

An aerial, top-down view of a server farm. The image shows a dense grid of server racks, each filled with various electronic components like circuit boards, fans, and drives. The perspective is from a high angle, looking down on the rows of equipment.

Liam Young and Kate Davies

A DISTRIBUTED GROUND



Chris Jordan, *Circuit Boards*, Atlanta, 2004
Image from photographer Chris Jordan's series
'Intolerable Beauty: Portraits of American Mass
Consumption'.

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THE UNKNOWN
FIELDS DIVISION

As leaders of the Unknown Fields Division at the Architectural Association (AA) School of Architecture in London, **Liam Young and Kate Davies** take their students on trips to the end of the earth. Cataloguing extreme territories, they investigate the role of design in developing new cultural relationships. Fictional speculation is used as an instrument for understanding emerging environmental and technological futures, in a process of experiencing, chronicling and, ultimately, reimagining the urban and the remote, and charting global flows and trajectories. Here they describe a speculative supply chain that begins below the surface of the Western Desert in outback Australia, and continues to the Arctic 'Northwest Passage' and on to London.

Far from the metropolis lie the dislocated hinterlands that support the mechanisations of modern living. A city like London is thoroughly embedded in a global network of landscapes and infrastructures that are too often forgotten, unseen or ignored. The Unknown Fields Division is a nomadic design studio that ventures out on biannual expeditions to the ends of the earth to explore extreme landscapes, alien terrains and industrial ecologies. With groups of students and embedded collaborators, it re-imagines the complex realities of the present as a site of critical and speculative futures. It aims to remap the city and the technologies it contains not as discrete, independent collections of buildings and technologies, but as a networked object that conditions and is conditioned by a wide array of local and global landscapes. By developing an atlas of these supply chains, from consumption all the way back to their source in the ground, we can begin to understand the complex connections that exist between our everyday lives and a wider global context.

Hunters for gold, pursuers of fame, they had all gone out on that stream ... what greatness had not floated on the ebb of that river into the mystery of an unknown earth! ... The dreams of men, the seed of commonwealths, the germs of empires.¹

In *Heart of Darkness* (first published in 1899), Joseph Conrad sets the narrator of the story, Marlow, on a boat on the Thames, with the city glistening serenely behind him, recalling a voyage into the unknown. In doing so he sets the familiar world of the city in direct relation to the distant continent in which his voyage into darkness unravels. The exact location of this voyage remains obscure in Conrad's text, uncertain next to the certainty of the departure point. The 'biggest and the greatest town on earth',² the site from which he embarks – the known from which we relate to the unknown – might be read as

the true ground for the narrative. It is both departure point and backdrop; 'and this also,' says Marlow suddenly, 'has been one of the dark places of the earth.'³ 'Here' and 'there' are woven together, and when the familiar is implicated in the framing of the unfamiliar, 'where do we come from?' is as important as 'where are we going?'. It is this dialogue between the immediate and the remote that is always at the centre of the work of the Unknown Fields Division.

The emphasis of Unknown Fields' research is to catalogue these sites as a productive process. In order to speculate on how design may play a role in developing new cultural relationships with the inevitable by-products of industry, a changing climate and the 'anthropocenic' world, we first need to attempt to understand that world by bearing witness to some of these emerging infrastructural landscapes. These territories must be lived, experienced and chronicled, but ultimately they must also be re-imagined. This complex web of interconnections and landscapes that gives shape to our world is too intricate to fully understand, but through storytelling and designed scenarios we can start to relate to that complexity in meaningful ways, and we can use these imaginative leaps to test our responses to possible futures.

For Unknown Fields, the journey is the site along which we construct a series of parallel narratives and partial fabrications, chronicling some probable fictions we have imagined in response to the improbable truths we have witnessed. As architects we have the ability to construct realities for others to inhabit, to help shape cultural narratives and inform the way we collectively think about the world. When considering these landscapes it is critical that we engage with the stories we construct as a culture around them. Whether through political spin, science fiction, nature documentary, environmental protest, disaster film, fairytale, folklore or scientific analysis, these narratives are many and varied. By understanding the mythology and stories of these distant landscapes and disrupting or intervening within them as a 'second site', we can bridge a gap between the here and there.

