continuous natural light into the cavernous underground at all times during the day and throughout the year.

A single continuous reflection pool runs the length of the floor of the Lower Mall and references the natural watershed network that exists underneath the airport (EA Engineering, Science, and Technology, Inc., 2002). The pool also recalls the reflection pool and axial arrangement of its namesake, the National Mall in Washington, D.C. Filled with people all year round, the Lower Mall effectively becomes an underground civic space that is unique to the airport.

As it has been stated however, the Lower Mall exists in a place where nature is now all but non-existent. Much of the material effect of the Lower Mall serves to not only transplant the natural, but also abstract it below ground, away from its original context. This effect is seen primarily through the spectacles of the Screening Lounges that hang from the roof slab of the Mall. Here, the floating, shape-shifting masses draw multiple readings, appearing as artificial clouds, machines like blimps, or even internal bodily organs. The effect is similar to that of Olafur Eliasson's *Weather Project* (2003) in the Turbine Hall at Tate Modern, where the image of the sun is replicated and internalized by an array of coloured spotlights. A natural form of the outside is abstracted and remade inside.

Fig 2.4 - 8 Taking the outside, in.
The Weather Project at
Tate Modern, by Olafur
Eliasson, 2003)

Fig 2.4 - 9 Early model of the Lower Mall, showing people scattering underground around shops and displays. The five large forms would ultimately become the inflatable Screening Lounges.

Fig 2.4 - 10 A final image of the Lower Mall. The Screening Lounges are now hung from the top of the underground, abstracting a form of nature and allowing for an unobstructed pedestrian space below.

TO MAIN TERMINAL
AND CONCOURSE A/B

Fig 2.4 - 11 A "You Are Here" map of the Lower Mall.

...THE INSIDE OUT

Like the National Mall, the Lower Mall is an active cultural space. This is afforded by the foot traffic of travellers moving through Dulles' undergrounds. As the pedestrians meander through the space, the empty Screening Lounges hang from the ceiling above as amorphous objects.

The Interstice functionally empties into the Lower Mall and the passengers are now moving from the inside of the facility, into the airport and to the outside world. The passengers are no longer spectators looking down onto the activity here, but are participants who are no different from the thousands of other travellers of the airport.

Operating twenty-four-seven, the Lower Mall is a form of infrastructure that is part of the day-to-day function of the airport as both a connector and civic space. A contemporary example of this form of hybrid building is *Yokohama International Passenger Terminal* (2002) by Foreign Office Architects. Here, a ferry terminal doubles as a public space for the city (Shannon, 2011).

In a similar fashion, the Lower Mall serves the pragmatic function of a terminal connection, which then permits a cultural space to exist. Afforded by the fact that the emergency program of the Interstice stands above it, the Lower Mall is able to offer a continuous surface of flexible, transitional program, such as the display of artwork similar to those that take place in the previously mentioned Tate Modern Museum. The nearby Steven F. Udvar-Hazy Center for instance may now display artefacts in this space, rendering the Lower Mall a cultural, educational space. The secondary function that is also allowed for is that of a duty-free shopping mall such as the ones present in contemporary airports like Dubai International Airport, Amsterdam Schiphol, and London Heathrow. The Lower Mall of Dulles is therefore a shopping destination that is lined on its south wall by a quarter kilometer, two level street-wall of boutiques and restaurants.

While prepared to protect the airport from an impending pandemic, the Lower Mall accommodates the flow of people moving throughout Dulles.

As an airport amenity, the Mall is a leisurely place. The theme of recreation and leisure in architecture comes across yet again in the work of the past. Projects such as the *Sin Centre* (1959-62) by Archigram's Michael Webb postulate the rise of a society that was able to take part in such a lifestyle. He then programs his Sin Centre with various forms of entertainments that embrace spontaneity and flexibility. Even Constant Nieuwenhuy's *New Babylon* mentioned earlier had been "planed as a labyrinth", rendering its occupants as "drifter's between continuous spaces of encounters

Fig 2.4 - 12 Longitudinal Section through the Lower Mall.
A leisurely, colourful place, with plenty to do.
Displays, shops and entertainments occupy
(or distract) the travellers of Dulles.

between mind, body, [and] space..." To Nieuwenhuys, New Babylonians would cross "cool and dark spaces, hot, noisy, chequered, wet, and occasionally windy spaces under the base sky" (Nieuwenhuys, 1974, n.p.). English architect Cedric Price, in his 1968 *Fun Place* for London, also seeks to create opportunity for leisure asserting the social value of recreation. Of this new leisure society, Price states, "The period during which they earn money can be little more than made mentally hygienically bearable and that a new mentality is awakened during periods of self-willed activity". His Fun Palace therefore becomes "a laboratory of pleasure, providing room for many kinds of action" in places such as a "fun arcade", science playground" and even a "plastic room" (Price, 1968, p. 129).

