# SUBVERSION, CONVERSION, DEVELOPMENT

Cross-Cultural Knowledge Exchange and the Politics of Design



Laura Watts

# Introduction

The following prose poem was a response to my first month of ethnography in Orkney, an archipelago off the northeast coast of Scotland. I wanted to gather my experiences and evoke them in a way that academic prose could not do. At the time, I was living and working with people who imagine and design future technologies in the islands. My interest was, and is, in how location and landscape affect the way the future is imagined and made. How are futures made differently in different places? Why are certain landscapes and places regarded as centers of innovation, and others as peripheral, and how might relocating our attention help refigure "innovation" and future-making? The future is not out there, floating on some temporal horizon, but, following approaches in social studies of science and technology, must be made in strategy meetings and standards documents, in practices of design and demonstration (Bowker and Star 2000; Suchman 2007). The future is always local to its sites of ongoing rehearsal and production; as with other forms of knowledge, futures are situated (Haraway 1991).

Orkney is a low-lying, relatively fertile archipelago of around twenty thousand people living among seventy scattered green and heather islands. Off the northern coast of Scotland, they are closer to the Arctic Circle than to London. These people and places are too often considered remote, at the northern periphery of the United Kingdom and Europe, and far from the usual centers of high-tech industry and future-making; beef farming is Orkney's largest industry. Why are these islands, then, also an international center for marine renewable energy research, and before that for wind energy research? Why have the environmental resources of Orkney, its powerful tides, waves, and wind, led to such world-renowned activity? Why do people from the global renewable energy industry, from Taiwan to Silicon Valley, visit this archipelago in droves (Watts, 2012)?



I came to these islands as an effect of prior research in the Thames Valley near London, a landscape of high-tech business parks, and a classic center of UK innovation. There I spent time with those making the future for the mobile telecom industry. Their future was often imagined as ubiquitous and pervasive, a future of unimpeded global access to information. But the landscape in which this future was located was one of dense mobile phone networks, cities lit by buried fiber optics, flat enough for radio signals to

networks, cities lit by buried fiber optics, flat enough for radio signals to propagate with relative ease, where smooth motorway tarmac and Heathrow flight corridors moved bodies and bytes at speed, and relative wealth created an experience of pervasive access to information for many (Watts 2008). The local landscape for this global future of "anyone anywhere anytime" connectivity was one of already pervasive information access. The mobile telecom industry future of worldwide "always on" information seemed to be more a replication of their everyday local experience; a copyand-paste of their sociotechnical landscape.

Some I spoke with in the mobile telecom industry were frustrated by this limited imaginary, which seemed to create substantial material and economic problems, such as vast debts from radio spectrum auctions (Cheng, Tayu, and Yu 2003), and a myopic fixation on ever-increasing bandwidth (sometimes characterized as Moore's Law; Watts 2008). They questioned how the industry might reimagine its future. How to do it otherwise?

So I wondered, how might the future be reimagined and redesigned if the landscape were different? If knowing is an effect of moving through a particular landscape (Ingold 1993; Turnbull 2002; Chambers and Turnbull, this volume), then so too are accounts, visions, and versions of the future. For example, what futures might be made moving through a landscape whose topography of hills and sea resists the propagation of mobile phone signals and optical fiber, a landscape whose temporality is not of newly erected mobile phone masts but of enduring five-thousand-year-old Neolithic stone monuments? How might ICT futures be imagined and made differently in such a different place?

Orkney is such a landscape. It has its own particular high-tech industries, its own particular approaches to making futures and future technology. Perhaps it is these distinctive futures, imagined and designed through these distinctive islands, that draw so many global visitors each year (tourists, politicians, venture capitalists, engineers, ethnographers). It was these *situated futures* I sought to understand during my ethnography in the islands. How were these futures made at the geographic edge, liminal futures that invited both local and international participation, that inspired so many, and perhaps resituated the so-called leading edge of the future?

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## Part I: Insistent Infrastructure

Hailstones

roaring down and across the slab rectangles of concrete runway; my twin-propeller plane is towed for repair. Flying to Orkney is never certain. I have heard tales of ghostly passengers haunting the departure hall of Aberdeen for days, waiting for winter weather to pass.

I land on Orkney in torrential sleet, mountain summit wind blazing, whipping my car door near off its hinges, then, pressurizing me in.

