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On Tenuous Grounds

Every earthquake is different. Different in itself, but also different depending on your situation. At 4.35 am on September 4 last year, Annie and I were asleep like most people in Christchurch. We woke to a scene from a poltergeist movie: things thrown about, the dogs and cats running from the room, the bed lifted and jostled about. When the first shock subsided, we stumbled outside and up the drive to check on Annie's mum as the ground squirmed under our feet.

Ever since then the quakes have kept coming, thousands of them, as diverse as they are unpredictable. Sometimes they're like lorries rumbling by, rattling the walls and windows. Sometimes the house sways silently and gently. Sometimes the ground trembles on and off throughout the day. On one occasion I was leaning on the window ledge and felt the wood kick beneath my hand, and that was all. Another time I was brushing my teeth when our little bathroom was shaken vigorously back and forth, like a matchbox in the hand of an impatient smoker.

Since then we've had aftershocks coming from opposite directions. Those from the Greendale fault in the west, the source of the September quake, arrive in waves, roaring as they come, like breakers on a beach. The quakes from the Port Hills fault, closer and shallower, occur without warning, a series of angry vertical jolts from beneath like punches from a titan's fist.

The day after I wrote the paragraphs above, Monday June 13, we had two more big quakes, a 5.6 at lunchtime followed by a 6.3 an hour or two later. The first felt like the corkscrew pitching of a boat; the second like the bucking of a big beast trying to throw its rider.

When the deadly 6.3 quake occurred on February 22, I was teaching a class at the university. As the floor lurched I staggered and would have fallen but the ground shoved me back up as I went forward. After the main shake we all filed out of the lecture theatre to join hundreds of students and staff in the carpark. Between aftershocks everyone stood, heads down, texting on an overloaded network. I told a colleague I couldn't get through to Annie, who was at home. 'In Lyttelton?' she said. 'That's where the epicentre was.'

I got in the car and, with a friend in the passenger seat, steered through mingled streams of traffic and pedestrians as far as Blenheim road. At

which point we became stuck in the gridlock heading east. As we sat there the road bounced like a trampoline. From the surrounding cars people's heads emerged, gazing in wonder at the tarmac.

Deciding to gamble on Dyers Pass, we u-turned and headed for the hills. I drove gingerly over rifts and humps, around sinkholes and volcanoes of liquid silt. Along every road the residents stood outside their homes, helplessly watching the ground simmer and boil over.

The Dyers Pass over the Port Hills was deserted and unblocked. A couple of times we had to edge past car-sized boulders—around which, with endearing precision, someone had already placed orange warning cones. Arriving in Lyttelton, we saw armoured vehicles guarding intersections and soldiers patrolling amid the rubble of fallen buildings. If the English language had a word for the false sense of familiarity you feel when you encounter in real life a situation you've often seen onscreen, I'd use it here.

That feeling recurred to the point of bewilderment in the days that followed. We watched images of destruction and rescue played over and over, mixing familiarity and unfamiliarity in a uniquely unpleasant way. They looked just like the scenes common to TV news and disaster movies, but instead of showing faraway countries and cities this footage showed places well known to us: a café we had lunch at last week, the second-hand bookshop we visit regularly, a shop we buy groceries from.

At the same time, it was becoming clear that nobody we knew had been killed in the quake. In this way a line, invisible but indelible, was drawn between us and others in the city. Between those of us whose lives were shaken and partly damaged, and those whose lives were fractured clean through, right down to the bedrock.

As the weeks have gone by and the aftershocks have kept coming I've found myself writing stuff down—images, ideas, snatches of overheard conversation. At some point I realised I'm assembling an essay, but not in my usual fashion. Usually I compile bibliographies, access sources, create files of notes, draw up plans, write the first draft from start to finish. On this occasion, instead, I've been recording little attempts, test runs, sound-bites, fragments of sense. Actually, that process is much closer to the original sense of the word *essay*. We owe the term to Michel de Montaigne, who used it to describe his own literary experiments. The *Essais de Michel de Montaigne* were his collected samplings or tastes of many topics: idleness, sleep, cruelty, cowardice, boastfulness and solitude. Books, horses, smells, prayers and coaches. Cannibals. Thumbs. Monstrous Children. Most of all, they were records of Montaigne's astonishment at the strangeness of the world, and the puniness of human knowledge.