Underneath the Interstice, the Mall combines together recreation, shopping, entertainment, culture and landscape in a manner not unlike many other airports around the world. Serving this new 21st century public, the Lower Mall offers a leisurely place like the social projects of Webb, Nieuwenhuys and Price. Unlike the projects of the 1960's however, the Lower Mall is ultimately a diversion for the people it houses, rather than a retreat. While the *Screening Lounges* served to calm the attentions of the evacuated passengers, the Lower Mall serves as a distraction for all others who meander through the airport infrastructure. Hanging above this concourse, the masses of the Lounges lay as warnings or reminders of the events of the crisis that the Interstice is meant to respond to. Masked by the spectacle and consumer culture of the in-transit duty-free, the Lower Mall is a diversion for all. A veil over the events that have just transpired during the 21st century pandemic.

Fig 2.4 - 13 The Interstice.

Fig xvi Early sketch of the major parts of the Interstice.

PART 3:
EPILOGUE

Fig 3.0 - 1 Educational pamphlet used to mitigate the spread of ebola.

On August 8th, 2014, the World Health Organization declared that the Ebola hemorrhagic fever was an international emergency. With over 700 deaths occurring in the opening months of 2014 alone, the virus itself has had a mortality rate of about 50 percent (BBC, 2014). Although the majority of cases are located in remote areas of West Africa; Guinea, Sierra Leone, Liberia and Nigeria, -the world has reacted.

Throughout the month of August, the CDC maintained a "Level 3" alert for Guinea, Liberia and Sierra Leone, warning against any "nonessential" travel to the affected areas (BBC, 2014). Airlines such as British Airways and United Arab Emirates all but stopped flights to the afflicted areas after the one individual died in Jeddah following a visit to Sierra Leone (Fofana, 2014).

In Liberia, medical staff have abandoned their positions, hospitals have been shut down and even clinic directors and staff have tested positive for the disease (Fofana, 2014). Two days prior to the World Health Organizations statement, Liberian President Ellen Johnson-Sirleaf announced that for 90 days, her government would attempt to quarantine areas of the country that were most affected. Deploying "Operation White Shield", Johnson-Sirleaf stated that the measure would be required in order to ensure "the very survival of [the] state and for the protection of the lives of [the] people" (Fofana, 2014). The police force and government of Sierra Leone followed suit, deploying blockades to the Kenema and Kailahun districts that were currently most affected (BBC, 2014).

While this outbreak has not been classified as pandemic, there is an ambience of fear premised in the very real threat that the contagion may travel to other locales. From Africa to America. The sentiment in the opening narrative by the Passenger that "those health alerts were always for other places, more remote and far away..." is one that might now be substituted by the question; "what if *they*, bring it here?"

Fig 3.0 - 2 News coverage documenting the arrival of an infected doctor to Emory University Hospital in Atlanta for isolation and treatment.

Across the world in the United States, two Ebola victims have been flown in sterile isolation units to Emory University Hospital in Atlanta for medical treatment via a modified Gulfstream III jet (Rogoway, 2014). With no known cure or vaccine, the US Food and Drug Administration has allowed an untested, experimental drug to be administered to the two American victims as a form of compassionate use where no other treatment would avail (Butler, 2014). The World Health Organization too, has deemed that treatment of patients in a life or death situation with such a drug is an ethical pursuit.

Served this “cocktail of antibiotics” the threat of this ebola virus has made it possible for government organizations to approve the experimental and the untested in the name of preserving health.

This aura of fear, giving rise to an us, against them mentality, of taking whatever measures, at whatever cost to preserve and prevent the spread of a virus, is summarized best by film director and screenwriter, Scott Z. Burns when he states, **“There is no more effective contagion than fear”** (Burns, 2014).

Fig 3.0 - 3 Movie poster for Contagion (2011), written by Steve Z. Burns.

