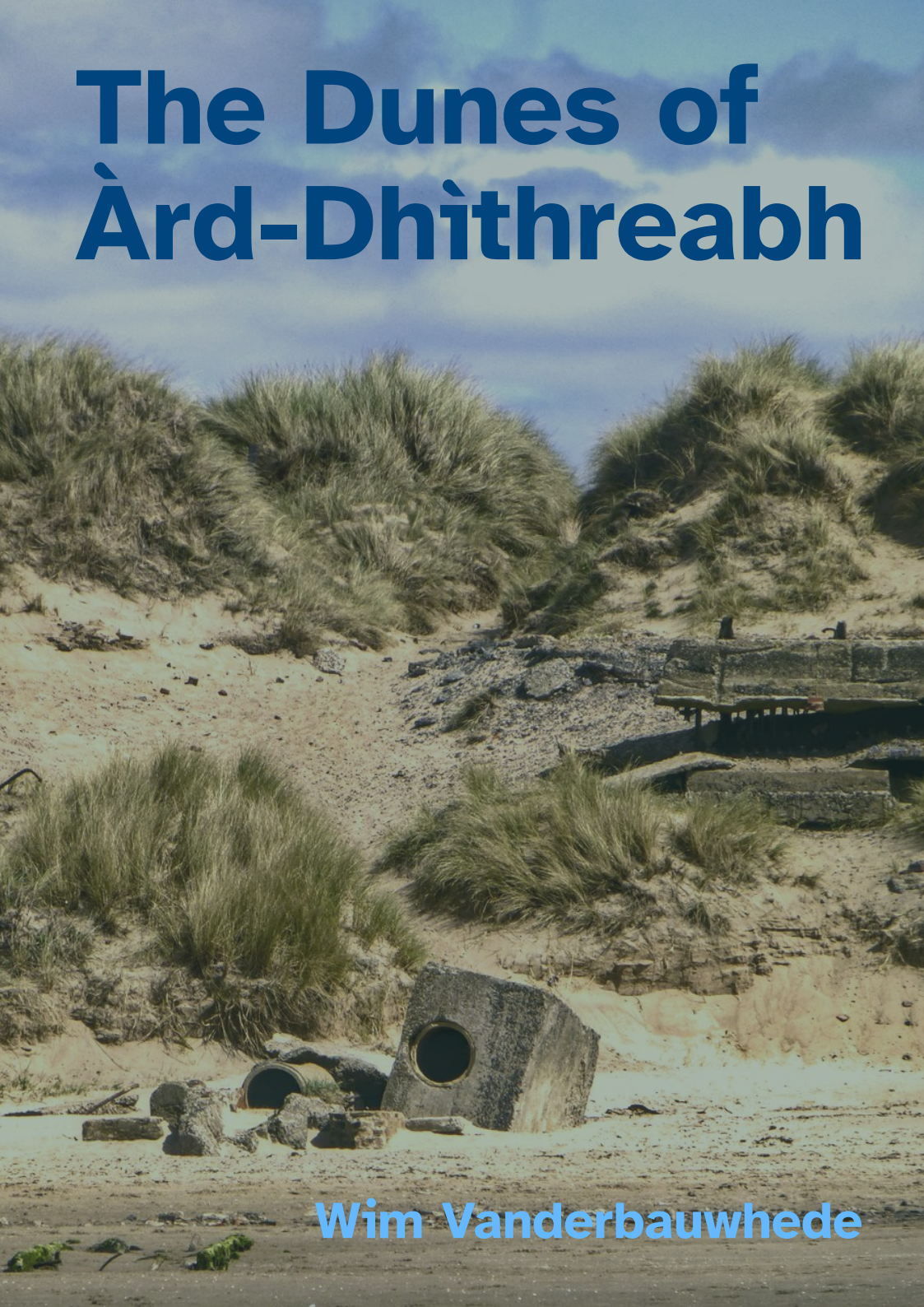
The Dunes of Àrd-Dhìthreabh



Wim Vanderbauwhede

The Dunes of Ard Dìthreabh

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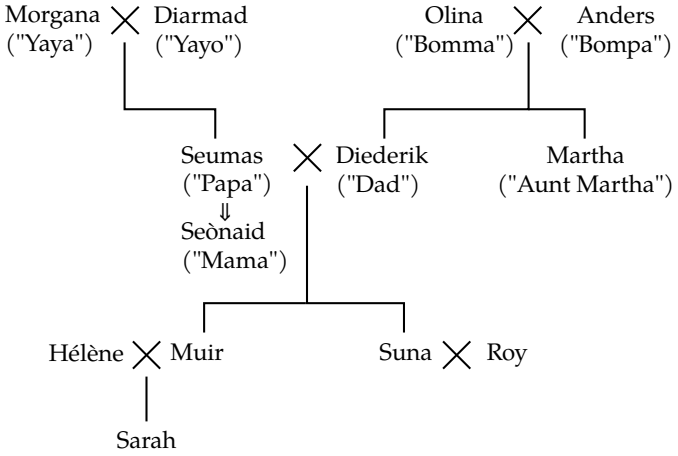
Family tree


Morgana
("Yaya")
Diarmad
("Yayo")
Olina
("Bomma")
Anders
("Bompa")
Seumas
("Papa")
⇓
Seònaid
("Mama")
Diederik
("Dad")
Martha
("Aunt Martha")
Hélène
Muir
Suna
Roy
Sarah

Location map

Chapter 1. Winter

Wissant, January 2061

It must have been in the fourth year of Dad's prison sentence that the concrete had started to crumble. Yes, thought Muir, 2054, that figured: it was the year he had started at the University, to study History. He hadn't liked it much, in fact he was at that point seriously regretting it. He remembered lying awake that night, fretting over his position in the class, how everyone seemed to ignore him. In particular none of the female students would give him the time of day. Muir smiled, thinking of Hélène. How angsty he'd been then.

The Erskine Bridge had been the first to fall. There had been this awful rending, rumbling sound, accompanied by what sounded like huge crashing waves, and the house literally shook on its foundations. Soon after, sirens started wailing through the night. The dreadful noise had woken Mama and Suna as well, and as it sounded really close, they'd quickly put on some clothes and gone down the hill for a look. Even in the starless night it had been clear to see what had happened: part of the bridge deck had come down into the street and crushed several buildings. Luckily, all those buildings had long been abandoned because of the flooding risk.

In the morning, the full extent of the disaster had become clear. The entire span of the bridge had collapsed and fallen into the Clyde. It had been what is technically called a catastrophic event, which means there is a sudden transition that can't be predicted. So nobody had seen it coming. It was a global catastrophe in the common sense as well. Initially, it was written off as a freak incident: the bridge was old after all, and it must have suffered from some form of cracks or fatigue that had escaped the inspections. A detailed investigation revealed nothing that could explain it.

The next bridge had fallen a few months later, somewhere in the Alps. Another few months and then two more bridges had fallen, one in Brazil and another in China. People had started to wonder if it could still be coincidence. There had been no need to wonder for much longer, as the pace had picked up and several more bridges

had collapsed, within weeks of one another. Amongst those a bridge in Spain, in Benidorm. Bomma and Bompa had been on the coach that was crossing that bridge when it fell, one February morning, only a few hundred metres from the hotel where they had been used to stay. They hadn't survived.

And so it happened that one of the first things for Dad to do after he'd been released from jail had been to travel to Vienna to arrange the repatriation and the funeral. They'd all joined him for the funeral. As they lived so far away, they'd never been very close to Bomma and Bompa, and Muir hadn't been all that much affected by their death, but Dad had clearly taken it badly. He had been utterly shaken. He'd stayed behind with his sister, aunt Martha, to settle the estate.

Dad hadn't come back from Vienna. Instead, he had just disappeared. Aunt Martha had sent a panicky message that he'd gone missing. But before Muir and Suna had a chance to start worrying, Mama had told them that Dad had vanished on purpose, and would be away for a long time, several years at least. She wouldn't say any more about it except that he'd had no choice, and that he had promised to stay in touch. Muir had fumed about that: he'd been looking forward to reconnecting with his Dad. Instead, Dad had absconded, leaving them all alone again. He still got worked up thinking about it.