The supermarket shelves are laid waste. Locusts ahead of the storm have cleared two aisles. Not even a carrot. For if the boat does not sail, then the shelves are not filled. Food and fuel, rolling on and rolling off the ferry, are barometers; piled "high" only by the will'o the sea, that most treacherous of waters, ridden with whirlpools: the Pentland Firth collision between Atlantic and North Sea tides.

The worldly rise and fall of food and fuel are visible here. Petrol and carrots register their weighty resistance to transport in the balance of empty shelves.

"You are connected to the weather here, connected to the supply chain," says a local librarian. "There is a sense of the interconnectedness of things." "Western consumerism is tempered," she says. There is clear green water always in sight, between you and your wants;

a ferry or two, between want and can have.

"We're at the end of the supply chain," says a start-up director, renewable energy maker; his company reversing the bearing of supply and demand: north to down south, not south to up north.

Food and fuel, weather and wind, people and property: their hard-world, hard-won relations are labeled and marked clearly in the high cost of electricity, in every boat-carried kettle, pencil, bright summer dress; in the slow, barely megabyte, broadband connection, (but "good view," says the marketing writer, a remote-presence working from home; "sod the broadband," he jokes).

The infrastructure of Western world living is laid bare and skin-close: an insistent touch of telecoms and transport; the smell of energy on the wind. (No urban sprawl to hide the passage of cable and coax, no dense population to excuse the economic accounts, no easy flat city to roll out the fiber.)

The National Grid cable, an electrical lifeline under the sea, over the hills and protected peat moorland, is the murmur of islanders, the talk on the ferries. A new cable is needed, capacity reached. But where should it flow? And many people speak, have a future they see: Tim worries for the archaeology; Keith for the view; Martin for peak oil, and Annie for folk, those who live, work, and die here.

Grant points to the problem of infrastructure centralization; the UK's postwar electrical system for urbanization. But archipelago Orkney is *de*central, distributed, urban distant; and so has one of the country's first local self-determined power management systems.

And it seems as if the future, the one where people care for their networks, for their infrastructure, supply and demand, that future has come early to Orkney.

# Part II: Self-Sufficiency

So this is not life in the past, not a honeydewed heritage, "not Orkney in a jar of formaldehyde," says the archaeological curator. "Not fossilized," says the start-up director of a potential wind turbine farm. "We must be ancient and modern," he continues to call. "It's a living landscape. We make a living here ..."

... from farming and producing: biogas, electricity, beef, cheddar, and fudge. Producing and farming is a futures way of living (as Jo Vergunst reminds me): a care for the next generation of cattle, community, and crop. Some here cite a millennium of farming descent; generations of futurists, farming for the future. Since the Vikings, go the tales, part myth, part gene. "You belong to the land, making the future.

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and the land belongs to you," says a local archaeologist. Hefted is a word I hear; a people made land, a land made people:

"I ask you to imagine how you see the world in the future," calls the start-up director, farmer of wind, earth, and time. He speaks, compelling the crowd and community: "I believe hydrocarbons will become rare in everyday use ... We're not the first place the government will send energy in energy-scarce times." He speaks of a storm-force future when the energy boat does not run.

"It is the sea which has contributed to self-sufficiency," says the islands council in its promotional brochure. These feisty waters hold depths of invention, a storehouse of marine power, fish stock, and tales. So tethered in Orkney are world firsts in tide and wave power; testing marine energy feasibility in the wild waters.

And Scotland's first locally owned wind turbine stands proud on its isle; joined now by others, more planned, futures too numerous to count, funded, owned, and contested by folk hereabout.

Orkney is "Initiative at the Edge" (as a government fund names its far reaches). This is life at the edge of Western world living, sharp,

# in focus, cutting-edge; cutting its own way.

And it seems as if the future, the one where people care for their future, long local, practical, self-sufficient, that future has come early to Orkney.

## Part III: Modest Innovation

But here is a tension, in the viscous flow of oil: energy poverty is greater here than elsewhere in the country. And yet on one island, burning orange-strong in the wind, is the Flotta oil terminal flare. Ten percent of the UK's energy lands from North Sea oil fields and is taken from there. The smell of energy is on the wind, in the carbon of the earth, in the uranium of the stone. "Orkney is in every sense an energy island," says the renewable energy forum. (It's a land-made-people, people-made-land, made future.)

"We aim as an island to be 100 percent renewable by 2012," says the director of a biogas firm; and son-in-law of the farmer of a trial site for the fuel. "You know all the board members," says the director of a wind turbine firm, and father-in-law and husband to others on the company board. You see, it's all in the family, communal and relational. It's trust in the network, the community bond, (as Michael Lange says).