Is this new, 21st century threat fiction, or is it reality?

In the face of extreme threats, moral judgements have been made and remade. The experimental, becomes the commonplace. The extreme becomes the typical. The fictional, becomes the real.

Is the story of the 21st century pandemic then so different? Presented as a science-fiction, is it not too bizarre to suppose that something like the Interstice could one day be built? The question of whether something could be built is therefore an innately architectural one. Even now, one of the more radical parts of the Interstice -its pressurized Quarantine Rafts can easily be compared to the technology of the negative pressure Aeromedical Biological Containment System that carry the ebola victims to the United States by jet.

Fig 3.0 - 4 The Aeromedical Biological Containment System that transport contagious persons overseas.

Still, nothing has been built that can be likened on a one-to-one basis with the Interstice as depicted here. In order to imagine such a thing, the Interstice is thought of as being *like* certain things, and *unlike* others. In the same vein as Oswald Mathias Ungers use of analogue to describe urban conditions, the comparison of built and un-built architectural ideas, as well as non-architectural ones becomes the generative method to imagine this project.

Fig 3.0 - 5 Spreads from O.M. Ungers book *Morphologie*. Exploring architecture and the city through analogy.

The 21st Century Pandemic is therefore a 'foil' –a lens through which to examine the condition of health and its relationship to architecture. From Frederick Law Olmsted's 'Lungs of the City' to Jane Jacobs, 'Eyes on the Street', the language of architecture is itself an analogue for human health as much as it is a measure of the quality and well being of the built. Like a human body, the Interstice can be read as part of this dialogue as it stands between the sick (those of the outside), and the healthy (those of the inside). This reduction of the condition of health to either being of the inside or of the outside, speaks as much as it does to architecture as it does to the present state of the human world.

The Interstice engages this duality in two ways:

Firstly, it can be likened to Phillip Johnson's house in New Canaan (1949). Here, the Interstice is a complete, hermetically sealed environment as afforded by the use of mechanical systems and an artificial, curated landscape (Banham, 1984). Like Johnson's glazed curtain wall, the various envelopes of the Interstice are presented as a perfectly sealed system, like Le Corbusier's *mur neutralisant* or *neutralizing wall*. Afforded by technology and mechanical systems, the Interstice protects its occupants from the hostile qualities of the outside -weather, pollution, odour; where necessary, but permits elements such as light, when desired. **Inside, vs. Outside.**

Fig 3.0 - 6 Glass House in New Canaan, by Phillip Johnson, 1949.

On the other hand, the Interstice is like Diller and Scofidio's *Blur Pavilion* (2002), an environment made up of climates that are both of the inside and the outside. Rice University professor of English, Carey Wolfe (2006) discusses indeterminacy as the *Blur* pavilion's defining quality. She states, "To 'blur' is to make indistinct, to dim, to shroud, to cloud, to make vague, to obfuscate... featureless depthless, scaleless, spaceless, massless, surfaceless, and contextless" (n.p.). To blur is then to make neutral, rendering opposing qualities as the same. The passengers, on their way from the extremes of the outside to the inside, similarly experience all of the conditions in between, as the different areas of the Interstice expose the individuals to varying spatial conditions, climates, and hygienic settings. **Inside and Outside.**

Fig 3.0 - 7 *Blur Pavilion*, by Diller and Scofidio, 2002.

Occupying a public, in-transit zone, the Interstice blurs the boundaries between the inside and the outside, the good and the bad, the safe and the hazardous. Occupying Screening Lounges and Quarantine Rafts that are expressed as objects and sculptures themselves, the disease condition is made visible. Yet, these pragmatic functions are contained in flexible skins that varyingly reflect, absorb and distort visible light, shrouding their ultimate function. Literally blurring the boundary between those who are healthy and those who are unhealthy.

In these two manners, the Interstice aims to represent the many underpinnings and conclusions that the creation and articulation of a building consciously (and perhaps subconsciously) entails. Echoing Ivan Illich's reading of the *morality* of health, Jonathan Metzl (2010) states;

"Health is a term replete with value judgments, hierarchies and blind assumptions that speak as much about power and privilege as they do about well-being. Health is a desired state, but it is also a prescribed state and an ideological position."

