11 'Post-natural Venice'

11.1 Overview

This speculative narrative serves as a design exploration that extends the ecological and cultural implications of vibrant matter within the city of Venice from the perspective of its inhabitants, which include human and non-human communities. This story was written and performed for the Meta.morf conference at the second Trondheim Biennale (Meta.morf, 2012b).

11.2 Post-natural Venice

'Hey! Get out of here! You don't have a vendor's licence! I'll call the police on you!'

The café owner of the wooden shack harassed the unnaturally tall and bronzed beachcomber who was bumping his aluminium cart over the sluggish, dry sand outside his shop. Quite without any right, the shopkeeper regarded this stretch of land as being his own.

'Hey! Are you stupid? I said, get your cart off my property! You foreigners are not welcome here!'

Feeling ignored by the giant, the shopkeeper dramatically slammed his fist against a large warning sign, painted with a mosquito glaring '*Pericolo! Malaria!*'.[77] Its surface swallowed up the force of his hand with a dull 'thud', which nobody heard and no one felt the least bit intimidated by. Being all too familiar with the shopkeeper's penchant for drama, the foreigner continued to jerk his reticent cart down the beach, through the searing heat.

The giant's orange skin was not a bad application of fake tan, but large amounts of carotene deposited in his skin, which had even tinged his eyes yellow. It came from the sweetest ice-cream oils, which were made using the red varieties of seaweed that were particularly rich in the vitamin. Evidently, the recipe was so tasty that the beachcombers ate a little too much of their dairy-free treat, on which they seemed to be able to grow tall – and still had enough left over to peddle to tourists.

Spotting the illegal vendor with the strange cart of recycled tubs and thermos flasks, a small boy dashed towards him, his hands outstretched for *gelato*.[78] He tripped on a half-buried shard of driftwood and fell sprawling just in front of the orange man.

77 Danger! Malaria!

78 Ice cream.

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The vendor lifted the boy to his feet and dusted off the sand from his palms with two quick 'high fives'. He pressed a dried seaweed cone into the boy's hand, who looked wide-eyed at the delicious treat, as it seemed to have appeared from nowhere.

'I call this one the "pick me up" flavour! Little man!'

beamed the giant, sunlight decorating his teeth.

A woman scuttled up to the vendor, exchanging care of the boy for a euro note. She perambulated the child firmly back towards the beach, partly chiding him for his impulsivity, but mostly relieved that her son had not been harmed by something nasty such as broken glass or metal fragments superficially buried under the sand. They settled down under a sun umbrella. His sister joined them but did not sit down. She danced on her tiptoes and began buzzing around the stem of the shade, flapping her arms as wings and humming in a low-pitched, irritating manner. She looked remarkably mosquito-like, with her harlequin-patterned fly-head *Commedia del Arte* mask that she was using as a sun visor. Suddenly, the fly dived on her brother, taking a large bite of his fizzing ice cream, which he was eating too carefully for her liking. Their childish wrestling brought their mother to her feet as the end of the cone crumpled and sticky effervescence splurged on the ground, while the boy fought off his licking sister.

An old man nearby watched an oversized, diamond-patterned mosquito seemingly devour a young boy. He quickly reapplied insect repellent that he kept in an over-stretched, algae-fabric pouch that had been given to him by one of his eight grandchildren. He couldn't remember specifically which one. The durable yet silky linen was embossed with 'grandfather' on one side of the purse and an imprint of San Marco on the other. The fabric possessed remarkable shape-memory qualities, which was great for pressing patterns into the fabric, but annoying when carrying large items, since they scarred the fabric with their imprint and were almost impossible to erase. All kinds of biting parasites were prevalent nowadays, like the pestilence of fleas upon rats in Venice hundreds of years before them. The old man particularly bemoaned that the region now had its own unique species of tiger mosquito, which were the main vectors of drug-resistant malaria. With the warming climate, these dreadful creatures were spreading their malady from the city into the body of mainland Europe. The old man's wife sighed as she rubbed cream into the chronic sores caused by sand flea bites on his legs, which had been hollowed out by secondary infection. Every illness nowadays appeared to be antibiotic resistant. All that she could offer her husband was love, care and the odd handful of salt in his bathwater. She slipped the stick of melting insect repellent from his grasp and helped him reach his scarred ankles, which made him wince.

'Careful woman! That hurts!' he complained.