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And it seems as if the future, the one where people care to join hands, get on and make something new happen, that future has come early to Orkney.

## Part IV: Mutable Futures

Hailstones fall on wet mush and March snow. I stand in the center, the fulcrum of Orkney: the Neolithic stone circles of Brodgar, Stenness. Sandstone mica glows soft with spring shadows. The grass, stone, and sea are a circular world in green, gray, and brown; the color of tundra and fast-tracking storms.

On this horizon of five thousand years of building and dwelling is a wind turbine farm, imagined, unnegotiated, unformed, heartfelt. This landscape is living, unfossilized, unfixed.

In a community hall the crowd gathers to debate three other wind turbines. Will they turn, over the sun? Some speak for the peat bog, high on the hill. Some speak for the ravens. One for the National Grid. One for the skyline, the tourists and their trade. Another for the shadows, strobing her house. And all speak of the future,

transparency, integrity. You are beholden to every word spoken, for there are no casual encounters, no conversations with strangers, no hiding in a city of blank faces, blank words. What is said is remembered, repeated, returned. So it's quick to get a decision here, I'm told with a grin, for everyone knows everyone (for good and for gossip).

A high-tech company director here names it:

But what's remembered is holding the door open, as much as a global expertise. "We include lepers but exclude arrogance," says the local ecologist. For there is no need to shout. Quiet, resourceful, these are the terms the local high-tech director repeats (in comparison with American West and East coasts). "Right, let's get on with it," is the response to a need for new futures, says the island council solicitor. So farm and food waste becomes biogas, biofuel; the smell of chip fat on the car-carried wind. It's a land-made-people, people-made-land, getting on, making the future.

Modest innovation, that's what I sense. Not entrepreneurship, a term that's disliked as too "bigsy," too big for your boots, too self- not community centered; (it's the next generation of cattle, community, and crop). so many conflicting. For the future is open, mutating, remaking. The turbines shifting, dissolving in quiet talks over farmhouse coffee and cake. These turbines are open, not just in material shape and design, but in ownership and presence; a whole part of a land-made-people, a people-made-land.

And it seems as if the future, the one where people remake their own future, make it mutable, fluid, that future has come early to Orkney.

## Part V: Early Adapters

Grant demos the tools of his mutable trade: a Virtual Terrain Program that models wind energy; makes visible, malleable, commensurable, the many voices and species that speak. In viewsheds, acoustic impact zones, and statutory sites: archaeological monuments speak, birds speak, the Orkney vole and otters speak. Data spreads speak for the hen harriers (from Jules watching and counting their flight), for the grass type beneath my virtual feet. There are data for the wind strength, for the heather and the houses; for the laws of the landscape, the economics of business.

It's all here at the touch of a slider, a dial to turn up or turn down; tuning in to a future, working to resonate with the possible. These are songs of the future, scored on CD-ROM; voices composed into visuals, not for comparison but for imagination. Songs of the future, scored into a virtual world, data voices open to creative interpretation; a world designed to be altered, made otherwise.

This is high-tech industry at the edge of Western world living; cutting-edge, cutting its own way; an early adapter, not early adopter.

And it seems as if the future, the one where technology is designed to be open, personal, adaptable, that future has come early to Orkney.

# Reprise

Orkney is life at the edge of Western world living; sharp, hard, demanding. "We are a place where technologies are trialed." "A technological test bed," says a high-tech company director; testing remote-working, renewable energies, renewable pasts.

And it seems as if the future, the one where innovation *is* at the edge: difficult, distributed, decentralized, that future has come early to Orkney.

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#### Discussion

The future has come early to Orkney. This future is shorthand for an imagined future that is designed, developed, and made in the present, as outlined in the introduction. It is a design practice with particular qualities in Orkney that would seem to be of interest to ICT developers elsewhere. This discussion will not translate or speak for the prose poem; it does its own work. However, I do want to explore the refiguring of this future in the poem: the distinctive way I encountered the future being imagined and developed in Orkney. And I want to consider the implications of this refigured future, and its making, for more normative accounts of ICT design and development—for example, implications for future-making in the mobile telecom community around London, highlighted in the introduction.

