

MELTING TIME



Gondwanaland always seemed to me a mystical place, not the result of a mighty geological collision. The supercontinent that once encompassed present-day South America, Africa, Arabia, Madagascar, India, Australia and Antarctica formed 600 million years ago. It started to break up 180 million years ago. Until 2019, when I visited the Antarctic Peninsula, these timeframes meant little more than lots of zeros, inconceivable beyond the abstraction of numbers.

Then on my sixtieth birthday, sitting in a black zodiac in Neko Harbour, famous for its calving glacier fronts, I heard a loud crack and turned to watch another chunk of ice crash into the sea. I was looking at thousands of years' worth of rain: a physical manifestation of all those zeros. That new perspective on time has stayed with me.

During the trip – luxurious, exhilarating and full of fascination – I didn't feel my age. Now, at the end of a COVID year, with the rhythms of life in disarray, it weighs heavily. The past is counted in decades, the future in years. Such gloom is exacerbated by the melting ice and 2020's Black Summer, when fire got within a kilometre of our house, razed four houses in the village, burned 23000 hectares of the surrounding Morton National Park and silenced the birds for months. Confined to quarters by a pandemic, which has now reached even Antarctica (as the bushfire smoke did at the beginning of the year), I cannot but contemplate the end of an era in human history.

A trip to Antarctica had been an ambition for a long time. In January 1988, it seemed I might visit one of the Australian bases in eastern Antarctica. I had just started working for the Foreign Minister who was planning a trip, given Antarctica was on the cabinet agenda, with ministers arguing whether mining in Antarctica – assumed then to be a real possibility – would be good for Australia. The visit fell through but from then on I hankered to see the frozen continent. The idea that such a vast territory, claimed by Cold War rivals, was being protected through cooperation rather than the threat of mutually assured destruction, appealed to me as a young diplomat.

Without international collaboration, the continent of peace and science could have been blown apart. In 1959, the Attorney-General Sir Garfield Barwick was enthusing about Antarctica becoming a site for nuclear tests and the disposal of radioactive waste. Instead, on 1 December that year Australia became one of the original signatories to the Antarctic Treaty, which declared that Antarctica would be used for peaceful purposes only. Nuclear explosions were prohibited and territorial claims (Australia claims 42 per cent of the Antarctic continent) put in abeyance. By the time my interest was piqued in 1988, Australia came close to signing a convention to regulate Antarctic mineral resources but Prime Minister Bob Hawke had second thoughts. He teamed up with the French President, Michel Rocard, to propose what became the Madrid Protocol. In 1991 mining was prohibited indefinitely.

Times do change, although the urge to travel into the unknown is perennial. The lure of Antarctica takes many forms: icebergs, penguins, adventure. The historian Tom Griffiths has described Antarctica as ‘a global archive, a window on outer space and a scientific laboratory; it is also a political frontier, a social microcosm and a humbling human experiment’¹. It was that political frontier rather than the feats of polar explorers or the cuteness of penguins or even the beauty of icebergs that first captured my interest.

¹ Tom Griffiths, *Slicing the Silence*, Harvard University Press, 2007, p.4

Fast-forward to December 2018, when I was chatting with colleagues about summer holiday plans. One was going with her boyfriend's family to Tasmania, driving around the island in a week. Others talked about the merits of being tourists in their own city. My turn came and I said, sheepishly, 'Peter and I are going to Antarctica', not wanting to admit to them that this very expensive cruise was to mark my sixtieth birthday, a milestone I could still not accept was just a month away. I was sheepish too because, while the dream was about to be realised, I was heading somewhere so utterly different that I hadn't been able to summon up the usual pre-trip excitement. Would it be life-changing, as many other travellers had claimed?