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She rolled her eyes and finished what she'd started, spreading the balm thickly. Then she conscientiously wrapped the spent remains of the applicator in a tissue and placed it her beach bag, not wishing to make even the tiniest contribution to the refuse invasion of the Venetian beaches. It was such a shame that the refuse barges couldn't make their way right into the canals any more to look after the city's canals and waterways, as they used to. Municipal dredgers had simply given up scraping the channels between the *bricole*, which were wooden posts that marked the channels in the lagoon that were accessible to boats. These were now clogged with sediment and thick, relentless weed. Consequently, people had become even more careless with their waste since there was nowhere to dispose of it. When they tossed it 'away' it finally ended up 'here', around the shores of the Venetian lagoon embraced by the Litorale Pellestrina, Litorale di Lido, and Litorale del Cavallino. These three strips of land were broken at three entrances to marshes that bordered around forty-five kilometres of the mainland around the Po delta, which was fed by lazy rivers and flushed by the slow tides of the Adriatic. At least, that was the state of affairs until the MOSE gates were constructed in 2016, a little behind schedule. Despite the prolonged protests against the series of seventy-eight robotic gates, the project had been completed and now commanded the tide like the old Danish King Canute. When the *acqua alta* came, they were raised to stave back the advance of the iceberg-fuelled rise in seawater that flooded the city limits and literally digested away the stones. Yet, these colossuses also made an unexpected, immediate impact on the lagoon: as they were raised so frequently, they caused the waters to stagnate like a giant pond.

As her husband began to doze, the woman returned to reading the out-of-print book she'd bought in a second-hand store in one of the narrow streets in the city. It was a compendium of historical insights into Venetian life, with excerpts and poems from a range of authors such as the courtesan-writer Veronica Franco.

A small queue of excited children, chattering mothers and heat-exhausted husbands straggled around the sand-bruised aluminium cart, waiting in turn to buy effervescing green and yellow cones of melting ice cream from the orange man. He used 'magic' tricks to produce the treats in exchange for currency or useful items such as batteries or old toy motors, which could be recycled. The crowd gathered not only to seek relief from the afternoon heat but also to escape the tedium of the beach. The vendor's antics entertained them with the illusion that carbonated ice cream could hide behind shade cloths, appear from out of the ears of small children, or be pulled out of the air.

The orange man's conjuring, which suggested that the cool confectionery could be extracted from the atmosphere, wasn't entirely misleading. Originally, the beachcombers were a handful of Dutch provocateurs that started an experimental, environmentally concerned, art community on the north end of the Lido. They strived to live solely on matter that could be harvested from the beach and expected to inhabit the shore for a fortnight. Yet, they found the appropriation of resources and change in lifestyle values not only a rewarding artistic pursuit, but also a profitable one. Within

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days, tourists had discovered the 'happening' and came to watch the community as they established the best ways to make shelter, and discover what *objets trouvés* were palatable, or safe to eat. Around a month into the newly extended project, locals began to make suggestions to help the foreigners familiarize themselves with the peculiarities of the region.

The beachcombers had limited access to wireless technology, except when they talked to spectators and asked them to research lifestyle challenges online. Audiences identified various marine species, discovered the melting points for glass and plastic and even suggested cooking recipes. Over the following months, crowds came to observe the experiment in 'sustainable' living and started to offer money or exchange goods for their strange inventions, artefacts and tasty produce. The beachcombers' most successful recipe was algae ice cream, which required a source of dry ice from beyond the beach. A group of young biotechnologists from the mainland donated the precious liquid gas in pressurized cylinders and brought it from their laboratory in Marghera by boat. They advised on using dry ice safely so that the ice cream was not eaten too soon, as it could cause frostbite. As their interest in the artistic 'experiment' grew, the researchers began to collaborate with the beachcombers spending weekends helping them build safe storage units for the cylinders and design the most efficient way of producing the algae ice cream. Their teamwork resulted in a commercial product that enabled people to make the delicious treat at home.

Having forgotten their ice-cream tussle, the boy and his mosquito sister climbed into their flip-flops, which were beachcomber-woven from ropey algae. The 'beach-safe' footwear offered significant protection against the treacherous amounts of unground glass and fractured shards of hard plastic that were deceptively sprinkled with sand. Also, summer temperatures were so hot that it was sometimes impossible to walk across the beach barefoot. Under the fiercest heat, the sun's rays turned sections of sand to smooth obsidian and melted beached plastics into oily mats that clung to unwitting skin like molten wax. With the spongy soles fizzing, flipping and flopping against the undersides of their feet, the children sped over the wet sand towards the colossal walls of the MOSE gates.

