Oystertecture: infrastructure, profanation and the sacred figure of the human

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> The life that begins on earth after the last day is simply human life. Giorgio Agamben, 1993, p. 6.

I

It is the last weekend of summer 2015. One of us is on Governors Island, along with two young men new to the scene, crouched over a plastic-coated rebar cage that we've just spent the afternoon making. We are struggling to tie a bowline knot, which we will use to attach our oyster test stations to concrete piers located a few meters offshore. None of us have much experience with oysters. Nor with bowline knots. And certainly not here, in the long shadow of New York City's financial district. We have been hard at work since morning, having caught the first ferry along with 40 others to spend the weekend learning how to care for an oyster restoration station. One of the men explains why he came: "I don't know. I was at happy hour last night and I told my friend, 'I'm going to become an oyster farmer tomorrow, and they said 'why?!' I dunno, I said, I read a bunch of books... In some idyllic future I'd like to do this full time, as a farmer. It sounds peaceful." Women of all backgrounds in flip-flops and manicured nails clutch pliers, bending metal. In the background, the freedom tower looms over us. Along for the ride is a journalist from CBS, there to record interviews on the new 'oyster mania' of which we are a part. Ann, one of the founders of Harbor School, says to him, "the future looks pretty grim, but you know when you're here now trying to bring things back to life and make a difference, you can be obsessed with the end for a while, but..." Her voice trails off. Although we have all just met, we make plans to monitor these stations, together, over the coming years.

A few months later, we contemplate future disasters projected for Staten Island, from a bulkhead on its exposed, southern coast. Staten Island was hit hard during super storm Sandy, and city officials now say that people were never meant to live along its exposed shores. In 2017, it will become the site of a large-scale real-time experiment in making the city 'resilient', when the state of New York – in collaboration with an unusual collection of actors, including engineers, critical infrastructure consultants, designers, and lawyers, together with oysters, concrete, steel, and computer models – will begin building two miles of artificial oyster reefs. The project is one among six winning designs in the US Department of Housing and Urban Development's 'Rebuild by Design' competition, and part of a larger effort to attenuate future storm surges and remediate polluted water in Raritan Bay. 'Oystertecture' or 'Living Breakwaters,' as the project is officially named, is today heralded as a cutting edge replicable infrastructure adequate to the 'new normal' faced by many coastal cities across the world. In the designer's projected future, the seas will continue to rise. Hurricanes will batter the city's coast with increased frequency and strength. An array of fiber optic cables will connect underwater live cams, trained on distant oyster reefs, to computer monitoring stations on land. The plan is to use oysters to lessen the impact of waves on the coast by absorbing and diffracting their energy in the hope that disaster will be managed, even if it can never be fully stopped.

To the casual observer, the unique nature of these proposed reefs may not be immediately evident. New Yorkers have become used to the idea that oysters might return to waters from which they disappeared decades ago. Indeed, since the early 2000s the oyster has been proposed as an indicator of ecological health, and a future with oysters held out as a sign that the city can heal its relationship with nature. In city plans and artistic visions – an oft-blurred distinction – the return of the celebrated molluscs is frequently couched in an aesthetic of old-timey lifestyles connected to the harvest and consumption of maritime resources. The first public exhibition of oystertecture – at the Museum of Modern Art's 2010 *Rising Currents* exhibition – portrayed a fanciful plan for the Gowanus Canal

Superfund site adjacent to Brooklyn's Red Hook neighborhood, pleasingly rendered by the landscape firm SCAPE and its lead architect, Kate Orff (Figure 1).[1] Set against a post-

Figure 1: Installation view of 'ZONE 4: Oyster-Tecture' exhibition at the Museum of Modern Art, New York, 2010. Retrieved from http://www.scapestudio.com/projects/oyster-tecture/. Copyright 2010 SCAPE/Landscape Architecture PLLC.

industrial backdrop of new condos, renovated warehouses, and water taxi stations, SCAPE's design delegated to oysters the role of cleaning polluted waterways, enabling the growth of other marine life, and buffering the shores of Red Hook from occasional high water. Dominating the exhibition was the 'reef-culture' oysters would help facilitate: rehabilitating a former wasteland via water-based localism, forgotten arts of oyster grilling, boardwalk jogs alongside new reefs and wetlands, and restaurants advertising oyster po' boys and Sixpoint Sweet Action beer (Figure 2). Oystertecture was seen as a means to

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[1] The MOMA exhibit featured 'soft' architectural responses to rising sea levels, infrastructural obsolescence, and the desire to reconnect NYC with its harbor. For more on *Rising Currents*, see Braun, 2014.

reconnect the city with nature, as part of an affluent, green, post-industrial urbanism: "a blue-green watery park for the next watery century," Orff announced in an exhibition video, "so get your TEVAs on!" Exhibit boards pictured oyster garden cages attached to the underside of recreational boardwalks, up close and accessible to joggers and families.

Figure 2. Mockup of the 'reef culture' imagined by design firm SCAPE as part of their 2010 'Oyster-Tecture' exhibition. Retrieved from http://www.scapestudio.com/projects/oyster-tecture/. Copyright 2010 SCAPE/Landscape Architecture PLLC.

Annual oyster FLUPSY parades were imagined.[2] "How much fun would it be to watch the FLUPSY parade and cheer on the oyster spats!" Orff continued, "By 2050, maybe you can 'sink your teeth into a Gowanus oyster'". In the future, things would be better, with oysters helping to usher in "a more sustainable, a more livable, and a more delicious future."

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[2] 'FLUPSY' is short for "Floating Upwelling System," a term for baby oyster nurseries.

All this would change dramatically after Hurricane Sandy hit New York City in the fall of 2012. Amid the post-storm wreckage a new image emerged of a fragile city menaced by myriad risks – hurricanes, rising sea levels, heat waves, technical failures – each of which threatened to interrupt transportation systems, financial institutions and energy networks in a cascading series of uncontrollable catastrophes (for a discussion of coastal precarity in Buenaventuram, Colombia, see Zeiderman, this volume). The 'living breakwaters' being built today by NY State emerged in this post-storm context, as one of several efforts to buffer the city from future extreme events.[3] The same landscape design firm that designed the Gowanus Canal plan now reimagined oysters in terms of 'disaster preparedness', in which 'letting water in' became less a touching matter of reacquainting New Yorkers with their friendly aquatic surroundings than a new strategy to respond to a changing climate and a hostile ocean. The quaint harmony of SCAPE's earlier oystertecture proposal was replaced with a focus on the project's infrastructural function; oyster shacks and sea kayaks swapped for sharp warnings about "wave velocity" and "environmental risk." Most importantly, oysters were reimagined as a "living, growing infrastructure" that could "drastically dissipate destructive wave energy."[4] SCAPE's designs now propose a "necklace" of oyster reefs as "layered lines of defense" around south Staten Island (Figure 3). As part of the project, designers are experimenting with new cultivation techniques and designing new reef structures in which oysters can survive further offshore in "high wave action" areas. Current plans involve anchoring multi-ton ECOncrete® "armoring units" to the ocean floor.[5] These will be seeded with oyster spat, layered with rocks and stone, and spaced at different intervals both horizontally and vertically, with some entirely submerged and others designed to rise high enough to absorb 16' wave crests. The reefs

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[3] These breakwaters can be understood as part of a *dispositif* of security that responds to the urgency of climate change. Foucault (1980) understands *dispositifs* as ad hoc assemblages, created by bringing together diverse sites and elements in order to manage crises. Only retrospectively and with a view to the 'network of relations' formed between them do those sites or practices appear as part of a plan devised in advance or as a coherent unity.

