UNIVERSITEIT VAN PRETORIA
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MEMORY AND DECAY

THE AUGMENTED LANDSCAPE OF HATHERLEY LANDFILL

KEITH FREIMOND

To my parents.

Without your support, this would not have been possible.

In accordance with Regulation 4[e] of the General Regulations [G.57] for dissertations and theses, I declare that this thesis, which is hereby submitted for the degree Masters of Architecture [Professional] at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at this or any other tertiary institution. I further state that no part of my thesis has already been, or is currently being, submitted for any such degree, diploma or any other qualification.

I further declare that this thesis is substantially my own work. Where reference is made to the works of others, the extent to which that work has been used is indicated and fully acknowledged in the text and list of references.

Keith Freimond

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Abstact

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The dissertation looks at our technological environment that become so complex and independents that it is best perceived as a nature of its own. The short life cycle of technological devices leave them to be discarded when they become obsolete, introducing materials into an ecosystem that cannot process it.

Very few waste management strategies currently exist within the city of Tshwane and it is largely left to informal waste pickers or reclaimers who sort and gather this so-called waste and sell it third-party recycling companies. The dissertation thus aims to look at paradigm shift through which these obsolete objects are not seen as waste, but rather as anthropological relics than can become a commodity in our future society. A commodity that can be mined for its material, energy, nostalgic and narrative value and even the data it contains.

The site of investigation is Hatherley landfill where the landfill has become the livelihood of hundreds of informal workers who live on the landfill and in the neighbouring informal settlement, Phumolong. Methods used to keep the landfill contained and out of site, now make the daily movement of these workers a dangerous process and work conditions are hazardous. The intention is to change the nature of the current edge condition of the landfill and establish a porous quality connecting it to the neighbouring community with architecture mediating daily exchanges. The intention is thus to investigate architecture as a device, to augment such landscapes, for the mining of everyday objects as though they have become anthropological relics, and the re-processing of these commodities for re-consumption; brining together issues of man, nature and technology.

The verhandeling kyk na ons tegnologiese omgewing wat so kompleks en onafhangklik geraak het dat dit 'n natuur op sy eie beskou kan word. Die kort lewe van tegnologiese toestelle veroorsaak dat n oormaat daarvan weggegooi word wanneer dit uitgediende raak. Hierdie stel ons ecosisteem aan vreemde materiale voor, materiale wat ons ekosisteem nie kan prosesseer nie.

Baie min vullis bestuur strategië bestaan in die stad van Tshwane en meerendeels word die taak aan informele werkers op vullishope gelaat. Hierdie werkers sorteer en versamel hierdie sogenaamde afval en verkoop dit aan derde party herwinnings maatskapye.
Die verhandeling ondersoek dus 'n paradigma verskuiwing waar hierde uitgediende objekte nie as afval gesien word nie, maar eerder as antropologiese oorblyfsels wat 'n kommoditeit in ons toekomstige samelewing kan wees. n Kommoditeit wat bemyn kan word vir sy material, energie, nostalgie en narratiewe waarde en selfs vir die data wat dit bevat.

Hatherley vullishoop word ondersoek in hierdie verhadeling aangesien die vullishoop die lewensbestaans van honderde informele werkers wat in die naburige infromele nedersetting, Phomolong woon. Metodes wat gebuik is om die vullishoop af te sonder , maak die beweging van die werkers 'n moeilik en gevaarlike prosess, terwyl werksomstandighede onvoldoende is. Die voorneme is dus om die natuur van die rand te verander en n poreuse gehalte te skep en dit verbind aan die naburige samelewing. The voorneme is dus om argitektuure te ondersoek as a toestel wat landskappe van afval aanvul, om elkedaagse objekte te bemyn asof dit 'n antropologiese oorblyfsels is, en die her-verwerking van hierdie kommoditeite vir herverbruiking en so kwessies van die mens , die natuur en tegnologie saam te bring.

Memory and decay:
an introduction

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Background

The dissertation looks at our technological environment that has become so complex and independent that it is best perceived as a nature of its own. Increasingly, technological solutions are being applied to the many serious challenges facing the world and is used as a tool to boost economy and service delivery. This is happening on a ever increasing and precise scale. Nature and culture now seem to merge as no landscape on earth hasn't been affected by man's influence to some extent. Our cultural environment is changing our natural environment faster than our perceptions of nature is changing.

The dissertation aims to challenge current perceptions about nature, that affect the way we deal with issues of sustainability and problems such as waste. Current attempts to manage and recycle this so-called waste, have been left to a largely privatized industry which rely on informal waste-pickers or reclaimers who gather and sort waste on landfills. The collected waste is sold to third-party companies who buy the waste from the reclaimers and pay a rate per kilogram. These reclaimers refer to themselves as 'Bagariesi'; and is understood to mean "someone who is looking for something valuable" (Samson, 2010; p2). We however neglect to recognise cultural and environmental potential of these spaces of waste.

These reclaimers, however, have often been kicked off and prevented from entering landfills and are often exploited by companies who run and work on the landfills. Only in recent years, with the adoption of the new waste act, in 2009, has this informal industry been recognised (Samson, 2010; p2). This new legislation, however, doesn't yet resolve relations with the waste-pickers. Recent attempts by municipalities to work with the reclaimers, such as providing a fund for projects that attempt to uplift and allow the reclaimers to support themselves, have been mostly unsuccessful largely due to a lack of infrastructure to support the emerging industry.

The dissertation thus aims to look at paradigm shift through which these obsolete objects are not seen as waste, but rather anthropological relics than have become a commodity in our future society. A commodity that can be mined for its material, energy, narrative and nostalgic value and even the data it contains. The dissertation also aims to challenge the way we perceive nature, which in today's society has become a subset of culture; exploring how technology might merge and even trade places with nature, bringing together issues of man, nature and technology. The project thus aims to investigate technologies and processes for how these commodities can be extracted and processed for re-consumption, through sustainable and resilient practices as well augment current waste-management practices done by the informal reclaimers.

The site for this investigation is Hatherley landfill, situated in Pretoria, on the periphery of the Mamelodi township. Originally the landfill was meant to be far removed from human settlements; with the ever expanding Mamelodi we now see a large informal settlement, Phumolong, to the north of Hatherley landfill; established in the early 2000's. Today we see hundreds of people crossing the landfill and working informally on the landfill, the majority inhabitants of Phumolong and neighbouring developments. For many inhabitant of Phumolong this landfill has become a valuable resource, and the source of their livelihood; enabling them to support themselves and earn a wage. As one of the Pretoria's oldest and largest landfill sites, this man made landscape will be the basis for investigating for how an architectural intervention might augment such landscapes and change the way we view such sites and their potential in environmental and cultural terms.

Problem statement:

The main problem revolves around how landfills are originally considered as places where the life cycle of products ends, meaning that resources and materials, which before where valuables, become useless and are disposed forever. This, however, needs to be reconsidered and as current practice on landfills indicate that this is no longer the

reality. Man's relationship to these spaces of waste needs to be reconsidered as these can become valuable resources within communities. Issues such as scarring of landscape and visual discomfort, air and water pollution due to the presence of toxic substances, changes in soil fertility, loss of biodiversity, spreading of pathogenic agents and a host of vermin such as insect and rats are other issues regarding landfill sites. Hatherley landfill currently receives 120 444 tons of waste per year and is set to be under capacity for the next 60 years. With the growing pressure on natural resources current waste-management needs to be reconsidered.

Current waste-management practices are unsustainable due to a lack of infrastructure to support these functions. These practices are often dangerous and hazardous to individuals and are inefficient and also don't support associated programmes to enable entrepreneurship and empower communities.

On an urban scale, current regulations of landfills sites call for them to be removed and enclosed off from communities, however Hatherley landfill now lies in close proximity to the informal settlement of Phumolong. Methods use to enclose waste off from the neighbouring developments, now make the daily movement of hundreds of people who cross and work on the site a challenging and dangerous task.

Hypothesis:

By realizing the possible material and cultural value of landfills, extracting the value could improve the livelihood of neighbouring communities. By establishing a sustainable infrastructure on site, it is possible to support waste-picking activities on site and enable waste-pickers to support themselves. By reconsidering current practices on landfills it is possible to improve conditions on site using architecture as to support and mediate exchanges between the landfill and neighbouring community. By using architecture and technology as a way of augmenting natural processes on site it can bring greater meaning to the landscape.

Objectives:

An investigation is thus under taken as to how such landscapes of waste can rather be seen for the material and cultural value, embodied energy and even the data it contains and how these can be extracted and reprocessed. This is to be done through sustainable and resilient means as a way to empower communities and adds value to the environment; supporting and enhancing existing networks of informal workers and augmenting current practices on site.

The intention is thus to investigate architecture as a device, to augment such landscapes, for the mining of everyday objects as though they have become anthropological relics. The dissertation will investigate processes of extracting commodities not only physical but also in cultural terms, and the reprocessing of these commodities for (re)consumption, through unprecedented programs and speculative technological systems, as well as enhance current practices on site and provide safe and comfortable spaces for this to occur. The intention is to explore new systems, processes and technologies for the extractions of commodities within waste sites with architecture as a bridge to re-establish man's relationship with nature and restore a sense of place to the scarred landscape; establishing a comfortable and safe environment for the informal workers supporting current practices on site.

On an urban scale how these spaces of waste can be seen as commodities in the construct of our cities both in terms of environmental and cultural constructs and how Hatherley landfill could be used to support the informal settlement of Phumolong and surrounding developments. The intention is thus to investigate the re-purposing of such sites as a public facilities and how they can act as a sustainable infrastructure within our cities. The aims is to challenge the policies and guidelines in which these sites are developed. The intention is to change the nature of the current edge conditions of the landfill and establish a porous quality connecting it to the neighbouring community with architecture mediating daily exchanges.