To build, is to construct this desired state of health. To build, is to make a place healthy. This aim is as timeless as the history of disease in human civilization, and of which architecture is not exempt from. But to build, is to also be surrounded by questions of values, judgements and human fears that are often unclear. What is made healthy? Who is made healthy? Who will be allowed inside of the built?

This thesis project partakes in this discussion, and what better way to do so, than to imagine what humanity would build in the face of an impending pandemic disaster.

REFERENCE LIST

- Adams, A. (2008). *Medicine by design*. Minneapolis, MN: University of Minnesota Press.
- Addington, M. (2003), *Energy, body, building*. Harvard Design Magazine, 18
- Airbus. (2013). *A380 aircraft characteristics airport and maintenance planning*. Blagnac France: AIRBUS S.A.S. Customer Services Technical Data Support and Services.
- Airport Cooperative Research Program. (2013). *Infectious disease mitigation in airports and on aircraft No. 91*. Washington, D.C: Transportation Research Board.
- Airports Council International and International Civil Aviation Organization. (2009). *Airport preparedness guidelines for outbreaks of communicable disease*. Montreal, Quebec: Airports Council International and.
- Alden, E. (2012). *Immigration and border control*. the Cato Journal, 32(1), 107-124.
- Architectural monographs no 28: Peter cook: *Six conversations* (1993). In Bettella A., Thomas O., Hodges N. & Trentham L.(Eds.), (1st ed.). London: Academy Editions.
- Banham, R. (1965). *A home is not a house*. Art in America, 2, 70.
- Banham, R. (1984). *the architecture of the well-tempered environment* (2nd ed.). Chicago: University of Chicago Press.
- Banham, R. (1976). *Megastructure: Urban futures of the recent past*. New York, NY: Harper & Row Publishers Inc.
- Banham, R. (1980). *theory and design in the first machine age*. Cambridge Massachusetts: The MIT Press.
- Barry, J. M. (2010). *the next pandemic*. World Policy Journal, 27(2), 10-12.
- Bashford, A. (Ed.). (2006). *Medicine at the border: Disease, globalization and security, 1850 to the present*. New York: Palgrave Macmillan.
- Bashford, A. (2006). *Global biopolitics and the history of world health*. History of the Human Sciences, 19(1), 67-88.

- Berczeller, P. (2004, September 6). The man who lost his past. *The Guardian*. Retrieved September 6, 2014, from <http://www.theguardian.com/film/2004/sep/06/features.features11>
- BBC. (2014). Ebola 'an international emergency'. BBC News. Retrieved September 6, 2014, from <http://www.bbc.com/news/world-africa-28702356>
- Blankenship, E. G. (1974). *Airport: Architecture--urban integration--ecological problems*. London, UK: Pall Mall Press.
- Booker, K. (2005). *Journal of the National Medical Association*. May 2005; 97(5): 648–656.
- Brown, T. (2011). 'Vulnerability is universal': Considering the place of 'security' and 'vulnerability' within contemporary global health discourse. *Social Science & Medicine*, 72(3), 319-326.
- Burns, S. Z. (2014). 'Contagion' screenwriter Scott Z. Burns: Ebola Isn't the Pandemic. Fear Is.. Time. Retrieved September 6, 2014, from <http://time.com/3079518/ebola-outbreak-pandemic-fear/>
- Butler, D. (2014). Ebola drug trials set to begin amid crisis. *Nature.com*. Retrieved September 6, 2014, from <http://www.nature.com/news/ebola-drug-trials-set-to-begin-amid-crisis-1.15813>
- Centres for Disease Control and Prevention. (2013). Quarantine stations. Retrieved September 23, 2013, from www.cdc.gov/quarantine/QuarantineStations.html
- Chan, M. (2007). *World health report 2007, A safer future: Global public health security in the 21st century*. Geneva, Switzerland: WHO.
- Conrads, U. (1970). *Programs and manifestoes on 20th-century architecture*. Cambridge, Massachusetts: MIT Press.
- Cook, P. (1970). *Experimental architecture*. London, UK: Studio Vista.
- Cook, P., & Archigram (Group). (1999). *Archigram*. New York, NY: Princeton Architectural Press.
- Crompton, D. (Ed.). (2012). *A guide to archigram 1961-74 (3rd ed.)*. New York: Princeton Architectural Press.
- Delia, J. (2005). *New runways, terminal facilities and related facilities at washington dulles international airport: Record of decision*. Federal Aviation Administration.