[4] All kinds of new terms began to be used to describe oysters: "physical-biological infrastructure" (Greenberg, 2014, 28), "living infrastructure" (Orff, 2014), and "ecological infrastructure" (SCAPE, 2013).

[5] These 'armoring units' have been engineered in Israeli laboratories by scientists attempting to mimic the composition of wild oyster reefs.

are not meant to keep the water out; unlike a sea wall, whose purpose is to stop flooding, block waves, or eliminate risk, the oyster reefs are intended to "make those events slower

Figure 3. Rebuild by Design entry by SCAPE, in which the design firm amended their earlier 'Oyster-Tecture' vision to now propose the use of oyster reefs as 'living, growing breakwaters' to defend the city against future storms like Sandy. Retrieved from http://designapplause.com/wp-content/xG58hlz9/2014/12/oyster3.jpg. Copyright 2013 SCAPE/Landscape Architecture PLLC/Rebuild by Design.

and safer," to "slow inundation," and to "take the energy out of the wave" as it passes over the breakwater (SCAPE, 2014).

II

The return of oysters to New York harbor appears to turn back the pages of history. After all, oysters and oyster reefs have long been found in the region's estuaries and bays. Before the arrival of Europeans, the Lenape had used oysters as weapons and to cover burial sites

(Wissler, p. 8; Pritchard, 2002, p. 91). In the 19th and early 20th century, the region became a key center of the commercial oyster industry, with oyster beds plotted as property and farmed to produce annual crops, part of a larger circulation of capital, labor and commodities along the East Coast. During the Gilded Age, New Yorkers could not get enough oysters, even as their habit of dumping tons of raw sewage and industrial waste into the water led to the oyster's demise. SCAPE plays on this history, and presents its plans as continuous with it.**6** But this apparent continuity masks a fundamental discontinuity. During the gilded age, oysters were valued for their *qualities* (nutrition, taste, texture, size and color). Today's oysters are valued for what they *do*. As sea levels rise, traditional breakwaters will be increasingly less effective. SCAPE hopes its oysters will grow on top of each other, layering onto and strengthening the assemblage to which they're attached, rising "elegantly" with the seas. This, SCAPE explains, is its core concept: "'growing' climate-change infrastructure biologically now rather than relying on capital-intensive big construction projects in the distant future" (Orff, 2011, p. 98).

It is not difficult to understand why New Yorkers are once again deeply attached to oysters. From enthusiastic volunteers at oyster restoration stations, to oyster festivals on city streets and the unexpected appearance of a woman proudly wearing an oyster hat on Staten Island, oysters have captured the imaginations, hopes and dreams of New York residents, first in a story of harmony and sustainability, now as a buffer against the coming catastrophe. We are interested in these attachments. But we are interested also in what oystertecture tells us about infrastructure, temporality, and politics, and the relation between them, in an age of global climate change.

Stated in simple terms, oysters in New York City are notable today for being refashioned and reimagined as infrastructure. Oysters have rarely -- if ever -- been asked to do this before.7 We might say that through their new infrastructural function, oysters have become

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6 A video presentation of the project can be found here: http://www.rebuildbydesign.org/project/scape-landscape-architecture-final-proposal/
7 Not unlike the 'relative existence' of Pasteur's microbes (Latour 1999), oysters are now seen to have *always* had this infrastructural function, transforming the past along with the present. We

'biopolitical'.[8] This is true not just because oyster life is now carefully managed – although this is most certainly the case – but rather because through managing the life of oysters it is now imagined that *human* life can be managed. In an instance of biopolitical doubling, we now manage *other* life to *secure* human life.[9]

III

At first glance, then, the novelty of oystertecture lies in its use of animals as infrastructure, such that the site and definition of 'critical infrastructure' is radically changed. But the use of living beings as infrastructure may be less novel than first appears. After all, animals have functioned as infrastructure before. As late as the mid-20th century, horses pulled boats along London's canals, their vital powers indispensible to the industrializing city. Likewise, before the development of carbon monoxide monitors, canaries served as 'biosensors' in underground mines. Along with headlamps, helmets, bells and whistles, they comprised a rudimentary safety infrastructure designed to protect both workers and capital. Even humans as living beings can be considered part of a 'social' infrastructure. If we accept AbdouMaliq Simone's (2004, p. 210) suggestion that people's heterogeneous activities constitute "mobile and provisional possibilities for how people live and make things, how they use the urban environment and collaborate with one another," then humans in and through their lives as living beings comprise something akin to a collective platform that subtends the practice of everyday life.

Yet, in important respects how oysters are enrolled as living beings *is* unusual. This has to do in part with the peculiar nature of contemporary risks. But it also has to do with the specific biology of the oyster. For residents of coastal areas, sea level rise and future storm

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are taught that oysters are a valuable infrastructure that the 'moderns' destroyed: "two centuries ago, reefs composed of 3 trillion oysters were a "natural seawall" that created shallower bays and served as a "first line of defense for Manhattan against storms as fierce or fiercer than 2012's Hurricane Sandy" writes Paul Greenberg (New York Post, June 21, 2014).

[8] It is tempting to analyze oystertecture as an example of 'green' infrastructure. In this essay we resist this label: as we will see, there is nothing particularly 'environmental' about this infrastructure except that it mobilizes animal life to secure human life.