The future has come early to Orkney. How to make sense of such a claim, one that is an explicit interruption of the usual story: well-known urban centers of innovation are somehow technologically ahead, on the leading edge of the future (e.g., London, Silicon Valley, Tokyo), while rural peripheries languish behind such innovation centers. The poem's claim implicitly evokes and plays with well-known critiques of technological determinism and linear technological evolution (Latour 1987; Bijker and Law 1992; Latour 1993). But its mirrored reflection of remote islands, rather than urban centers, as technologically ahead has some precedent. Fragile and remote islands whose populations are acutely aware of their own potential transience in time, whose finely tuned ecosystems are hypersensitive to change-such places have long been named as "advance indicators or extreme reproductions of what is future elsewhere" (Baldacchino 2007a, 9), and as "the first, the harbingers, the pioneers, the miner's canary" (Baldacchino 2007b, 166). As former UN Secretary-General Kofi Annan put it in his discussion of Small Island Developing States, "Islands are frontline zones where many of the main problems of environment and development are unfolding" (Baldacchino 2007b, 7). Orkney is a pioneer, a living reproduction of what is only an imagined future in other locations as an effect of its fragile archipelago landscape, and by landscape I mean both natural and cultural, both the people and the place. The fragility of Orkney is an everyday experience for the people who live there. The dependent infrastructures of contemporary living, forgotten and literally buried in urban places, are visible and embodied in the weather-reliant ferries, in the occasional electricity blackouts, in the "not spots" of absent broadband and mobile phone signal; insistent infrastructure, as the poem names it. As an effect of such tenuous connections, depopulation is a pressing concern for the twenty or

so inhabited islands, some with fewer than a hundred people. A sustainable future is not something abstract talked about only by national politicians or global business, not a distant worry that can be packaged and shelved as a vague matter of "global climate change." Here it is a matter of community survival, next year and every year. The future, especially future infrastructure technology, is an everyday concern, talked about over farmhouse coffee and cake, as the poem suggests; everyone is a participant. In contrast, the government in London talks about such Orkney experiences as if they lie in the future: "A high-carbon world is one with more extreme weather, where we and our children are faced with the costs of adapting the way we live and the infrastructure and systems that support us. We must face up to these challenges and make the necessary investment to move to a low-carbon economy now" (DECC 2009, 18). Orkney is a frontline zone where this future of local adaptation to extreme weather and limited infrastructure, local investment in up-and-running renewable energy projects, is already lived. It is more than a matter of landscape agency or environmental determinism. The specificity of how that low-carbon future has been made and lived, the qualities of design and development in Orkney that perform such local adaptation (named in the poem as self-sufficiency, modest innovation, mutable futures, and early adapters), is therefore of wide relevance.

Reconfiguration could perhaps be one way to characterize Orkney approaches to future-making, the reconfiguration of not just technical parts but also social and environmental parts to "get on and make something new happen." The renewable energy futures in the poem are created through ongoing social, technical, and environmental negotiation and contestation; the heterogeneity needed to make future technology is obvious here (Law 1992). Wind turbines are not imported and simply installed but understood as reconfiguration projects that, with great care and personal investment, must be translated and negotiated through intense discussion and community debate. Some wind turbine projects are sufficiently mutable and can establish ongoing relations with the community, the archaeology, the wildlife, the peat, and so on, while others cannot and so do not happen. The biogas start-up company and its biofuel technology are embedded in, and integral to, familial relations, cattle that produce slurry for fuel, and an island community and its strategy to become energy selfsufficient. The Neolithic archaeology of stone circles and the future archaeology of wind turbines are seen as concurrent parts of the landscape, which have to be reconfigured and woven together in the hard work of making sociotechnical and environmental relations, if they can be woven together at all (there is no guarantee of relationality). That the future is situated,

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that technology must be situated socioculturally and environmentally for it to be sustainable, in the double sense of both enduring over time and as enrolled in a strategy for self-sufficiency, is unquestioned. The work of situating technology, that is, trying to get technology designed elsewhere to operate and keep operating in Orkney, is just too hard to be ignored. Getting ICTs designed for different places to operate here means hacking the relational connections between technology and community, as much as with the stormy weather and disparate archipelago landscape. Orkney resists technologies designed for cities and suburban landscapes, making visible the reconfiguration work that always happens as technologies are supposedly "rolled out" to new places. This reconfiguration work has been well discussed elsewhere as a necessary aspect of technology design, development, and use (e.g., Suchman 2002). Ethnographic studies have shown how local improvisation by "users" plays an integral part in making a technology work as it moves from place to place (see de Laet and Mol 2000), and how these so-called users can be more helpfully understood as participants in the design process, or as parts of the sociotechnical infrastructure in which a technology, such as a wind turbine, is embedded (Star 1999, 2002). Orkney's resistance to rolled-out energy or telecom networks, its resistance to copy-and-paste infrastructures imagined and designed elsewhere, is not a resistance to innovation (as is perhaps too often thought) but precisely its opposite. It is a resistance that both *generates* innovation, in the sense of generating intensive local improvisation to make things work, and invokes innovation, in the sense of invoking designers to collaborate with the islands and so make their designs and futures work "anywhere." Orkney's resistance is a call for design innovation, for designers to reimagine their technology embedded in a more diverse landscape, a landscape that is not behind but on the future front line.