Not much after, tall concrete buildings had started to crumble as well, and other large concrete structures, until not a day went by when there wasn't a news item about the Global Concrete Collapse. Less dramatic but much more far-reaching, the concrete runways and aprons of airports all over the world had turned to sand. As had the Glasgow pavements, Muir thought with a grim smile. The parallel had amused him at the time.

He wondered if all that sand was what had made him end up here, to live within a bowshot of the great beach of Wissant, which Hélène had told him meant "wit zand", white sand in Flemish. But he knew it had really been Dad's leaving. His second betrayal.

It was a truly magnificent beach, and the rise in sea level had not affected its beauty. Even on a bleak winter day like this, with a

biting easterly wind pushing the clouds over the Channel towards England, it had an austere appeal. Just being able to walk on this beach every day made living here worthwhile, or at least bearable. The enormous expanse of sand at low tide, bracketed between the two promontories of Cap Gris Nez and Cap Blanc Nez, the huge dunes – he never tired of it. The dunes were even taller than those of Àrd-Dhìthreabh, and as a kid he'd thought those were the tallest in the world. They seemed to have gotten smaller as he got older, Muir thought wryly.

On a clear day, when the fancy took him he would climb up to the top and gaze at the cliffs of Dover. But he loved just sitting on the beach and watching the huge rigid-sailed robot freighters make their way through the Channel towards the ports of the Low Lands.

Not today though, it was too cold to sit still for long. A rare cold day, one to savour. Also, this morning there had been only an old lonely sailing boat, a square rigger, and it had made him think of Dad. That was the flip side of the beach, so many things reminded him of Dad. He walked on briskly, watching his breath form surprisingly dense puffs of mist, like small clouds, and ruminating on the past.

Diederik Vandewoesteyne, aged forty, from Glasgow, had committed a crime, confessed to it, and gone to jail. It sounded so simple. That had been in 2050, when Muir had been fifteen. He got out five years later, and Muir and Suna had thought that life would return to something like the old normal, but it wasn't to be. Of course, it would never be the same, too much had changed. For one thing, neither of them where teenagers anymore. For another, Papa was now Mama. That had not come as a surprise to Dad, but it had still been a big change for all of them.

Well, for a short while, the four of them had lived together, studiously avoiding the past, and things had been cosy. But then Dad had just vanished. Muir had been heartbroken, and filled with resentment. He had missed his Dad so much for all those years, and now he would be away for even longer. He felt cheated. It seemed to him that Dad was being very selfish. But he could see that Mama was fully behind it, and it was clear Dad wasn't doing this for fun. And that they didn't want to tell him or Suna anything meant they

were better off not knowing. That was a bit sinister; but then Muir had never been able to shake off the feeling that there was a lot more to the affair. For one thing, Dad simply couldn't have committed that crime. They had all known that. But he had confessed and gone to jail. Too simple.

Dad had said he'd keep in touch. And he had, but that was small comfort. It would be another two years before he would be back. Another eternity.

Muir shrugged. Time to get back. It would be noon by the time he got home. Hélène would have finished her job for today and Sarah would be back from school.

Chapter 2. Spring

Àrd-Dhìthreabh, April 2061

Suna paused at the foot of the embankment to take in the sight.

At low tide the beach of Àrd-Dhìthreabh was always looking its best, even on a bad day. But today, on this glorious spring afternoon, the light so pale and fresh it was almost sparkling, it was truly stunning: an uninterrupted stretch of sand as far as the eye could see, hundreds of metres wide, tall sand dunes on one side, the surf on the other, running in a shallow curve along the bay towards distant An Truthail, barely a smudge on the horizon. Sand dervishes seemed to form out of nothing, did their whirling dance and dissolved again into the beach. The sea surface was a hardly ruffled steel blue on which Eilean Arainn sailed at anchor, majestic with its tall snow-capped mountains. Suna had seen this sight hundreds of times but it still took her breath away.

As soon as she had gotten up she'd seen that it was one of the first truly nice mornings of spring, and on a whim she'd decided to give herself the day off. Roy had had a late shift and was still asleep. After breakfast she quickly made a few *onigiri*, left a note and set out along the beach. Instead of her usual morning run or walk, today she would go all the way to Àrd-Dhìthreabh. The tide looked just right.

Seals were basking on the rocks that were all that was left of the old Irbhinn harbour pier. Suna climbed halfway up the nearest dune and ate her lunch. Out here in the open food always tasted as good as anything, and she loved *onigiri*, but she still felt herself wishing for a simple slice of home-baked bread. But the wheat was growing thin, so bread was now a luxury. Maybe one day.

From her vantage point, she could see the remains of the old Inventors Bridge sticking like huge bleached bones out of the sand amongst a sea of dunes. She remembered how once, as a child, she'd set out to get to it. She'd sunk knee-deep into the loose sand but had kept wading. It was a strange sensation: the top layer of the sand was hot from the sun, but at her toes it was cool, almost cold. With every high step it repeated: hot, then cool, hot again, cool

again. Up close you could still read some of the names punched in the ironwork: Maxwell, Kelvin. She suspected that memory might have been why, much later, she'd decided to study Physics.

Once, most of this had been water, the saltmarsh and mudflats at the confluence of the Garnock and Irvine rivers. Hundreds of years ago it had been the main port for Glasgow. Yaya had told her that in the late 2020s, the storm surge of a super-hurricane had breached the coast line at Stevenston, and the enormous amount of rain it had dropped had pushed the swollen Garnock and Irvine rivers through that breach. With the more arid climate, the old river courses had first turned into sand flats and later into dunes. It looked like a small desert, and that was appropriate for a place called Àrd-Dhìthreabh, which meant wilderness in Gaelic.

Her steps traced a shallow cycloid on the firm wet sand along the water, towards what in her mind was "Àrd-Dhìthreabh proper", near the river mouth. A little game, walking along an imaginary periodic curve, as if she was a point on the spoke of a giant wheel. This was one of her favourites, she loved the twirling phase.

That place always sparked memories, and today was no exception. They had come here so often, it was Dad's favourite place. Dad had been away for a long time now, making his slow way into the East, and before that he'd been in prison. And before that ... she recalled feeling a kind of vague dread as a teenager, beyond the usual unease of that awkward age. There had been lots of subliminal signals from Dad, Papa and even Yaya. A kind of premonition. And then, in the pit of a dark and moonless night in October of 2050, there had been the raid. Papa had been incommunicado, away in Inbhir Èireann caring for Yayo with Yaya, who still insisted on living off-grid.

In that colourless hour before dawn, Dad had woken her and Muir and said, "Kids, the cops are coming to arrest me. Don't worry, they won't hurt you. Show them that you know your rights. Don't say more than you should. It's me they want. I'd better go down before they break down the door." And with that he'd flipped on the lights, gone down the stairs and carefully opened the door, and from the landing they'd watched a team of heavily armoured *poileas*

pouring into the hallway and pinning Dad to the floor. Suna in particular remembered how they'd shone their ultra-bright torches in her face, forcing her to shield her eyes, even though all the lights were on. And how they'd taped her mouth shut before she'd even had a chance to object.

Suna involuntarily winced at the memory, and for a while focused on the beach, marvelling as always at the sheer number of shells, in some places so dense they painted the dark sand a bright white. If the populations remained sustainable, the beach would get whiter and whiter. The thought appealed to her. It made her think of the *hoshizuna*, the sand on some beaches of the Ryūkyū islands that was made up of countless tiny star-shaped skeletons of single-celled organisms. Star sand, what a beautiful word.

It had been Yaya and Yayo who had taught them their rights. They remembered the bad times and Suna knew they had been permanently scarred by them, although she didn't know what had happened. They never talked about it. Yaya had drilled it into them: "Kids, in Scotland we still have some laws and the cops still mostly follow them, but only if you show you know your rights. If they arrest you, the law says they must inform your parents that you're in police custody, even if you don't ask them to. And they can't interview you without one of your parents or close family present. But you must ask them, else they will just assign you some social worker. If Seumas or Diederik can't be there, you should ask for me or Yayo. Until one of us is there and there is a solicitor, you should say nothing at all."