[9] This is increasingly true with regard to 'ecosystem services' more generally.

surges are a growing risk, the consequence of our ongoing addiction to fossil fuels. Future climate is expected to be more turbulent, and extreme events more frequent. The peculiar nature of how oysters live – and die – appears the perfect antidote. Oysters begin life as one of millions of eggs released into surrounding waters by mature oysters attached to existing reefs. Not all eggs survive and transform into oysters— much depends on the first few days after they hatch. As a newborn, the oyster is little more than a tiny mobile blob of larva, nourished only by the nutrients from the egg. Within a few days, it begins to extract calcium carbonate from lime-rich waters, develops organs able to process food, and begins to grow a thick, hard shell (Brooks, 1996, pp. 23-25). Having reached this point, it swims
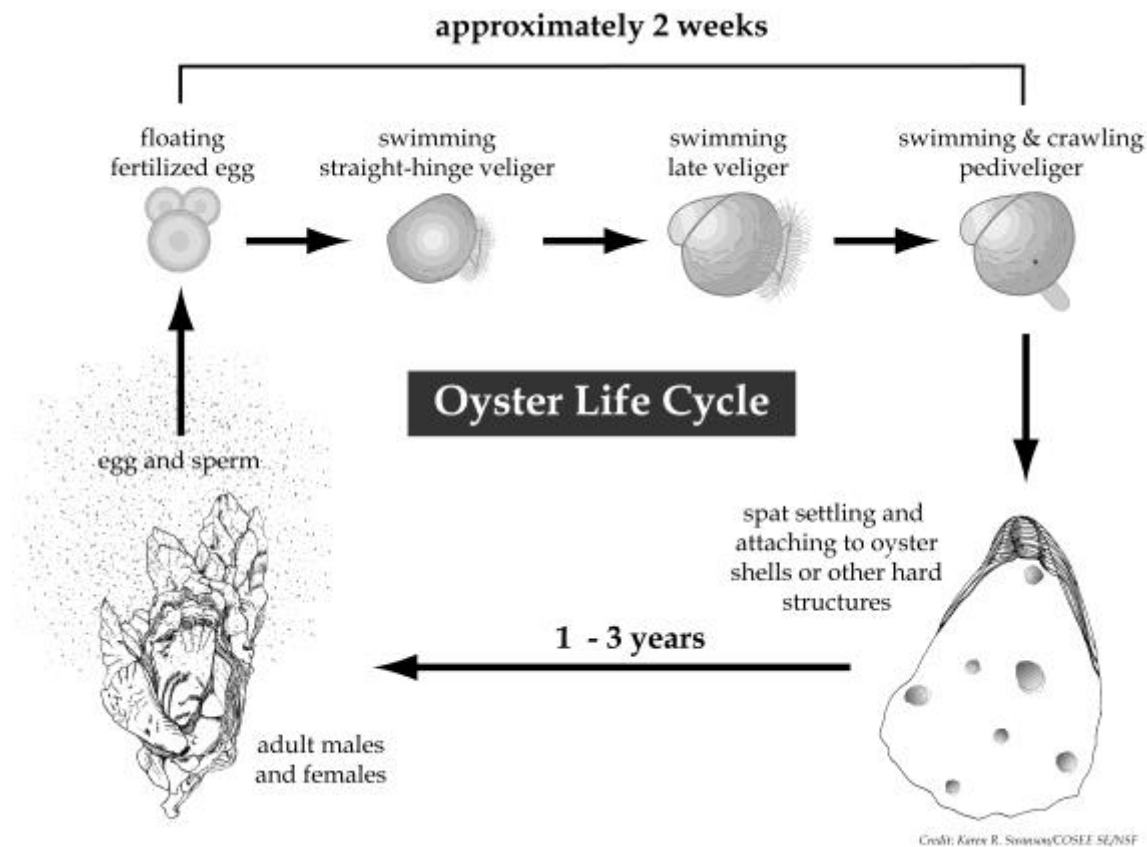

Figure 4: Oyster life cycle diagram. Copyright Karen R. Swanson/COSEE/NSF. Retrieved from http://score.dnr.sc.gov/deep.php?subject=2&topic=15

until it arrives at a stable surface, where it attaches and remains for the rest of its life. Unlike clams, which burrow in the mud, or mussels, which attach to outcropping of rocks,

the substrate to which wild oysters attach is usually other adult oysters, or the shells of dead ones (Figure 4). The hardening and layering of shells individually and together constitute what we refer to as a bed or a reef. As each oyster matures it releases millions more eggs, perpetuating the cycle. Over time, oyster reefs grow in an ever-expanding self-agglomeration, stuck together like glue, growing up and out, with older oysters inside and younger oysters on the exterior. In New York in the 1600s, immense reefs stretched through the Raritan Bay and its tributaries, the East River, along the Hudson River as far north as Ossining, NY, as well as throughout Arthur Kill, Jamaica Bay, and south Newark Bay (MacKenzie, 1984; 1992).

Today oysters are no longer found in the Hudson River, Raritan Bay, or any other location in the region. In the 19thC oysters in New York waters were planted, harvested, and planted again, in a mass production process that had no regard for the oysters' unique life world or the cycle needed for reefs to grow. In stark contrast, the designers of the city's new 'living breakwaters' seek to recreate the oyster's life world and then *let it be*, seeing in the 'natural functioning' of oyster reefs an inherent productivity and emergent potential that can be harnessed to protect the city from the sea (Orff, 2010). It is the hope of SCAPE's designers that oysters will grow on each other, layering onto and strengthening the assemblage to which they're attached: "Designed as living systems," SCAPE's report to the Rebuild by Design jury explains, "they build up biogenically in parallel with future sea level rise" (2013, p. 23). SCAPE member, Paul Greenberg (2014a, p. 28), dramatizes the fecundity of oyster life by typing out the estimated annual spawn of oyster larvae in colonial New York – 300,000,000,000,000,000,000,000 (three hundred quintillion) – an almost unfathomable quantity of matter and energy that can magically organize itself into a complex, functional infrastructure. "Layer by layer," marvels Greenberg "the reef builds vertically, each new oyster generation building on the last….No other bivalve builds in 3 dimensions with such architectural zeal" (p. 28). Whereas traditional breakwaters will grow deeper and be less effective as sea levels rise, oysters "really become nature's wave attenuators" (Orff 2010, n.p.).

For this infrastructure to function, then, it is the 'species life' of the oyster – in its totality – that matters, and continues to matter even after its death.[10] The horses that pulled boats along London's canals were certainly valued for their vital powers, such that their 'species life' was integral to the movement of goods and people. But the death of a horse interrupted the functioning of the infrastructural system: it provided no work and produced no infrastructural value. The canary in the coal mine could be seen as part of the safety infrastructure of the mine, charged with preserving the life of the miner (or, more to the point, making sure that dangers were identified so that the laboring body could survive to work another day). Here it was not the life of the canary that mattered, but its passage into death, or at least its potential to do so. The value of the canary was realized only in the moment it showed distress or expired.[11] A dead canary, like a dead horse, had no infrastructural value.

Part of what makes the oyster-as-infrastructure unique, then, is that over the course of living its life, and passing over into death, it *builds* the infrastructure and *is* the infrastructure. Moreover, it builds the infrastructure in response to changing environmental conditions, adapting to ocean levels as they rise and fall. This in part explains oystertecture's immense appeal, for it appears as nothing short of nature's very own solution to the volatility that our activities have introduced into global climate. Nature is there to assist us, provided that we understand what it is capable of doing.

IV

For SCAPE's oysters, there is no reprieve. They are expected to work, from birth to death – and beyond death – to secure human life. What matters today is not what oysters are – their texture and taste – but what oysters *do*, individually and collectively. Oysters become

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[10] We borrow the distinction 'species life' from Marx (1988/1844), who distinguished it from 'species being'.