Program and client:

The intention is not to simply design a recycling facility but to rather explore new systems, processes and technologies for the mining and extraction of commodities within waste sites with architecture supporting these functions. The programme does not envisage an end result for the landfill but rather a series of programmatic interventions that continually evolve and changes the landscape over time. The programme interacts with the sites' subsurface, surface and edge and attempts to mediate and enhance interaction between the urban actors and the landscape that already exist on site. Not only the material value of the relics is to be mined but will also investigate the embodied energy, nostalgic value and even the data it contains. The dissertation will look at the re-possessing of these commodities and possibilities for its re-consumption through didactic, practical, and recreational experiences.

Research methodology:

A literature study will be used to investigate relevant theories, history, programmatic requirements and technologies. The intention is to draw on extant theory to frame new theory regarding the social issues at stake. Relevant precedents and case studies with similar programmatic components will be investigated and where there are no relevant studies, it will be investigated through experimentations. In- depth site analysis will be conducted using photographic, video, analytical drawings and interviews, to determine the scope of the issue and will also form part of the qualitative and quantitative study of the site. These research methods will be used inform the architectural response which is to be developed and explored through sketching, planning, 3d computer modeling and physical models.

The project will investigate the use of archaeological methods of extracting value from landscape. The process is contained into three parts. Part 1 - surveying, part 2 - Excavating and part 3 - communication of findings.

Research questions:

- How can architecture be used as a device to augment man-made landscapes, to re-appropriate and extract commodities from them?

- How can technology and design be used to change our perceptions of nature and natural systems?

- How can technology be used to form a symbiotic relationship with nature and even trade places?

- How can architecture act as a sustainable infrastructure to re-purpose landfill sites as public facilities?

- How can infrastructure enable communities and enhance current networks?

Part

1

Surveying
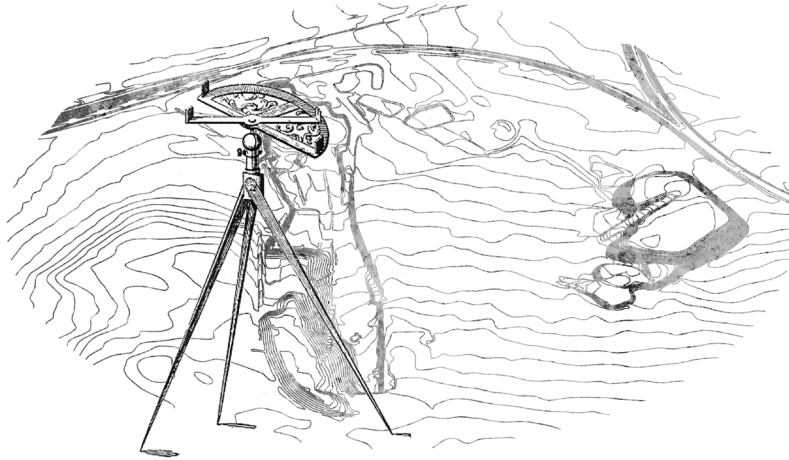
The survey is a type of field research by which archaeologists search for archaeological sites and collect information about the location, distribution and organization of past human cultures across a large area.

[1.1] Collage
By author(2015)

SURVEYING PARADIGMS

Humans have been impacting their environment from the start of our history. From stone tools to domestic fires and agriculture, man has shaped his environment to suit humanity's needs and to yield the most out of his natural environment. Today it is happening on an ever increasing as well as precise scale; scientific and technological solutions are being applied to most of the world's political, economic and environmental problems from genetic mutation, engineered microbes to creating digital networks. Rapid changes in technology and media have been offered as solutions to many problems and have become catalysts in shaping our cities.

The eventual obsolescence of these objects, however, have resulted in a fast-growing surplus of electronic waste around the globe (Andreotti 2015). Our reliance on fossil fuels has caused unintended side effects such a climate change and our planet is still trying to cope with the effects of industrialisation that has resulted in oceans full of plastic and landfills full of waste. We are continually changing nature both intentionally and unintentionally and our environments are forced to adapt.

[1.2]
Obsolete technology as art.
(Andreotti, 2015, edited by author)

[1.3]
Obsolete technology in landfills.
(van Mensvoort, 2009, edited by author)
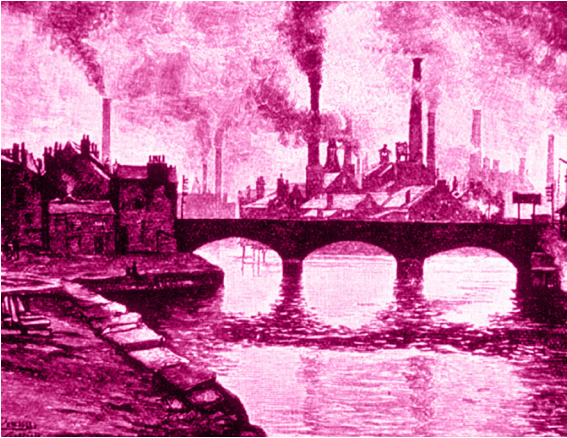
**[1.4]
Industrial revolution.**

(Fitzgerald, n.d, edited by author)

**[1.5]
Atomic cloud after Nagasaki atomic bombing.**

(Atomic archive, 1945, edited by au-

We have changed our environments to the scale that many argue that our current geological epoch should be designated as the Anthropocene; a chronological term that serves to show that humans have had a significant impact on earth ecosystems, on a scale comparable to major geological events that have shape previous epochs (Kolbert 2010). Events that include "meteorite strikes, extraordinary volcanic outbursts, colliding continents, and disappearing oceans" (Zalasiewicz et al. 2010:2228). All these events on the largest scale that seemingly even the world's largest number of people aren't able to match.

Several measurable scientific markers, however, have indicated otherwise, suggesting that "Humanity and its instrumentalities are thus the most potent and influential geological force (Sterling 2010)" even on a geological time scale that spans across billions of years, meaning man is making irreversible changes to our landscape. These markers

Images above used as evidence of man's influence on our environment. Comparable to major geological events that have shaped previous epochs.
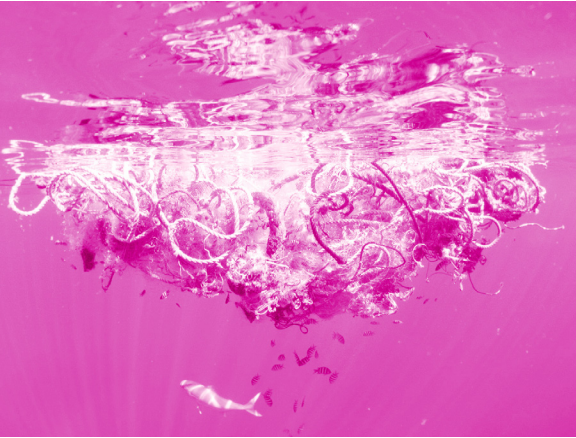
[1.6]
The great pacific garbage patch.

(Guerrisi, 2012, edited by author)

[1.7]
Urbanisation as a result of the great acceleration.

(Author unkown ,2008, edited by author)

include major changes the world has undergone, such as the industrial revolution in the early 1800's, resulting in the mass production of products leading to higher levels of carbon dioxide in the atmosphere and ultimately large quantities of waste entering the earth's ecosystem, leaving a distinct geological record (Kolbert 2010); the atomic age, from the first nuclear tests in the 1940's leaving behind a permanent record in the form of radioactive isotopes (Kolbert 2010); the 1940's also coinciding with the start of a mass production of plastics, introducing large amounts foreign material into the earth ecosystem (van Mensvoort 2011); as well as what is referred to as the 'great acceleration', a rapid increase visible in population growth around the world ''increasing by 2% per year" and "unprecedented changes in agriculture and food production", coinciding with the end of the atomic age in the 1960's (Sullivan 2015).

This idea is, however, not new. As dr. Koert van Mensvoort (2014), artist, philosopher and scientist, known for his work on the philosophical concept of Next Nature, states:

"All species transform their surroundings. The dizzying complexity of landscapes on Earth is not just a happy accident of geology and climate, but the result of billions of years of organisms grazing, excavating, defecating, and decomposing. Nor is it unusual that certain lucky species are able to out compete and eventually entirely displace other species."

Many things are still unclear about this new suggested epoch, but what is clear is that this epoch is still in its infancy and the world is still coming to grips with what it means for the planet, the environment and the human race (Kolbert 2010). It is thus essential that we reconsider how we deal with issues facing the world, as the world and nature is changing faster than our perception of nature is.