Suna had recalled those lessons. The cops had started asking questions as soon as they got to the police station, but all she told them was to get Papa or Yaya. She had no doubt that Muir would do the same. They had locked her in a windowless room with a chair and a table and the kind of very bright lighting that still manages to look dim, and left her alone for a long time. A few times someone had brought some food and drink. Shortly after the third meal, they had taken her to a similar, somewhat larger room where there had been several cops, but also Muir and Yaya and a woman who had introduced herself as their solicitor.

They'd asked both of them some questions which had seemed rather perfunctory, and let them go. Back home, Yaya told them the local cops had come to her house in Inbhir Èireann early in the morning and arrested Papa. "Then they came back and told me the presence of me or Yayo was required in Glasgow because they wanted to interview both of you. I inferred they'd arrested Diederik as well. I kicked a fuss because I couldn't leave Yayo alone, so they had to send over a nurse to look after him. When I finally got to the police station in Glasgow, the solicitor informed me that Diederik had already made a full confession. So they only asked you a few things to check and let you go." They'd let Papa go soon after as well.

As so often when Suna was absorbed in such recollections, the river embankment appeared much sooner than she'd expected. She climbed onto it and stood for a while looking at the dike that kept the river mouth in place. It had been constructed nearly half a century ago by a Belgian company and was made entirely of lime-treated soil. No concrete at all, and it had proven entirely erosion resistant. That approach was now common, but this dike had been the first of its kind in Scotland. It was covered with machair between copses of ash trees. This early in the season, the ashes were still bare but the turf was already carpeted with dense clusters of lovely primroses. Soon it would explode into a riot of colour and scent.

The trial had been a strange affair.

Dad had at the time been up to something, Suna had been sure of that. But she still had no idea what it had been. But whatever it was, it couldn't be what Dad had confessed to, even though apparently there was incontrovertible evidence, a geo-located IPv6 address trail leading right to their house. But the IT wizard in the house was Papa, not Dad. Then again, even Dad would never have been so careless to leave a trail like that. And Papa wouldn't have let him.

But Papa must have had a totally watertight alibi, they didn't even charge him. Apparently, this was about some cyber crime dating back to 2034, before Muir and Suna were even born. But the police had all the records, and it was beyond doubt that at the time

of the events Papa had been with Yaya and Yayo, firmly off-grid. How the police could be so sure was a mystery, but Yaya had told them that in those bad days, surveillance was at its peak.

Still, there was something wrong about the whole thing. Dad was no elite hacker, the best he could do was some scripts for his DNA sequencer. He could never have pulled off such a thing. Papa could have done it, especially with Yaya's help. But that had apparently been ruled out entirely. It was all very odd.

After a brief trial behind closed doors, Dad was sentenced to ten years in prison, but the solicitor had assured them that he'd have to serve five years at most.

Suna sighed and shook her head. She had been over this much too often. Today was too beautiful a day for all that. She put it out of her head and focused on the epicycles instead. Tracing her graceful periodic arcs onto the wet sand, she slowly made her way back along the beach towards Bàrr Fhasaidh.

Chapter 3. Summer

Inbhir Èireann, July 2061

Seònaid stood on the beach near the remains of the forest of Roseisle and looked north over the Morray Firth towards the distant low lying land of the Tairbeart peninsula. It was a beautiful day and quite hot, and the far-off land was shimmering in the haze.

Apparently, where she stood had once been a sizeable forest, planted on top of the dune system to stop it from shifting and engulfing the homesteads. With the rise of the sea level, part of the forest had flooded and the trees had died. The rest of the forest had burned down repeatedly and in the end no more attempts at reforestation had been made. The dunes were magnificent now. It might have been her imagination but they seemed even taller than when she was a child. And the forest was not quite dead: everywhere small conifers were shooting up through the sand, and in sheltered dune slacks there were already some small groves.

The dark roiling pall of smoke from the moor fires in Srath Uairidh obscured most of the northern sky, but luckily the wind carried it off into the east. It reminded her of a scene from *Yokohama Kaidashi Kikō*, an old manga that she and Diederik loved. When it was published in the 1990s, the scenario in that story had seemed implausible, but it had turned out to be prophetic. Floods and fires. The rise in sea level had been much steeper than any of the models had predicted. But then people had behaved a lot more stupidly than the model designers had dared to assume.

Diederik. Going home to Inbhir Èireann inevitably made her feel his absence more keenly. The house brought back the memories of that fateful night. But she didn't want to dwell on it. That was more than ten years ago, and a lot had happened in the meanwhile. The concrete rot had changed everything. Within a span of barely five years, almost every major concrete structure in the world and countless others had collapsed or crumbled. Any concrete construction still standing was deemed unsafe. The consequences had been devastating: long-distance transport became impossible, even shipping was severely affected. Concrete wind towers had also collapsed.

Luckily, most wind towers were steel, so electricity generation was not all that much affected. And fortunately, most large dams were not made of concrete, and those that were had survived, for as yet unknown reasons. Another stroke of luck was that the high-density concrete of nuclear power plants had also remained unaffected. So there had been no disasters, but all plants had been shut down because of safety concerns.

The main damage had occurred in the early years, when it was not clear, or rather not widely accepted, that there was a common cause to the events. But scientists, civil engineers and actuaries had caught on really early. Even in the first year, when only a handful of bridges had collapsed, it had been clear to them that the odds were enormously against it being coincidence. Soon, a fungus had been identified as the root cause. Further investigations showed that the spores were windblown but that the main vector of the rapid global spread had been via the tyres of airplanes.

The airline industry had tried hard to deny this, until their runways had started to turn to sand. It had been their worst blow ever. There was no slack in global air travel, even a single runway out of action at a major airport had worldwide repercussions. And it had been infinitely worse: the majority of runways became unusable. The irony was that a lot of these had been converted from asphalt to concrete in the previous decade, mostly because the cost of asphalt had rocketed but also because with rising peak temperatures in many places better heat resistance had become necessary. And so, one airport after another, and one airline after another, became insolvent. Nationalisation could not possibly save them all, especially as they could now only operate at a loss. There were technical solutions, like polymer-glass tarmac, but the airports could not afford them. Only the few that had been saved would eventually get back in operation.

Long-haul transport had been a similar story, mostly for the same reasons: motorways had increasingly been surfaced in concrete. At first, the vested interests had tried to downplay the damage to the bridges so the lorries could keep on running. Until too many bridges had collapsed, and too much of the motorway surface had turned to sand. The carcasses of countless lorries that had fallen

victim to this refusal to accept reality were still there today.

The railways had been the first to recover. In many places, and in particular in Britain, the damage was relatively minor because many of the bridges were so old that they didn't use modern concrete. The main damage had been concrete sleepers turning to sand, but these had quickly been replaced by metal or wood. As concrete roads were no longer an option and tarmac was too expensive, transport soon moved to rail. Initially, there had been reluctance to accept this state of affairs: people kept hoping for some kind of miracle that would restore the roads quickly and cheaply. But after a few years, common sense had won and new railways were built on the remains of the main motorways. Small-scale shipping had also experienced a renaissance.

There were many theories about the concrete rot. There was a rumour that the fungus was a genetically engineered weapon, but as it had affected the whole world that was so patently absurd that no amount of propaganda or misinformation could make it stick. Another theory was that it had in fact been caused by climate change – that otherwise the fungus could never have mutated like this. If that were true, Seònaid, thought, it was rather a sweet revenge. The world had been pretty much forced into what used to be called the solarpunk utopia. It was none of that, of course, neither predominantly solar, nor much to do with punk at all, and certainly not a utopia. She knew very well it wasn't true. Still, the collapse had taken the fash with it, and that was what really mattered. They had peace again, even if the price had been high.

Seònaid started to walk along the beach towards her rendezvous with Morgana. At first, the beach appeared completely empty. Then, the shimmering heat haze started to contain a hint of order and structure. The dancing patterns started to coalesce, slowly and waveringly; and then quite suddenly a person was there, as if teleported. Even though she was still a few kilometres away, Seònaid immediately recognised Morgana. How little did she change over the years, as if time had less hold on her than on ordinary people. Small and slim, even frail, but you could see the light of her inner fire shine through, even in the intense glare of the sunny beach.