"Be careful! Don't go too far!"

their mother shouted after them, sighing audibly.

When the gates first rose and fell, churning up the lagoon waters like the lips of a slobbering great sea beast, they were quickly colonized by plaque-like algae that were quick to feast on the opportunity of a disrupted environment. The tenacious weeds set the scene for rapid invasion by all kinds of other aliens, such as bryozoans – small yet persistent creatures that had lurked in similar 'warm muddy pools' since the Cambrian era. New sandbank stretches that once intermittently protruded through the waves as silty shallows now rose like sea monsters and choked the dancing currents into the consistency of an ecological soup, setting a feed-forward cycle in motion. The

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rapid stasis enabled ferocious, toxic algal blooms to further slow the tidal exchanges, resulting in a dramatic shift in marine biodiversity with a particularly nasty outbreak of tiger mosquitoes. Silt quickly deposited in the deepest basins of the lagoon, which became so thick and persistent that it even prevented the dredgers from keeping the navigational channels open. Venetians watched from behind the protection of their submarine wall, as the richest Mediterranean costal ecology simply ground to a halt. By the time the authorities admitted that the light-sprinkled, cavorting waters of the lagoon had become a thick, refuse-trapping expanse of organic sludge, the tipping point had already passed. Although the gates were permanently lowered to invite the Adriatic back into the lagoon, the concession was too late and merely encouraged the algae-filled, refuse-packed waters to spill into the sea and propagate along new shores.

The wall of the MOSE gates was further away from their mother's recycled shade-umbrella than the boy and the fly had assumed. They stopped to cool down and splashed each other for a while, cleaning attractive shells in the waves that crept onto the beach. The colours sparkled vibrantly while they were wet but faded into mute pastels as the water evaporated. Viewing their haul as a magical, transmuted treasure, the children stuffed their pockets full and raced each other again towards the wall, which never seemed to get any closer. On baking hot days like today, the Venice lagoon was not an inanimate realm but a rising landscape of vitalized, interacting agents that marched together towards the city like Burnham Wood. Their entwined bodies heaved in networks of novel ecological interactions that appeared to cast out the city from the waves like flotsam and return it where humans belonged, back on terra firma. This non-human rebellion appeared to be orchestrated by Nature itself, conjuring strange matter that squirmed within the lagoon. This proto-soil was riddled with marine interactions between all different kinds of matter – living and non-living – that collectively heaved the city back to the mainland. Webs of interaction between minerals, pollution, refuse, excrement, bacterial mats, weeds, crabs, barnacles, shellfish, waders, snipes and gulls were shockingly revealed by the engorged corpulent lagoon as a gluttonous spectacle of autocatalytic organic cycles of growth and decay. Their potent, collective forces quickly reshaped Venetian life and its economy by driving the vendors and tourists from the city to the beaches.

Indeed, the native wildlife seemed to no longer consider Venice as being a seashore habitat, but a metropolitan enclave. Yet, in the winter when the algae blooms were quietest it almost seemed that the lagoon was reverting to its former aquatic character. Pools split through the sticky organic films like tiny grey mirrors under the muted light. This attracted the seagulls, which were being netted to limit damage to historic brickwork from the build-up of caustic guano, back out towards the sea. Yet the predators screamed defiantly and thrived despite increasingly concentrated efforts to completely eradicate them, having learned to snack upon easy-prey pigeons rather than fish. Seaweeds slept until May, when their metabolic activity was roused by the climbing sun and lengthening day.

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As the algae swelled, everything choked and the city started to drown again beneath the proliferating bodies of organic matter, refuse and thriving biofilms. As one thing was chemically converted to another, the lagoon experienced radical changes in salinity, oxygen content and in the spectrum of its primary microbial flora, pathogens and parasites. These alien relationships worsened the biochemical changes in the region's ecological webs. Proteins secreted by microorganisms turned organic matter into pungent gases, atmospheric oxygen oxidized mineral precipitates, and even immortal plastic polymers were digested and split into sweet, noxious organic vapours that circulated through the extended metabolism. The giant, carnivorous, organic beast in the lagoon began to swell and drink the water underneath Venice's foundations so, against all the calculated odds, the city started to dry out and the monstrous mass ruptured at the edges to spawn lumps of gelatinous land.