However, reconfiguration as an approach to making the future is not heroic or romantic, not an inherent rural good over some urban bad. Archipelago self-determinism does not negate the important question of who determines. Although the Orkney vole and otter speak, although the farmer and archaeologist speak, although the different island communities speak, they do not all have an equal say. Relations, both familial and heterogeneous, are always ongoing and always come with obligations (see Strathern, this volume). Negotiation and contestation are never rational or equitable. The future in Orkney is an effect of a morass of silent obligation and "wrong" decisions for some, despite intentions otherwise. But it is that morass of obligation, the dense knit of social, technical, and environmental relations and exchanges—people committed to, and part of, the place, as much as part of extended Orcadian families and island communities (Forsythe 1982; Lange 2007; Lee 2007)-it is these relations that produce a capability to act fast, to have a high-speed response: "It's quick to get a decision here, for everyone knows everyone." So all it can take is a few brief telephone calls to bring together the island council representative, the company director, the farmer, the designer, the academic, to put an idea into practice that afternoon, because the relations are already woven together; a commitment and obligation to the islands' future is already there. This contrasts with the popular conception of rural life as slow paced, versus the speeding temporality of urban living. Orkney is not slow to act but the converse, able to swiftly reconfigure and transform relations between people, places, and things, and so enact futures imagined elsewhere. This capability to make rapid rearrangements of relations, to reuse, is recognizable as Orkney's self-sufficiency. This self-sufficiency is the reconfiguration of existing relations: chip fat is also biofuel. But it is not resource management, for things always push back, if not outright talk back; not every relation goes. Self-sufficiency involves a certain relational creativity, putting things together in new ways: old chip fat from the island chip shop becomes new biofuel; the old familiar car becomes the new island-converted biodiesel car. In Orkney the "new" is made by reusing and reconfiguring the "old"; invention is a matter of rearrangement, not technical novelty (Barry 1999). This is not due to some romantic sentiment but rather a necessary effect of its remote islandness and the insistence of the infrastructure; flows of new goods, people, data, and energy are not unending but stop in bad weather, so you have to make your own new things. For this reason, remote small islands often evoke sustainable futures (Kerr 2005). Future-making in Orkney is self-sufficient, sustainable, creative, and fast paced as an effect of its particular location, its particular geography and history, its particular relations and obligations between people, places, and things.

Orkney future-making, in the form of reconfiguration, also resists heroic inventors and competitive entrepreneurialism ("too bigsy") often associated with high-tech industry. Instead it promotes communal endeavor, shared participation, and self-effacement. This modesty is not due to some naturalized goodness in island or rural communities but is an effect of island obligations to share, for benefits to be communal; what matters is "a care for the next generation of cattle, community, and crop." Modest innovation is an effect of island living and its frontline concern with the future survival of the community, not the individual. Such modesty creates a future with a politics different from more normative ICT industry futures, where celebrations of the lone, often male, inventor or designer are common (Wajcman

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1991). In addition, such modesty has a temporality different from more heroic versions of future-making. There is a care in Orkney for the longer term, for the next generation of the community and place, and a sense of long-term continuity over millennia ("five thousand years of building and dwelling"). In contrast, designers in the mobile telecom industry, as in other high-tech industries, often have a shorter-term care for the next generation of products or the next economic quarter as part of their own obligations to their corporate community.

I am not arguing for a copy-and-paste of Orkney future-making practices to urban centers of design and innovation. Neither am I arguing that Orkney approaches to future-making are without similarity elsewhere; creative relationality, for example, is by no means limited to these Scottish islands (Ingold and Hallam 2007). But, as I hope this discussion has made clear, Orkney reconfiguration approaches to future-making are situated in Orkney. Its practices are integral to its location, to the islands, the people, and the place. Just as copy-and-paste approaches to designing new technology in London do not work when "rolled out" in Orkney, the opposite must also be the case. Perhaps the crucial difference is that those who participate in making the future in Orkney appear to understand its locatedness: their everyday experience involves reconfiguring technology to work in different islands in the archipelago; a wind turbine project in one island is not the same as in another (even if the technology has the same specification).