Our perception of nature hasn't changed, despite major changes society has seen in the world. We still view nature as a static given; scerene, balances, harmonic and picturesque to be viewed from afar as
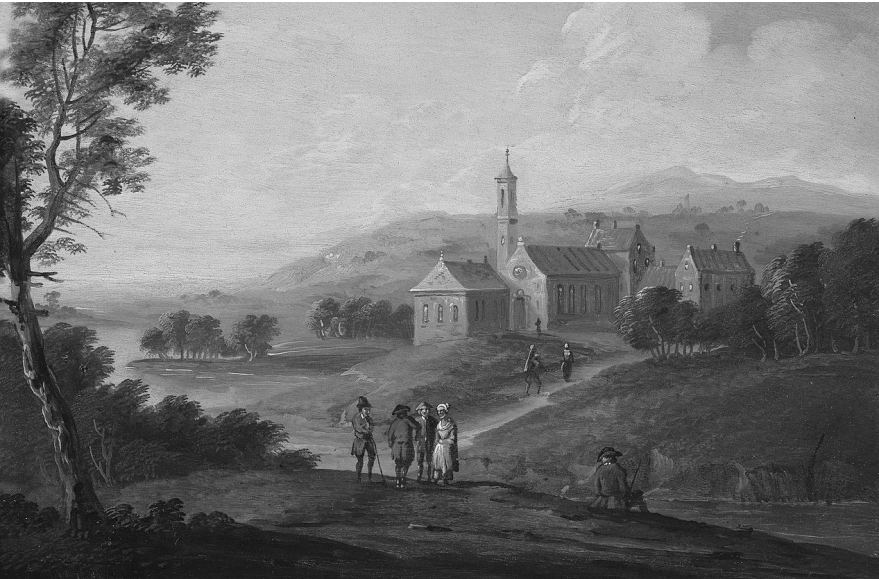
[1.8]
Flusslandschaft mit einem Dorf und Wanderern. Typical 18th century lanscape painting.

(Jan Pieter van Bredael, 1735)

landscape paintings form the 18th century depicting the idyllic rural landscape would suggest. This perception is naïve and needs to be reconsidered as even the rural landscape has been transformed to our cultural ideals; rural landscapes are continuously marked by mechanised strategies and require irrigation in order to be cultivated. The rural landscape is not wilderness, but an ordered landscape: nature has taken an artificial patina and our perception of nature is simply a picturesque ideal (Smout et al. 2007:6).

Representation of landscapes how it has developed over time, is important in understanding our environment and reveals a deeper understanding of nature. South African artists such as Cecil Skotnes and William Kentridge have explored landscape representation through their works "with the purpose of communicating its social and historical dimensions" (Godby 2015, p.41). Kentridge realised that historical events leave little trace on the landscape thus developed new techniques to depict the social forms within landscapes. Kentridge used collage techniques depicting the landscape as a series of fragments, displaying that landscapes are formed by a number of influences (Godby 2015:38). In his work, landscapes were often depicted as animations, fluid and yielding, continually absorbing new features and memories.
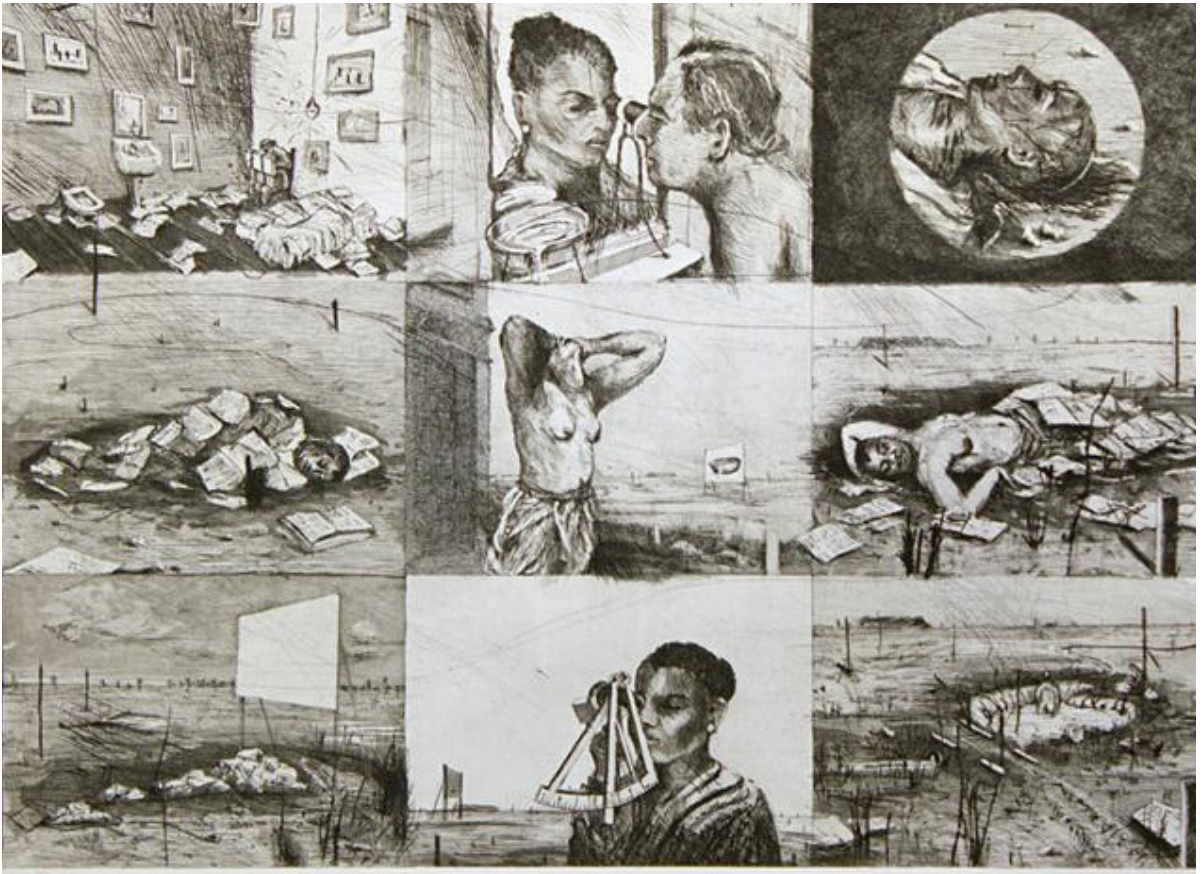
[1.9]
The invention of Africa 1,
mixed media.
(William Kentridge, 2012)

[1.10]
Drawing for the film
Other Faces.

(William Kentridge
2011)

[1.11]
Still from the animation, Felix in Exile.
(William Kentridge 1994)

Skotnes on the other hand realizes the landscape's power for recalling memories, and juxtaposed abstracted landscapes with figures, and often uses the landscape to tell narratives, displaying the landscape as a stage for humans. Skotnes, not representing the landscape itself but rather an interpretation of landscape, in an attempt to reveal intangible components of the landscape and its cultural dimensions (Godby 2015:40)

Artist such as Kentridge and Skotnes have often pushed representation of landscape to reveal more complex truths, showing that landscapes have cultural dimensions as well and are not only part of our natural word. This view of the landscape is not shared among the ma-

[1.12]
The Gunner Makes the Land.
The White Monday Disaster series.
**Print.**

(Cecil Skotnes, 1975)

[1.13]
His Second Brave Pair.
The White Monday Disaster series.
Print.

(Cecil Skotnes, 1975)

jority of society as we can see with the availability of kitsch art often sold along the road, displaying featureless landscapes representing the landscape as accessible if not familiar. Similarly Pierneef, one of South Africa's most popular artists, displayed a similar view towards landscapes, representing the landscape as empty, with repeating forms (Godby 2015, p.39).

Rarely is landscape used to refer solely to pastoral scenery or garden planting, for instance— images with which it is most conventionally associated. Instead, its usage is diverse and rich, embracing urbanism, infrastructure, strategic planning, and speculative ideas alongside the more familiar themes of nature and environment (Corner 2015).
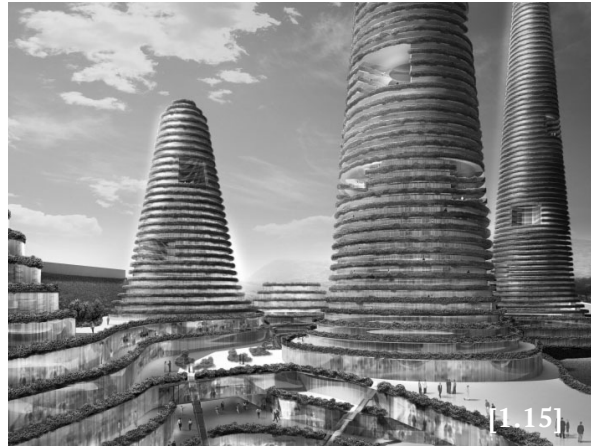
In our architectural environment there seems to be a renewed appreciation for landscape and the pastoral ideal, where architects seek to rather engage with the landscape than the urban condition. The results, often, speculative projects with whole cities with undulating form, mimicking the rural landscape, in an attempt to combine the urban and the rural (Castle 2013:6) a new expression of utopianism. Similarly, in many recent urban projects, the scale of landscape architecture has increased to work on an urban scale. Landscape theories such as landscape urbanism, led by architects James Corner and Charles Waldheim has gained popularity. The aim of landscape urbanism, to build our cities around natural systems by attempting to bring ecology into urbanism and where the landscape is reduced to its processes and exploited to act as infrastructure within our cities (Balmori 2014:78 - 79). Very few built examples, however, exist, greatly due to society's naive interpretation of landscape, with projects such as these, falling outside the general frame of understanding.

What this new appreciation of landscapes and its processes does show is that we can no longer accept the standard notions of sustainability. Society's approach to sustainability is to create environmentally responsive buildings and mostly aimed at reducing waste and using fewer resources. Although an important consideration, this narrow minded interpretation will not solve the issues plaguing our world,

[1.14] [1.15] MVRDV Gwanggyo Power Center. Mixed use 77,000 inhabitants development near Seoul.

(Enhuber, 2011)

[1.16]

[1.17]

[1.16] [1.17]
The highline. Field Operations. One of the few built examples of landscape urbanism

(Unknown author, 2009)

but will only postpone an inevitable outcome until buildings are able to add positively to the environment. Our attempts at sustainability view architecture and nature as opposing forces, where the creation of one leads to the destruction of the other, yet a mutually beneficial relationship between the two is obtainable.