The essay is the right genre for thoughts on tenuous grounds. Loose associations rather than tight arguments. Fragments of narrative, overheard conversations, impressions, rumours and rumblings, things seen and heard and felt, all propped together unsteadily. The whole thing on a bit of lean.

Since September every conversation you overhear in this town—in cafés, at the checkout, on the street—is about earthquakes. You hear folks recounting their experience of the latest aftershock, describing the state of their land and brickwork, outlining their plans to move away, complaining about the EQC, worrying about their kids or their elderly parents or their animals. The merest exchange becomes more significant: no more phatic greetings. *How are you doing* now encompasses a range of genuine inquiries: *did you come through the last shock ok? how badly is your house damaged? do you still have a job? are you sleeping?*

Language seems weightier. Light-hearted idioms feel heavy, jaunty turns of phrase fall flat. *Safe as houses. Solid as a rock. Terra firma*. Ironies emerge all over the place but they are dense and ponderous, materialisations of metaphor. *Like a ton of bricks. A house built on sand. When the dust settles. Groundbreaking ideas. Hidden faults*. When one of these clichés slips out we make wry faces. Levity gives way to gravity. Nature and language are conspiring in a leaden pun, an overly concrete joke at our expense, and it's not amusing in the least.

Numbers also take on a new weight. They become talismanic. *How big do you think that one was?* we ask each time. *Five point eight? Six?* It seems all wrong that the quake of September 4, which damaged some buildings but killed nobody, was 7.1 while the February 22 aftershock, which killed 182 people and injured 164 and destroyed the central city and several suburbs, was only 6.3.[1] Other numbers—truer ones? better ones?—are invoked to explain this anomaly. The Richter Scale measures magnitude, the overall energy expended during a seismic event, but not its felt intensity or destructive power on the ground. That depends on other factors, for example how deep and how distant the precipitating subterranean event—or, to use the geological terms we've become familiar with, the location of the hypocentre and epicentre. September's big earthquake was centred 40 km west of central Christchurch at a depth of 10 km; February's was 10 km south-east and a mere 5 km underground. Geologists use the Peak Ground Acceleration (PGA) scale to measure how hard the ground actually shakes, both vertically and horizontally, in particular places. On February 22 the vertical acceleration was greater than the horizontal acceleration. As a result, people and buildings and objects were thrown upwards as well as back and forth, multiplying the destructive effects. The PGA ranged between 1.8 and 2.2g.[2] By way of comparison, the highest PGA on September 4 was 1.25g; during the devastating Haiti earthquake of 2007

(a 7 on the Richter Scale), the PGA was 0.5g. On those numbers the February 22 quake was the most destructive ever recorded in New Zealand. For a few weeks it was one of the highest ever recorded anywhere: then the Japanese Tohuku earthquake struck, registering a PGA of 2.7g.[3]

Yet another system of measurement, the Modified Mercalli Intensity (MMI) Scale, tries to account for the multiplicity of effects and intensities produced by a seismic event. As Simon Winchester writes in his book about the San Francisco quake of 1906, 'earthquake waves propagate themselves in different ways, according to the nature of the rocks through which they pass', so any measure of intensity must be

> not merely subjective and ambiguous but also very local. Any one earthquake might display a number of very different apparent intensities in locations that were just a few hundred yards apart, since buildings might react (collapsing or not as the case might be), first, according to whether they were built of brick, masonry, iron, paper, mud, felt or wattle, and second, according to whether they had been constructed on a base made up of mud or granite, schist or shale.[4]

The MMI Scale draws on accounts by people who have experienced an earthquake in varied locations, along with observations of damage to structures; it assembles this data into a graded scale from I (not felt) to XII (total destruction). Of all the scales, this one comes closest to recognising that an earthquake is not a single thing but a complex of divergent effects, proximate events, subjective experiences.