[11] Canaries were considered better sentinel species than mice because, unlike mice, which might present similarly in life, sickness, and death, canaries would visibly sway on their perches before falling sick or dying. Many thanks to Peter Forman for pointing out the different qualities of sentinel species and how these are given infrastructural functions.

infrastructure through their biological functions (for an extended discussion of the 'functionalism' of infrastructure, see Ballestero, this volume). Yet however central the species life of the oyster is to our story, and however novel may be the idea of self-organizing, 'living' infrastructure, to focus on the use of animals as infrastructure may lead us to miss the larger significance of these projects, namely, that they reveal a new relation to being, time and politics. Oystertecture is not significant only because it enrolls nature as infrastructure, but that with projects like oystertecture infrastructure gains a new political ontology.

This shift merits comment. When we think of infrastructure, what often comes to mind are the many roads, bridges, pipes, cables and wires that underwrite our everyday lives, not unlike the ferry that took us to Governors Island. Much of this infrastructure is mundane, and remains in the background (e.g. Graham and Thrift, 2007). But at particular historical moments modern infrastructure has also had a spectacular dimension (Larkin 2008). Consider Michael Ondaatje's (1987) remarkable description of an ornate and imposing water treatment plant in his novel *In the Skin of the Lion*.[12] Built with great fanfare in Toronto in the 1930s, the treatment plant captivated an entire city, promising an end to water shortages and unclean drinking water.[13] Or consider the massive dams built during the New Deal era, which captured the imagination not of a single city, but an entire nation. These great engineering feats provided evidence of humanity's power to order and shape 'external' nature (a power and a concept of nature that we now view in a very different light). More important, they promised the future. This promise was powerful. In the 1950s, it was common for working class American families to take side-trips to visit infrastructures. Inside shoeboxes buried at the bottom of many Americans' closets are Polaroids of parents or grandparents smiling in front of imposing dams or monumental bridges. Despite their faded colors, there remains something immensely hopeful about

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[12] The historical reference is the palatial R.C. Harris Water Treatment Plant, which was designed in the Art Deco style and named after Harris, who served as Toronto's Commissioner of Public Works from 1912 until 1945.

[13] For more on the infrastructural sublime, see Gandy 2003.

these images: a sense of being part of a historical movement, one of ongoing progress and improvement.

Borrowing from Kregg Hetherington (2016), we might say that modern infrastructure contains a progressive temporality, part of what Hetherington calls 'development thinking'. Infrastructure is not just something that fades into the background to enable other things to occur, it creates the conditions for *another* order, or at least promises a new order to come. The tense of infrastructure is thus the future perfect, "an anticipatory state around which different subjects gather their promises and aspirations" (p. 1). Today many infrastructure projects continue to promise the future, even if that promise is increasingly frayed: the new highway promises to facilitate mobility, new fiber optic cables promise increased connectivity and speed. The mythical time of modern infrastructure is unidirectional, irreversible and teleological, traveling, like Christian salvation, toward an assumed – and assured – end.

Oystertecture turns this temporality on its head. Rather than promising the future, oystertecture functions to *ward it off*. Moreover, it seeks to do so in perpetuity, elegantly adapting to changing conditions so as to keep all other things the same. In this sense, oystertecture is emblematic of a brand of 'resilient' infrastructures being developed across America's cities that are not meant to be eventful in their own right, but to cancel out or absorb events. These do not replace modern infrastructures. Instead, they are necessitated by them. Indeed, despite their 'green' characteristics – oysters, swales, reefs, and marshes – they set perfectly well alongside the proliferation of pipes, cables, wires and roads that underwrite 'modern' life. One need go no further than Raritan Bay to see this, crisscrossed as it is by some of the most important shipping routes in the US Northeast and witness to a steady parade of oil tankers to and from massive petrochemical facilities on the Jersey side of the bay. None of this is projected to go away. In their design for the reefs, SCAPE was required to incorporate these routes. As 'emergent' infrastructure, oysters are not meant to *change* the world; they are tasked with adapting to a *changing world*.

We are now in a position to better understand the temporality and politics of oystertecture – and 'resilient' infrastructure more generally – for it is precisely the ability of oysters to collectively adapt to changes in sea level that allows oystertecture to fulfill the political function of what Carl Schmitt (2003) called the *katechon*: the permanent management of the present to hold back the forces of chaos. Schmitt borrows the concept from the apostle Paul, who first used it in when writing to the community of believers at Thessalonica, who had abandoned work in anticipation of the return of Christ. This may have been a response to Paul's earlier teaching that Christ's coming was near, an interpretation that worried the apostle. The apocalypse, Paul cautioned, would not come until the *katechon* -- 'he or what withholds' – would be 'taken out of the way' (2 Thessalonians 2:1-12, spec. 2:6-7).[14] It was important that the community of believers continue on with their everyday labors. Referred to ambiguously as a 'who' and a 'what', the concept of the *katechon* has since Paul's time come to mean something quite different from its original use. The early Christian theologian Tertullian, writing in the 3rd century, identified the role and position of the *katechon* with the Roman Empire, which managed the earthly world, postponing the end of days until its appointed time. For Schmitt, different political authorities occupied the place of the *katechon* at different times: the Holy Roman Empire, the Byzantine Empire, or individual authorities such as Emperor Rudolf II of Hapsburg. Giorgio Agamben (2005, p. 110) expands the range even further. For him, "every theory of the State, including Hobbes's—which thinks of it as a power destined to block or delay catastrophe—can be taken as a secularization of this interpretation of 2 Thessalonians 2."

To ward off the apocalypse, however, also meant warding off salvation, since in Christian eschatology the former is seen to precede the latter. Tertullian, like many others, saw the trials and tribulations of the end days as so horrific that it was preferable to hold them off, despite the cost of postponing redemption indefinitely. For Schmitt, the Holy Roman Empire – and international law and order more generally (*ius publican Europaeum*) — had a similar positive function (Schmitt, 2003, pp. 59-60). As a force that warded off chaos, it was portrayed by Schmitt as the only possible source of sense and order in the world.

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[14] We follow here Patricia Dailey's translation in Agamben, 2005, p. 109.

Today, resilient infrastructures are asked to play this role, but with a crucial difference: whereas for Paul there still remained a promise of salvation to believe in – albeit in another time and another heavenly place – today there is no promise of future redemption. Instead there is only the endless and continuous management of crisis here on earth, in which the chaos held at bay is generated by the same order that the management of crisis seeks to preserve. Time marches on, but history comes to a stop.[15]

V

As resilient infrastructure, oystertecture is not merely physical; it is also metaphysical. It embodies and installs a particular relation to time, and a particular relation to being. How might we respond to this? How might futurity be reopened, and on what terms?