- Department of Communicable Disease. (2005). WHO global influenza preparedness plan. Switzerland: World Health Organization.
- De Serres, G., Bourgault, A., Couillard, M., Charest, H., Boivin, G., Rouleau, I., et al. (2010). Contagious period for pandemic (H1N1) 2009. *Emerging Infectious Diseases*, 16(5), 783-788.
- Dessauce, M. (1999). In Dessauce M., Architectural League of New York. (Eds.), *the inflatable moment: Pneumatics and protest in '68*. New York, NY: Princeton Architectural Press.
- Dewey, C. (2013). Heres what happens to asylum-seekers who stay in airport limbo indefinitely. *Washington Post*. Retrieved September 6, 2014, from <http://www.washingtonpost.com/blogs/worldviews/wp/2013/06/26/heres-what-happens-to-asylum-seekers-who-stay-in-airport-limbo-indefinitely/>
- Dotinga, R. (2006). Sad Story of 'Boy in the Bubble'. *WIRED*. Retrieved September 6, 2014, from <http://archive.wired.com/entertainment/theweb/news/2006/04/70622>
- EA Engineering, Science, and Technology, Inc. (2002). Washington dulles international airport: Final environmental assessment tier 2 and related projects and FAA general conformity determination. Washington, D.C.: Metropolitan Washington Airports Authority.
- The expanding airport. Eames, C. and Eames, R. (Directors). (1958). [Video/DVD] the Office of Charles and Ray Eames.
- Edwards, B. (2005). *the modern airport terminal: New approaches to airport architecture*. London UK: E. & F.N. Spon.
- Ella, L. (2003, October 4, 2003). Withholding of amoy gardens report criticized. *South China Morning Post*,
- Fagan, G. G. (1999). *Bathing in public in the roman world*. Ann Arbor, Michigan: University of Michigan Press.
- Fofana, U., & MacDougall, C. (2014, August 7). Sierra Leone army blockades Ebola areas, Liberia declares emergency. *Reuters*. Retrieved September 6, 2014, from <http://www.reuters.com/article/2014/08/07/us-health-ebola-africa-idUSKBN0G70WW20140807>
- Fuller, B. (1965, September 26. 1965). the case for domed cities. *St. Louis Post-Dispatch*.

- Gaber, W., Goetsch, U., Diel, R., Doerr, H. W., & Gottschalk, R. (2009). Screening for infectious diseases at international airports: the frankfurt model. *Aviation, Space, and Environmental Medicine*, 80(7), 595-595.
- Gendall, J. (n.d.). "Reflecting Absence" Memorializes 9/11 with Voids that Give Shape to Memory. *Practicing Architecture*. AIA RSS. Retrieved September 6, 2014, from <http://www.aia.org/practicing/AIAB090845>
- Gensini, G. F., Yacoub, M. H., & Conti, A. A. (2004). the concept of quarantine in history: From plague to SARS. *Journal of Infection*, 49(4), 257-261.
- Gissen, D. (2009). *Subnature: Architecture's other environments : Atmospheres, matter, life* (1st ed.). New York: Princeton Architectural Press.
- Harvey, D. (2010). *the enigma of capital: And the crises of capitalism*. Oxford ; Toronto : Oxford University Press, 2010.
- Hawkins, B., Lechner, G., & Smith, P. (2005). *Historic airports: Proceedings of the international l'europe de l'air conferences on aviation architecture : Liverpool (1999) berlin (2000) paris (2001)*.
- Homeland Security Council (U.S.). (2005). *National strategy for pandemic influenza*.
- Illich, I. (1975). *Medical nemesis: the expropriation of health*. London UK: Marion Boyars, 1975.
- Johnson, P., & Wigley, M. (1988). *Deconstructivist architecture*. New York, NY: Museum of Modern Art.
- Johanis, D. (2007). How toronto pearson international airport applied lessons from SARS to develop a pandemic response plan. *Journal of Business Continuity & Emergency Planning*, 1(4), 356.
- Kamran Khan, Jun Wang, Jennifer Sears, Martin S Cetron, Rose Eckhardt, John S Brownstein, et al. (2013). Entry and exit screening of airline travellers during the A(H1N1) 2009 pandemic: A retrospective evaluation. *World Health Organization. Bulletin of the World Health Organization*, 91(5), 368.
- King, B., & Jatoi, I. (2005). the mobile army surgical hospital (MASH): A military and surgical legacy. *Journal of the National Medical Association*, 97(5), 648-656.