In our attempts at sustainability, a reduction in waste is one of the main goals. Waste in its original meaning, referred to an environment no longer suitable to human habitation (Till, 2006. p67). But we must not necessarily see waste's relationship to nature as anti-ethical, as in ecosystems waste takes on a different meaning. As Capra (1996:101), leader of ecosystemic thinking, states: "all living organisms take in energy and matter and discard waste products was the most general characteristic of life he could identify". This occurs on all scales from a cellular level to up to a larger systemic level, "where all life uses the atmosphere and oceans as fluid media for raw materials and waste products and there is a continual movement of matter through living organisms and systems" (Capra 1996:18). In ecosystems our interpretation of waste thus does not exist; what is waste for one species is food for another, so that waste is continually cycled through the ecosystem, and as a whole generally remains without waste (Capra 1996:77).

Architects such as Bjark Ingels have started to deal with issues of ecosystemic thinking by proposing what he calls a hedonistic sustainability, recognising our consumerist lifestyles and accepting waste as an inevitable product; attempting to transform the whole sustainability debate. Hedonistic sustainability looks at building as ecosystems where waste and resources can flow between the built environment, without needing to compromise on quality of life. (Ingles 2010) This idea builds on ecosystemic thinking "seeing the world as an integrated whole rather than a dissociated collection of parts" (Capra 1996:6). In its application, Ingels' projects however have been met with mixed results, often failing to properly integrate his buildings on an urban level or integrating with the landscape. What's missing from Ingels' vision is the landscape; his projects, often expressive and playful; but ultimately becomes islands in the landscape, the opposite of what is set out to be achieved. Ingels' projects rely on a connectedness of functions within a buildings, often proposing two very different functions within the same buildings, but neglect interconnectedness into the landscape ultimately becoming a superficial ecology. In contrast Capra calls for a deep ecology which "recognises the fundamental interdependence of all phenomena and the fact that, as individuals and societies, we are all embedded in (and ultimately dependent on) the cyclical processes of nature" (Capra 1996: 6).

The problem with the majority of contemporary, sustainable projects is often a superficial understanding of nature. Nature is often mimicked copying its form without understanding the processes at a deep level, ultimately still working within an industrial paradigm only looking at the end product of sophisticated systems. (Armstrong 2013) Society tends to use technological solutions as a tool to solve many of the world's problems. A healthy relationship between technology and nature that is required. We still see architecture as a machine requiring external energy to be useful. (Armstrong 2013) Nature on the other hand deals with processes that are never static, or the systems are no longer living. As Armstrong argues (2013), the aim should be to develop more lifelike technologies that may be beneficial to our environments.

[1.18] Right **Orestad development. Largely considered a failure.**

(L. Olsson, J. Loerakker, 2013)

[1.19]
Two plots developed by BIG Architects.

(L. Olsson, J. Loerak-ker, 2013)

Van Mensvoort (2013) proposes the idea of a "next nature", a philosophical idea that seeks to shift our understanding of nature as we no longer are able to tell where nature ends and culture starts. Van Mensvoort (2013) argues that where technology and nature, traditionally seen as opposed, now appear to merge or even trade places. Next Nature is not the cultural ideal of an undisturbed picturesque landscape but suggest a nature that is continually evolving as nature is changing faster than our perceptions of nature is changing (Sterling 2010). Next Nature argues that nature is not simply a static entity that can only be "discovered, dissected and destroyed by human agency'' (Sterling 2010), but that nature actually evolves through human technological intervention. Next nature asks that we must re-evaluate our roll in how we shape nature as van Mensvoort (2013) states:

"We must not see ourselves as the anti-natural species that merely threatens and destroys nature, but we should rather see ourselves as catalysts of evolution. With our urge to design our environment, we must design a Next nature that changes along with us."

[1.20]
Conceptual image of how nature and culture have merged.
(Brendan Cormier, 2013)

[1.21]
**Cultural imagery mimicking nature has become more recognisable than its natural counterparts.**

(Koert van Mensvoort,2009)

Next nature attempts a shift our understanding of nature and asks us much deeper questions about our humanity and how we're going to shape it as we experience a paradigm shift in the way we live (Armstrong 2014). Interventions into nature should thus not be seen as anti-ethical to nature but a necessary part of its evolution. Similarly our technological environment should learn from nature, as it has done in the past, as it is just as complex and unpredictable as nature. The natural and the technological can thus fuse into a next nature as it already has begun to do.

"What we have to learn from nature is to understand its technology. We need to understand those processes through which these outputs are produced and how the outcomes are entangled to form more ecological forms of technology. These systems won't be machines but will be a different kind of technological platform, with completely different outcomes and impacts on the environment to those we associate with the industrial age. Potentially buildings can form systems that help us transform our waste into products that may replenish, not deplete our environment" (Armstrong 2014).

The augmented landscape:

In designing a next nature we must not only consider architecture, but also its relationship to technology, nature and the landscape. What is thus proposed is an augmented landscape; technological and strategies fused into the body of architecture, technologies that "are essentially environmental as they employ air, water, sun, and earth to augment the performance of the building as well as the landscape" (Smout et al. 2007:9). An augmented landscape aims to understand natural processes on site and aims to augment them, using technological strategies to merge with and enhance environmental processes. Technology that is "embedded, contextual and visual" (Smout et al. 2007:9).

The architecture of the augmented landscapes aims to mediate, suggesting a sensitivity to the environment. The augmented landscape aims to engage and mediate various geographies, from memories and experiences to artifacts and technologies; interventions that play with both extremes, in order to resonate most in the contemporary world (Smout et al. 2007:9).

Architects Mark Smout and Laura Allen often explore the idea of the augmented landscape through speculative projects. In the Grand Egyptian Museum, an extensive project for the relocation of the Museum of Egyptian Culture on an exposed sand dune landscape as the site (Smout et al. 2007:9). The landscape is seen as a deep surface, which the architecture inhabits; the skin and roof merging with the strata of the landscape. Three subterranean galleries cut into the landscape, connected by chasms for ventilation and circulation. The landscape exploits environmental processes in order combat the harsh climate. Roofs are flooded with water and architecture takes advantage of the passage of sun, with the chasms clad in glazed tiles reflecting light down into the deep galleries (Smout et al. 2007:10). The project merges with the landscape where the natural and the artificial both inhabit the deep surface. The landscape here is restless, constantly active.
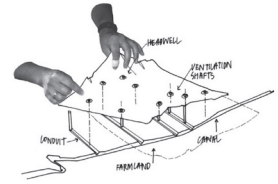
[1.22]
Museum of Egyptian Culture: Conceptual image of sunken chambers.
(Smout & Allen, 2002)
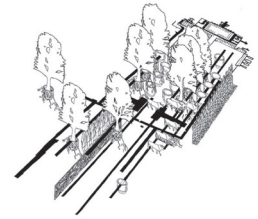
[1.23]
Museum of Egyptian Culture: Diagrammatic arrangement of structures.

(Smout & Allen, 2002)

[1.24]
Museum of Egyptian Culture: The environmental performance of the landscape.

(Smout & Allen, 2002)

A: Chasms (external public areas) chronographically regulate light and shade

B: Tiled linings to chasm walls. Faceted tiles have a partial faience face to reflect the midday sun. Unfinished matt facets absorb and diffuse solar energy at dawn and dusk.

C: Excavated "deep surface" gallery spaces and circulation

D: Water-chilled draught corridors and service tunnels

E: The vegetal chronograph, a diurnally and seasonally changing landscape of blossoming vernacular planting. Varieties of water lilies bloom throughout the day, the blue from morning to midday and the white from late afternoon to the following day.

F: Final stages of the far-reaching *qanat* network. Networks of this kind bring life to an otherwise uninhabitable desert.

G: Cisterns

H: Irrigated "flood plain" gardens

I: Sunken and shaded workshop courtyards pierce and puncture the augmented landscape.

J: Evaporative cooling from irrigated landscape to museum spaces below (the Ancient Egyptians hung wet mats outside as cooling devices).

K: Mass temperature is controlled by constantly regulating the flow of water in the irrigated landscape and therefore the overflow of water down the chasm faces and floors.

L: Profiled roof surfaces, with "wet blankets" to the internal faces, provide ventilation of thermally modified air to the main body of the museum.

M: Horizon

N: A frayed edge exists between the natural dunescape and the augmented landscape.

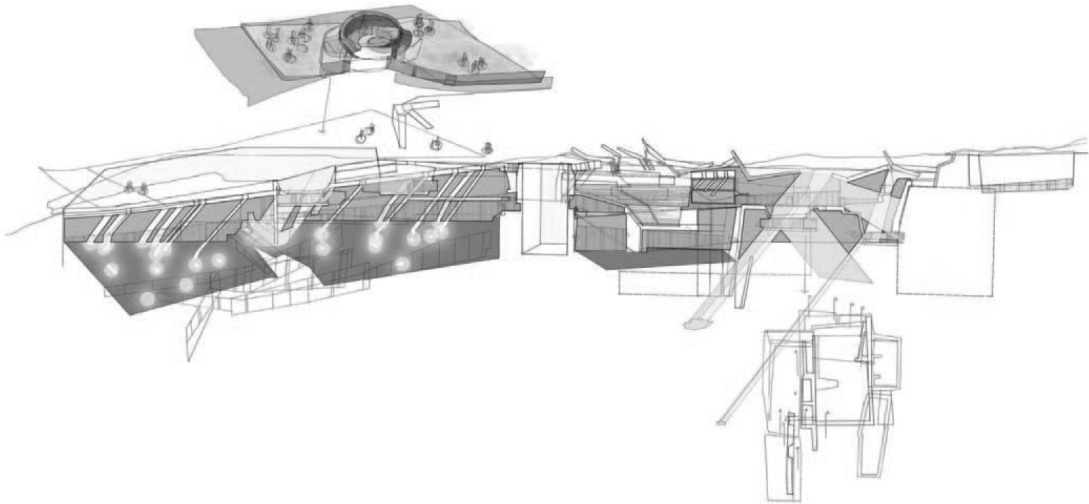O: Prevailing wind draws out the museum's stale air through profiled surfaces.

