CHAPTER 2

Resilience: The Power of Interactive Life

Introduction

In the introductory chapter we analysed how Anthropocene thinking draws upon and thinks with islands as key figures for engaging the central concerns of relational entanglements, awareness and feedback effects. Thinking with islands stands in direct opposition to the homogenising and universalising approaches of 'mainland' modernity. In this chapter, we focus upon the sphere through which island approaches have most prominently entered mainstream debates about the Anthropocene: *Resilience*. Our key argument is that Resilience reflects a paradigm shift towards a relational ontology which centres upon the immanent interactive potentialities of life itself – an approach which is not merely illustrated by island life, but which, as we examine, is analytically derived from particular ways of engaging and thinking with islands. In Resilience, the world is beyond our powers to command and control in the way of modern reasoning. Instead, the immanent potentialities and processual becomings of (island) life itself becomes a self-organising problem-solver, bringing about adaptation and order out of chaos. For Resilience ontologies, interactive (island) life is understood as becoming more efficient and harmonious, rather

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than entropic and disordered, thereby articulating an alternative or immanent telos of development and change. Here, islands and island cultures have become important symbols of hope in debates about the Anthropocene for the wider world to learn from, and to give Moderns a second chance to learn how to adapt to and even to gain from, the forces of planetary change.

The first section of the chapter highlights the importance of understanding Resilience as a relational ontology which challenges the universal assumptions of linear causality and technological progress which underpin modernist policy approaches to governance. The second section draws out the analytical content of this ontology, focusing upon the most widely understood and discussed facets of island life – the powers of diversity, differentiation and interaction, and the key assumptions informing them: of interdependency and feedback effects. The concluding section turns to how some contemporary approaches are developing or extending this immanent island relational ontology to the more quotidian or 'everyday' interaction of what we call 'Patchwork' island ontologies, which are then taken up and examined in more detail in Chapter 3.

Resilience as an Ontology of Adaptation

Resilience ontologies, as deployed in contemporary governance discourses, mark a major shift from earlier, modernist constructions of environmental and resource care, particularly those of 'sustainability' (O'Brien, 2017;[1] Wakefield, 2020). Prior to the move towards the problematic of relational entanglements, awareness and feedback effects, which today dominates Anthropocene thinking, concerns for environmental care were discursively framed in more top-down and managerial ways (Chandler and Pugh, 2020a; Wakefield, 2020). These were focused upon stability and equilibrium; in attempts, for example, to balance competing concerns, to produce with greater efficiency, or develop new materials or techniques (Derissen et al, 2011; Rist et al, 2014). In these older framings, there was a fixed set of assumptions about

relations and therefore a greater confidence in an external perspective for managing or predicting changes in resource consumption and use. Here, islands were frequently constructed as being marginal and on the periphery of international debate, and often in need of saving by others (Farbotko, 2010; Cameron, 2011; Proctor, 2013; DeLoughrey, 2019). As we explore in this chapter, these older discourses of stability and constancy, and their concomitant assumptions of knowledge and control, highlight a 'mainland' approach which assumes a universal or 'one world' ontology of linear causality with fixed entity properties and law-bound relations. Resilience thinking in the Anthropocene works through the development of an alternative set of ontological assumptions about the world and its constitutive relationality; challenging the modern perspective and repositioning islands much more centrally within international debate.

Our focus in this chapter is how Resilience approaches utilise the science of relational feedbacks to generate solutions by drawing upon the dynamic powers of interactive life. Resilience is often defined as: 'the capacity of a system, community or society to resist or change in order that it may obtain an acceptable level of functioning and structure' (United Nations, 2004: Ch.1, S.1, 17). Or similarly, as 'the ability of groups or communities to cope with external stresses and disturbances as a result of social, political and environmental change' (Adger, 2000: 347). Such definitions reflect the central tenets of the seventeenth-century Latin word *resilire*: meaning the ability of physical materials to rebound and recoil (Reid, 2017), or 'leap back' (Gunderson et al, 2010: 64), into their original shape after the exertion of an external force. Whereas modernist framings of the world understand life to be composed of fixed entities, which possess discrete properties or essences, Resilience ontologies see life as a dynamic process in which entities are always in relation. As anthropologist and cybernetician Gregory Bateson (2000: 457) puts it: 'the unit of survival is a flexible-organism-in-its-environment'.

This focus upon the relational, processual or interactive ontology of life can be traced through a number of fields, from the biological

science of evolutionary Darwinism to the physics of thermodynamics, and later interdisciplinary sciences of systemic interaction and cybernetics (Holland, 1998; Johnson, 2001; Harford, 2011). As we will discuss in the next section, the history of evolutionary biology has been particularly important in positioning islands as central for the generation and production of ontologies of Resilience. Both the theory of evolution and theories of thermodynamics suggest that 'life' can be cast as a struggle for order or system maintenance against the natural forces of entropy or decay (Darwin, 2010; Bateson, 2000). Thus, existence or continuity is not something that can be taken for granted but can be better grasped as processual change: as a product of iterative work and interaction. In other words, being is understood as a process of becoming or emergence. As Resilience theorists often comment, an 'equilibrium-focused view is attractive to humans', but 'it fails to capture the behavior of complex systems' (Gunderson et al, 2010: 230). Resilience theory is thus concerned with the 'nonlinear dynamics of complex adaptive systems' (Gunderson et al, 2010: 230; Svedin and Aniansson, 1987; Gunderson, 2001).