Seònaid was immensely proud of her mother. She knew better than to tell her so to her face though.

Morgana saw Seònaid approaching in the distance: a tall, powerful woman with dark skin and very short, bright red hair, silver glittering in her ears, with a bright eye and a permanent ironic smile, and the bearing and composure of a martial arts master. To Morgana, she looked young and bright and beautiful, and she was quite happy that her erstwhile son had become a daughter. She wondered what she looked like to Seònaid. A frail, wizened but proudly upright figure perhaps, old but not bent by age. Not that she felt particularly old today. It was high summer in the sunniest part of Scotland, there wasn't a cloud in the sky and hardly any wind. The late afternoon sun was still high in the sky, but the UV was not too high for someone with her skin tone.

Her skin tone. It seemed to have gotten darker over the years, despite living so far up north. She remembered how her Rioplatense mother had called her *parda*, and she'd liked the sound of the word. Her Playero dad had nicknamed her "Morgana la gatoparda", and she'd loved that. She could imagine being a leopardess, or maybe a leopard woman, a female counterpart to those feared leopard men from the old stories her grandmother had told her. She and the other leopard women would be the opposite of those ruthless assassins. They'd work to make things better rather than rule by terror.

Even now, after more than fifty years living in Scotland, people would occasionally ask her where she was from. Her only solace was that even golden-haired Diarmad, who was only a shade darker than the typical Scottish pallor, got asked the question as soon as he opened his mouth. His years on Corisco had left him with a slight but immediately noticed Spanish accent.

They sat down on the sand. Morgana had brought cooled segments of watermelon. "From Yayo's greenhouse. Still going strong after all those years." They ate them together, spitting out the pips and talking quietly about nothing in particular. After a while Seònaid fell silent and sat gazing at the sand. Morgana turned to her and said, "Well Seònaid, you must be glad that it will finally be over."

Without looking up, Seònaid replied thoughtfully, "But will it?"

"I don't think the fascists will be coming back any time soon now. Not for twenty years at least."

"That's what we thought the last time, but they were back in charge after just fifteen years."

"I really think this time is different. Last time, even though the network state collapsed and took all those other regimes down with it, the physical infrastructure was still there. But the concrete rot has totally beaten them this time. The world has completely changed and the people have laid the blame squarely on their shoulders. It all happened on their watch and they couldn't shift the blame to some outgroup as before."

Turning to face her, Seònaid replied, "I so hope you're right. Maybe the people are still blaming them for the disaster. Maybe they even blame them for letting climate change happen. I really hope so."

Morgana shrugged, "At least we have avoided catastrophic warming. Global emissions have really plumetted. That's what really matters. But I think Diederik will be safe now. It's been tough for you and the kids, isn't it?"

"Aye, especially Muir. It think there's going to be trouble when Diederik returns. But I know you've missed him too, Yaya. Diederik was always so fond of you." With a mischievous look she added, "Sometimes I think you're more fond of him than of me."

Morgana laughed out loud, a surprisingly rich sound coming from such a wispy body. But she quickly grew serious again. "You're right though, this whole thing has really messed up our family and I still feel guilty about it. I know what we did was for the best, and history has borne us out, but sometimes I think it might be easier to live with the weight of harm caused by inaction."

Seònaid looked at her silently for a long time. She scooped up some sand and let it run through her fingers. "It has been hard, but I can't really see it that way, not anymore. The only thing that really bothered me is that we couldn't tell Suna and Muir."

Morgana shook her head. "I'm not so sure. If I had done nothing, I'm sure I would feel bad about it a lot of the time. But seeing the

effect of your actions on the news is something else again. Killing people is wrong, and causing people to die is only a tiny bit different. We didn't intend them to die but we knew that statistically it was unavoidable. I think the main difference is that most people do nothing, and are not much bothered by the consequences of their inaction. It's dilution of responsibility. When you do something and you are confronted with the consequences, and you know you are responsible, it's harder to take."

"But your responsibility was also carried by many. It wasn't just you!" Seònaid retorted.

Morgana smiled thinly. "That's a bit like being in the firing squad for a fallen dictator, isn't it?"

But Seònaid wasn't having it. She dusted off her hands and made an impatient gesture. "I felt like that for a while after, but not anymore. After all, it was I who did the actual hacking. We brought down the network state and it caused mayhem, for sure. People died as a direct result of us crashing the financial systems. But we both know more would have died otherwise."

"It's not that," Morgana replied. "I know all that. By the calculus of suffering, our conscience is clear. But look at what it did to our family. That's what I feel guilty about. It makes little difference that we did what we did for the best of reasons." Seònaid looked at her mother with deep sympathy. "You know what they say, Morgana. Guilt is anger at yourself, and nobody is the better for that. It's all over now. You had to make hard decisions, and you made them. Think like Musashi: 'I will not regret anything' ".

Now it was Morgana's time to be pensive. When she finally looked up, a rueful smile played on her lips. "I guess you're right," she said slowly. Then her smile broadened. She stood up. "Anyway, that's all in the past, and soon Rico will be back, for good."

They walked back along the beach, past the high dunes and then the sunken ruins of the old village. In the distance rose the incongruous structure that was Inbhir Èireann. It was a sight that always delighted Seònaid: a whole village raised on stilts, as if floating above the water. A symbol of inventiveness and resilience. Morgana saw her admiring it and laughed out loud. Seònaid looked

at her but wasn't surprised. It was just one of Yaya's happy attacks.

"You know, me being a Playera, I still find it funny that the best beach in the world is right here, in the north of Scotland. Of all the unlikely places."

Chapter 4. Autumn

Wissant, November 2061

Late Autumn was Muir's least favourite time of the year to be on the beach. The dark days and the interminable blanket of low grey cloud made him feel melancholy; and for some reason it always made him think of the battle that had been fought here. Which was now a hundred and twenty-five years ago, and still the beach was strewn with corroded bullets and age-blackened shells. The concrete bunkers had all turned to sand though, only their rebar remaining, like cubist whale skeletons.

Yesterday, a new message came from Dad. As usual, it was an old-fashioned memory card with pictures of sand and a few cryptic notes. With Mama's program, it turned into a long letter.

Despite his resentment, Muir had to admit that Dad's letters were fascinating. His descriptions of his trek through Georgia, Azerbaijan and Secular Persia were eye-opening. And his account of reunified India was perhaps the most uplifting of all. India had seen a real green revolution. It was of course a well-known story how their local fascist regime had fallen in 2034, in fact it was history: the fall of the regimes in the US and India had started the domino effect that was now known as the Global Fascism Collapse. But, in contrast to what had happened in most of the rest of the world, the far right in India had not managed to stage a comeback, probably as a result of the reunification. Instead, they had what was arguably the most proactive government in the world when it came to tackling the climate emergency. As a result, India's economy had suffered a lot less than most other countries. The concrete rot had also had a relatively minor impact, because from the start the government had invested massively in the railways, and India's rail infrastructure was now the most extensive and amongst the most modern in the world.

Still, Muir thought, Dad's train journey through India from Mumbai to Agra, just to see the Taj Mahal, was simply crazy. For starters, Muir had thought that that area was now too hot for human habitation. But when Diederik asked in Mumbai, they had

assured him he could get to Agra, by train. So people were still living there, and enough to make maintaining the high-speed rail connection worthwhile.

Indian long distance trains were clearly more weather resistant than Scottish ones. Or maybe Dad had simply not found it worth commenting on the quality of service. What he did describe was how, when they got into the hotter regions, the land was extremely arid but more like a steppe than a desert. Clearly, some of the vegetation could withstand the heat and prevented a dust bowl effect. He also saw from afar several large, milky white, translucent dome-like structures. As they became more frequent, some were closer to the railway line and he saw that they weren't domes but clusters of huge umbrella-like constructions made of wooden or bamboo frames with what looked like plastic sheeting. His fellow passengers explained that these were plastic solar panels with adaptive transparency. They ensured a constant level of illumination and warmth underneath by controlling the absorption spectrum. Large parts of Agra were covered in this way, and the microclimate underneath those canopies was indeed liveable, and suitable for growing crops. They called them *suruj-phool*, which meant "sun-flowers" in Urdu.