P: Surface perforations
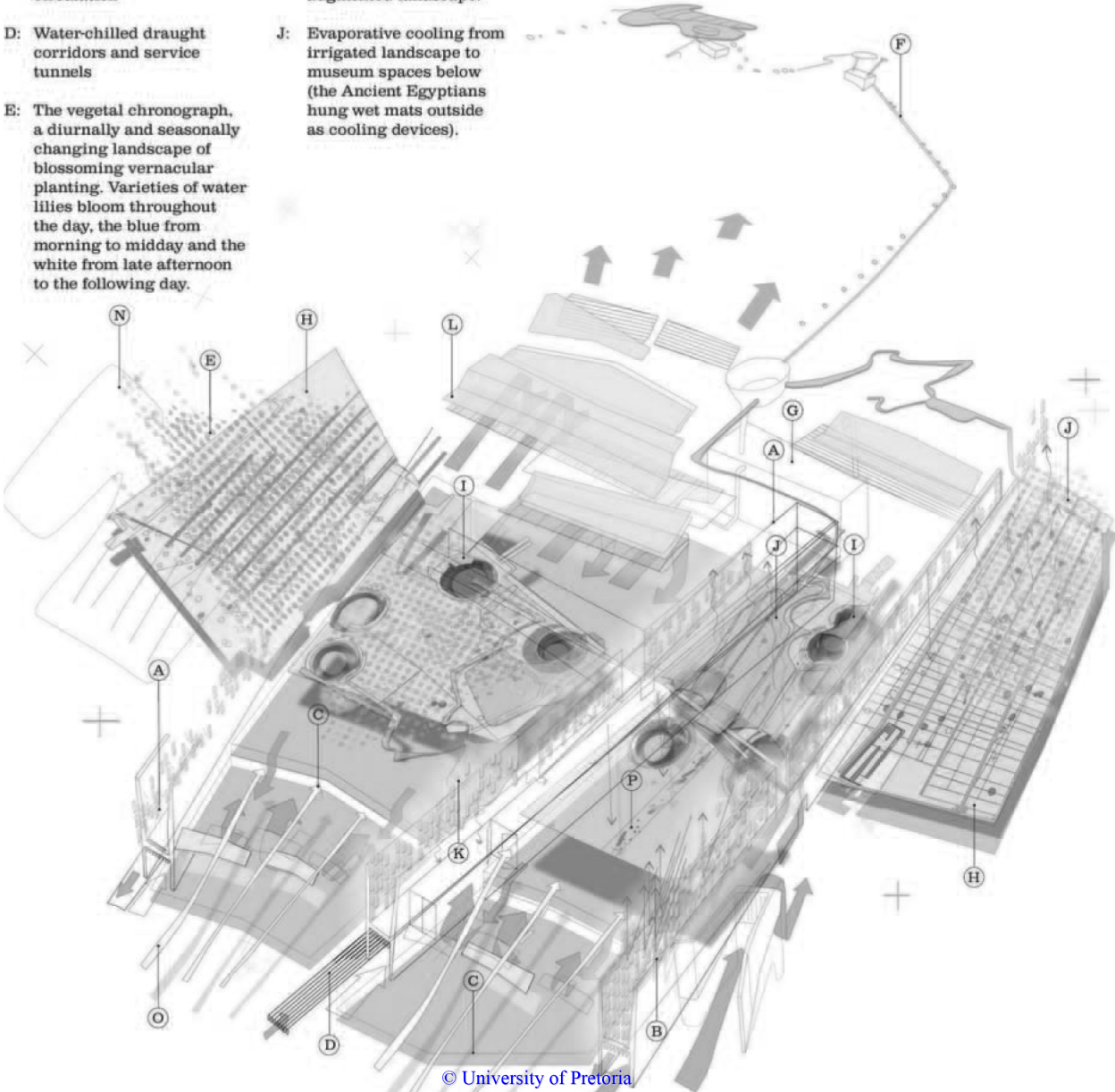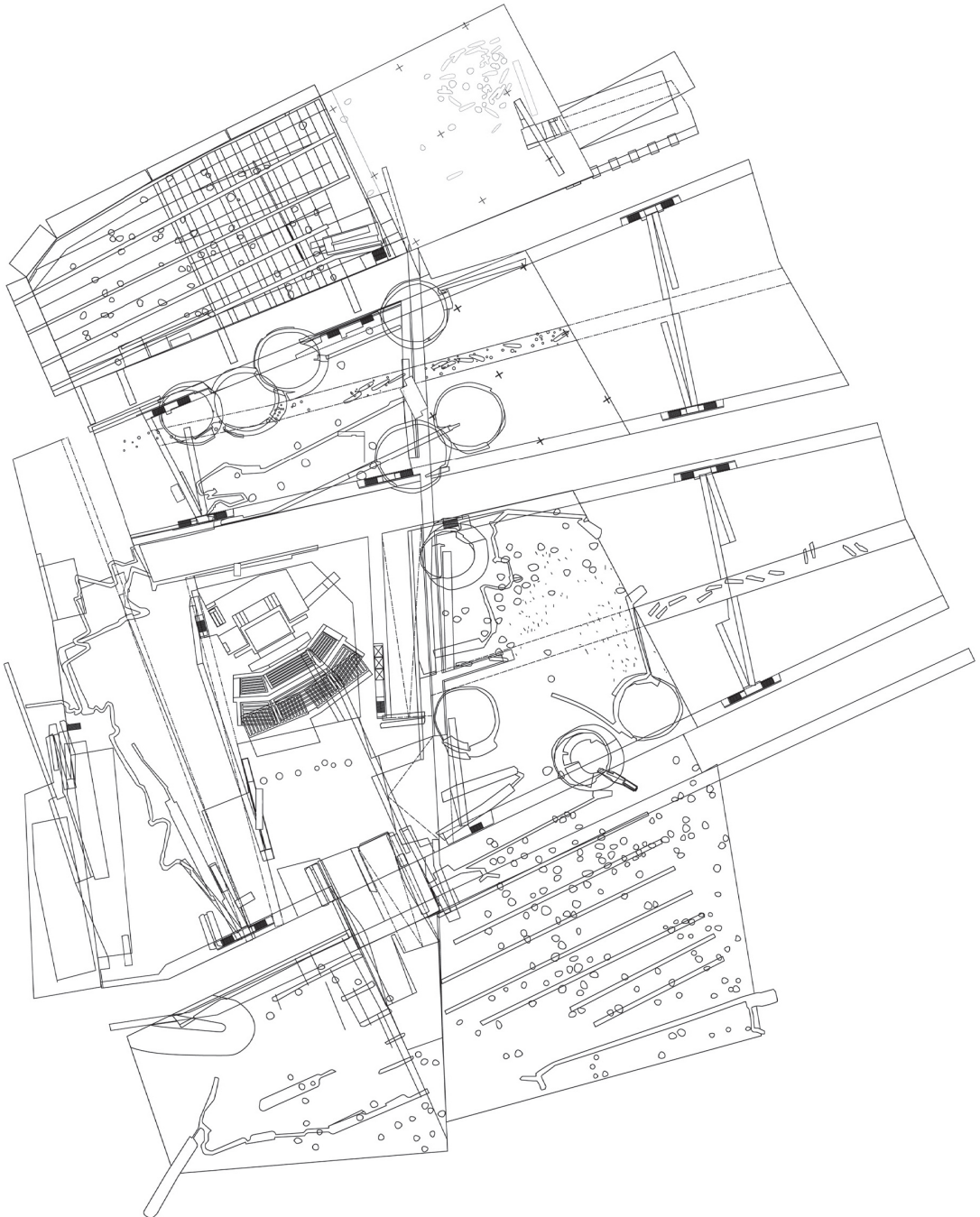
[1.25]
Museum of Egyptian Culture: Section showing the architecture cutting into the deep surface.

(Smout & Allen, 2002)

[1.26] Left
Museum of Egyptian Culture: Plan

(Smout & Allen, 2002)

The augmented landscape successfully fuses issues of man, nature and technology. The architecture of the augmented landscape exploits the landscape as a cultural object to be transformed by man, but celebrates its natural processes to enhance its performance. The augmented landscape exploits resources on site, in order to positively impact its environment.

Surveying new paradigms

In creating architecture that positively adds to its environment it is essential we understand the ecological processes of the landscape. Waste is a very important part of an ecological system. In our modern society, yet we seem to do our best to avoid its issues and its potential. Built into our cities we have systems that move discarded waste away from our city centres, yet rarely consider its final destination in an attempt to minimize the area it impacts. Rubbish is, however, always with us and corrupts our sense of propriety and thus we do everything to hide it and get rid of it. As Till (2009) states: "It pervades the air, swells in water, dissolves, rots, disintegrates, changes into smoke, into soot. Engulfing the world."