Rather than a linear unidirectional understanding of causality, where causal relations have already been set in motion and merely work themselves out across time and space (as in Newtonian physics), Resilience approaches see life as a product of interaction and therefore as less predictable and with more possibilities for alternative developmental pathways (Holling, 1973). They reject modernity's operating frameworks of command-and-control and instead focus upon the dynamic potentialities of interactive life. It is here that islands in particular are widely understood as extremely productive sites for understanding and developing Resilience, understood as a set of adaptive capacities. Islands are regularly framed as:

> paradigmatic places of human–environment relationships. Island livelihoods have a long tradition of existing within spatial, ecological and ultimately social boundaries and are still often highly dependent on local resources and social cohesion. Island cultures and their rich biocultural knowledge can be an important basis

> for revitalizing and innovating sustainable human–nature relationships … islands can serve as real-world laboratories. (Kueffer and Kinney, 2017: 311)[2]

For Resilience ontologies, the whole island system, including island ecosystems *and* cultures, will always be more than the sum of its parts (in contrast to reductionist, modern and atomised understandings of life) (Barnett, 2001[3]; González et al, 2008). In this way, the feedback effects necessary for complex self-adaptive individuals, communities and systems to operate efficiently are said to enable adaptive transformative effects. It is the power unleashed by complex system relations that needs to be understood, accessed, redirected and repurposed. Thus, it is broadly understood that island cultures also exemplify the dynamic relational ontology of interactive life which is central to Resilience thinking:

> Despite the rich cultural diversity across and among the subregions of Micronesia, Melanesia, and Polynesia, at the center of what we believe it means to be human is a shared life philosophy of balance, harmony, and deep connectedness. Our epistemologies, knowledge systems, and practices are premised on relational spaces – hermeneutical dimensions of life worth living... (Vaka'uta et al, 2018: 127)

For Resilience analytics, this relational knowledge and interactivity, exemplified by island ecosystems and island cultures, is a valuable resource (Nicks, 2017). Indeed, it has become central for research and practice concerned with unlocking and enabling the resilient potentialities of (island) life to emerge (Salick and Ross, 2009; Raygorodetsky, 2017). Resilience operates on these potentialities of island life and cultures, by drawing out how resilient capacities are part and parcel of a whole island socio-ecological system accessible to and used by islanders (Percival, 2008). In a world where it appears that the application of human science and technology to control or direct nature has undermined natural processes of regulation – including the catastrophic unintended consequences of climate change and global warming – Resilience

seeks to slow down this runaway process by restoring more power to (island) life itself; seeking alternative ways forward that redistribute understandings of agency:

> As a home to important flora and fauna, with rich cultural roots and heritage, island communities are often characterized by their deep social ties with the natural environment. However, due to environmental degradation, impacts from climate change including slow (e.g. sea level rise) and sudden (e.g. hurricanes) onset events and the associated changes to livelihood structures and opportunities, islands throughout the world face increasing threats. In order to understand and appropriately address livelihood risks in these communities and to identify opportunities for resilience-building, there is an urgent need to shed light on the historical and cultural context of island societies and ecosystems. These approaches should build upon local and traditional knowledge and be grounded in established practices developed by island communities over centuries which continue to be heavily impacted by current political and economic trends. (De Souza et al, 2015: 3)

For Resilience analytics, islands and island cultures are key to teaching the rest of the world how to adapt to transforming planetary conditions (De Souza et al, 2015; Kueffer and Kinney, 2017; DeWeerdt, 2019). Thinking with islands and island cultures is said to challenge understandings of a world framed in terms of a top-down modern telos of progress, and human/nature hierarchies, instead foregrounding a relational ontology of interactive life. Thus, for those who research regions which are dominated by island life, like the Pacific:

> More significant than their exposure is the resilience of Pacific Islanders. The practices and knowledge associated with their resilience to environmental variability and unpredictability in the past suggest an adaptive capacity that is relevant to addressing the social-ecological effects of climate change now and in the future. Because of local limitations on resources and tight feedback loops, small island communities often see the limitations of

> their environment more readily, more quickly understand how anthropogenic and natural influences affect resource availability, and adapt accordingly. (McMillen et al, 2014: 1)

Once understood as secondary to modern, 'mainland' thinking, and even at times populated by 'savages' (Malinowski, 1921:1; Gillis, 2004, McMahon, 2016), in contemporary debates about the Anthropocene the situation is being reversed. It is increasingly islands and islanders which have become important sites of interactive life, interdependency and feedback effects and, thus, of resilient life:

> Pacific islanders living on atolls are already negatively affected by climate change, facing threats to available fresh water and food. Yet the long-term familiarity with the variable nature of the atoll environment, where survival is held in a tight feedback loop with this unforgiving environment, has led to the development of adaptive and flexible resource management regimes which could provide a model for global responses to climate change. (Salick and Ross, 2009: 138)

Similarly, for Nakashima et al (2012: 11):

> Small island societies have lived for generations with considerable and often sudden environmental change. The traditional knowledge and related practice with which small island societies have adapted to such change are of global relevance.

As Kelman and Randall (2019: 354) say, '[i]sland societies are often touted as being especially resilient'. Thus, today leading organisations, like Thompson-Reuters, regularly ask the question: 'How are small islands innovating to become more resilient in the face of growing pressures?' (Thompson Reuters Foundation News, n.d.). It is widely held that the rest of the world can learn a great deal from the answers (Rowling, 2017). The intensive focus is not confined to islands in the 'Global South'. Indeed, from the Dutch Wadden Island of Vlieland (Galle, 2017), to Tilos in Greece

(Cordis, 2018) and Denis Island in the Seychelles (Nwanze and Sinon, 2013), islands have become arguably *the* figures of Resilience in the Anthropocene. From large-scale European Commission programmes like Clean Energy for All Europeans (European Union, 2019) to the recent success of the Netflix series 'Islands of the Future' (Filmproduktion and Arte G.E.I.E., 2016), there is a wide focus upon the Resilience capacities of islands and islanders from across the world. The running narrative of the five episodes of 'Islands of the Future', covering El Hierro, Orkney, Madeira, Iceland and the Danish island of Samsø, is that resilient technologies emerge on islands, more than elsewhere, because there is something essential to islands, at the level of ontology, which makes them particularly powerful candidates for resilience. For Gleb Raygorodetsky (2017: 264), in his book *Archipelago of Hope*, focusing upon islanders' own 'stories of resilience' gives us 'our best chance to remember – or learn – how to care for Earth in a way that keeps it healthy for our descendants' (Raygorodetsky, 2017: xix).