The old woman looked up from her book to start a conversation with her husband about the time when everyone presumed that the sea, just like in the legend of Atlantis, would claim Venice, but he had fallen asleep. Pesky sand fleas continued to make fresh wounds in his flesh, so she grabbed a few clean tissues and swatted the crustaceans as the old man's legs twitched. The old man snored, actively dreaming, and retracted his legs from his wife's flapping.

'Mind out!'

he mumbled through the depths of REM sleep. The old woman smiled and withdrew her attentions.

He was happy and most probably reliving his time of glory when he was appointed captain of one of four custom-built 'protocell' barges. These custom-made vessels delivered an experimental technology to save Venice from 'drowning'. It was the highlight of his career and his appointment was even accompanied with a mayoral handshake and his picture in the national paper. Unlike the rusty, pea-green refuse barges that provided a domestic rubbish collection service through the canals, these boats were designed for the future. They glared with polished silvered surfaces that were impossible to look at directly as they acted as a suntrap to channel solar energy into the vessel to power its mechanical arm.

This rather elegant robot had wrist and finger actions so it could rather deftly mix the protocell solutions together in special containers on the deck with its fingers and quickly empty them into the canal with a brisk flick of its wrist. Several sites around Venice were approved for testing, including the industrial shores at the intersection of the Via Liberta with the main island, the Castello region around the Giardini and Arsenale, and near to the Stazione Marittima on the Giudecca Canal. Each location was allocated its own protocell barge. Captains not only steered the vessels but also gathered data on the performance and environmental impacts of the chemically programmable oil droplets through arrays of sensors on the underside of the vessel. It was expected that this strange fluid, with a will of its own, could actually grow an

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artificial limestone-like reef under the foundations of the disappearing city. When the silver arm tipped the agitated, oily solution into the water, its sudden effervescence was spectacular.

The droplets were sensitive to light and exploded sideways away from the sunshine and towards the shaded banks of the waterways. Here they jostled for the darkest nooks and crannies to activate a second chemical system that enabled them to make solid matter using dissolved carbon dioxide and minerals to forge stable chemical bonds and generate repetitive crystalline units. Sometimes they seemed to create pristine, symmetrical formations and at other times they twisted to enfold impurities into the structures. These submicroscopic interactions could be examined through fibre-optic tentacles and the barges tested the vigour of the lifelike chemistries to assess whether any changes in the mother solution were necessary.

When sample droplets exploded too quickly to be recorded, they could be documented by following the milky trails that were left behind, which were studded with little white pearls of a concrete-like material, called 'protocrete'. The captain marvelled at the ingenuity behind the technology, which continued to work long after he'd shut down the robotic arm. In the privacy of darkness, the protocells continued to make hundreds of thousands of tiny mineral shells under the foundations. Each droplet produced a formation with a unique character, shaped by their combined interactions with marine currents, wildlife, shadows, reflected light, pollutants and effluvia. Together, these agents thickened the girth of the narrow woodpiles and spread the weight of the city over a broader base, attenuating its slow slippage downwards into the muddy soils on which it was founded.

Not all protocells were destined to become part of the reef. Some were eaten by fish fry, others floated like little polystyrene beads and occasionally churning currents drew shoals of glistening droplets out into the lagoon. Yet the misfortunes of the few were outweighed by the success of the many. As long as the test sites were fed with new droplets and minerals, 'protocrete' continued to grow around the woodpiles. Strange mosaic gardens, which were even seeded across the lagoon in a range of environmental niches were visible at low tides from the shore.

These breakaway protocell communities no longer depended on support by the brilliant, robot-armed barges but had become feral, somehow surviving on their own and redefining the very edges of Venice. Satellite GPS systems digitally documented this material revolution that appeared as a worm-like infestation of the shoreline, which took place so subtly and on such large a scale that it remained unnoticed by local inhabitants.