And as it wasn't made of concrete, the Taj Mahal still stood there, imposing as ever. There was an obscure reference in the letter about how he'd better leave the description of that magnificent building to Uncle Rory. Muir assumed it must be a character in one of those old novels Dad liked so much.

From Agra he'd gone to Sri Lanka. There he'd managed to join the crew of a sailing boat bound for Phuket. From there he'd taken the train to Ho Chi Minh City and then via Hanoi and the Friendship Pass into China. "I would have loved to take the high-speed train all the way from Hat Yai to Kunming, just because it's such an amazing thing: a five thousand kilometre long high-speed rail trajectory. But of course I didn't. Seeing the train go past in the station was enough. Instead, I took the slow trains and walked. I walked from Ho Chi Minh City to Da Nang, and from there to Hanoi. There I took the train to China. First I went to Nanning, the Green City. It had always been lush but in the past decades had

adapted from a city with lots of trees to a subtropical forest where people lived. From there I went to Kunming, the City of Eternal Spring, just so I could watch the high-speed train from Singapore arrive, half a year later."

"I had been fascinated by Vietnam from an early age. It started with an old movie I watched as a teenager, *The Scent of the Green Papaya*, set near the end of the French occupation. It was so beautiful and moving. I wanted to know more about this place so I watched more movies, both French and American. Films like *Indochine* and especially *Apocalypse Now* left a deep impression and I started to read up on the country and its history, in particular the war. I was appalled at the use of chemicals like the napalm incendiary and the agent orange defoliant and the other rainbow herbicides. I couldn't understand how people could apply their ingenuity to create such horrible weapons. I understand that better now, but it was partly to show I could do better than that that I decided to become a biochemist. I also read a lot of fiction set in Vietnam. The one book that stayed with me always was *The Quiet American* by Graham Greene."

"That atmosphere of the country captured by Greene a hundred years ago is still very much the same, a combination of climate and culture, even though the climate has changed for the worse and the culture has evolved a lot over the course of that century. What he wrote about human nature still applies as well: 'Sooner or later, one has to take sides. If one is to remain human.' and 'I never knew a man who had better motives for all the trouble he caused.' I recognise myself in there. Maybe, despite trying very hard to be as different as possible from a CIA agent like Pyle, the eponymous Quiet American, I had ended up becoming more like him in my mind."

"Ho Chi Minh City was a very green city. It was almost entirely covered by a near-unbroken canopy of very tall trees. I talked to the people, mostly in French or in Chinese, sometimes in English. In a move to resist the linguistic imperialism of both the Anglo-Saxons and the Chinese, after the glorious revolution the new left-wing government had gone back to promoting the language of those

occupiers and enemies of long ago, the French. They had also started the campaigns to plant the tall canopy trees that were typical of the Vietnamese jungle. All over the country, they told me, the cities were now covered in those. It had taken thirty years for the trees to reach their full height."

"Here as anywhere else, all the tower blocks had fallen. On the whole, it seemed people were not much bothered by the destruction of the skyscrapers. 'Nobody except the very rich was living in them. People want to live under the canopy.' The bridges had been another matter, especially in a city so veined with rivers and canals, but like everywhere else, people had been resourceful and inventive, and the famous flows of bicycles had long been restored."

As usual, Dad's letters minimised the effect of the concrete rot. If you had to believe him, it had almost been a blessing. Muir frowned. Looking at it soberly, that had of course been the case. It had caused the huge drop in emissions that had stopped global warming from getting totally out of control. He sighed. Still, it had been a global disaster, and somehow he blamed it for his father's absence. He wondered why that was. After all, it had started when he was in jail, and that had nothing to do with it. Maybe it was because he left in the period when it was at its worst? Muir shook his head and continued his walk along the beach. He stared morosely at the grey sea and the gloomy sky, seeing instead the tropical light and greenery evoked by the letter, and he had to admit that right now he'd rather be there. And they even spoke French!

Chapter 5. Winter

Àrd-Dhìthreabh, February 2062

It was early afternoon on a typical West of Scotland winter day. In this season, Suna always tried to spend as much of the short days outside as possible, even if it meant less business. It was a matter of survival. So here she was on the beach at Bàrr Fhasaidh, with the tide coming in, driven by the cold, merciless wind. It also brought showers of horizontal sleet, stinging her face and whipping at her clothes. During such squalls, everything was a gloomy grey, as if the sun had already set, or maybe never risen. Visibility was only a few paces, but she trundled on regardless. And although they seemed to last like an eternity, soon the sun would break through the clouds, the beach and dunes would lit up and you would feel the warmth on your face, and it was glorious to be out.

The day before, a new message from Dad had come. As usual, it was a memory card with pictures of sand and a few cryptic notes. Suna still thought it was very clever to combine one-time pads and steganography, and the sand pictures always had a certain poetry. Mama had written a small script that figured out which key to use to get the stego message, then which pad to use to decrypt it. She had very likely also written the scripts Dad used to create the images.

Suna had been worried about what would happen if Dad lost his one-time pads. Mama had said, "Then he'll mail me a poem. If that happens, I mail him back the sand pictures. If he receives them all right, he knows what to do. If not, he'll send me a song lyric. If that happens, from then on we'll fall back on a mathematical function we agreed on as a pseudo-random generator. Some Euler-Riemann zeta function. Your Dad's not a great coder but I have left all he needs scattered across the internet and he knows where to find it. If he can't find a computer, he'll resort to manual encryption. Very slow, but he has a lot of time anyway." She had smiled rather wickedly and added, "Strength in depth." Suna had been impressed. So far, it had not been necessary: the sand pictures had kept coming.

When Dad had written this letter, he'd been in Japan. Unusually,

there were some pictures that were not purely sand or beaches. Normally, Dad limited himself to descriptions of the places he visited. But this time he'd taken pictures. One in particular was taken from high up on a headland on the Miura peninsula, looking out over the partially flooded coastline. Another one showed a view of a partially submerged large city. There were several tall building still standing. Somehow the concrete rot hadn't affected them. Maybe because they stood in the sea? From the shape of the tallest one, there could be no doubt it was Yokohama. Another picture showed a sea of tall waving grasses. He said it was called *hachijōsusuki*, or simply *kaya*. Suna recognised the scenes right away: they were straight out of *Yokohama Kaidashi Kikō*, an old manga that had been a favourite of Dad and Mama. They had often read it together. It was uncanny how close those pictures were to the drawings. No Alpha, Dad wrote. No *robotto*, what a shame. Very likely no *taapon* either. It was fiction after all.

The letter also described scenes in Kyōto and Kagoshima. Kyōto had fared relatively well. Somehow, many of the earthquake-proof concrete buildings had not been affected, and its climate had somehow not been affected as much as other parts of Japan, probably the surrounding hills providing some micro-climate. Suna had never been there, none of them had, but she knew it had been a kind of spiritual home for Dad.

She knew that Kagoshima had once been a good place to live despite being right next to a live volcano, Sakurajima, which often covered the city in a thin layer of ash. Now it was too hot most of the year and a large part of the city was under the sea. And of course the volcano was still active. But people were still living there. And like the cities in Vietnam, it had become a very green place full of tall trees with wide canopies. From a distance, it looked almost like a rainforest, and that was apparently exactly the idea, to create something like a rainforest ecology. People lived under those trees, which sheltered them both from the sun and the ashes, and provided them with food as well. They even grew excellent coffee. Ostensibly, that was why Dad had gone there: to taste that coffee. Suna smiled, coffee was of course another key ingredient of

Yokohama Kaidashi Kikō.

But although the letter didn't say so (it never talked about the next destination), to Suna, Kagoshima was obviously his stepping stone to the Ryūkyū islands. Unlike in the story, Japan was now effectively a closed-off country because of the *sakoku* policy. And although the politicians would have preferred to get rid of the Ryūkyū, in practice that was impossible as they grew the vegetables and fruit for most of Japan. That put them in a very powerful position, and they were not nearly as closed-off as the rest of Japan. As a result they had become the gateway for smuggling of goods and people to and from Japan, and the local authorities turned a blind eye. It was the ideal place to get in or out the country.