Today, in short, to foreground the vulnerabilities of islanders is increasingly said to 'downplay the resilience of communities, cast[ing] them as powerless … [something which risks reifying] … relationships of inequality between the powerful and weak through paternalistic interventions to "save" the powerless Other' (Mortreux and Barnett, 2009: 106). The relation between mainland and island has been reversed, with islands and islanders, significant sites for thinking through the relational interactions and resilient capacities of life itself, coming to the fore. 'Recent academic research has been increasingly moving beyond "doom and gloom" headlines to instead frame islands as sites of livelihood resilience to the impacts of climate change and disaster risk' (De Souza et al, 2015: 15).

A New Ontology of Interactive Life

Many readers may be familiar with the above types of analysis and approaches which foreground how important islands and island

cultures are for the development of ontologies of Resilience. They may be aware that much of the very earliest Resilience theory was developed on islands (for examples, Gane, 1975; O'Keefe and Conway, 1977; Lewis, 1984; Campbell, 1984). But we think it is important to understand this well-known, productive relationship between Resilience and islands not as a one-sided process in which islands are reduced to 'blank spaces' or 'laboratories', and Resilience narratives are simply imported or imposed upon them, tried out and tested. The geographical form of the island and island cultures is doing important 'work' in these debates too. The key argument of this book is that island work and thinking do not simply follow in the *slipstream* of contemporary Anthropocene thought, but play a notable role in its development. Thus, we think it is important to understand the shift to reposition islands and islanders as exemplars of Resilience thinking as more than merely the by-product of a waning faith in modernity in the West. This would be to deny the work that widely held understandings of island life and island cultures themselves do in shaping Resilience ontologies and Anthropocene thinking. It would be to deny that thinking with certain geographical forms and cultures matters for the generation of thought and practice in the world. So, in the rest of this chapter, we will expand the analysis to engage with why and how Resilience thinking can be better understood once it is seen to be closely imbricated with an island ontology.

As noted in the last chapter, Darwin's understanding of the evolution of life profoundly overturned modern frameworks of reasoning associated with a telos of linear progress and a fixed human/nature divide, instead focusing upon how speciation and diversity emerges from the differentiating forces and co-relational entanglements which generate all life on Earth. As Cary Wolfe (2017), Timothy Morton (2017) and Stacy Alaimo (2010: 158), have all pointed out, Darwin's thinking with islands 'may have given us our first glimpse of the always already "posthuman"' (see also Alaimo, 2016). This is, of course, one key reason why many of these high-profile contemporary scholars are increasingly returning to Darwin in debates about the Anthropocene. But why did

this radical new relational ontology emerge from Darwin engaging *island* life in particular? Because, for Darwin, islands – which are separate from the mainland and the homogenising forces of modernity – are seen to intensify or amplify relational entanglements and effects. Islands can therefore be understood as distinctive in that they are more clearly and obviously engines of differentiation or 'individuation' for the productive relational dynamics of life itself.

Thinking with islands was a central part of Darwin's development of the theory of evolution as a theory of diversification and differentiation, rather than a modern and hierarchical theory of linear progress (Quammen, 2018a). Darwin was extremely enthusiastic about how this 'island effect' was key to unlocking his revolutionary understanding of life, as his correspondence and personal notebooks regularly illustrate:

> 'Why is life short,' he asked, omitting the question mark in his haste. Why is reproduction so important? Why do animals of a given kind tend to be constant in form across an entire country but to differ at least slightly on separate islands? He remembered the giant tortoises on the Galápagos, where his stopover had lasted only thirty-five days but catalysed an upheaval in his thinking. He remembered the mockingbirds too … Did creatures somehow become different when isolated? Put a pair of cats on an island, let them breed and inbreed there for generations, with a little pressure from enemies, and 'who will dare say what result,' Darwin wrote. He dared. The descendants might come to look different from other cats, might they not? (Quammen, 2018a: 5–6)

It is well known that 'Islands have inspired a large number of scientists to develop key ecological and evolutionary theories.' (MacArthur and Wilson, 1967/2001; Borges, 2018: 1214; Patino et al, 2017; Mathews et al, 2019; Berry and Gillespie, 2019). It is commonplace to examine how species diversity is affected by the properties of islands and archipelagos (Triantis and Matthews, 2020). Important here is how evolution occurs in relatively isolated relational contexts; and how island separation from

mainlands can be seen as intensifying or amplifying this power of relation and feedback effects; while modern frameworks of reasoning, in contrast, attenuate the importance of relation, flattening existence, homogenising life to modernity's disciplinary norms and values. As Elizabeth Grosz (2004: 7) says, in contrast to modern reasoning, Darwin's 'founding presupposition' is that as time and life move forward this 'generates more rather than less complexity, produces divergences rather than convergences, variations rather than resemblances'.