In a short tract entitled *What is an Apparatus?*, Giorgio Agamben revisits Michel Foucault's (1980, pp. 194-196)) concept *dispositif* (apparatus) in order to explore the metaphysics of 'government' or '*oikonomia*', but also to explore a potential politics.[16] His is a metaphysical, rather than anthropological, investigation, since he is interested foremost in the question of 'being', namely, the nature of our factical existence and, most important, the possibilities it holds for constructing worlds.[17] For Agamben, government is significant not just because it orders earthly affairs, but because it names an operation that separates us from our capacities, both from our ability to actively construct worlds, and our ability to *believe* in the worlds into which we are thrown and participate.[18] It demarcates what is possible. Take, for example, an apparatus with which many of us are intimately familiar: the

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[15] See Masco, this volume, for a discussion of "crisis" as a counter-revolutionary idiom that stabilizes existing present condition rather than engaging its multiple temporalities.

[16] A more extended discussion would follow in 2011, with the publication of Agamben's *The Kingdom and the Glory*.

[17] An 'anthropological' or 'historical' investigation would explore 'being' in its concrete historical conditions. As we will see, for Agamben the latter becomes crucial for any politics.

[18] For Agamben, 'government' is bound up with the human desire for happiness, salvation or redemption: "the capture and subjectification of this desire in a separate sphere constitutes the specific power of the apparatus" (Agamben, 2009 p. 17). Our desire for a better life is abstracted onto an apparatus, and subsequently separated from us.

university, with its ordered curriculum, divisions of knowledge, classroom architecture, and methods of evaluation, all of which encourage us to understand ourselves as if viewed from a site external to our actions: as 'student', 'instructor', 'researcher', 'administrator', and so on, and where the possibilities inherent to the tools of the trade – books, lecterns, whiteboards, laboratories – appear to be fully exhausted by the work to which they are currently put. Rather than individually and collectively grasping the possibilities of our factical conditions, our activity is governed so as to direct it toward a *particular* end, or, as in the case of apparatuses of security (e.g. resilience), to ward off the imagination or realization of any *alternative* one.[19]

Notably, for Agamben (2009), almost anything can be part of an apparatus, that is, almost anything can have a 'governmental' dimension. Not only schools, prisons, factories, and confessions, as Foucault (1979) famously noted, but also the pen, literature, computers and cellular phones, "literally anything that has in some way the capacity to capture, orient, determine, intercept, model, control, or secure the gestures, behaviors, opinions, or discourses of living beings" (14). Even oysters, as we saw above, although in a rather more complicated form: in capturing the actions of oysters, it is human lives that are governed. We will see later how this 'doubling up' of apparatuses to include living beings complicates Agamben's ideas, since he narrowly limits the elements of any apparatus to the inorganic.

For our purposes, what is most striking about Agamben's discussion is not only how he understands 'government', but also how this leads him to call for a certain relation to it, centered on the notion of profanation and an understanding of destituent rather than constituent power. Agamben begins by closely following the definition of 'apparatus' (*dispositif*) that Foucault offered his interviewers in 1977:

> What I'm trying to single out with this term is, first and foremost, a thoroughly heterogeneous set consisting of discourses, institutions, architectural forms, regulatory decisions, laws, administrative measures, scientific statements, philosophical, moral, and philanthropic propositions—in short, the said as much as the unsaid. Such are the

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[19] See, for instance, Moten and Harney, 2004.

elements of the apparatus. The apparatus itself is the network that can be established between these elements… by the term 'apparatus' I mean a kind of a formation, so to speak, that at a given historical moment has as its major function the response to an urgency. The apparatus therefore has a dominant strategic function…" (as cited in Agamben, 2009, p.2; Foucault, 1980, pp. 194-96).

Most commentators of Foucault emphasize the relation between apparatuses and government, and Agamben is among them. But we can also draw out an additional point in Foucault's statement – that the governmental aspect of things is not *inherent* to the things in question; rather, it obtains from the relations into which they are drawn. There is no necessary relation between the elements, except from the perspective of 'administration'. Ultimately, for Foucault, as for Agamben, apparatuses are ad hoc arrangements that emerge in relation to an urgent need. This insight helps us understand how oysters are drawn into apparatuses of government in the aftermath of Hurricane Sandy – how they come to be seen in terms of their 'function' as infrastructure. It also helps us understand Agamben's initially opaque concept of 'profanation'. For Agamben, what is notable about any apparatus is that it involves removing things from 'common use' and placing them in a separate sphere, that of management, administration or *oikonomia*. The effect is that the elements of an apparatus come to be thought of abstractly, as if part of a separate and pre-existing plan that transcends the elements that comprise it rather than immanent in their arrangement. In other words, the magic of an apparatus is that it encourages us to see 'behind' the apparatus a larger order, which the parts merely 'express'.[20] By this view, the elements are 'sacred', insofar as they appear to have a pre-ordained purpose. But just as the elements of an apparatus can be removed from common use, so also can they be returned to common use. That is, although we are encouraged to understand the elements of an apparatus abstractly, as part of a plan, we can begin to take on the elements of an apparatus as 'handy' and 'useful', thereby 'disrupting' or 'detourning' their governmental function: in short, by 'profaning' the elements of an apparatus we can begin to participate in the world, rather than conforming to its apparent order. Crucially, for Agamben, to return to common use – to profane an apparatus – does not mean to return the elements of

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[20] One of the best discussions of this remains Timothy Mitchell's (1988) discussion of the 'exhibition' in his book, *Colonizing Egypt*.

an apparatus to their original, correct, or proper use. To do so would merely insert them within *another* apparatus, and to yet again separate 'action' from 'being'. To return to common use is instead to deactivate the governmental dimensions of things and turn toward the Open, what Agamben (2009) describes as "the possibility of knowing being, as such, by constructing a world" (pp. 16-17).

Elsewhere, Agamben (2014, pp. 68-69) productively speaks of this in terms of the middle voice, verbs "that are neither active nor passive, but the two together." These verbs are rarely found in Modern English. Drawing on Benveniste, Agamben notes that while the active voice "denotes a process that is realized starting from the subject and outside of it", in which the subject stands above the process as an actor, in the middle voice the subject is "internal to the process". *The subject is both the agent and the site of the action, being affected in its own act*. What Agamben finds attractive in this formulation is its radical transformation of the subject:

> Not a subject that uses an object, but a subject that constitutes itself only through the using, the being in relation with an other. Ethical and political is the subject that constitutes itself in this use, the subject that testifies of the affection that it receives in so far as it is in relation with another body.

In the middle voice 'action' is no longer separate from 'being'; thus, to act in the middle voice is not just the opposite of government, it 'deactivates' government and renders it 'inoperative'. Crucially, this is not an attempt to return to some original order in order to destroy it; rather it is a destitution without refusal, in which our mode of living, not the mere fact of living, is what is at stake.