Closer to An Truthail, debris from the recent storm littered the beach. Teams of beachcombers were sifting through it. It was a familiar scene. When she came closer, she saw that one of the teams were all Chinese, or at least East-Asian, like herself. Probably recent immigrants who had not found employment yet. It reminded her of Dad's previous letter, the one she thought of as the "China Letter", and which she knew he had written especially for her.

From Kunming, Dad had traced his way to Shanghai via a long pseudo-random route, first moving east along a corridor of relatively moderate temperature, and then north up the coast. Apart from the now familiar devastation of the concrete rot, the lands in this first part had been relatively unaffected by climate change. There were of course the now-ubiquitous localised floods and droughts. As in so many other places, the habitable and arable land area had been reduced considerably as huge swathes had been sacrificed as floodplanes. In Jianxi and Fujian provinces, the more frequent and longer droughts had led to an increase in the bamboo forests for which the region was famous. But the region remained suitable for human habitation. Closer to Shanghai, that was no longer the case. Temperatures had become almost unbearably hot, and coastal cities had no choice but turn into inhabited forests. Wenzhou had turned into a forest of Chinese *banyan* trees, which was both a practical choice, as they grow tall and wide and were remarkably adaptable to urban environments, and a poetic one, as it had been the official

City Tree for nearly a hundred years and was a symbol of endurance and spiritual growth.

Where the trees would not grow only barren land remained, quickly turning into desert as the topsoil was washed away by frequent excessive rain, and the vegetation could not recover sufficiently because of the heat. But people were inventive. In many of those wastelands, solar panels had bloomed. Part of their energy harvest was used for irrigation and together with the shelter they offered, that had made agriculture possible and halted further desertification. Apparently, it was a lesson learned the hard way: without the vegetation, the dust from topsoil erosion would cover the solar panels. Cleaning them was too expensive, and many of the early operators had lost the fight against the dust, until someone had come up with this solution.

Dad's final destination in China had been Shanghai, to witness the enormous submerged area covering most of Jiangsu province, all the way north up to Lianyungang. There was a part in the letter where he addressed her directly: "Suna, I did try and find your family. I knew it was pointless, the local authorities would have tried to trace them long ago, but I felt I had to. I didn't succeed. But I did manage to visit your parents' home. That neighbourhood of Shanghai is now completely under water. The typhoon broke the defences and they were never rebuilt because the sea level rise was too rapid anyway. Then the land sunk even further under the pressure of the water. But there are companies there that offer this service: you give them the coordinates and they take you there in a little fishing boat and lower you in a kind of transparent plastic diving bell, so you can visit the place under water. Your parents had lived in a modern apartment block, and most of it still stood there. I left a little memento at the front door. Back on the boat I burnt ghost money for them."

"I think one day you will want to come and see this place. The new city that has grown under the trees is amazing, so vibrant and colourful. There is a real sense of optimism here, despite the climate disaster."

Suna was moved by Dad's efforts. She didn't have any memories

of Shanghai, and only very vague memories of her parents. She'd been only two when her family died in the huge flood caused by a super-typhoon. She knew that her mother had been Japanese. She'd been taken to London by her great-grandmother, who had been British Chinese. Granny had died soon after, and that's how she'd been finally adopted by Dad and Papa. They, and Muir, had become her real family. She knew Dad was right though: she did want to go and see Shanghai, and also Japan. Now that she'd read his letter, she wanted to go there more than ever. And from Dad's reports, it seemed it would be even quicker and easier than she'd thought. There was so much high-speed rail now, and he would be able to advise her better than anyone else.

Dad had not been able to trace anyone of her Japanese family either. She knew her mother's parents had been from a small fishing village on Nakadōrijima, one of the Gotō Islands, but that village had long been reclaimed by the sea. Still, she wanted to go to and visit the island. She had often explored the route, and even dreamed of it: the long ferry from Shanghai to Osaka, *shinkansen* to Nagasaki, and from there to Arikawa, alighting on the pier into steamy heat or subtropical rain.

Suna blinked against the low winter sun. Her eyes were watering from the stinging windblown sand – or maybe she was crying. She wiped her eyes and came back to the reality of the flotsam on the beach. Lit by the pale slanting rays, and drenched by the passing squall, the scene of debris strewn amongst the silver pools was abstracted into a stark monochrome. It actually looked quite beautiful. The figures moving amongst it seemed ethereal, like benign spirits reaping a spectral harvest.

Chapter 6. Spring

Wissant, April 2062

Mama had asked if she could come and stay with then. They hadn't seen her in over a year and Sarah was delighted at the prospect of seeing her granny. Mama was still living in Glasgow so it was quite a journey.

Muir also looked forward to seeing Mama. But he also suspected that the timing of the visit was no coincidence: in his last letter, Dad had hinted he might be coming back soon. Mama might have come to pave the way, so to speak. Muir felt a certain apprehension.

She arrived in the afternoon, having walked from Pihen station. She was in a very good mood, and they had a very merry reunion over coffee and cake. After that, Muir took her out for a walk on the beach.

"Muir, I guess you know why I have come now, don't you? Dad will be back soon and we need to have a talk about that. We both owe you an apology, or at least an explanation."

"Both of you?"

"Both of us, and Yaya too. You must have figured out that things were never quite what they seemed, mustn't you?"

"Well, all I know is that it was all very odd and a lot didn't add up, but I still don't see why Dad had to desert us."

"That will be for Dad to explain to you himself when he's back. But I want to explain what led on to it. You know that until 2035, the fascists were in charge everywhere, don't you?"

"Aye, and that they came back to power around the time of Dad's trial. I kind of suspected there had to be some connection, but I could never work it out."

"Do you know what caused the Global Fascism Collapse?"

"We learned in school that it had something to do with what they called the Network State in America and India. Some globally distributed network with blockchains and agents that managed the economy or something. They explained that it had, due to the introduction of those agents, it actually been a chaotic system but nobody had realised that, and so it had collapsed without any

warning, and taken the fash down with it."

"That's what the history books in Scotland say alright, and it's mostly correct. The reality was only a little bit different. The Network State, this kind of ostensibly distributed but really highly centralised state substitute run by the tech megacorps, was always unstable, that bit's true. The agents were probabilistic so there was never a guarantee of stable feedback. But it was not chaotic in the theoretical sense. Meaning that it needed quite a push to collapse. Also, the instabilities were known. People had worked out for quite some time where the pressure points were and what it would take to bring it down. And *that* was what your Dad was tried for, and found guilty of. The new regime didn't want to make a hero, that's why they hushed it all up."

Seònaid said all this in a matter-of-fact way, as if it was obvious.

Muir was taken aback. "That sounds fantastic, I can't believe it. Dad could never have done something like that: he wasn't good enough a hacker, and also, wouldn't you have known?"

"I didn't say he *did it*. I said that's what he was *tried for*. But he did confess, didn't he?"

"Aye."

"And all evidence supported his confession, right?"

"As far as that went. You know I'm no expert, Mama, but me and Suna went over this again and again at the time, and we couldn't believe he would leave a trail like that. If nothing else, *you* would have noticed."

"Ah, but I wasn't there at the time, was I? That was confirmed during the trial: I was with Yaya, looking after Yayo, firmly off-grid." She said this with an ironic smile while stressing the last two words.

Muir stopped and looked at her. "Meaning you weren't?"

"Oh, I was there all right, all the time. But you know, being off-grid and being offline is not always quite the same."

"So you knew what Dad was up to?"

"Your Dad didn't do anything."

Muir was a picture of confusion "He didn't – but then how – who –"

"It was Yaya who organised it, and I and many others helped

with the execution. And even if I say so myself, we did an almost perfect job: no leads, not a single shred of evidence against us. Also, the new governments were none too keen to investigate the cause of the collapse, for fear it might compromise their legitimacy. And so for many years, all was well. Then in the late 2040s, the fash were staging a comeback. Something had to be done to stop them, and Dad had a plan. It was dangerous and ethically questionable, but we all agreed to it. Reluctantly, and after interminable discussions, but we agreed in the end. It was something that would take years to materialise. But shortly after we'd put it in motion, we got a tip-off that the case had been reopened, and that the investigation might be on our trail. We needed a contingency plan to protect the organisation. Somebody had to be the fall guy. It couldn't be me because that would implicate Yaya and Yayo and probably all the others. We had very little time, and Dad volunteered." Seònaid waited for Muir to interrupt, but he just looked at her mutely. She continued, "Yaya and I faked a complete evidence trail that would lead them straight to him. Luckily, it worked. You know the rest."