Today, every day, living here, we hear these different kinds of numbers spun and respun into webs designed to fix, if only in retrospect, the volatile world beneath us. 'Trying', as Canterbury tectonics expert Mark Quigley puts it, 'to do science amid all this chaos'.[5]

Human cultures have always struggled to make sense of earthquakes. Seismic activity features importantly in Māori creation myths. After the forest god Tāne and his siblings force apart Papa and Rangi, the earth mother and sky father, in order to let in the light of day, the two lovers grieve perpetually and cover the world in mists and floods. The gods decide to turn Papa onto her belly so she and Rangi can no longer see each other's faces. In the process their brother Rūaumoko, not yet born, is trapped inside his mother's body. Earthquakes occur when Rūaumoko moves resentfully within the womb of the earth. The first syllable of his name provides the noun meaning 'earthquake' and the verb meaning 'to shake'.[6]

The creation of the islands of Aotearoa also involves earthquakes (an origin theory echoed by geologists). The demigod Maui uses a hook baited with his own blood to catch the great stingray that becomes Te Ika a Maui, the North Island; Maui's waka becomes the South Island. Unfortunately his brothers try to carve up the land-fish prematurely, making it convulse in agony. That violent

scenario—the writhing leviathan, the waka alongside nearly capsizing—vividly captures the Māori sense of how muscular these islands can be.[7]

In European history and legend, earthquakes offer a crash-course in humility when people have grown too big for their boots. The original superpower, Atlantis, is destroyed by an earthquake and tidal wave, according to Plato's *Timaeus*. There are plenty of earthquakes in the Bible: half a dozen in the Book of Revelations alone. They wipe out cities and populations at the command of a God who, in these moments, embodies the natural world at its most arbitrary and destructive. Nowhere is this more apparent than in the Book of Job. The title character's prosperous life is destroyed by a series of overwhelming natural disasters—'acts of God', as we still call them today. These misfortunes result from a wager between God and Satan about whether Job's faith will withstand catastrophe. Here, personifying Nature, the Old Testament God appears as fickle and irresponsible as a problem gambler, as cold as a vivisector. When Job dares to complain, his two-faced, moody, irrational deity answers from a whirlwind, reminding him of the limits of human understanding. 'Where wast thou when I laid the foundations of the earth?' the Lord asks huffily. 'Who hath laid the measures thereof, if thou knowest? or who hath stretched the line upon it?' God's trump card is Leviathan, a creature of oceanic magnitude: 'When he raiseth up himself, the mighty are afraid'; '[h]e esteemeth iron as straw, and brass as rotten wood'; his movements 'maketh the deep to boil like a pot'.[8] Very like an earthquake.

No wonder, in Christian cultures, leviathanic beasts have continued to represent tectonic-grade trouble. The *Physiologus* (fourth century), the *Voyage of Saint Brendan* (ninth century), the medieval bestiaries, and Milton's *Paradise Lost* (seventeenth century) all repeat the story of sailors who make delighted landfall on an island, only to find that the ground begins 'to be in motion like a wave'.[9] Thrown into the sea, the sailors watch helplessly as their island swims away or sinks into the deep. It is of course a vast sea-creature whose stony back, rising above the waves as the monster basks on the surface, the mariners have mistaken for land.

This leviathanic tradition achieves its apotheosis in Herman Melville's Moby Dick who, with seismic force, breaches from beneath to splinter boats and sink ships. Describing his first encounter with a sperm whale, Melville's narrator Ishmael describes how 'something rolled and tumbled like an earthquake beneath us'. Ninety chapters later the cataclysmic appearance of the white whale is presaged by a 'low rumbling sound', a 'subterraneous hum'.[10]

Earthquake and Leviathan are so strongly associated because they both exemplify nature's capacity to act on a titanic scale, along with its indifference

to human wellbeing. Of all the agencies to which humans are vulnerable, a special terror and dismay attends the submerged and the subterranean, which burst from the depths with no warning—no gathering storm, no barometric forecast. So it is that Ishmael, when he describes his attempt to apprehend the great whales scientifically, sounds just like a Canterbury geologist: 'The classification of the constituents of a chaos, nothing less is here essayed'.[11]

New Zealand's greatest nature writer, Herbert Guthrie-Smith, also imagined the earth as an immense living creature, jittery and thin-skinned. How could he not, writing in Hawkes Bay in the 1930s? In his masterpiece, *Tutira*, he introduces a chapter on the Napier earthquake, the country's most deadly, as follows:

> In calculations that run into millions of noughts astronomers tell us how we are whirled through space. Of these, the normal speedings and spinnings of our mortal lives, we are corporeally oblivious. ... Occurs, however, a brief wrinkling of the epidermis of the earth, as evanescent as the shrug and stamp of a fly-pestered ox, and every man has his personal miracle to relate, his impossibility to voice ...[12]

The slightest twitch of the earth's thin skin creates effects so outlandish we fall back on the language of miracle and wonder. Guthrie-Smith, of all people, doesn't do so lightly. *Tutira* represents the painstaking, intimately detailed record of half a century of environmental changes, of every kind and on every scale, occurring in a particular locale. A compulsively meticulous observer and documenter, Guthrie-Smith traces the most surreptitious networks of cause and effect: the interaction amongst soils, rocks and waters that builds ridges and digs valleys; the cooperation of rain, clay, vegetation and sheep's hooves that further sculpts the hills; the conspiracy of roughly sewn sacks, gloves, mud, wheels and tiny seeds to disseminate European weeds. Yet when faced with the earthquake of 1931, Guthrie-Smith's powers of explanation fail him, and he returns, as though in shock, to what he calls the 'incomprehensibilities of an earthquake'.[13]

His observations of earthquake damage are mostly confined to his own house and property, yet even within this mundane environment he witnesses 'nightmare happenings [that] can only be fitly related in vertiginous language'. Accordingly 'the reader is entreated to think in terms of the "Arabian Nights", ... to credit as in childhood's dawn the power of djinns and afreets ....' The most extended example concerns the trajectory followed by a block of masonry. While two of the Tutira homestead's three chimney-stacks 'disintegrated in a hailstorm of bricks', only part of the third broke up while 'the residue, a solid hundredweight section' was found 'on the edge of the gravel path surrounding the house'.

> Beneath the main roof is the verandah roof, beneath the verandah roof extends the verandah flooring, enclosed by the usual three-foot-high wooden railwork of two by two rimu. Under this intact verandah roof—

> under this intact veranda roof—remaining as it had been built twenty-four years previously, but through this verandah flooring—through this verandah flooring—directly below the roof had the hundredweight block crashed. In its fall not only had it splintered the floor-boards, but smashed the joists upon which they rested. Over the verandah railing had the block apparently passed to get in. Over the verandah railing had the block apparently passed to get out. The railing was unbroken, unscratched, untouched.

Guthrie-Smith's vocabulary, usually rich in elegant variation, is here reduced to uncomprehending repetition: 'somehow that block had fallen from a height sufficient to splinter and stave in the floor-boards and joists. Somehow in its descent it had cleared the verandah railing, somehow in its rise and exit it had cleared that same railing.' For once Guthrie-Smith cannot offer a credible cause-and-effect narrative. Instead he imagines the block of masonry as a supernatural creature, an 'amorphic other-world insect or bird of passage':

> We have the gap in the roof from which it had hatched and flown, we have the hole in the verandah floor where it had settled, and which had smashed beneath its weight; lastly, we find the creature dead, inert, its brief aerial career closed, lying on the gravel edge beyond the house.[14]

Faced by the lively activity of inorganic matter during an earthquake, Guthrie-Smith shakes his head in mystification. *Que sais-je?*, he seems to be saying, just like that other keen observer before him, Michel de Montaigne. *What do I know?*

I recently heard about a local chimney-stack that behaved almost as perversely as Guthrie-Smith's. It stood on an old house that had been condemned to demolition, before the quakes began, simply as a result of age and dilapidation. The date scheduled for the house to come down was February 23. The day before, when the earthquake hit, a heavy chimney-stack flew off the roof and over the fence, where it smashed the corner of the neighbour's house. EQC inspectors subsequently red-stickered the neighbour's house but declared the old house safe for occupation. In just this fashion, Guthrie-Smith tells us, 'the freakish eccentricity of seismic movement' was demonstrated many times in 1931, when 'one home in Napier would be wrecked whilst the neighbouring edifice would be scarcely disturbed'.[15]

In earthquake terrain a restless motility infects even statues, monuments and graves—objects we consider proverbial of stability and inertia. I notice this afresh each morning when I walk my dogs round to the Lyttelton East Cemetery. While the dogs collect and deposit their scent-messages, I mooch among the graves, reading the headstones. Or I used to: now most of the graves are smashed. Because the cemetery is on a slope, the older graves are surmounted by concrete or brick tombs, higher at the downhill end to create a level surface. Almost all have cracked, gaped and then fallen apart as successive quakes have lifted and shaken them. The place looks as though its incumbents have busted their way out in

stages—a kind of time-lapse Last Trump. (Shattering, in the process, more familiar idioms: *quiet as the grave*, *rest in peace*.)