Traversing a Speculative Supply Chain

We narrate here a scenic journey with the Unknown Fields Division along a speculative supply chain. It is a field guide through the science-fictional landscapes of the present, the landscapes of technology and the technologies of landscape. It is a trajectory woven from some of the very real physical sites the Division has explored across the last few years. Stitching these places together forms a new territory for us to inhabit, a city of logistics and trajectories, of shifting resources and distributed ground. It is a space that is at once nowhere and everywhere.

The Unknown Fields supply chain begins 1 kilometre (0.6 miles) below the surface crust of the earth. The ground steams and rumbles as the division stands in a new shaft of the Wiluna Gold Mine, on the edge of the Western Desert in outback Australia. Unknown Fields will follow the material of this excavated landscape of caves and canyons as it is scattered



Christina Seely, Arctic ice shelf, Barrow, Alaska, 2011

Unknown Fields stands on the frozen Arctic Ocean as their expedition plane makes its landing run in the sky above.

Wiluna Gold Mine, Wiluna, Western Australia, 2010

On its Western Australia expedition, the Unknown Fields Division stands 1 kilometre (0.6 miles) below the ground at Wiluna Gold Mine, a huge hole in the ground that is a material consequence of a culturally constructed fiction: the gold price.



Super Pit, Kalgoorlie, Western Australia, 2010

During the Unknown Fields 'Never Never Lands' expedition, the Division stands on the edge of the Kalgoorlie Super Pit gold mine.

Super Pit night mining, Kalgoorlie, Western Australia, 2010

Unknown Fields watches the mining operations continue uninterrupted throughout the night in an effort to maximise production.



across the earth. We each have a little piece of Wiluna on us now, in our pockets; 0.034 grams (0.001 pounds) of it is locked away in our mobile phones. We travel up through the gold fields and monster iron-ore mines, following the 2-kilometre (1.2-mile) trains that drag the mountains out of the Australian outback and onto colossal ships bound for China to build cities for a rapidly urbanising population. Here lies the shadow of those cities, the silent twin: the void where a landform once was. These are the dislocated resource sites that support the world that we are more familiar with. Australia is a landscape whose material has been exploded into a global constellation, from iron ore for the pop-up cities in China, to bauxite for aluminium smelting in Iceland, uranium powering UK nuclear reactors, gold-plated connections in supercomputers modelling climate change in Alaska, food-grade titanium paint marking 'm&m' on confectionary in a convenience store in Los Angeles, and diamonds for sharpening knives in a sushi restaurant in Tokyo.

This vast infrastructural geology is cut out of the narrative landscape that embodies the creation stories of the Aboriginal Australians. Aboriginal dreamtime narratives speak of a time when the ground was soft and creation beings shaped mountains and rivers. When the rainbow serpent slinked across the ground to create a river, and a wild dog came to rest to form a mountain. Stories and ceremonies of dreaming beings that once shaped the sacred sites of ranges and riverbeds are now spun with the ghosts of modern technologies. Explosives, diggers and drills have replaced the slow erosion of rivers and winds. The division follows a railway to Port Headland where iron ore is stockpiled for export to China. Here we meet the Aboriginal painter Lorraine Sampson, standing in the red dust blown from the carriages, 'watching the trains take her country away'.

Mining survey planes track back and forth, laser scanning the earth searching for the topographic anomalies that indicate pockets of undiscovered minerals on the ground. The scans locate a field to be core sampled, creating a geological map of the ore body below ground, a void in waiting. Traditional paintings of dreamtime stories have often been used to support land rights claims, set in relation to the narrative of a fluctuating market that also lays claim to this landscape. The technologies with which this ground is surveyed and recorded also become the political means through which groups claim ownership over it.

As the Unknown Fields Division heads further along the supply chain we visit the Wiluna mine design office in Perth and watch the shape of the excavation change as the variable gold price is entered into the engineering software. As the gold price rises, it becomes more economical to mine areas of lower gold-ore concentration. As the price drops, the virtual mine shrinks as the software focuses the next cut around deposits of richer gold ore. Cut by cut, the fluctuations of the gold price are etched into the ground of Western Australia at the scale of the Grand Canyon. This steamy black void in which the division previously stood is a live graph, a wormhole

shaped by the frequency of electronic trades in London and New York. The gold is extracted from this ancient ground so it can be quantified and weighed. It is then shipped across the world from one hole in the ground to another as it is stored below the surface once more in the vaults of HSBC or the Federal Reserve. Here the majority of this material remains, to be traded virtually. The gold's value is a fiction, embodied by a block of material wrung like blood from a stone from vast tracts of earth to end, sitting trapped, back in the earth.