Given this refusal to just adopt or universalize Orkney reconfiguration approaches to design and development, what can be gained by future makers elsewhere? How might this discussion help mobile telecom industry designers reimagine their future otherwise?

First, the refusal to universalize is itself an important mechanism to make visible universal futures that are otherwise taken for granted, such as visions of ubiquitous computing (Dourish and Bell 2007). These futures are located in the social and technical landscapes where they are made, as much as Orkney futures. High-tech industry communities are just as situated, just as embedded in their own places and obligations, as those in island peripheries. Ubiquitous telecommunications, which require ever-increasing bandwidth and ever-increasing infrastructure rollout, are a particular future, imagined as an effect of a particular place. As an imagined future that leads to people making design decisions, it is no more or less global than the self-sufficient and reconfigured future made in Orkney; although they have substantive differences in power and influence, futures are not equal. To acknowledge that the future is situated in people and places is to acknowledge that there are many possible futures, in many places. Rather than one global solution, there are only ever local variants, ever more local versions that you cannot fully describe or document, no matter how many field sites you visit. Situated futures go all the way down. So rather than imagining and designing one universal future technology for all, how might a design be envisioned for people to redesign? How to make a future technology that is malleable and adaptable, designed for incorporation into other futures, designed for development by other places, places a designer or product manager never imagined? How to refigure ownership of the future so that this is possible, for example, open standards, open source, copyleft? What futures can be imagined by high-tech industry that are open to transformation by others, open to becoming embedded in other landscapes, rather than demanding subversion tactics to get them integrated and working?

Second, colloquial assumptions concerning peripheries and rural landscapes as behind the future are not necessarily the case. Instead there are some, perhaps unexpected, places (not necessarily outside one's national border; see also Nafus, this volume) where futures are made in different ways. This is not a simple matter of geography: not all islands are frontline zones, and not all urban business parks are sites of cutting-edge innovation. Attention to local practice, to how a future is made in a particular place, is necessary. The benefits of this attention are not the acquisition of new futures that can be applied to the latest design, however. Instead such attention can be the beginning of a collaboration between designers, both local and visiting, leading to a shared understanding: in practical terms, what works in that place; and in strategic terms, a more nuanced articulation of what counts as the future, innovation, and creativity (e.g., Leach 2004). The prose poem, its draft description of Orkney future-making, is itself an example of such a collaboration, one to which I am unashamedly committed.

Finally, the archipelago's ability to reconfigure what is at hand, to try things out, is also a quality that supports testing and trialing of new technology. The poem calls the islands an *early adapter*. Orkney has a practical expertise in getting things to work in its diverse and difficult landscape; it is a fast rewirer of relations. Moreover, in a landscape on the sustainable-future front line, designers and future makers also have an opportunity to test prototypes in a place that is already living the future, and where future technologies are an everyday, vivid concern. This opportunity, Orkney as an industry test site for futures, is already ongoing in the form of the European Marine Energy Centre (EMEC). Designers, politicians, engineers, mariners, and many others are collaborating with the islands, drawing on local professional expertise as well as the local environment, to imagine and reconfigure energy infrastructure and energy futures—from wave and

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tidal turbine devices to new environmental standards and electricity grid networks.

Orkney as a test site is not a version of the nefarious island laboratory, or island as *terra nullius* to be colonized and experimented on (Rainbird 1999). Rather, it is laboratory as collaboration, laboratory as extended community of people, places, and things, where a shared commitment is created to the futures under construction. It requires those who visit with their prototypes to understand that in testing them, in getting them working and learning from the islands, they become participants in making an Orkney future as well as their own; collaboration comes with obligations that go both ways. This is always the case when organizations work together, and there are well-established modes for doing so (e.g., non-disclosure agreements). However, partnership between diverse groups, such as between ICT design centers and island peripheries, requires a duty of care on both sides, and attention to the mutual benefits—attention to both futures.

The future has come early to Orkney is an opportunity for both the islands and high-tech industry to collaborate and to imagine and make their futures together. Orkney is an archipelago at the edge, both fragile and futuristic. The futures that might be designed there are liminal: they are at the limit of the possible, at the storm-force, spread-too-thin limit of infrastructure; and they are betwixt and between, formed and reformed from fluid and shifting relations, always being made anew. In Orkney the future can always be otherwise.

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