But Muir wasn't satisfied. He replied, "Lucky for all of you, but not for Dad, and for us. Also, that doesn't explain why he had to leave us for so long."

Seònaid studied Muir for a moment, trying to gauge his emotions. She went on, "That was because he was very worried that they would come and ask him questions, because if that happened they would definitely put him away forever, and the rest of us as well. He'll have to tell you himself what it was, but the upshot was that he needed to disappear until the fascists were gone again, just in case they would have managed to trace something back to him. It took a bit longer than we'd hoped."

Muir shook his head forcefully, as if to chase away a fly. "And you didn't even consider telling Suna or me?"

Seònaid looked really troubled. "We did consider it. But what you don't know can't be gotten out of you. It was simply too dangerous for you and Suna to know. I know, it was an awful thing to do, but there were no good choices."

Muir threw up his hands. He was really angry now. "And what

if we had guessed it anyway?"

"What of it? Guessing is not the same as knowing. If you had been questioned and told them your guesses, it might have gone bad for all of us, but if you had really known for sure, it would have been far worse."

"So you and those others just sent Dad away like the scapegoat."

Now it was Seònaid's turn to be incensed. "It wasn't like that at all. Look Muir, I totally understand you are angry. Do you think I *liked* it? I had just as little contact with Dad as you, both when he was in jail and afterwards. Don't you think *I* missed him too?"

Muir flinched at Mama's sudden outburst.

Seònaid immediately felt sorry for him, and she shrugged in a resigned way. "Anyway, you'll have to talk this out with Dad. I've told you as much as I could. We've all been feeling guilty about not telling you and Suna, even Yayo."

Muir clutched at the straw Mama offered. "Even Yayo? *He* was in it too?"

"Well, he was already ill, so he didn't actively participate. But of course he knew. He and Yaya had been activists together forever, from when they first met. We would never have done any of this if it wasn't for him. You know he was in the civil service before his illness. He'd been in charge of a lot of the cybersecurity work, and he still had his contacts. He really was our key source of information and nobody ever suspected him. It was he who got the tip-off."

"So everybody knew except for us?" Muir knew he was sounding petulant and childish but he couldn't help himself.

Seònaid looked at him for a while and then said, "Yes Muir, everybody who had to know knew." She knew the worst was over. Muir needed to save his wounded pride but his real anger had gone. For a long time they walked in silence along the beach, while the sun went down in a wrack of clouds.

Chapter 7. Spring

Inbhir Èireann, May 2062

Out of the blue but not unexpected, Diederik called at the house, one morning when the hawthorn was in full bloom. They had breakfast and made small talk, then went onto the beach. There was a smell of coconut in the air, wafting over the beach from the thickets of gorse at the foot of the dunes, so dense with flowers that they looked like deep yellow clouds.

"Well, Rico, I am so glad you made it back in time." He'd always been 'Rico' to her. She could see the name triggered a flood of memories.

"I'm very glad for that too, Morgana. And to find you so well too. I'm sure you'll be with us for a long time yet."

Morgana thought Diederik had aged surprisingly well. He was older and a little greyer but seemed mostly wiser. His face was more lined but they were the lines of one who smiled frequently. Long ago, in his younger years in Belgium, Diederik had for a while worked as a life drawing model in one of the art schools. A student had gifted him a portrait, and much later, Diederik had in turn given this portrait to her. It was a large drawing in thick graphite pencil, executed deftly on grey paper with minimal highlights in white chalk. It showed the profile of a lank young man with very pale hair and a pale thin face with a long, sharp nose. He was sitting on a Thonet chair, wearing a slim-fitting dark suit, legs crossed, barefooted, chin on hand, looking pensive.

Somehow, this portrait had over the years become Morgana's mental image of Diederik. If that portrait had aged like that of a wholesome Dorian Gray and come to life, it would be his spitting image. "You look well too, Rico. I see your travels must have agreed with you. We've of course all read your letters, but you clearly left a lot unsaid. Want to tell me about it?"

"I guess so, but I don't know where to start. Let's just amble for a while."

From the village, the beach ran due north for a few hundred metres and then curved sharply eastwards before returning to a

shallow upward sweep towards Roseisle. It was low tide and far out in the water the remains of the flooded village once known as Findhorn were visible. When they were past that point, Diederik spoke out.

"I'm very sorry I couldn't be here for Diarmad."

Morgana countered, "We knew that's how it would be. He knew that as well."

"Still."

Morgana didn't reply but asked instead, "What are you going to do next?"

"I have to go and see Muir and Suna. Especially Muir. From what I gathered from Seònaid, Suna has practically worked it all out by herself. But Muir ... I feel very guilty –"

"Don't do that. You did what was best for all of us. I think we should all be fine now. I don't think the tide will turn again before you and Seònaid are my age, and by then none of it will matter anymore. Muir's all right, with Hélène and Sarah he has to live in the present. I'm sure he'll be glad to see you."

"I hope you're right," Diederik said heavily. He fell silent again, pondering.

They continued past a stretch of dunes that had calved off, exposing a steep bank of compacted sand. Diederik observed the characteristic holes of sand martin nests. He felt his mood lift. He'd always been very fond of those birds. Their flight was endlessly fascinating. They sped over the waves, nearly touching the foam; they wove patterns over the beach like swallows; they formed and reformed into threes or fours, fluttering like butterflies and touching down on the sand for a fleeting moment.

They watched the birds for a while in companiable silence. Then he said, "I'll tell you something about the last part of the trip."

"When I reached the Mediterranean at Iskenderun, I sailed to Cyprus and then from one island to another until I got to Spain, to the fishing harbour of a place called La Vila Joiosa. It's very close to Benidorm, so I went there. It was really strange. That famous high-rise skyline has completely turned to rubble. The tall buildings had mostly been hotels and holiday flats, so now the

tourists have nowhere to stay. Of course they can't even fly there any more either, so it doesn't matter. It has become a ghost town. But nature has already reclaimed the rubble mounds, and now they are largely covered in a kind of maquis with oleander, bougainvillea, olive, orange and palm trees."

Morgana nodded, "You didn't pick Benidorm at random, did you?"

Diederik shrugged, "It was a kind of pilgrimage, if you like. I felt I had to visit the place where my parents died. But it was just luck that took me to La Vila Joiosa, I couldn't have planned it. Anyway, it wasn't all bad. Most of the old town is still intact and life just goes on there. From what I heard, the esplanade had always been several metres above the beach. When the sea level started to rise they'd raised the beach as well. Now it's full of tall palm trees. Most of the buildings on the waterfront are still standing; but they are all closed and many are boarded up. The sunsets were beautiful."

"From there I walked north and your friends took me from a beach near Bilbao all the way to Lorient. Then I sailed from Paimpol to the Isle of Man, and from there to Am Ploc. There I just took the train to Farrais."

He stopped and smiled at her, looking genuinely happy, "It's so good to be back."

Chapter 8. Summer

Wissant, June 2062

Dad had announced his visit well in advance. Like Mama, he'd arrived in the afternoon at Pihen station and walked to Wissant. They'd had something to eat in what Muir thought was a rather forced atmosphere, although Hélène and Sarah had been genuinely glad to see Diederik again. Dad himself had been all smooth and mellow but Muir wasn't fooled.

They had gone onto the beach the four of them. At some point, Muir and Dad had sat down on the sand; in unspoken understanding, Hélène and Sarah had walked on. Dad had said nothing, and a rather awkward few minutes had followed, until Muir couldn't hold out any longer and burst out, "Well, Dad, what can you possibly have done that was so bad you had to leave us all for more than ten years?"

"Ten years ... Aye, it's been that long. And really, Muir, not that it helps you any but I am very sorry it had to be this way."

"You're right, it doesn't help. Come on, Dad, what did you do?"