This is a landscape of conflicting narratives and value systems that raise difficult questions about our role as custodians. We continue along the mineral train line, rumbling towards the vast ports of the Western Australian coast. Everything in Port Headland is painted red. Everything is dusted in the rich ochre of the interior, blown from the top of stockpiles and the loaders that are filling immense ships bound for distant lands. Tanker by tanker an ancient landscape is being atomised and redistributed.

From here, bauxite mined in the Western Australian outback is shipped as alumina to the edge of the Arctic to harvest Iceland's outpouring of energy for aluminium smelting. We travel with it to this next stop on the supply chain, a landscape mined for its energy. In Iceland, an excess of geothermal energy means that this island is an oasis in a region shaped by power consumption. They are harvesting energy at 3 cents per kilowatt-hour in relation to the rest of the world where production ranges from 7 to 20 cents per kilowatt-hour, and Iceland is rushing to create new industries to put it to use. This 'clean' energy means it is economically viable to ship raw material, extracted half a world away, here for processing only to send it back across the planet again. Alcoa runs a plant near the town of Reydarfjörður, which contains a hydropower station with twice the energy output as all those used to power the rest of the country put together. Iceland's unique resources mean the conversation about energy is at odds with the usual narratives.

Iceland is 30 milliseconds from Alaska – via the FARICE-1 and Arctic Fibre undersea data cables. The Unknown Fields Division clicks 'cheap flights Alaska', two price-comparison windows open and we contemplate our carbon footprint, but not for the reasons you might think. The servers that enact this search consume approximately the same amount of energy it takes to boil water for a cup of coffee. The carbon footprint of the IT industry is set to overtake the airline industry by 2020, and Internet giants and their server farm empires are the other new industries starting to capitalise on Iceland's 'guilt-free' energy. These machines need little beside cool temperatures and cheap power. Here the cloud of digital technology is caught feeding, and the arctic north is becoming the home of the world's data. The ephemera of the cloud, the invisible web of connections finds an extraordinary physical form in the volcanic deserts of Iceland. Standing beside the vast server racks, our faces are illuminated by thousands of blinking LEDs, flashing with



Iron ore shipping, Port Headland, Western Australia, 2010

Unknown Fields films from their expedition sailboat as tankers are loaded with iron ore to be shipped to the instant cities of China.

Hellisheidi Geothermal Power Plant, Hengill, Iceland, 2009

Unknown Fields is lost in geothermal steam as the station harnesses the energy that now fuels Iceland's growing aluminium-smelting and data-server industries.



Jökulsárlón glacier lagoon, Iceland, 2009

Unknown Fields clamber across broken fragments of the Vatnajökull glacier as they drift back and forth, trapped in a lake of melt water.

Pacman Supercomputer, University of Fairbanks, Alaska, 2011

At the University of Fairbanks, the group listens to the Pacman supercomputer calculate the possible climate futures of the Arctic Refuge.



every email, search, naughty chat and magnum opus. This ethereal landscape laced with folklore and boiling beneath with energy in abundance is the incubator for new stories we may tell ourselves.

The Arctic region is more familiar as the protagonist in current environmental narratives and a territory in which we find the complexities and contradictions of the energy debate playing out. Unknown Fields follows the data stream, an information supply chain, from one Arctic information hub to another, from geothermal warehouses to a large white room in Fairbanks, Alaska. At the Arctic Region Supercomputing Center we meet a supercomputer called 'Pacman' with its banks of parallel processors, performing trillions of operations per second, flanked by entire rooms full of data tapes, each one full of readings and measurements, extrapolated figures and complex computational models. Mindboggling numbers are involved as these computational behemoths carry out their task of predicting the future. This is a major hub in a global feedback system, assessing and predicting the effect of human activity on the planet's ecology. Reminding us that now as never before our actions in a city like London have huge implications on a faraway landscape we may never visit. Pacman computes climate and weather forecasts, modelling sea-ice formation, Arctic Ocean dynamics, ecological systems and resource depletion. It is from places like these that we are relayed news of pressing environmental concerns as the complexity of the natural world and our thirst for certainty about long- and short-term futures requires ever-finer resolution and ever-greater computing power.