Our society does its best to avoid issues surrounding waste and our cultural perceptions of waste prevent us from dealing with it. Garbage is only a modern conundrum and there is more of it than ever before and its management is a great challenge .It is only now that we start to realise its impact. Garbage is hugely misunderstood and popularly ignored other than as an environmental issue. Yet our city contains large amounts of wastelands in the form of industrial complexes, factories, and landfills, many in disuse in our post-industrial age mostly found in the peripheries of the city; areas that are un-habited, un-safe and un-productive. Curulli (2006:33) however poses a different perspective on wastelands, stating: "Wastelands record memories and recall memories. They demand that we remember where we are, how we got there, what our values are." As Till(2009:69) points out: "waste and monument are only kept apart by fragile differences; that one could easily mistake the quarry for the great pyramids, but what separates the two is its spirit and its intent as it is a product of intentional human action." Wastelands embody the passage of time.

Similarly, society views waste itself negatively yet the vast amount that we discard will create a record of our activities for future generations. In our current paradigm objects are assigned as one of two categories. Either transient or durable, where the value either increases of decreases over time. When objects' value decreases to an extent

that is worthless it becomes waste. Objects' values are not defined by stability but by their potential obsolescence (Till 2009:73). Yet with time certain objects regain value not as objects to be used as was originally intended, but start to take on new meaning as displayed by how valuable we hold archaeological artifacts. These artifacts are in most cases the waste left behind by previous human populations.

''99 percent or more of what most archaeologists dig up, record, and analyse in obsessive detail is what past peoples threw away as worthless—broken ceramics, broken or dulled stone tools, tool-making debitage, food-making debris, food waste, broken glass, rusted metal, on and on'' (Shanks et al. 2004:65).

Salvaged artifacts were considered worthless by previous societies. Archaeologist are slow to admit that what they are investigating is waste because of the cultural value associated with these artifacts. Looking at the way that previous cultures have dispersed their waste (or today's artifacts); unwanted objects were simply dropped on the ground (Shanks et al. 2004:65). Once permanent settlements were established, waste was often discarded into pits or buried (Shanks et al. 2004:65). It is only in recent times in highly populated centres that we have specialised services that move larger volumes of waste from streets to dumps or landfills on the outskirts of our cities. Could our landfills thus not become large resources of information and a record of contemporary society. What we throw away could not only have physical value, but an intangible value, for objects that we throw away represent a collective and cultural memory and will form a record for our future generations.

The connection between garbage and archaeology was only recently made in a field that is much older. In 1973 we saw projects like "archaeology of us" and "the garbage project" lead by Dr. William Rathje and a group of his archaeology students at the university of Arizona, that we saw archaeologist sorting through and collecting household refuse (Shanks et al. 2004:65; Allan 2012:3). It is however often denied that the work that was done is considered archaeology with the main rationale being that the material is not old enough and it is

often that artifacts and sites need to be 25 years or 50 years older to be considered appropriate for investigation (Shanks et al. 2004:66). This is illogical as "it is a significant aspect of the garbage conundrum that archaeologists believe they should wait an arbitrary time to begin research while all kinds of information about how and where and when artifacts and sites were generated critical information on the most intimate dynamics of our social systems degrades"(Shanks et al. 2004:67).

In many cases our landfills are much older than the required 25 to 50 years, yet we are slow to consider their cultural value as we do not want to associate waste with archaeology. Garbage should be a fundamental part of archaeology. Ruins are often included in the field of archaeology but landfills that contain vast amounts of building rubble are ignored. "Landfill sites are modernity's ruins" (Shanks et al. 2004:67).

Waste as data:

The findings of these archaeological digs of landfill sites reveal a great amount of data about our material culture and reveals accurately what, until that point in time, was only assumptions; the garbage was not decomposing in ways that were expected and the volume and types of waste contained within the landfill where also unexpected. Landfills are a great source of knowledge and can reveal our societies' consumption habits and can also influence the way we think about and dispose of trash (Allan 2012:4). As Dr. Rathje (2001:54) has said, "what people have owned - and thrown away - can speak more eloquently, informatively, and truthfully about the lives they lead than they themselves ever may."

[1.27]
Examples of obsolete data storage devices
(Lost Formats Preservation Society, 2000)
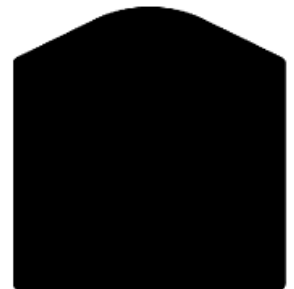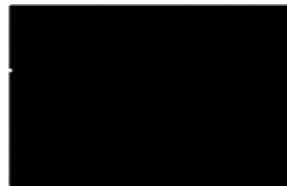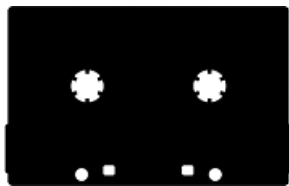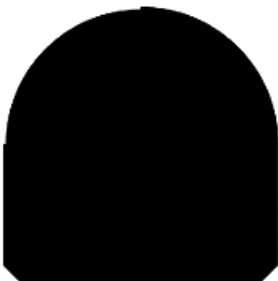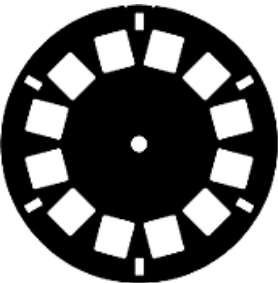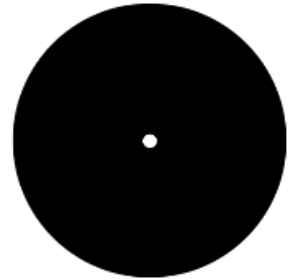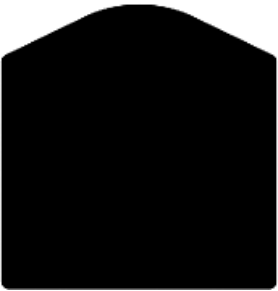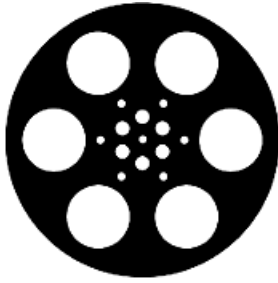
Waste as narrative:

Archaeology is thus a far more complex field of research and goes further than society's current narrow-minded interpretations. It is very rarely that society deals with landfills and their archaeological implications. One of the recent investigations was that of Fresh Kills: the world's largest landfill that was reopened to be the final resting place for debris from the 9 -11 attacks, where the material deposited there held such vivid powers of remembering an event that greatly impacted society. Fresh Kills Landfill was originally opened in 1947 along the western coast of Staten Island as a temporary solution for New York City's waste problem (Vinnitskaya 2013). In the years to follow there was, however, an exponential rise in consumption and the landfill became New York's main landfill until its closure more than 50 years later (Vinnitskaya 2013).

In close successions to the aftermath of the events of 9 -11, representatives from thirty-three museums came together to consider how to document the events (Shanks et al. 2004:61). The main question being what things to collect and preserve for display for generations to come (Shanks et al. 2004:61) The ultimate selection was called "Bearing Witness to History", displaying artifacts dug up from Fresh Kills landfill along with associated stories, photographs and documents from the events of 9 - 11(Shanks et al. 2004:61). The resulting collection was a series of everyday objects, that were damaged by the event in some way as well as artefacts associated with the aftermath such as commemorative coins, artwork and rescue equipment (Shanks et al. 2004:61).

The process was about documenting a history that was in the process of being written, and each of the artifacts chosen served as material icons of a complex story. The narratives attached to the objects portrayed a very individual story, and their power to evoke ultimately formed part of a collective memory. It is interesting to note how mundane objects with narratives attached have the power to evoke vivid memories. Similarly, one can recall a memory from one's childhood.

[1.28]
Cell phone used outside World Trade Center.

(National Museum of American History, Smithsonian Institution, 2002)

Archive entry:
On September 11, Bob Boyle, who worked near the World Trade Center, used this cell phone to contact family and friends.

Narrative:
On September 11, Bob Boyle was one of thousands of New Yorkers who tried to use their cell phones to reach loved ones. But the attack cut cellular service from the transmission tower located on top of the north tower of the World Trade Center, and other service quickly overloaded. Boyle, an amateur photographer, wanted to stay near the disaster scene to take pictures but reluctantly left in search of a better phone signal. Soon thereafter, the south tower collapsed near where he had been standing. He credits this cell phone with saving his life.

[1.29]
Purse and Wallet.

(National Museum of American History, Smithsonian Institution, 2002)

Archive entry:
This purse belonged to Lorraine Lee, who worked as an administrative assistant at Aon Risk Services, located on the 101st floor of the South Tower. The purse and its contents, including keys and 29 cards, were recovered from the debris of the World Trade Center.

Narrative:
After the first plane crashed into the North Tower, Lorraine Lee spoke with her sister, Patricia, and confirmed she was safe. Lorraine served as fire marshal for the 101st floor, and in times of emergency she was responsible for directing people towards the stairwell and making sure nobody was left behind. Shortly thereafter, a plane crashed into the South Tower, impacting the 78th-84th floors. According to newspaper reports, 99 percent of the people below the points of impact survived. Yet for those above the impact zones or trapped in elevators, there was no escape.

Waste as Nostalgia:

Similarly our obsolete objects have value as nostalgia. Throughout the world our interfaces are mimicking nostalgic objects to appear more familiar and simple even though what lies behind is much more complex. Our digital readers mimic bookshelves and our software still uses an image of a floppy disk as a universal save icon, even though the newest generation won't ever come into contact with one. Our nostalgia is being mined and used in the digital world and has value, as the object we grew up with helped shaped our memories.