> A life that cannot be separate from its form is a life for which, in its way of living, what is at stake is living itself, and, in its living, what is at stake above all else is its mode of living. What is at stake, then, is a life in which the single ways, acts and processes of living are never simply *facts*, but always and above all *possibilities* of life, always and above all potentiality.....[it is] to replace the ontology of *substance* with the ontology of *how*, an ontology of modality. The decisive problem is no longer 'what' I am, but 'how' I am what I am.

Ultimately, Agamben's response to apparatuses of government is not to reject them, but to *destitute* them – to return them to common use, not in order to govern life, but in order to live life as potentiality.[21]

VI

As a species of resilient infrastructure, oystertecture is intended to secure a mode of life – to govern life in a particular way. Located well offshore, secured from curious humans who might otherwise seek to collect or consume them, SCAPE's oysters are meant to manage crises, warding off the coming catastrophe. Despite the oyster festivals and oyster parades and despite volunteers' dreams of oyster farming, New Yorkers will be forbidden from visiting these reefs. The woman in the oyster hat will never see them, never touch them, and never taste them. Invisible and continuously at work, rising 'elegantly' with the seas, the reefs have a simple function: holding the seas at bay while presenting a calming image of a pacified world in which everything is 'okay'. The present becomes a time of waiting, outside history and without future.

If for Agamben there is a politics to be found, it is about reanimating history. When Agamben turns to the question of 'use', his goal is to free us from an abstract relation to apparatuses – a relation encouraged equally by apparatuses of government and critiques thereof – in order to return us *to* the world and the *concrete* exploration of the possibilities it holds. This implies a pragmatic, experimental practice that depends upon the groups practicing it and the places where they do so. Arguably, this is consistent with a conception of 'use' found in Foucault's work. For the Greeks, Foucault (1990) wrote, use (or non-use) of a body was governed not by moral interdiction or code, but instead determined by a

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[21] Here we note the value of ethnographic studies of infrastructure and 'logistical life', for what these studies reveal are the ways in which people and communities frequently 'deactivate' the governmental aspects of technical systems, in order to live 'as not' within them. In other cases infrastructure becomes the site of struggles for *inclusion* in an existing biopolitical order: as citizens, ratepayers, consumers. While this is not the return to 'common use' that we argue for here, these struggles should not be dismissed: it is often far better to be included within a valued form of life, than abandoned and placed outside it! See Nikhil Anand, this volume.

number of 'strategic' considerations – the time of year, the weather, one's social standing and age, in addition to one's training and ability. Use was not prescribed, but neither was it arbitrary – it was determined by what was possible, and what was not, as well as when, how, and with whom. Use had determinate conditions, not all of which were 'human' or 'social'.

Yet here we may need to go beyond Agamben, or at least extend his thought in new directions. What would it mean to 'profane' oystertecture, or to return it to 'common use'? Do we interpret this literally, in terms of putting oysters to *other* uses? Or is profanation more about an *orientation* to the world? And how might our analysis change when the elements of a *dispositif* are themselves living beings? Little if any of the growing literature on infrastructure *qua* government considers the question, and at least on the surface Agamben gives us few ways of thinking about it. This is not only because his interest in the animal goes no further than how the human-animal distinction is manufactured (see Agamben 2004). Nor is it only because his concept of use remains insistently anthropocentric, since for Agamben use almost always references the human.[22] Both of these matter, and we will return to them. But equally as important, Agamben limits his understanding of what an apparatus can do or become. This is evident if we return to Agamben's reading of Foucault, which is noteworthy as much for what it leaves out as for what it includes. As we saw earlier, Agamben begins by noting Foucault's initial definition of an apparatus as the elements and the system of relations that can be established between them. For Agamben, this constitutes the governmental machine that relentlessly separates 'action' from 'being'. But this is only the beginning of Foucault's definition. Curiously, Agamben skips over what comes next:

> ...Secondly, what I am trying to identify in this apparatus is precisely the nature of the connection that can exist between these heterogenous elements. Thus, a particular discourse can figure at one time as the programme of an institution, and at another it can function as a means of justifying or masking a practice which itself remains silent, or as a secondary re-interpretation of this practice, opening out for it

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[22] In this sense Agamben is consistent with much of Western metaphysics. See Derrida 1994. We thank Rosemary Collard for reminding us of Derrida's trenchant critique.

a new field of rationality. In short, between these elements, whether discursive or non-discursive, there is a sort of interplay of shifts of position and modifications of function which can also vary very widely.

We see here aspects that Agamben gestures to, but chooses to downplay. While he emphasizes that apparatuses can be 'profaned', he pays less attention to a different point: that apparatuses are dynamic and inherently generative.

Foucault's interviewer presses him on precisely this point:

Wajeman: So an apparatus is defined by a structure of heterogeneous elements, but also by a certain kind of genesis?

Foucault: Yes. And I would consider that there are two important moments in this genesis. There is a first moment which is the prevalent influence of a strategic objective. Next, the apparatus as such is constituted and enabled to continue in existence insofar as it is the site of a double process. On the one hand, there is a process of functional overdetermination, because each effect —positive or negative, intentional or unintentional— enters into resonance or contradiction with the others and thereby calls for a readjustment or a re-working of the heterogeneous elements that surface at various points. On the other hand, there is a perpetual process of strategic elaboration. Take the example of imprisonment, that apparatus which had the effect of making measures of detention appear to be the most efficient and rational method that could be applied to the phenomenon of criminality. What did this apparatus produce? An entirely unforeseen effect which had nothing to do with any kind of strategic ruse on the part of some meta- or trans-historic subject conceiving and willing it. This effect was the constitution of a delinquent milieu very different from the kind of seedbed of illegalist practices and individuals found in eighteenth-century society. What happened? The prison operated as a process of filtering, concentrating, professionalizing, and circumscribing a criminal milieu…" (Foucault, 1980, pp. 195-196).

In contrast to Foucault's understanding of apparatuses as generative, Agamben's reworking of the concept is more restrictive. Apparatuses order worlds, Foucault tells us, but they also

give rise to new desires, new subjects, and new politics that potentially escape to draw new lines of flight. In his own essay on the concept, Gilles Deleuze (1988) stresses precisely this aspect. For him, a *dispositif* is

> a tangle, a multilinear ensemble…composed of lines, each having a different nature…subject to *changes in direction*, bifurcating and forked, and subject to *drifting* (p. 159, italics in original).

While readers of Foucault frequently emphasize the matter of government – as does Agamben – we argue that this may be what interested him the least. Foucault was equally interested in what apparatuses were capable of becoming, the ways in which they could wander off in new directions, opening new 'urgencies' and new possibilities for strategic elaboration (i.e. new modes of government), but also how they continuously produced elements that *escaped* such elaboration. In his discussion, Agamben nods towards this movement, noting that an apparatus can produce 'elusive' elements, but he ultimately argues that today we simply witness the "incessant although aimless motion of this machine".[23] What Foucault helps us see is not only that one 'deactivates' and returns things to common use from *within* the movement of these apparatuses, but also that one does so from *within the new desires and possibilities that they unleash*, not unlike the practical possibilities that *overspill* the imagined infrastructures analyzed by Jensen and Morita (this volume). What mattered for Foucault first and foremost was not the operations of government, but the possibilities for life that emerged within and alongside them.