The four protocell barges were decommissioned when the lagoon turned and the waters retreated. Although involuntary retirement marked the end of the old man's working career, the barges were kept busy, as they had work to do elsewhere in the intercoastal regions of the world. Two were shipped to Songdo, one to Shanghai and the last was destined to feed the mineral-starved natural reefs of the Maldives. Protocells were not successful because they performed the job they were programmed to do,

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but because they were flexible enough to carry out other unforeseen tasks, for which they had not been designed. So, as the organic beast in the lagoon grew thirsty, the droplets responded to the environmental changes without the need for the barges and began depositing their materials in a downward direction. The calcareous protocrete impregnated the vulnerable Venetian woodpiles and protected these pickled organic structures from decay. As the lagoon dried out further, a maze of unique networks of walkways and natural bridges straddled the shallow canals, which swelled when they were moistened by rains. Their periodic changes in the Venetian landscape were orchestrated by the swelling and sinking body of the beast, and attracted visitors headed for the famed Biennales who were fascinated by the artwork of 'synthetic nature'.

These artefacts were spat out from the lagoon, attained cultural status and were critiqued alongside other non-human works, such as chimpanzee paintings. The celebrities who had bought property in Venice and attended such affairs had abandoned the idea of living in the city, long before it started to smell unbearably. Tourist industry employees, who could not afford their own place on the island, had moved to Maestre on the mainland, away from the growing malodour and increasing pressure of visitors that continued to visit the historic city centre.

Yet despite the olfactory assault from Venice's stagnating waterways, its cultural prestige increased – especially with the strange new views across the lagoon and 'protocell gardens' – which ensured that the tourists still came.

Yet, they no longer took the traditional route by sea into the lagoon but came by land and train and regarded the overbearing odours as being 'authentic'. Indeed, it became de rigueur to pass through the alleyways behind a bouquet of herbs as in days gone by, when plague doctors braved the streets dressed as scented crows.

The orange man turned his empty aluminium cart around and headed back to the commune, with a few over-excited children following him, conspiring that should he turn around, they would disappear from his view as if by 'magic'. The giant smiled with contentment as he trudged back up the beach, and the children tired of their game. Although many Venetians had left the region, the beachcombers moved in the opposite direction. They formalized their residence with permanent shelters made from 'tabbycrete', which was produced by mixing sand with lime made from boiled-down oyster shells and adding crushed shells, to give the mixture strength. Occasionally, fragments of protocrete which had broken off from one of the protocell gardens and migrated along the shoreline were also used to thicken the paste. The beachcombers sometimes conjectured whether the protocrete was actually sufficiently 'alive' enough to propel itself through the water and, if this were the case, would it then be ethical to add the rich, actively calcifying substance to their tabbycrete mixture?

At the MOSE gates, the children caught their breath with their clothes flapping around them like beached fish and bathed in the chilled sea breeze. Perching on a huge chunk of limestone, they studied the strange, beachcomber huts that sprouted like barnacles out of the base of the supporting wall. Each of the living pods was

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designed to accommodate the tallest person in that family group standing upright and was crowned with an apical hole. This was plugged with melted plastic to let in the light and cover the skylight when the weather or temperature changed. During the summer months, the heat was unbearably hot and the thick tabbycrete walls provided welcome cooling. During the night, when temperatures plummeted, the layers of plastic bottles that let studded light into the space also offered robust insulation against the wind and the sea chill. Compared with industrial buildings, tabbycrete and recycled plastics were much less structurally sound and less hardy than industrial materials, but their fragility was never really a problem for the beachcombers. The pods had never been imagined as being permanent structures, and it was accepted that they would weather, crumble and be subsumed by the ravenous shoreline. So the community continually rebuilt, reshaped and reinsulated the weathering plastics, replaced the crumbing tabby and reappropriated their living spaces to meet their changing needs. Moreover, the community grew outwards, not upwards, so the pods never needed to deal with considerable structural loads that bedevilled skyscrapers. Pods merged, separated, moved over and under each other, just like a proliferating mass of living cells. Revitalized, the boy and the fly raced each other back to their mother, passing the most ambitious public structure built by the beachcombers – a large light-filled series of domes that were perforated by hundreds of glass and plastic apertures, which intersected at tree-like pillars. This space was called the 'clam' where beachcombers welcomed visitors.

'It's just like the Doge's palace!'

breathed the boy admiringly, before following his sister back down the beach to protest to their anxious mother that the MOSE gates really were not all that far.

The shopkeeper had been waiting for the orange man's return, to caution him against stealing his business and instruct him to find another part of the beach to sell his wares on. The gracious orange man nodded politely yet unmoved as he passed the animated shopkeeper whose words were spitefully snatched by an upstream wind, and a tiger mosquito quietly bit him on the leg.

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