For Darwin, evolution, differentiation and the richness of speciation – revealed by thinking with the power of islands – occurs through relations of co-dependency and this makes island life appear more creative and adaptive. As Elizabeth Hennessy (2019) has argued, the Galápagos islands where Darwin worked are emblematic sites of relational entanglement. Darwin's relational thought and understanding of life emerged from thinking with islands as radically alternative material sites of investigation. Since then, islands have become the most obvious differentiating mechanisms of life across the academic disciplines. Islands *reveal* how life is adaptative to its surrounding environment. In demonstrating this, the early or prototype posthuman relational ontologies developed by Darwin blurred the divide between life/environment, pointing the way towards how all life on Earth can be characterised in terms of relational entanglements: as an interdependent, interactive, non-linear, processes of becoming.

Interdependency

In the seminal works of Darwin, island space is conceived as relational and in a constant state of becoming, and therefore as more dynamic and open to adaptive change. However, it matters how relational interaction is understood and how relations are put at risk or excluded. As we will see in this book, there are many ways of thinking about the key problematic of the Anthropocene and relational entanglements – on one level, not many people would disagree with the truism that entities are in relations with others,

all life is dependent on other entities for sustenance, oxygen, warmth and so forth. Therefore, it is no surprise that within the massive range of Resilience literature today it is also the case that relational effects and implications can be grasped in different ways (Pelling and Uitto, 2001; Joseph, 2013; Chandler, 2014; Pugh, 2014; Evans and Reid, 2014; Grove, 2018; Wakefield, 2020). But what we wish to isolate analytically in this chapter is the productive grounding of engaging and drawing upon islands for today's relational thought in the Anthropocene, specifically as taken up in understandings of Resilience as adaptive change and transformation.

Central here is how relational interaction, highlighted in the key trope of 'feedback effects', is at the heart of island ontologies and epistemologies. What is it about islands that foregrounds the importance of feedback effects so powerfully? There are two related answers. First, is the *high level of interdependency*. Islands are (to varying extents) isolated from mainlands. This means that there is a greater dependency on immediate relations, and it is why islands, as noted above, are regularly characterised as 'paradigmatic places of human–environment relationships' (Kueffer and Kinney, 2017: 311; Bridges and McClatchey, 2009). Historically, in a crisis situation, you cannot just phone for deliveries or expect some external agency to intervene or assist. On the one hand, there is therefore the long-held trope of greater island self-reliance (Wilson, 1973; Goffman, 1978; Watts, 2018). This is the reason why, in modernist island tropes, such as that of *Robinson Crusoe*, the autonomous individual is foregrounded; and why those who have settled on islands more generally are said to demonstrate 'a long-term resilience borne of a basic human capacity to endure hardship' (Percival, 2008: 4). On the other hand, it is also clear that self-reliance is, in fact, a highly focused and situated dependency, or rather set of dependencies. Local resources and threats to these resources need to be understood in their specificity. Greater attention must be paid to the smaller and more tenuous modes of being of others. When time and resources are necessarily in short, contingent, or at least seasonal supply, life is necessarily one of adaptation.

It is because of the need to focus upon these details and nuances of relations on islands that Laura Watts (2018: 198) defines being an islander as a 'shared experience of making practical ad hoc solutions to similar problems'. Here, for Watts (2018: 75–76), the islanders of Orkney exemplify the self-sufficient resiliency of islanders worldwide:

> … infrastructure breakdown is just mundane, not cause for a social media meltdown. People shrug and clean out the grate in the stove and get it lit with a spare bag of coal. Many are on gas bottles or oil-fired cookers and heating, running from large buried oil tanks that do not blink when the electricity does. There are backup generators at the hospital, of course. Farmers and other businesses have invested in their own diesel generators and just keep going. I remember a nice story in the newspaper about a morning whip-round for some island generators to allow a wedding to go ahead that afternoon, despite an unexpected summer blackout. Surprisingly, on-grid wind turbines stop working when the power goes out (which seems like a major design flaw); wind turbines are not quite the road to self-sufficiency some might imagine. When the infrastructures considered essential to modern living fail, [Orkney Islanders] carry on with their modern lives, just wearing an extra jumper. Although communication, energy, and transport infrastructures are all but broken in the storm, civilization carries on. Despite what dystopian science fiction writers might suggest, when the lights go out, there is no apocalypse, no zombies, no drama. The Energy Islands are resilient, and suggest resilience is possible even when modern infrastructures are not.

Resilience ontologies draw heavily upon the idea that island life is by necessity relational, in the sense that survival is always a matter of being more than an entity, more than an individual, more than a set of fixed essences, tastes and preferences. For some commentators, this means that dynamic adaptive interdependencies literally force entities to 'become-other' – to hone and specialise their adaptive capacities in relation to other relations of 'becoming-other'.

As Rubow (2018: 38) writes, with regard to how cyclones are experienced on islands:

> There, on the ground, when sea and atmosphere evolve into a grand air and water pump, winds whip the waves white and force them into powerful cyclical movements that can reach 20 meters or more in the open ocean. Sea spray batters vegetation, rips foliage off trunks and branches and deposits them like a thick brown plaster on windward walls. In the low pressure on the ground, cars, roofs, stones, sand, windows, trees, doors and people enter an extreme, shaking state of culturalnatural hybridity in the Latourian sense in which humans and things are inextricably connected … It may be possible to hold a 'modern' or 'global' perspective on things on a fine clear day, and at a distance to see a cyclone as a discrete weather-object. But when the loud howling noises, the invading waters and crushing boulders enter one's house, the hybrid mess of things and humans is impossible to overlook.