- Kohn, G. C. (Ed.). (2001). *Encyclopedia of plague and pestilence: From ancient times to the present* (Rev. ed.). New York: Facts on File.
- Koolhaas, R., & Mau, B. (1995). *the generic city*. In R. Koolhaas, B. Mau, J. Sigler & H. Werlemann (Eds.), *Small, medium, large, extra-large: Office for metropolitan architecture*, (2nd ed.). New York, N.Y.: Monacelli Press.
- Krueger (n.d.). *Hospital air curtain systems*. Richardson, TX.: Krueger Corporate Headquarters.
- Laugier, M. (1756). *An essay on the study and practice of architecture*. London.
- Le Corbusier. (1986). In Etchells F. (Ed.), *Towards a new architecture*. New York: Dover Publications.
- Libeskind, D. (1987). *City edge competition, berlin*. AA Files, 14, 28.
- Libeskind, D. (1990). *Between the lines: Extension to the berlin museum, with the jewish museum*. *Assemblage*, 12, 18.
- Lord, C., Schreier, C., Shapiro, A., Marquez, H., Hurr, D., & Michels, D. (1973). *Inflatocookbook: A pneu-age tech book* (2nd ed.). Sausalito, Calif.: Ant Farm, Inc.
- Manauh, G. (2009). *Biology at the border: An interview with alison bashford*. Retrieved July 07, 2013, from <http://bldgblog.blogspot.ca/2009/10/biology-at-border-interview-with-alison.html>
- Manauh, G. (2009). *Extraordinary engineering controls: An interview with jonathan richmond*. Retrieved July 10, 2013, from <http://bldgblog.blogspot.ca/2009/10/extraordinary-engineering-controls.html>
- Manauh, G. (2009). *Isolation or quarantine: An interview with dr. georges benjamin*. Retrieved July 10, 2013, from <http://bldgblog.blogspot.ca/2009/10/isolation-or-quarantine-interview-with.html>
- Manauh, G. (2009). *Landscapes of quarantine studio: Participant update*. Retrieved July 07, 2013, from <http://bldgblog.blogspot.ca/2009/09/landscapes-of-quarantine-studio.html>
- Manauh, G. (2009). *Until proven safe: An interview with krista maglen*. Retrieved July 07, 2013, from <http://bldgblog.blogspot.ca/2009/11/until-proven-safe-interview-with-krista.html>

- Manaugh, G., & Twilley, N. (2010, August 25, 2009). Landscapes of quarantine. Message posted to <http://bldgblog.blogspot.ca/2009/08/landscapes-of-quarantine-call-for.html>
- Metropolitan Washington Airports Authority (2013). Air traffic statistics. Washington DC.: Office of Finance.
- Metropolitan Washington Airports Authority (N.d.). Aerotrain - Dulles Airport Train System. Washington D.C.: Office Of Finance.
- Metzel, J. (2010). Against health: How health became the new morality. New York, NY: NYU Press.
- MIT Juanes Research Group. (2012). New model of disease contagion ranks U.S. airports in terms of their spreading influence. Retrieved October 23, 2013, from <http://web.mit.edu/newsoffice/2012/spread-of-disease-in-airports-0723.html>
- Nieuwenhuys, C. (1974). New babylon. Haags Gemeetenmuseum: the Hague.
- Office of Medical History. (1953). Office of Medical History. Retrieved September 6, 2014, from <http://history.amedd.army.mil/booksdocs/korea/KWUUnithistories/8076thMASH.html>
- Olmsted, F. L. (1871). Public parks and the enlargement of towns. *Journal of Social Science*, 3, 1.
- Pallasmaa, J. (2012). In Holl S., MacKieth P. (Eds.), *the eyes of the skin: Architecture and the senses* (3rd ed. ed.). Chichester, West Sussex, UK: Wiley.
- Pearman, H. (2004). *Airports: A century of architecture*. New York, NY: Harry N. Abrams.
- Price, C., & Littlewood, J. (1968). the fun palace. *the Drama Review: TDR*, 12(3), 127-134.
- Rogoway, T. (2014). This Amazing Jet Will Transport Ebola Victims From Africa To The U.S.. *foxtrotalpha*. Retrieved September 6, 2014, from <http://foxtrotalpha.jalopnik.com/this-amazing-jet-will-transport-ebola-victims-from-afri-1614420685>
- Ruskin, J. (1885). *The works of john ruskin*. New York, NY: J.B. Alden.
- Sadler, S. (1999). *the situationist city*. Cambridge, Mass. MIT Oress.
- Shannon, K. Smets, M. (2011). *the landscape of contemporary infrastructure*. 2010. rotterdam: NAI publishers.