The larger monuments have behaved most capriciously. The earthquake of September 4, big as it was, produced only one really noticeable effect here: the tallest monument in the place, a black marble obelisk standing three metres tall on its plinth, dedicated to the memory of James Frazer Grange (d. 1872), advanced till it overhung its base by a third. Four days later it fell, during the strongest of the September aftershocks, snapping the iron bars framing it and stamping an obelisk-shaped hole deep into the concrete tomb, where it now lies. No doubt before long it will complete its own burial.

But the subsequent aftershocks have inspired the stones with wanderlust. After February 22 many more monuments lay shattered on their graves. Of those that remained—obelisks, columns, crosses, figures, scrolls, books, arches, tablets—about a third had shifted on their bases. Yet they had moved neither backward nor forward nor sideways, but rotationally. They had swivelled, like spectators at a tennis match or sunflowers in a meadow, all in the same direction and all to the same degree. The Lyttelton East Cemetery runs along Reserve Terrace on a north-south axis, so for 150 years every grave faced the road, that is, westwards. But at 1.51pm on February 22, 2011, dozens of large monuments turned forty-five degrees to face north-west. (In some cases the base turned part of the way, the monument a little further, and the capstone completed the full forty-five-degree turn.)

Of course, far more exorbitant earthquake stories are not hard to find. During 1811 the town of New Madrid in Missouri, like Canterbury today, experienced an earthquake sequence lasting several months, produced by a network of intersecting faultlines. After one of the more aggressive quakes the Mississippi river—in this region nearly a kilometre in width—'developed violent overfalls and began to flow *backwards*, its waters surging in bore-like shudders up towards the mouth of the Ohio, and spuming as they battled against the furious downstream torrent'.[16] And who will ever forget the images broadcast after the March 2011 Japanese earthquake and tsunami? A giant wave scattering cars like pebbles on a beach, a ship dry-docked on top of a building, an entire house adrift in the ocean, a dog at sea for three weeks on a floating roof.

The quake stories in our city may not be quite so apocalyptic in scale, but they are unsettling in the same way because here, too, non-human entities have behaved with such lability. After February 22 the newspapers carried a picture of a ceramic mug that punched a hole through a wall, emerging in the next room intact.[17] They also reported that the Port Hills had risen by half a metre while suburbs in the east had dropped by the same amount. And they told us our home in Lyttelton had moved several

centimetres closer to our workplace in Christchurch.[18]

Perhaps the most demoralising manifestation of the seismic flux has been the phenomenon of liquefaction. During each major earthquake huge volumes of liquefied silt, neither fluid nor solid but an unworkable hybrid of the two, erupts through roads, pavements, lawns, floors and walls, building up into weeping boils a metre tall. Before the quakes nobody had ever seen this stuff. After February 22 a third of a million tonnes of it was removed from the city (that is, prior to June 13, when a whole lot more emerged).[19] The distressing uncertainty that liquefaction inspires is evident in the way we use the word to describe both process and product. And indeed, watching this grey formless matter surging up, it's easy to feel that the veneer of everyday order has cracked, letting through the primal sludge from which all things are made. A reminder that trees, bricks, mountains, glass, plaster and human flesh are transient forms, djinni's tricks that will all, in time, dissolve back into the wet dust they came from. Liquefaction is earth's grey matter; like brain tissue, it's something you never want to see, a substance whose appearance signifies an irreparable injury.