In this kind of work, island life is capable of enabling forms of thought and practice which do not rely on modernist abstractions of linear causality or illusions of empty grids of time and space. As Wolfe (2017) and Quammen (2018b) say, island forms of being and becoming literally take us into 'more-than-human' or processual and relational worlds, in ways that modern or 'mainland' experiences cannot so easily access. Such thinking is highly generative for contemporary Resilience design processes. For Robertson (2018: 50–51), the point is obvious when we think with islands: 'the ocean and its rhythms, the endless sound of the waves breaking on the reef, and the tides, constantly contracting and expanding around the islands like a heartbeat, feature in most aspects of daily life'. The observation becomes even more apparent for those who return to an island after living on a continent for a while:

> When I enter the ocean, my indigenous identity emerges. I become a historical being riding waves, running as a liquid mass, pulled up from the deep and thrown forward with a deafening

> roar. I disappear with fish and strands of seaweed as I course through veins of the ocean currents … Hitting that first wall of water, I become a Kanaka Maoli (Native Hawaiian) surfer. I ride waves; read the wind, swell directions, and tides; know the reefs and the seasonal sand migrations; and find myself most comfortable floating atop a board with my *na'au* (gut), mind, and heart facing the sea. (Ingersoll, 2016: 1)

Such examples are illustrative of how it is frequently said that Indigenous islanders in particular 'don't see nature as separate from people' (Lakpa Nuri Sherpa, quoted in Forest Peoples Programme, 2019). They offer 'a worldview that privileges not just the perspective of other men, but of other living beings—of trees, animals, oceans and stars.' (His Highness Tui Atua Tupua Tamasese Ta'isi Efi, 2018: x). Thus:

> Climate has always been important for Māori. It affects the winds, waves, and ocean currents, influences which plants, trees, and birds are found in various parts of the country, and impacts the social, economic and cultural well being of individuals and communities. Through the generations Māori have built up extensive knowledge of local climate, from the character of local winds and rain to the forecasting of drier and warmer summers. These forms of knowledge have traditionally helped to make important decisions about the best time to farm, fish and navigate, among other activities. (National Institute of Water and Atmospheric Research, quoted in Percival, 2008: 13)

By contrast, '[i]n the developed world', Salick and Ross (2009: 138) argue that the 'loss of traditional cultures and perspectives has led to a disconnect between people and nature'. Therefore there is a close connection between imaginaries of tightly knit interdependencies of island ontologies and what is popularly understood as Indigenous cosmologies, which are similarly said to be immersed in practices of process and relation: 'Indigenous peoples have often been found to have intimate familiarity with the natural rhythms and processes of their ecosystem' (Salick and Ross, 2009: 138).

Feedback Effects

Thus, we can see islands as not merely demonstrating the interdependency of all life, but, more importantly, particularly in terms of Resilience ontologies, the ways in which adaptation operates as an interactive process of mutual feedback. Here our main claim in this chapter is that drawing upon and thinking with islands and island cultures has become powerfully important for the development of Resilience approaches in the Anthropocene. The second and related aspect that it is important to highlight here is *the meaning and importance of feedback for ontologies of Resilience*. Feedback effects can be understood as intensifying relations between relations: binding life together in a process of interactive development. It is this process of interactivity – of mutual feedback effects – which enables some of the island capacities and affordances noted by Darwin, in terms of speciation, i.e. the differentiation or individuation of species.

Islands, as we have said, are significant sites for understanding relational entanglements as the overarching problematic of contemporary Anthropocene thinking. It is therefore not surprisingly that this focus upon 'the conceptual power of islands' has significantly intensified in recent years (Graham et al, 2017: 323).[4] Islands as isolated communities of interdependency can intensify relations of feedback in relational entanglements, as small differences in climate, habitat or food ecologies can be magnified through a high level of interactive relation. Feedbacks are the way in which we understand the mediation of these multiple and ongoing interactions, as changes in environment or actions of other agencies evoke changes, in habits or behaviours, in other entities. Feedbacks then make the world or are a way of describing how the world makes itself or comes into being through relational interaction. In this way, islands can be understood as self-making communities. This is not autonomous self-making or autopoietic but, as indicated above, more accurately, a set of sympoietic communities of becoming and 'making-with' (Haraway, 2016: 58).

In developing this point it is useful to highlight that the endorsing of a relational Resilience ontology does not necessarily imply being anti-technology or against the human repositioning or redirecting of relations. Despite what could be inferred from the strong focus upon resilient Indigenous islanders in these debates, it is important to grasp the core analytics of contemporary Resilience in the Anthropocene. Neither does Resilience thinking with islands today align well with that of *The Island of Dr. Moreau* and H. G. Wells' 1896 version of Darwinian naturalism (2005), which comes with the moral lesson that humans should not interfere with 'nature'. For, as we have said, in contemporary Resilience discourses the key analytical point is that there is no strict human/nature hierarchy, and therefore no pure and separate 'nature' to be interfered with. The more-than-human is always already relationally entangled with the human after the end of the world – once the environment could not be stood apart from and grasped by way of modern framings of a human/nature separation. Thus, many contemporary Resilience approaches reposition and adjust feedback effects and rework relational entanglements in new ways. It is here that island life takes on even more important purchase and power, becoming generative of new ways of being resilient in the Anthropocene.