We emphasize this reading of apparatus not only because it complicates the temporality and ontology of 'government', but also because it provides a means for thinking about the doubling up of apparatuses today: the way in which living beings are now being enrolled in the administration of 'life' – the harnessing of capacities of some living beings (oysters) for the purposes of managing other living beings (humans). As apparatuses of government, oysters promise to produce certain effects – they attenuate the power of waves and storm surges, filter toxins from water, and hold together a set of underwater relations that are seen as essential for maintaining existing social and economic relations above water or on

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[23] Certainly this characterizes much of what occurs within the political rationality of 'resilience' today.

land. But are not oysters also living beings that, like humans, project themselves in and against their factical conditions? In other words, should we imagine that oysters will simply submit to their governmental function? Or will they *also* explore its possibilities to construct worlds?[24] Is this not an apparatus that is, literally, 'subject to drifting'?

The point is not just that oysters may refuse to be enrolled, in a fashion similar to Callon's (1996) famous scallops. Rather, the point is that oysters may 'use' us, rather than us 'using' them. Oysters are, after all, rather pragmatic creatures. They will affix themselves to all manner of surfaces – known as 'biofouling' when it clogs up infrastructure – and will conform to the shapes of whatever surface they happened to attach to as larvae: "an oyster growing in the neck of a bottle takes the smooth, regular curve of the glass, and on the claw of a crab an oyster shell sometimes follows all the angles and ridges and spines, as if it were made of wax instead of inflexible stone" (Brooks, 1996, p. 21). Nor do they conform to any particular size. Oysters can live for up to 20 years and can grow to 12 inches in length. That this surprises is only because a significant part of the oyster industry has been devoted to standardizing oysters with an eye to selling them to well-heeled consumers with discriminating tastes: not only were workers in the industry's early years employed to dilute the taste of salt water, rinse off mud, separate oysters from each other, and scrub off any biota still clinging to the shells, but oyster farmers calibrated precise methods for growing only 'pleasing' sizes and shapes, creating the now-familiar oyster we find in bars, restaurants and food markets (MacKenzie, 1992).

This leads to a key point. For Agamben, all living beings are *in* a form of life. But not all *are* a form-of-life, or have the possibility to be so. He tends to reserve the possibility of the latter for humans. Yet, there is no reason to assume that oysters do not share the same ontological conditions as do humans, whether understood in terms of 'conatus', 'temporality', or whatever other concept we use to capture this, nor that they do not also live in the middle voice. This is precisely the insight offered by writers like Nigel Clark and Myra Hird (2014) who note that other living beings have lifeworlds and trajectories that

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[24] This is precisely the possibility that Heidegger (1995) refuses the animal.

are overwhelmingly unknown to us, even as we rely on them. Moreover, these beings actively 'use' worlds we produce in order to construct worlds of their own. Unlike us, they do not have an abstract relation to the elements of an apparatus. To borrow language from Agamben, they are as just as likely to be an 'elusive element' that escapes its governmental function (and that puts us to new use!) as they are to be an element put to a 'governmental' use.[25]

At one level this returns us to a commonplace in infrastructure studies: enrolling oysters as infrastructure not only requires establishing the right conditions, it also requires continuous maintenance. This is rarely discussed in proposals to enroll living beings in the maintenance of human life. What oysters 'do' is assumed to be known in advance. That infrastructures work is due to no end of human labor – measuring, monitoring, maintaining and repairing, that is, all the work, knowledge and skill that is required to corral elusive elements and put them to work. Today the hope is to give oysters a new telos: instead of commodities, infrastructure. In stark contrast to the early 20th C oyster industry, which strove to remove oysters from their lifeworld, the wager today is that oysters as 'living breakwaters' will function properly by *creating* and *maintaining* this lifeworld.

Today, NY State is spending millions of dollars to do so in a desperate bid to save New York City from rising seas. There are no guarantees that any of this will work. Not only because oysters have no regard for the purposes of our all-too-human designs, but also because it may be impossible to make them live. This is a power that humans may not have, or may have long ago extinguished. Oysters today are functionally extinct through much of their original habitat. Long gone are the conditions that historically made their life in the Raritan and other waters possible: a rocky substrate, non-toxic waters, and so on. In their place exists a deserted ocean floor covered in black goo, ten feet deep in some places, cut through by shipping channels, with bottom sediments and water laden with PCBs and heavy metals, massive algae blooms, and the accretion of the 1.1 billion gallons of wastewater poured

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[25] In this sense oysters have the "potentiality to precipitate the new", much like the aquifers studied by Ballestero (this volume), but they do so in part by appropriating the worlds we incorporate them within.

into the harbor daily (Sam Janis, personal communication, April 17, 2015; Waldman, 1999, pp. 56-57; New York City Department of Environmental Protection, 2004). Even SCAPE's designers understand that the odds are stacked against them: "What we're looking for," Kate Orff explains, "is a spark, a critical mass enough to jumpstart life again in a place that is practically speaking dead" (personal communication, May 29, 2015). With the threat of ocean acidification looming, it may be too late to get the new ecosystem off the ground and able to reproduce on its own.

If there is a possible politics to be found in oystertecture, it may not be found in 'profaning' oysters – they do this on their own – but in a more radical recognition that returning to the world – returning things to common use – returns us to a world that exceeds us and which we do not control. If for Agamben, profanation means to refuse an abstract relation to the world, to refuse to imagine a plan that stands over and above our lives, to live in the middle voice, then perhaps we may have to give up something in exchange: the assumption of an ordered world that apparatuses themselves lead us to believe in. If apparatuses give us the appearance of an order that stands over and above its elements and its relations, then returning to the world is perhaps to return to a world in which such an order cannot be assumed. To live in the middle voice, acting so as to change ourselves in the acting, or to be 'a' form of life rather than 'in' a form of life, may at the same time require accepting the provisional, uncertain and unpredictable work of entering into experimental collaborations in which the outcome cannot be known or predicted in advance. It will require not ever more 'resilient' apparatuses to ward off the future, but rather to learn to inhabit capitalist ruins in a more-than-human world; ruins in which 'we' may not stand at the center. If *dispositifs* of resilience leave us suspended in an eternal present, then to jump start history may require that we be deliberately and explicitly post-apocalyptic, living as if the end of times has already arrived, and with it, the end of 'man' as we currently know him.[26] More than anything else, profanation may require profaning the sacred figure of the human.