- Simmel, G., & Wolff, K. H. (1964). *Sociology of Georg Simmel*. New York : Free Press.
- arrive. (2010). In Stevenson, A.(Ed.), *Oxford Dictionary of English*. : Oxford University Press.
Retrieved 4 Aug. 2014, from http://www.oxfordreference.com/view/10.1093/acref/9780199571123.001.0001/m_en_gb0041130.
- arrival. (2010). In Stevenson, A.(Ed.), *Oxford Dictionary of English*. : Oxford University Press. Retrieved 4 Aug. 2014, from http://www.oxfordreference.com/view/10.1093/acref/9780199571123.001.0001/m_en_gb0041120.
- departure. (2010). In Stevenson, A.(Ed.), *Oxford Dictionary of English*. : Oxford University Press. Retrieved 2 Aug. 2014, from http://www.oxfordreference.com/view/10.1093/acref/9780199571123.001.0001/m_en_gb0217200.
- filter. (2010). In Stevenson, A.(Ed.), *Oxford Dictionary of English*. : Oxford University Press. Retrieved 2 Aug. 2014, from http://www.oxfordreference.com/view/10.1093/acref/9780199571123.001.0001/m_en_gb0295780.
- interstice. (2010). In Stevenson, A.(Ed.), *Oxford Dictionary of English*. : Oxford University Press. Retrieved 27 Aug. 2014, from http://www.oxfordreference.com/view/10.1093/acref/9780199571123.001.0001/m_en_gb0417980.
- quarantine. (2010). In Stevenson, A.(Ed.), *Oxford Dictionary of English*. : Oxford University Press. Retrieved 3 Aug. 2014, from http://www.oxfordreference.com/view/10.1093/acref/9780199571123.001.0001/m_en_gb0678820.
- screening. (2010). In Stevenson, A.(Ed.), *Oxford Dictionary of English*. : Oxford University Press. Retrieved 2 Aug. 2014, from http://www.oxfordreference.com/view/10.1093/acref/9780199571123.001.0001/m_en_gb0743630.
- St John, R. K., King, A., de Jong, D., Bodie-Collins, M., Squires, S. G., & Tam, T. W. S. (2005). Border screening for SARS. *Emerging Infectious Diseases*, 11(1), 6-10.
- Taubenberger, J. K., & Morens, D. M. (2006). 1918 influenza: the mother of all pandemics. *Emerging Infectious Diseases*, 12(1), 15-22.
- Tift, W. S., & Dunne, T. (1971). *Ellis island*. New York : Norton.
- Tschumi, B. (1996). *Architecture and disjunction* (1st MIT Press pbk. ed. ed.). Cambridge, Mass.: MIT Press.

- Ungers, O. M. (2012). *Morphologie - city metaphors* (3rd ed.). Cologne, Germany: Verlag der Buchhandlung Walther König.
- Warren, P. (2006). the evolution of the sanatorium: the first half-century, 1854-1904. *Canadian Bulletin of Medical History = Bulletin Canadien d'Histoire De La Médecine*, 23(2), 457.
- Wolfe, C. (2006). Lose the building: Systems theory, architecture, and Diller+Scofidio's blur. *Postmodern Culture*, 16(3)
- Yew, E. (1980). Medical inspection of immigrants at ellis island, 1891-1924. *Bulletin of the New York Academy of Medicine*, 56(5), 488-510.
- Zardini, M., Borasi, G., Campbell, M., & Canadian Centre for Architecture. (2012). *Imperfect health: the medicalization of architecture*. Zürich: Lars Müller Publishers
- 50th dulles anniversary (2012). Washington DC: Metropolitan Washington Airports Authority.
- Zumthor, P. (2006). *Atmospheres: Architectural environments - surrounding objects* (5th ed.). Berlin: Birkhauser Architecture.