For example, in 2017, during the Tallinn Architecture Bienniale (TAB), ecoLogicStudio curated and designed an exhibition entitled *Anthropocene Island* (ecoLogicStudio, 2017a). This project involved architect-researchers, artists and scientists looking at the former Soviet military base at Paljassaare, on the contaminated peninsula in Tallinn. This is the site of a large wastewater treatment plant and landfills, and has been designated part of the European Natura 2000 network as an important nesting site for migratory birds. Concerned that understandings of the Paljassaare Peninsula were being shaped by two outdated and conflicting ideologies – on the one hand, the site as an illusionary wilderness; and, on the other, commercial development into an ideal green city – *Anthropocene Island* sought to challenge these ways of understanding human–environment relations as 'deeply

conservative' (ecoLogicStudio, 2017a). Framing the site as existing at the 'inevitable frontier of future urbanity' (ecoLogicStudio, 2017b), *Anthropocene Island* 'speculates on how from such a controversial site the origin of a new notion of bio.City may emerge' (ecoLogicStudio, 2017a).

The central thrust of the project was that island life exemplifies the creative or 'emergent' powers of life that cannot be accessed directly by way of modern frameworks of reasoning. The curators argued that when we view islands from the different perspectives of orbiting satellites, or micro-organisms, we see that islands are composed of intricate webs and assemblages of human and non-human co-relations. *Anthropocene Island* instead sought to develop:

> … a non-anthropocentric view of the urban. From this perspective cities and their morphologies are mostly determined by flows of matter, information and energy that fuel their metabolisms. This shifts our attention from looking at urban form (figure ground) to the morphogenetic process that underpins the current morphology of an urban landscape: we can look at cities as living systems. (ecoLogicStudio, 2017c)

Anthropocene Island was about working with, enhancing and designing systems of biosensors, membranes and 'digestive apparatuses' which enhance Resilience within the complex human and non-human relational entanglements of the Anthropocene. Bringing together disciplines of biology, computation and urban design, and organised through a range of scales from the vastness of the Baltic Sea to the micro level of algae, *Anthropocene Island* explored the possibilities for designing new 'resilient topographies' (Barnett, 2017) which:

> promote a new urban morphogenesis whereby Tallinn's urban wastewater infrastructure deeply affects the biotic substratum of the peninsula. The resulting 'contamination' becomes a morphogenetic force, inducing an artificial hyper-articulation of the landscape and its living systems which will evolve into a digestive

> apparatus or membrane. Pathogens are re-metabolized, diluted or captured by augmented ecosystems; infrastructural networks thicken into filtering surfaces, which in turn fold into convoluted epidermis populated by a large amount of biochemical reactors. (ecoLogicStudio, 2017a)

The purpose here is to understand islands as living, interdependent, interactive systems of human and non-human co-relations and feedback effects. In thinking *with* islands as important sites of relational entanglements, a different and more dynamic ontology becomes apparent which feeds into the development of contemporary analytics of Resilience.

Immanent Life

In Resilience ontologies, islands are often understood as isolated systems where relations of interdependence and interactive feedback establish an internal set of immanent processes which shape or guide the direction of emergent causality. It is the differences between islands and their unique systems of inter-relation that come to the fore, as they did for Darwin and many others, rather than universal laws of development or coexistence. Life itself is seen to work in island ways; where differences make differences and life appears as the interactive power of difference-making, differentiation and individuation. Thus, while there may be universal laws of nature, these can be grasped only in abstraction; in concrete contexts it is the interactive and lively effect of individuation that is the most important aspect. Thus, relational approaches often draw upon imaginaries of island systems of close interdependencies, enabling them to emphasise the importance of context, of relationships, of the powers of entities to affect and become affected, rather than thinking of entities in terms of essential properties and fixed causal paths in empty grids of time and space.

We wish to emphasise that this ontology of interactive life foregrounds *immanence*: stressing relationships as having a

generative and creative power rather than merely being expressions of Newtonian mechanical causality. In immanent framings of life, entities make a difference not as autonomous self-making rational subjects, but as collective interacting agencies joined by virtue of the fact that their interaction is itself the process of 'life'. In thinking with islands, as we have shown, entities are always 'more-than' isolated entities with inherent properties, but always in relation and always 'becoming'. This is because they are constantly adapting to, affecting and being affected by, other agencies and entities. Concomitant with this interaction, the environment then not only shapes the becoming of entities, it *is* the becoming of entities through their interaction. The environment, in an immanent ontology, is no longer a passive object or background but active and indistinct from the actors in the foreground. In experiencing life as interactive, the core binary divides of modernist or mainland understandings become blurred and indistinct, and therefore increasingly problematic. These are the divides between figure and ground, subject and object, agent and structure and organism/entity and environment. Island thinking – which foregrounds thinking with interactive relations – is not merely a matter of adding more things or entities to concerns but crucially provides *a different ontology of the world*.

The contemporary framing of debates and forms of Resilience, such as the example of *Anthropocene Island*, centre upon the immanent interactive potentialities of life itself – an approach that is not merely exemplified by island life, but which, as we have seen, is analytically derived from thinking with islands. This represents an important change in direction from the earlier sustainability approaches we noted above, which sought to contain the radical shifts heralded by the Anthropocene and to maintain existing forms of life to ensure a 'happy ending' for modernist ideals of progress (Tsing, 2015). Today, the focus is increasingly moving in the direction of 'staying with the trouble' (Haraway, 2016), stressing contingency and the work of governance as one of continual care and responsivity. Indeed, in the relational ontologies of Resilience, there is increasingly less of a focus upon islands and islanders

existing as harmonious, self-regulating adaptive systems, and more upon the work that this requires of islands and islanders: harmony is the product of constant attention to new configurations, threats and opportunities. Thus Resilience is not so much about ways of using resources most efficiently or sustainably but of becoming sensitive to changes and shifts in environmental relations: a way of coping or living on after 'the end of the world'.