The welling-up of this subterranean protoplasm reminds us that earthquakes have the power to transgress the boundaries between different states of being, to cross or altogether destroy the distinctions we use to understand our world. What is immobile moves, with incredible rapidity. What is solid becomes permeable and what is delicate becomes dangerously massy. The earth ripples and bubbles like water; the sea collapses onto houses in waves like brick walls kilometres long. Pillars of sand rise up through pavements; streets open into chasms; rivers run backwards. Houses are launched onto the waves and ships run aground on buildings. Graves open and their contents rise; monuments turn their heads and walk off their bases. Household objects become animated, creeping to the edge of shelves, sitting up where they lay or lying down where they sat. Fragile crockery passes through walls unbroken. Single things fall apart, separate things combine.

And living bodies are transformed, many of them. Most grievously of all, some are so utterly changed that they leave no trace, not even DNA, by which they might be identified.

In her recent book *Vibrant Matter*, Jane Bennett suggests that for too long—at least since modern science, capitalism and positivism became our dominant modes of thinking—Western cultures have relied on a false distinction between 'dull matter' (it/things) and 'vibrant life' (us/beings).[20] She believes we might better understand the world—and live in it more sustainably—if we break down this distinction, and aim instead for a philosophy of 'vital materiality'. She draws on the work of Bruno Latour, a sociologist of science, in

using the term 'actant' to talk about the liveliness of non-human things in a way that doesn't assume that non-human matter needs consciousness, intentionality or decision-making power in order to make things happen. An actant, in this sense, is simply a 'source of action': 'it is that which has efficacy, can *do* things, has sufficient coherence to make a difference, produce effects, alter the course of events'.[21] By this definition, obviously, an earthquake is an actant, but so is each single element that *makes a difference* during any particular seismic event. Guthrie-Smith's magical chimney-stack and the wall-piercing coffee mug are actants. Both possess a form of power that Bennett calls *conative*, drawing on the philosopher Baruch Spinoza, who used the term 'conatus' to refer to the '"active impulsion" or trending tendency to persist' inherent to all objects; hence, for example, the conative power of the falling stone is 'to continue in its motion'.[22] The flying chimney-stack, the penetrating mug are 'quasi agents or forces with trajectories, propensities and tendencies of their own'[23]—and so is each element in the seismic chain of movements. During the revolutionary movements that take place in Lyttelton East cemetery, the cast of actants includes not only the monuments themselves but also each rock, each geological stratum, each faultline and each vector of acceleration that conspires to produce a forty-five degree rotation.

This perspective does away with the simple division between human beings who have agency—the power to make things happen—and matter (or 'nature' or 'things' or 'the world'), which passively waits until we act upon it. Instead, agency occurs as a 'distributed' effect. Stuff happens, things move and act, because of the (sometimes intensely complicated and utterly unpredictable) relationships amongst different kinds of actants: organic and inorganic; natural and artificial; solid, liquid and gaseous; human, animal, vegetable, mineral, microbial and chemical. This would mean thinking of the nonhuman world no longer as a warehouse of dead matter, waiting inertly for us to make use of it. Nor as a mechanism whose processes we can measure and control. Instead we'd need to think of humans' role in the world as bit-players in a drama, a complex of plots and sub-plots enacted by a non-human cast of thousands, an ensemble of shifty characters—opportunists, entrepreneurs, brokers, agents, movers and shakers—doing dodgy deals, forging unlikely alliances, making ad hoc arrangements.

In trying to conceive of a world full of vital materiality, rather than one separated into vibrant life and dead matter, Bennett aims for a more ecologically responsible mode of consciousness. She writes: 'my hunch is that the image of dead or thoroughly instrumentalized matter feeds human hubris and our earth-destroying fantasies of conquest and consumption'.[24] Be that

as it may, in Christchurch these days, it's not hard to accept there might be rather more vibrancy in matter than we used to think.

Conceived in this way, vibrant matter never dies. Or rather it dies endlessly and is reborn, a material eschatology of reincarnation rather than death-judgement-heaven-hell. The front page of *The Press* for May 7 showed a photo of the mountain of wreckage from demolished buildings accumulating in Bottle Lake Forest. So far the mountain—actually it's a long ridge—is 25 metres high, something like the (former) average height of buildings in Christchurch's CBD. Some of this matter will, in time, be transformed once again into human structures: the buildings we shopped and worked and lived in will be crushed into aggregate, which will be used for new buildings and shops, new workplaces and homes.