Rather than answering directly, Diederik looked towards a rusted tangle of rebar at the foot of a nearby dune. "That was a German bunker, wasn't it? Ever wondered what caused it to turn to sand?"

Muir was getting really annoyed. Even Dad knew very well what had happened to all the concrete. He was about to make a cutting rejoinder when he saw that Dad was now gazing at him intently, with a strange gleam in his eye. "Well, did you? Never wondered why the Erskine bridge was the first to fall? Or how it spread so quickly?"

Muir was dumbfounded. Suddenly, he understood, and at the same time he saw that he should have understood long ago. All blood left his face. "You – it was you? You didn't! How could you?"

Slowly, he recovered and now his confusion turned to anger. "You are a mass murderer! Thousands of people died because of what you did!"

Diederik said nothing for a while, staring at the sea. Then he said quietly, "My parents were amongst those who died. 'Stir not

the bitterness in the cup that I mixed for myself.' I make no apology. What I did was a terrible thing."

Muir deflated a bit. Dad looked utterly miserable, and he couldn't sustain his anger. He remembered what Mama had told him. The movement had approved Dad's plan, and it had worked to defeat the fascists worldwide, and avoid catastrophic warming. Rationally, he knew it had been the right thing to do, but it was still awful to think his Dad had in cold blood created a bioweapon and unleashed it on the world. They sat in silence for a very long time. A way off, Hélène was helping Sarah to build a sandcastle. The tide was coming in.

Chapter 9. Summer

Àrd-Dhìthreabh, July 2062

A few days after Beltane, a message had come from Dad. It was an ordinary letter, on paper, and it contained only a single sentence:

> When the *fionnan geal* flowers on the machair
>
> and the morning tide is at its lowest,
>
> I'll look for you in Àrd-Dhìthreabh.

That read like a genuine cryptic Dad message. "I bet you didn't send something like this to Muir", Suna thought, but she smiled. How like Dad to do something as whimsical as this. She looked at the envelope. Postmarked in Inbhir Èireann, on the day of Beltane. Suna's smile broadened. So he had been to visit Yaya first. How sweet.

Dad had no way of knowing when the *fionnan geal* would flower, so Suna guessed he'd come to Àrd-Dhìthreabh and stay there until it did, and watch the tides. They both liked that delicate flower, which was more commonly known as grass-of-Parnassus, and flowered from June onwards. It was rather rare on natural machair but on the lime-soil dike at Àrd-Dhìthreabh it grew abundantly. So Dad would probably be here from early June, and look out for her when the tide was low. She checked the tide tables in June and found that the first low spring tide before noon would be right on the summer solstice. How neat. And mercifully, the low tide would be close to noon. There would be no need to get up especially early.

And so it came to pass that on the day of the summer solstice Diederik met Suna on the dike at Àrd-Dhìthreabh. Suna saw him approaching over the crest of the nearest dune, skidding down at a reckless pace, throwing up a tall plume of fine sand in his wake. She started down the embankment to join him. At the foot of the dune he checked himself and walked towards her with long, measured steps, smiling broadly. "Suna-chan!" he cried, at the same time as she called out "Dad!", and they flew in a tumultuous embrace. He swirled her round until they were both dizzy and collapsed on the sand.

Diederik led her over a pass in the seaward dunes and through a dense maquis of sea buckthorn. The branches were covered in small yellow-green flowers and new leaves; in a few months she'd be collecting the berries again. They entered a wide round valley hemmed in on all sides by the bushes. The sand at the bottom was covered thinly with short grass. There were a few old concrete posts and other pieces of old stonework and some old enamel pots under a sheet of rusty corrugated iron.

"Here is where I did my experiments," Diederik explained. "I had stumbled across the fungus quite by accident in the lab, researching bacteria to digest plastics. There was a section of the lab that was being refurbished and it had a lot of exposed concrete. One day I noticed that blotches had appeared on, like a dark mould. It couldn't be mould though, and they had appeared almost overnight. So I took a sample and that's how it started. I generated many varieties of the fungus using the gene editing facilities in the lab, and tried them out here. Most of them did nothing. Some of them actually protect the concrete, that's why some of those posts are still intact. Others destroy it. The fungus infection does really break down the concrete quite rapidly: only a few years after I'd finished, while I was still in jail, the old concrete wall that protected the Ardeer works had already completely crumbled. But somehow at the time nobody paid any attention to that. They probably just put it down to poor quality concrete."

"I've wondered about something for a long time," Suna said. "When you were doing this, you must have been thinking about the consequences, right?"

"Definitely, and not just me. We debated for many long hours. But in the end we felt that not doing it would be worse."

Suna shook her head quickly, "That's not what I mean. What I mean is, you could assume that relatively few people would die when a bridge collapsed. But when a building full of people suddenly collapsed, there would be a lot of casualties. And even worse if a large dam broke."

Diederik nodded. "I see, yes, I thought about all those things. The others didn't ever bring this up, I think they didn't want to put

even more weight on my shoulders. But I had many sleepless nights over it, until I discovered that the fungus needs ozone to work. I didn't engineer it that way, but I found out that it worked like that. That was a huge relief. The concrete of bridges and airport runways is obviously a lot more exposed to ozone than that of buildings. So it was very likely that the bridges would fall first and serve as a warning. Also, we didn't leave the fungus to spread by itself. We basically seeded the airports and also contaminated long-haul road transport. I explained the mechanism to the others and I'm sure they were equally relieved, at least Yaya and Mama were. As for the dams, I had made a study of all the large dams and what would happen if they broke. But it turned out that most of them are not concrete at all, they're mostly just earth. Also, the concrete of a dam is of course partially under water. So it would degrade much slower than a bridge. I reckoned that no dam would break until long after it was clear what was happening. But I still wanted to try and avoid it. The biggest problem as far as I could see was the Three Gorges dam, as that is made of concrete and a breach would be a disaster on an enormous scale. So I studied the type of concrete they'd used, and I was in luck. The concrete of the Three Gorges dam was made with something called fly ash, a coal combustion product. When they built that dam, they had plenty of that from their coal-fired power stations and they used it instead of cement. It makes for a very suitable construction material for such a dam. So I got hold of some fly ash concrete and with trial and error I found a strain of the fungus that would degrade cement-based concrete but not fly-ash-based concrete. Some old fly-ash concrete structures would survive, but that was fine by me. Of course none of the more modern concrete structures use fly ash, as we're no longer burning coal. And even historically, cement-based concrete was more popular. So it was a small proportion. I never told anyone this. I wanted to avoid the endless discussions about weakening the impact of the action and all that, and I thought it was mostly my responsibility and my conscience."

"You paid very dearly, didn't you, Dad?"

Diederik smiled wanly, "It's not enough to know you're doing

the right thing." He considered for a while. "Still, if I hadn't done this I would never have made a trip like the one I set out on, and it has left me overall with a positive outlook. Humans are resilient. We are going to get through this and afterwards it will be better for everyone."

"But I do miss my parents," he added forlornly.

Suna put her arm around him. "We are all very glad to have you finally back with us, Dad!"

They sat side by side high up on the slope of a dune overlooking the beach. The sun was setting and though it was still high in the sky, the spectrum was shifting towards the red, bathing everything in a golden light. The tide had come in and with it had come the gannets. At low tide they had been mere specks, far off and indistinct in the shimmering atmosphere. Now the flocks had moved in with the flood, and the air was clear and limpid. Incessantly they dove into the sea, throwing up fountains of spray. If you looked closely, you could see them surface, sometimes still swallowing a fish, shake their wings and take off again into the skies.

Suna imagined what it would be like to be one of those gannets. Soaring really high, she would be able to look over the whole magnificent dune system of Àrd-Dhìthreabh, all along the wide sweep of the bay. And she would see the two small figures sitting high up on a dune, looking back at her. Would she wonder why they were there, when the rest of the beach was deserted? No, she'd simply rejoice in just being, without conscious thought. Oh, to be such a bird!

Diederik seemed to guess her thoughts and said,

> "Birds find succour in the high heavens."

Suna recognised the quote. How like Dad to quote from an old anime at a time like this. She replied:

> "Fish hide in the deep waters."

Smiling at the memory, at peace in the present, they watched the sun go down behind the mountains of Eilean Arainn.