One particularly good example of this is Watts' (2018) acclaimed book *Energy at the End of the World: An Orkney Islands Saga*. For Watts, the key thing about island life is that the environment is not passive, but one of processual, immanent becoming, which blurs the binary between humans and nature. However, Watts is less focused upon 'happy endings' and more concerned with life in the Anthropocene as a condition which we are all *already* in; one requiring a pragmatic alertness to the need for constant adaptation. If there is hope here, then this remains in the creative potentialities of everyday life, which, as we have already noted above, for Watts, are exemplified by island life. But here the approach has shifted to one of pragmatic world-making, rather than of tapping into the power of self-regulating adaptive systems.

Watts' central illustration of this is what she calls the 'Orkney electron', associated with the generation of renewable energy and power through the Orkney archipelago. As Watts (2018: 65) says, '[e]lectrons are always tricky to think with. They exist in lightning strikes, interconnector cables, amber resin, envelope glue, light bulbs, hydrogen atoms, electrons as spinning particles, and electrons as waves of probability'. Her key point is that when we focus upon electrons in this constant state of becoming, '[p]ower is no longer a story just about scale, centralization, or development' (Watts, 2018: 45), but also, more fundamentally, about tracking the emergent effects, disturbances and frictions (material, political and otherwise) which generate Orkney electrons. As Watts (2018: 75) writes, these 'are tangible in the Energy Islands, but not just because I can touch the national grid cable … You can feel Orkney electrons in the sheer cold wind …' they emerge in the 'undersea power lines between the islands, and in the cables

strung up over the heather.' Watts' particular framing of island life in these explicitly more-than-human terms of becoming, like the other approaches to Resilience ontology discussed above, clearly poses a direct challenge to modernist separations of human/nature and subject/object. But, in her work, Watts seeks to go further in following the disturbances and emergent effects, understanding (island) life more as an open and contingent process of becoming than as a contained or bounded self-regulating system.

To be clear, Watts is certainly focused upon the resilience of islands and islanders and is particularly concerned with how they can better harness renewable energies. But she also extends or reworks Resilience as an ontology in a different way from the previous examples discussed in this chapter. For Watts, as noted, the Anthropocene is a condition we are within rather than one we observe from the outside, and this shift in perspective leads to jettisoning the notion that (island) inter-relations could be viewed as if they were bounded and discrete self-regulating systems, or that Resilience approaches could be rolled out in an instrumental way of holding back planetary change. For Watts (2018: 127), it is too late to restore the human as subject separate from and directing the world as object; the change has already come, and we therefore now need to learn new ways of creatively 'stay[ing] with the trouble'. One notable illustration of this is Watts' employment of what she calls a fictional cyborg, in the form of the 'Electric Nemesis', who becomes her guide throughout her fieldwork to a deeper, more fundamental, understanding of (island) life itself in the Anthropocene.

Holding a ball of twine in hand, Watts (2018: 369) is taught about how 'the creative possibility is in the refiguration of existing things and materials (string, gut, bacteria, patterns, knots), artful integration work.' The Electric Nemesis is a guide to understanding that everyday (island) life is generative, creative and world-making. But this is not necessarily a harmonious, self-regulating system, which leads to a better ordering. The focus is upon the disturbances and emergent effects of co-relational entanglements. On the islands of Orkney, as Watts points out, these are expansive

and work well beyond the island boundary – through the politics of Westminster, the role of venture capitalists living in North America, or the European Union, which funds renewable energy projects, as well as tidal forces, wind patterns and particular island geographies. For Watts, there is therefore a need to regularly intervene, often intensively, to carefully cultivate and amplify the already creative capacities of island life that exist within often vast relational entanglements.

Here, Watts (2018: 350) takes a pragmatic approach, arguing for 'a self-determined, decentralized solution that is appropriate to the place: reconfiguring and reweaving the local energy network with what is at hand. In this case, tying it together with electric cars, council-run charging points, the need to resolve fuel poverty, and an imaginary that is not constrained by an overheating smart grid.' But, for Watts, thinking with islands is not about producing detailed models and replicable programmes of Resilience which can be transferred off island to elsewhere. On the contrary, thinking with islands is more of an ethos or ethic of world-making; for acting in the world differently. As the Electric Nemesis says to Watts (2018: 370) at the end of her book:

> 'The saga is ending. But you cannot take the islands with you. You can only take me.' She leans forward, and I swallow hard, certain I can smell every rotting stich and suture that holds her bruck flesh and folklore guts together. 'I am made of the Energy Islands, remember. I am the saga. Let's go see what we can do with something other than a bit of Orkney salted string …'

Such contemporary approaches do not design intricate models of Resilience by analysing island cultures and islander ecosystems, which could then be replicated, 'off-plan', in order to give continental, 'mainland', Moderns a chance to rein in climate change and environmental instability. For Watts, this would be to go against how things already are in the Anthropocene. She instead employs islands as a 'living laboratory' (Watts, 2018: 105) for generating a new ethos or praxis which focuses upon the active and dynamic powers of life itself (exemplified, above all, by island

life); understood in terms of its immanent, generative and creative potentialities. In a development of earlier and simpler ontologies of Resilience, here the spatial-temporal imaginary is expanded and thought through more openly. Resilience is not seen to operate in flat space-time, so that order and self-regulating harmony increasingly emerge out of chaos. Rather, Watts forwards a pragmatic approach to island- and world-making, where it is the ascribed immanent potentialities and pragmatic creativity of island and islander life which generates hope for such thinking in the Anthropocene:

> [T]he saga I am telling is not another end-of-the-world climate fiction. It is not a prepper's saga of how to survive some coming apocalypse. It does not grind to a halt in the face of capitalism's rapacious devouring of the planet's resources. The Orkney electron gives me hope that the future can be otherwise, that there is another way of being and living that is not apocalyptic. The Orkney electron tells me the end is not nigh. There are some people who are just getting on with making a low-carbon and renewable energy future, centralization be damned, the rules of capitalism be damned – even while they are within and reliant on both. (Watts, 2018: 123)