Meanwhile, all around the city, trucks carry away the contents of tens of thousands of chemical toilets and portaloos—which, like those magic bowls in fairy tales, promptly fill up again. And the rest of the city continues flushing into the broken sewers and the damaged treatment plant. All this stuff too, will have a very active afterlife. The undigested remains of our meals, spiced with pesticides and preservatives, mixed with cells shed from our guts; the rich broth of our urine, seasoned with oestrogen from our contraceptives and serotonergic agents from our antidepressants; the chemical brew used in portable dunnies—all this will break down and recombine into new compounds. Leaching from disposal sites and ruptured pipes, it will travel through capillaries under the earth's thin skin; will flow into groundwater and culverts and creeks; will resurface through liquefied silt; will enter root-systems, fill the veins of plants, nourish leaves and fruit. And so, in time, be consumed by insects and birds and animals, including humans.

Since the two big aftershocks of June 13, the Lyttelton East cemetery has been sealed off from public access. Tall wire-mesh fences block each point of entry. But this morning the dogs and I squeezed through a gap between fence and shrubbery to catch up with our restless gravestones.

All the monuments that rotated on February 22 have now fallen—except for two, which have rotated once again. The first, a granite block about a metre square and half a metre thick, marking the resting place (so to speak) of Kenneth Mac Lennan (1842–1923), has revolved a further forty-five degrees, so it now faces north. In the course of this year it has turned a full ninety degrees, like a key in a lock. On the other side of the cemetery a two-metre Celtic cross of white marble, sacred to the memory of the Very Reverend Patrick Joseph Cooney, Lyttelton parish priest till his death in 1939, also turned forty-five degrees on June 13, as it did on February 22—but

this time in the reverse direction, counter-clockwise. Having first turned northwards, it now faces west, as it did for the first 72 years of its vigil.

So that's where things rest for the moment. Of course tomorrow is another day, and nothing stands still for long.

Notes

1 Chris Moore et al., *Earthquake: Christchurch, New Zealand, 22 February 2011* (Auckland: Random House, 2011), p. 192.
2 All these figures are taken from Geonet.org.nz.
3 Rong-Gong Lin II and Sam Allen, 'New Zealand quake raises questions about L.A. buildings', *Los Angeles Times*, February 26 2011. Hamish Campbell, 'Technically It's Just an Aftershock', *New Zealand Herald*, February 24 2011. Erol Kakan and Volkan Sevilgen, 'March 11, 2011 M9.0 Tohoku, Japan Earthquake', *United States Geological Survey*, http://nsmp.wr.usgs.gov/ekalkan/Tohoku/index.html. Accessed June 23 2011.
4 Simon Winchester, *A Crack in the Edge of the World* (Camberwell: Viking, 2005), p. 358.
5 Diana Wichtel, 'Trying Times', *New Zealand Listener*, Vol 229, No. 3711, June 25–July 1 2011, p. 12.
6 A.W. Reed and Ross Calman, *Reed Book of Māori Mythology* (Auckland: Reed Publishing, 2004), p. 25.
7 *Ibid.*, pp. 136–40.
8 Job 38: 4–6; 41: 25–31.
9 Joseph Nigg, ed., *The Book of Fabulous Beasts* (Oxford: Oxford University Press, 1999), pp. 134–6, 172–4, 292–4.
10 Herman Melville, *Moby-Dick* (New York: Modern Library, 1992), pp. 327 and 813.
11 *Ibid.*, p. 190.
12 Herbert Guthrie-Smith, *Tutira: A New Zealand Sheep Station*, 4th ed. (Wellington: A.H. & A.W. Reed, 1969), p. 42.
13 *Ibid.*, p. 48.
14 *Ibid.*, pp. 48–9.
15 *Ibid.*, p. 44.
16 Winchester, *A Crack in the Edge of the World*, pp. 77–8.
17 Beck Eleven, 'Getting on with Life after Disaster', *The Press*, February 28, 2011.
18 Moore et al., *Earthquake*, p. 192.
19 *Ibid.*, p. 192.
20 Jane Bennett, *Vibrant Matter: A Political Ecology of Things* (Durham: Duke University Press, 2010), p. vii.
21 *Ibid.*, p. vii.
22 *Ibid.*, p. 2.
23 *Ibid.*, p. viii.
24 *Ibid.*, p. ix.