Architect and artist Daniel Arsham has often explored the use of nostalgia in his work, specifically in his series of 'Future Relic.' The artworks are a series of objects that represent obsolete technologies in various states of decay. The objects are cast in elemental material such as volcanic ash and crushed glass as though freezing them in time. Though a series of short films, Arsham explores the discovery of these 'relics' in a near post-apocalyptic future challenging the view-er to whether or not these objects should remain in a physical form, mining our everyday experiences and exploiting our nostalgia. His work brings together art, architecture and film and challenges the way we see objects we often consider waste.

[1.30]
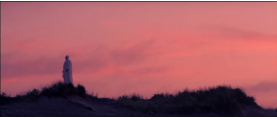**Future Relic 1:**
Mobile phone.

(Daniel Arsham, 2013)

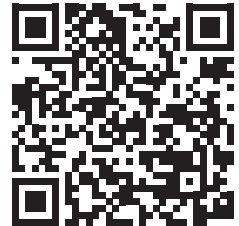**[1.31]**
Future Relic 2:
Camera.

(Daniel Arsham, 2014)
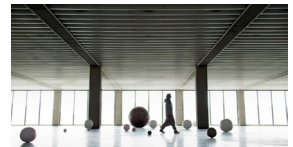
[1.32]
Future Relic 3:
Clock.

(Daniel Arsham, 2015)

[1.33]
Video still:
Future Relic 1.

(Daniel Arsham,
2013)

[1.34]
Video still:
Future Relic 2.

(Daniel Arsham,
2014)
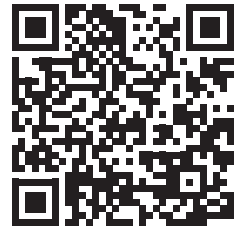
[1.35]
Video still:
Future Relic 3.

(Daniel Arsham,
2015)

Surveying technologies of memories:

Objects have a power to evoke memories. Events and objects and how we interpret them, therefore ultimately become part of our cultural memory. Cultural memory is constantly changing and evolving as we as a society constantly negotiate what to remember or disremember in order to honour or distort history. Other times we forget what seems of little importance. Remembering happens either at an individual level, recalling a personal past, or at a national level recalling a collective memory. Cultural memory lies at the crossing point between personal and collective and between past and future actively constructing the identity of a social group or of an individual (Plate & Smelik 2009:2-3).

"By remembering we form an idea of our self and shape a sense of our identity; thus we end up embodying the memory that inhabits us. Yet, memory is a dynamic phenomenon for any individual, but also for a culture as a whole. Memory is affected by politics, ideology, or art and popular culture. By changing over time, memory may unsettle received ideas of the past, and consequently also of the present and even the future" (Plate & Smelik 2009:1).

As social groups or as even as nation we share certain experiences that create collective identities and a sense of togetherness (Tierb 2009, p.26). Memory is always an imaginative reconstruction of the past, playing a strong role in buildings one's story and identity.

The interpretation of landscape itself also helps shape our memories. With the closure of the Fresh Fills landfill the question was also asked, what to do with the landfill itself; a landscape that holds such vivid memories while at the same time has been seen as negative space within its city. Ultimately a competition was held to explore the possibilities. The winning design is a master plan by James Corner's field operation, set to be implemented over the next 30 years, aiming to turn the landfill into New York's largest park. The park is to be dividing into 5 smaller parks, each with gathering and recreational

areas, such as sports fields, waterfronts, footpaths and trails with scenic overlooks and an earthwork memorial to remember the 9 - 11 attacks(Vinnitskaya 2013). Other aims of the project include extracting methane gas from the landfill, to power the neighbouring community, and to restore some of the natural functions such as acting as an environmental buffer against Atlantic storms and hurricanes which New York faces regularly; the park will help to redistribute the accumulating water with its permeable soil and wetland areas (Field Operations n.d.).

Although the project will start to uplift the neighbouring community, which it has plagued for many years, the project, however, missed a larger opportunity to deal with material contained in the landfill. Rather than actively dealing with the rich layers, the project unfortunately covers the complexity contained underneath. The project also misses an opportunity by not addressing issues about its consumerist

[1.36]
Fresh Kills Park
site plan.

(James Corner Field Operations, 2001)

past. New York has not yet made any effort to mitigate its trash prob-
lem as the waste generated by its inhabitants is now simply diverted
to several landfills in New-Jersey (Vinnitskaya 2013). Ultimately the
largest criticism of the park lies in the question if its right to design
a great park yet leave the question about waste unanswered and not
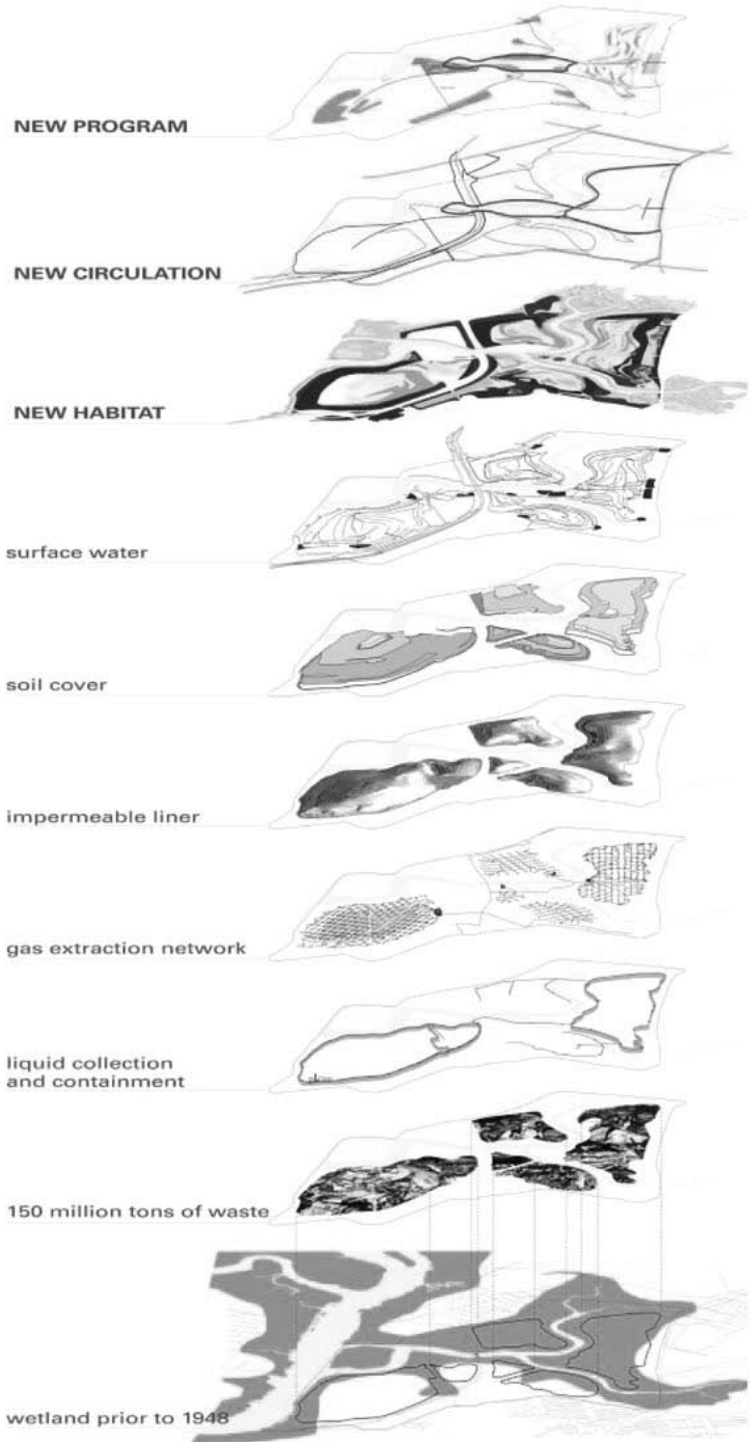engage with material that is wasted so easily.

A different finalist from the same competition attempted to deal with
the complex layers of the landfill in a more active way. The project
stands in opposition to the winning project, almost as an answer to
the criticism Field Operation's project received. Developed by Mathur,
da Cunha and Tom Leader Studio, the project aimed to respond to
the landscape's "shifting nature" and "material diversity" (Holmes
2010). The developed proposal is ultimately not a master plan at all,
but rather a series of catalytic interventions that do not propose an
end-state for the landfill, but rather attempts to actively engage with
the layers contained. Ultimately the proposal is a design process and
strategy to deal with the future of the landfill.

The project celebrates the diverse layers of the site, a series of inter-
ventions are proposed that all extend past the boundaries of the land-
fill and become transformative events in the neighbouring community
(Mathur / da Cunha + TOM Leader Studio n.d.). The interventions are
grouped as "event surface", "experimental field", "material datum",

[1.37]
Fresh Kills Park.

(James Corner Field
Operations, 2001)

NEW PROGRAM

NEW CIRCULATION

NEW HABITAT

surface water

soil cover

impermeable liner

gas extraction network

liquid collection
and containment

150 million tons of waste

wetland prior to 1948

**[1.38]**
Fresh Kills Park development strategy.

(James Corner Field Operations, 2001)

"depositional edge", and "tectonic zone"(Mathur / da Cunha + TOM Leader Studio n.d.). Each of these interventions deals with a layer that formed the end state of the landfill. In phasing the project these interventions attempt to expose each of these layers and celebrates the diverse material depositions. The layers of the site includes debris from the twin towers of the World Trade Centre; city garbage which comprises the landfill; salt marsh deposits; glacial sediment deposited ten thousand years ago by the retreating Laurentide ice sheet and crushed rocks form 300 years ago from a geological fault line (Mathur / da Cunha + TOM Leader Studio n.d.; Holmes 2010).