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[26] Only the most privileged still imagine that the apocalypse lies off in the future. After the ravages of colonial capitalism, for billions of people the 'post-apocalyptic' is lived daily.

This may be most in keeping with our co-volunteers as we struggle to tie oysters to oyster stations off of Governors Island. "Life", Agamben (2016, 220) writes, "is a form generated by living." It is a process of experimentation *with* the world, within its determinate conditions. Oysters as infrastructure may confront us with is a lesson that goes beyond governmental apparatuses to destitution itself: that we make worlds within a world that is not 'for us', but 'for itself'. Ultimately, the construction of worlds – life lived in the 'middle voice' – occurs within *this* horizon, even if we continuously fail to acknowledge it. One can be obsessed with the end for a while, but....

References

Agamben, G. (1993). *The Coming Community.* Minneapolis: University of Minnesota Press.

Agamben, G. (2004). *The Open: Man and Animal*. Trans. K. Attell. Stanford: Stanford University Press.

Agamben, G. (2005). *The Time That Remains.* Trans. Dailey, P. Stanford: Stanford University Press.

Agamben, G. (2009). What is an apparatus? In *What is an Apparatus? And Other Essay*s. Trans. D. Kishik & S. Pedatella, Stanford: Stanford University Press, pp. 1-25.

Agamben, G. (2011). *The Kingdom and the Glory: For a Theological Geneology of Economy and Government.* Trans. L. Chiesa. Stanford: Stanford University Press.

Agamben, G. (2014b). What is a Destituent Power? *Environment and Planning D: Society and Space, 32*, pp. 65 – 74.

Agamben, G. (2016). *The Use of Bodies.* (Kotsko, A., Trans.). Stanford: Stanford University Press.

Braun, B. (2014) "A New Urban Dispositif? Governing Life in an Age of Climate Change. *Environment and Planning D: Society and Space*, 32: 49-64.

Brooks, W. (1996). *The Oyster*. Baltimore and London: John Hopkins University Press.

Callon, M. (1986). Some elements of a sociology of translation: domestication of the scallops and the fishermen of St. Brieuc Bay. In J. Law, ed. *Power, Action and Belief: A New Sociology of Knowledge?* London, Routledge, pp. 196-223.

Clark, N. and M. Hird (2015). "Deep Shit." *O-Zone: A Journal of Object-Oriented Studies, 1.*

Deleuze, G. (1988) "What is a Dispositif?" in *Michel Foucault, Philosopher*, ed. T. Armstrong. New York: Routledge, 159-168.

Derrida, J. (1994) *Specters of Marx*. Trans. Peggy Kamuf. Routledge.

Foucault, M. (1979). *Discipline and punish: The birth of the prison.* New York: Vintage Books.

Foucault, M. (1980). *Power/Knowledge: Selected Interviews and Other Writings, 1972-1977*. Gordon, C (Ed.). New York: Pantheon Books, pp. 194-96.

Foucault, M. (1990). *The History of Sexuality, Volume 2: The Use of Pleasure.* New York: Vintage Books.

Gandy, M. (2003). *Concrete and clay: Reworking nature in New York City.* Cambridge, MA: MIT Press.

Graham, S. and N. Thrift (2007). Out of order: understanding repair and maintenance. *Theory, Culture and Society*, 24 (3): 1-25.

Greenberg, P. (2014). *American Catch: The Fight for Our Local Seafood.* New York: Penguin Press.

Heidegger, M. (1995). *The Fundamental Concepts of Metaphysics: World, Finitude, Solitude*. Trans. W. McNeill and N. Walker. Bloomington: Indiana University Press.

Hetherington, K. (2016). Surveying the future perfect: anthropology, development and the promise of infrastructure. In Harvey, P, Jensen, C.B., and Morita, A, eds. *Infrastructures and Social Complexity: A Companion*. London: Routledge.

MacKenzie, C.L (1984). A history of oystering in Raritan Bay, with environmental Observations. In Pacheco, A. (1984). Raritan Bay: Its Multiple Uses and Abuses. American Littoral Society, New Jersey Marine Sciences Consortium, National Marine Fisheries Service— Proceedings of the Walford Memorial Convocation. Sandy Hook Laboratory Technical Series Report, 30, pp. 37-66.

MacKenzie, Jr., C. L. (1991). Biographic Memoir of Ernest Ingersoll: Naturalist, Shellfish Scientist, and Author. *Marine Fisheries Review, 53, 3,* pp. 23-29.

MacKenzie, Jr., C. L. (1992). *The fisheries of Raritan Bay*. New Brunswick: Rutgers University Press.

MacKenzie, Jr., C. L. (1996). History of Oystering in the United States and Canada, Featuring the Eight Greatest Oyster Estuaries. *Marine Fisheries Review, 58*, 4, pp. 1-78.

Marx, L. (1988/1844) *The Economic and Philosophic Manuscripts of 1844*. Prometheus Books.

Mitchell, T. (1988). *Colonizing Egypt*. Berkeley: University of California Press.

Moten, F. and S. Harney (2004). The University and the Undercommons. *Social Text*, 22, 2: 101-115.

New York City Department of Environmental Protection. (2004). New York Harbor Water Quality Regional Summary. Retrieved from http://www.nyc.gov/html/dep/pdf/hwqs2006.pdf

Ondaatje, M. (1987) *In the Skin of the Lion*. Toronto: McClelland and Stewart.

Orff, K. (2010). Reviving New York's Water -With Oysters! TED presentation. Video retrieved from https://www.ted.com/talks/kate_orff_oysters_as_architecture?language=en

Orff, K. (2014). Rebuilding Eco-Infrastructure. TEDx Gowanus presentation. Video retrieved from https://www.youtube.com/watch?v=NZPT5mgzOCU

Pritchard, E. T. (2002) *Native New Yorkers: The Legacy of the Agonquin People of New York*. San Francisco, Council Oak Books

SCAPE / Landscape Architecture. (2013). Rebuild by Design/ Living Breakwaters (IP Report, Staten Island and Raritan Bay). New York: Rebuild by Design.

SCAPE / Landscape Architecture. (2014). Final competition boards submitted to Rebuild by Design jury. Retrieved from https://www.dropbox.com/s/ajage4uml9ja55s/SCAPE_Final_Boards_140327.pdf

Schmitt, C. 2003. *The Nomos of the Earth in the International Law of the Jus Publicum Europaeum*. (Ulmen, G.L., Trans.). New York: Telos.

Wakefield, S. and B. Braun (2014). Governing the resilient city. *Environment and Planning D: Society and Space 32, 1,* pp. 4 – 11.

Waldman, J. (1999). *Heartbeats in the muck: The history, sea life, and environment of New York Harbor.* New York: Lyons Press.

Wissler, C (1909) *The Indians of Greater New York and the Lower Hudson (Anthropological papers of the American Museum of Natural History, Volume III*). New York: American Museum of Natural History, 1909. p. 8.