Instead of investing hope in top-down, modern frameworks of reasoning, or linear narratives which coherently play out over time, these approaches allow for more flexible responses, rather than intervening directly to tackle root causes or engineer outcomes on a larger scale. They 'facilitate', 'enable' and work hard to 'cultivate' existing powers and capacities, seeking to redirect them to new possibilities for 'staying with the trouble' after the crisis of faith in modern frameworks of reasoning. They are intensive, but not in top-down, command-and-control ways. The Electric Nemesis is insistent on this point in her guidance throughout Watts' (2018: 126) saga, cautioning against the 'hubris' of modern ways and those who speak in terms of transferable models; saying to those who aspire to a god's eye view of the world 'I smell them! I always smell them! God-trickers!' (Watts, 2018: 365)

This move to develop or expand the relational ontology of Resilience from a tightly contained self-making system – where (island) life is articulated as a complex problem-solver which takes us towards ever more efficient systems – illustrates a move along the heuristic continuum, established in the Introduction, towards the Patchwork ontologies which are the focus of Chapter 3. For whilst, as we have explored, Resilience breaks with modern frameworks of reductive linear reasoning, unlike many of the other approaches to Resilience discussed in this chapter, Watts does not tend to reify the world and suborn us to it. In her approach, we make, journey and explore the world through creative and often contingent forms of refiguration, rather than merely reflecting upon and becoming aware of relations so as to 'bounce back' better. It is true that Resilience is her key concern, but Watts also radically opens up the innovative possibilities associated with the relational affects and knots of co-relational entanglements; pushing further away from notions of an immanent telos, offering an alternative mode of goal-directed transformative change. As we will discuss in the next chapter, Patchwork ontologies characterise the work of many contemporary scholars, experimental artists, designers and activists concerned with the Anthropocene.

Conclusion

In this chapter we have analysed how Resilience relational ontologies draw upon, engage and think with islands. These challenge top-down approaches of command and control, which seek to save islands and islanders by way of modern frameworks of reasoning; instead, focusing upon the dynamic potentialities of adaptive interactive life itself (exemplified by island life). The first section focused upon how islands and island cultures are key figures for Resilience thinking, while the following sections went further and drew out how Resilience thinking can be analytically understood as being derived from thinking *with* islands. Here, Darwin's theory of evolution – enabled through his island experiences – was shown to have been historically key to an understanding of

life as an interactive and adaptive process of becoming. Darwin profoundly disrupted modern frameworks of reasoning, the hierarchical understanding of the human/nature divide, and a telos of linear progress and hierarchical development. For Resilience thinking, this understanding of life is a highly productive resource to be drawn upon. It enables us to think of life itself as emerging through interactive, processual becoming; through an immanent trajectory of ordering and ongoing adaptation. In this way, Resilience draws upon island life as a system of complex and dynamic organisation. This, as we examined, has done much in international debates to invert the relationship between mainlands and islands; so that today, the argument often goes, we can all learn how to be more resilient by paying greater attention to islands and islanders. Whilst this has been notably generative for promulgating Resilience as a relational ontology, towards the end of the chapter we also began to map out how, for some commentators, the ontological stakes have extended beyond tightly constrained or closed-system imaginaries towards the more open ontology of Patchworks, which we turn to in the next chapter.

Notes

[1] As O'Brien (2017: 43) says: 'A common way to imagine environmental futurity in the early decades of the twenty-first century is through stories about resilience. At a time when the concept of sustainability has largely given way to a sense of recurrent crisis, narratives of successful adaptation have powerful currency.'

[2] Thus, for Wu et al (2019: 1), 'the island is an example of a coupled human-environment system … which is integrated at the local (intracoupled), regional (pericoupled), and global (telecoupled) scale.' This has important implications for the position of islands in debates about the Anthropocene. For example, for Vitousek and Chadwick (2013), '[a]lthough the islands of remote Oceania were among the last places reached by humanity, many islands entered the Anthropocene early. Extinctions – some caused by the first people to discover islands – have been far more frequent on islands than continents, and the intensity and consequences of human-caused

biological invasion, deforestation, and landscape alteration have been substantially greater as well … [Therefore], islands provide a useful model for understanding how coupled human and natural systems experience the Anthropocene.' As another example, Holdaway et al (2019: 17) focus upon Ahuahu (Great Mercury Island), New Zealand; saying that 'The lateness and prominence of Polynesian colonisation of New Zealand make it an ideal place to investigate the Anthropocene [and, in particular, to study] ongoing human–environmental interaction. Elsewhere in the world, a lengthy history complicates the ability to differentiate between the impact of people on the environment and the consequences of engagement. [Island] characteristics provide the scope to study the impact of engagement where it is particularly discernible.'

[3] To further illustrate, Barnett (2001: 979) focuses upon island resilience research in the Pacific, examining the need to engage the 'whole island systems where the full gamut of biophysical, social, and biophysicalsocial interactions are taken into account … to shift from the study of the parts to a study of the whole …'

[4] As Graham et al (2017: 323) write, 'Islands are widely considered to be model systems for studying fundamental questions in ecology and evolutionary biology. [Here, debates about the Anthropocene] exemplify the historical and continuing importance of islands …'. Thus, in recent years, there has been a proliferation in the field of island, Anthropocene and evolutionary biology research (for examples, Helmus et al, 2014; Leppard, 2018; Salinas-de-León, 2020).