In a cafe in Anchorage we meet an oil lobbyist for Arctic Power. He discusses the future of the Arctic National Wildlife Refuge (ANWR), arguing that the US has no option but to drill there. To support his claim, he reels off an exhausting list of products made from oil: the plastic spoon in his hand, the fertiliser for the food we are eating, our medicines, cosmetics and clothes among others. The computed figures and predictions convince him that the ANWR will one day produce a million barrels a day. Others interpret the same figures very differently. What is revealed to us is a stretch of landscape in Northern Alaska caught in a state of becoming. That is, becoming part of a supply chain. It is an irreplaceable haven for wildlife earmarked as a future oil field. It is monitored by environmentalists and speculators alike and is a space woven with conflicting forecasts for its future.

Our supply chain comes to an end in a landscape in limbo at the top of the world. We land on the icy runway at Barrow, on the far north coast of Alaska, at winter solstice, and we slip into the darkness of an endless night. We stand on the frozen Arctic Ocean, its landward edge illuminated by street lights along the shorefront. This is the landscape Pacman is thinking about. Here, climate scientists and Inuit work together to divine the future of this landscape. They watch this place. The Inuit compile ice diaries from careful observation and share ancestral knowledge, and scientists consult delicate instrumentation and differ in their outlook fundamentally.

There is a thick streak of determined pragmatism from the Inuit community whose attitude as a culture is to approach change with confidence in their own ability to adapt and so embrace multiple future scenarios with openness and resourcefulness. At the same time environmental scientists assemble their observations into climate forecasts with the hope of predicting the future as precisely as possible. The Far North is a landscape as a science experiment, a predictive model of itself that informs the future strategies of global environmental and energy policies that are penned back in the metropolises it supports. A distant landscape conditioned by, and conditioning, the cities closer to home. A landscape mined for data as well as resources. A landscape measured in retreating ice and remaining barrels of oil. It is a supply-chain territory, precious and fragile, violent and terrifying.

Returning Home

As we come to the end of our travelogue, from the 'Antipodes' to the 'Northwest Passage', we are reminded again that our point of view – the here from which we relate to there – is a large part of the story. It is interesting to note that both of these terms presume an origin in Northern Europe: 'Antipodal' being the point diametrically opposite a given location on the globe, and 'Northwest' assuming a Southeast from which to view it. We are aware that connections may tell a more accurate story than the nodes.

This has been a narrative voyage through just a few of the sites we have visited with the Unknown Fields Division over the last four years. Sites that offer us a new perspective from which to understand the emerging conditions we are designing for. Landscapes where we find the future in the present tense, and which act as condensers of wider issues that we relate to only in an abstract sense in our more familiar cities. They are places on the margins of our knowledge where issues such as climate change, depleting resources, declining biodiversity, pervasive technologies and so on play out with more immediacy and more urgency. They provide us glimpses into alternative futures and form test beds for designers to critically evaluate the implications of emerging technologies.

Architects operate in the fertile ground between culture, nature and technology. We are in a unique position to synthesise diverse and complex factors, to pose alternative scenarios and counter-narratives, and communicate them with imagination and precision. An aim of Unknown Fields is to prototype different ways of thinking about and acknowledging this complexity. If we can reveal this hidden cartography, we can begin to acknowledge the interconnected nature of 'place' and explore new ways to start to navigate through a complicated planet. We are a generation privileged enough to be able to bear witness to this emerging world, and this is a powerful place to be – on the very edge of the potential for change. ▢



Satellite dish array, Barrow, Alaska, 2011

An array of communications dishes on the edge of town beams data back to the cities in the South.

Living on the edge of the world, Barrow, Alaska, 2011

For the winter solstice, Unknown Fields stays in the scientist quarters on the coast of the Arctic Ocean.



Research station, Barrow, Alaska, 2011

The Unknown Fields Division approaches a distant scientific research station on the coast of the Arctic Ocean.



Notes

1. Joseph Conrad, *Heart of Darkness*. Penguin Classics (London), 2007, p 5.
2. *Ibid*.
3. *Ibid*

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