The project has a greater understanding of the issues at hand and recognises how little we know about dealing with issues such as this, but acknowledges opportunity to engage with the material in a more meaningful way. Paradoxically it seems that materials need to decay to a certain point until we recognise their memories are worth preserving. As Tierb(2009:21) states: "Incompleteness and fragmentation possesses a special and evocative power".This leads to show in what an interconnected relationship memory and decay live together and how the two even seem to enhance each other.

[1.39.1-5]
Fresh Kills Park: Experimental strategies developed for the diverse material depositions.

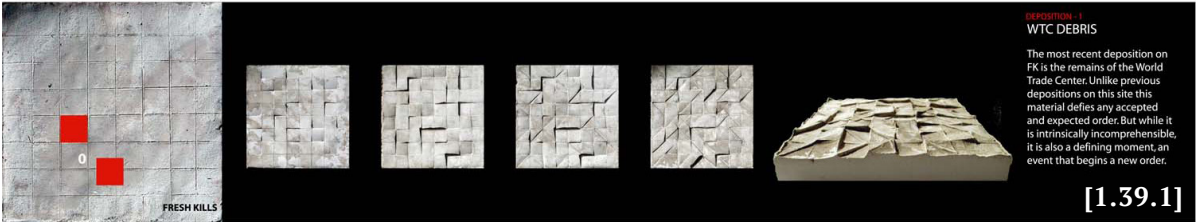(Marthur, Da Cunha & Tom Leader Studio, 2001)
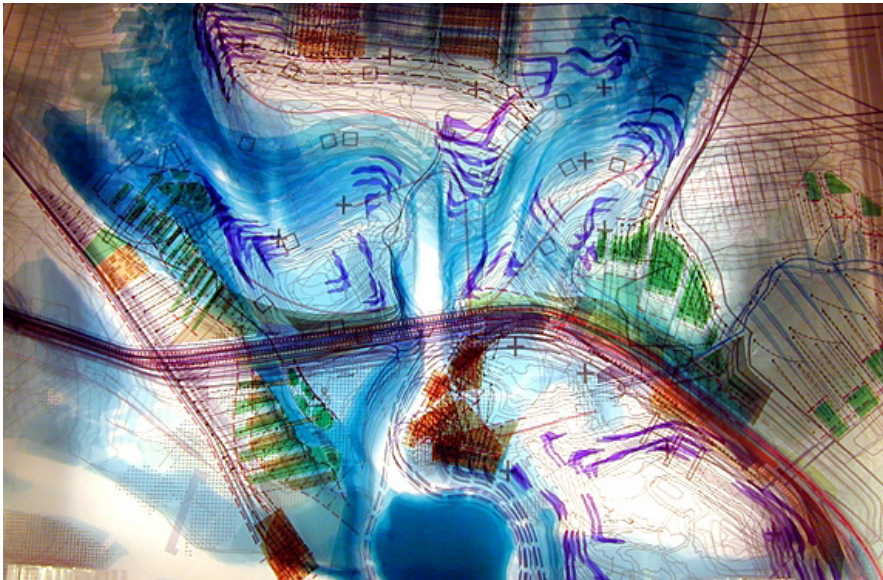
[1.40]
Fresh Kills Park: Landscape strategies represented as layers.

(Tom Leader Studio, 2001)

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

SURFACE

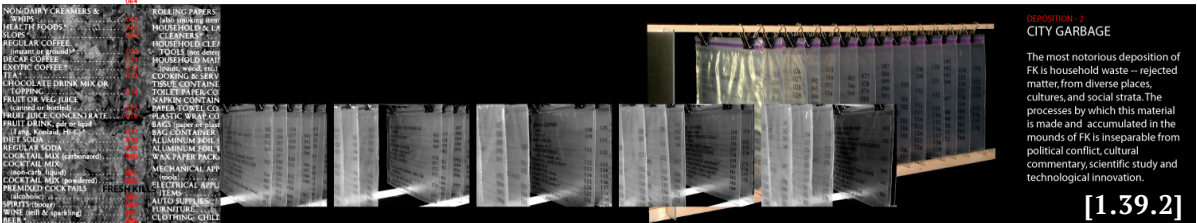DYNAMIC - 1

DEPOSITION - 1
WTC DEBRIS

The most recent deposition on FK is the remains of the World Trade Center. Unlike previous depositions on this site this material defies any accepted and expected order. But while it is intrinsically incomprehensible, it is also a defining moment, an event that begins a new order.

[1.39.1]

FIELD

DYNAMIC - 2
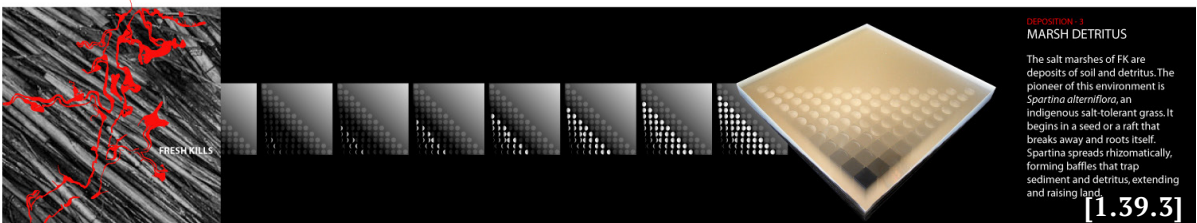

DEPOSITION - 2
CITY GARBAGE

The most notorious deposition of FK is household waste -- rejected matter, from diverse places, cultures, and social strata. The processes by which this material is made and accumulated in the mounds of FK is inseparable from political conflict, cultural commentary, scientific study and technological innovation.

[1.39.2]

DATUM

DYNAMIC - 3

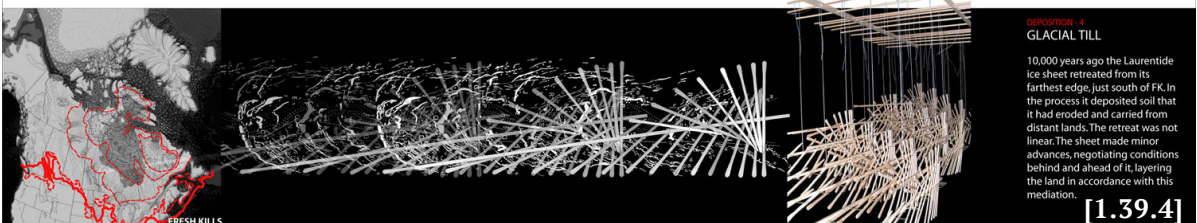

DEPOSITION - 3
MARSH DETRITUS

The salt marshes of FK are deposits of soil and detritus. The pioneer of this environment is *Spartina alterniflora*, an indigenous salt-tolerant grass. It begins in a seed or a raft that breaks away and roots itself. Spartina spreads rhizomatically, forming baffles that trap sediment and detritus, extending and raising land.

[1.39.3]

EDGE
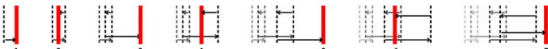
DYNAMIC - 4

DEPOSITION - 4
GLACIAL TILL

10,000 years ago the Laurentide ice sheet retreated from its farthest edge, just south of FK. In the process it deposited soil that it had eroded and carried from distant lands. The retreat was not linear. The sheet made minor advances, negotiating conditions behind and ahead of it, layering the land in accordance with this mediation.

[1.39.4]

ZONE

DYNAMIC - 5
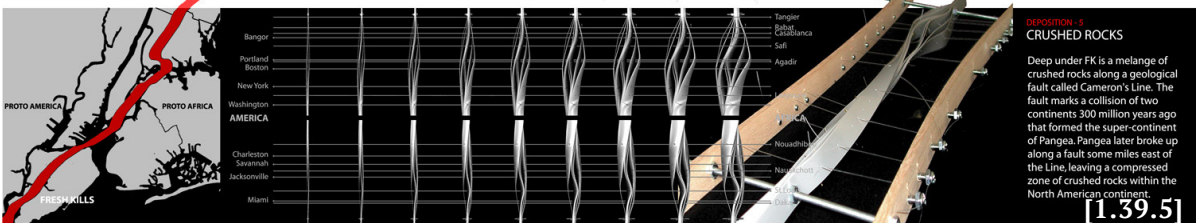
DEPOSITION - 5
CRUSHED ROCKS

Deep under FK is a melange of crushed rocks along a geological fault called Cameron's Line. The fault marks a collision of two continents 300 million years ago that formed the super-continent of Pangea. Pangea later broke up along a fault some miles east of the Line, leaving a compressed zone of crushed rocks within the North American continent.

[1.39.5]

"Memory and decay exist in an inextricable relationship. Without memory, it is questionable as to whether decay exists, as there would be no recollection of the existence of an object in any other form than its current. Without decay, can memory exist? If nothing ever changes then one can never have a record of something in a previous state" (Almond 2009, p.13)

Memory and decay are two processes that exist on all landscapes. Elements and living creatures exert forces on a landscape leaving a memory while 'natural' forces counteract this, breaking materials down, fading memory. Everywhere around us nature and its forces are fading memory, the sun blasting radiation, fading colours. Similarly, water breaks down materials, making materials shrink and swell repeatedly, turning shiny new objects into what society calls waste. Spaces of waste are grand mnemonic device within our cities, yet its value in society is unrecognised and the memories it contains are disappearing.

Similarly, waste and growth lives in an inextricable relationship. Whenever we build, there will always be mounds of waste and scars in the landscape where the materials were sourced. The dissertation thus doesn't attempt to subvert the problems of waste as an answer to the sustainable imperative, but acknowledges that all things become waste and attempts to find new meanings and new ways to re-consume them. Rather than seeing spaces of waste as negative spaces within our cites, see its potential for new growth.