7 January 2019. Flying over the southern peaks of the Andes makes the journey feel real. We are at 54 degrees south – below the passage of the Roaring Forties, the gale-force westerly winds that blow around the Earth between latitudes 40 and 50 degrees – about to land in Ushuaia, Argentina – once part of Gondwanaland, now 4,000 kilometres from the South Pole. Everywhere on the unkempt verges are lupins a carmine red I've not seen before. At this latitude they grow only half the size of these usually statuesque flowers.

After a tour of the southernmost city in the world, including its former prison, modelled on Tasmania's Port Arthur, we are bussed to a hotel, where we lunch with our fellow passengers – mostly Americans – and 'expedition' guides, many who are experts on climate change, the theme of the cruise. We are served Chilean sea bass, one euphemistic alias for the endangered Patagonian toothfish, that we are assured has been sustainably harvested. It's delicious. Over lunch, people swap tales of other travels. Why does travel prompt talk of other places, rather than the destination of the moment? One of the Americans, wiry and confident, tells us her father wanted her to see the United States before anywhere else, so he hired a private carriage with a porter and cook, which was hitched up to trains

travelling across the USA. It gave her the travel bug. Like most of our fellow cruisers, she is at least middle aged and well heeled. A clutch of hand surgeons is on their annual get-together. A too-plump lady is obsessed by penguins; she has had them stencilled onto her fingernails. A group of Chinese with their interpreter keep to themselves. An Indonesian mother is travelling with her three daughters. One of those girls stands out not just because of her luminous complexion but also her infectious enthusiasm. She is here because one of her sisters studied environmental science and has persuaded her siblings to save hard for a couple of years to go with her on this adventure.

Our assorted group of 199 were among more than 56,000 tourists who visited Antarctica during the 2018–2019 season. The International Association of Antarctica Tour Operators (IAATO) predicted this would rise to around 78,000 in 2019–20 (it turned out to be just over 73,000). These statistics prompted the Netherlands government to convene in April 2019 a workshop on how to regulate Antarctic tourism. The results were presented at the annual Antarctica Treaty Consultative Meeting. Reading through that meeting’s minutes is disheartening. Despite an apparent consensus that tourist numbers must be managed to preserve Antarctica’s uniqueness, no concrete measures were agreed upon. For the time being, COVID has done the job but the question remains: what adds up to a sustainable number of visitors? IAATO, a voluntary association, operates on the principle that tours should leave Antarctica precisely as they found it, having created on each trip a new set of ‘ambassadors’ for the continued preservation and conservation of Antarctica. Being one of those privileged enough to get there, I like this justification but have to wonder if it is just that. Assuming scientists will be able to monitor the effects of the last year’s reduced human presence on Antarctic species, habitats and ecosystems, we may get an answer to guide the post-COVID normal.

We board our sleek ship in the afternoon and set sail. The oft-perilous Drake Passage has become a lake; a calm crossing with only one downside: there are fewer birds to see. That's not just because of the lack of wind or W-I-N-D as Suzana, the expedition director, spells it out over the intercom every morning when she wakes us with her mellifluous voice. It is also because 3,000 of the 10,000 species of sea birds recorded on the planet are in decline, caught as by-catch in the world's fisheries and choking on plastic (and now face masks). Patri, the ornithologist on board, conveys these facts with a compelling combination of erudition and humour. Her first lecture is aimed primarily at preparing us to meet penguins.

I hadn't thought much about the penguins before the trip but quickly learn that knowing your penguins is important. Soon we can tell the difference between Gentoos, Adélies and Chinstraps. The expedition's climate ecology expert, Professor James McClintock, explains that the Adélies – named by the French explorer Jules Dumont d'Urville after his wife – are the canary for climate change on the Antarctic Peninsula. Forty years ago, biologists counted 15,000 breeding pairs of Adélies, in 2019 there were 1,800. Hearing the story of their decline brings the abstraction of global warming into clearer focus. With rising temperatures come snowstorms during the breeding season. When the snow melts, the eggs drown. Of the three types of brushtail penguins we encounter, the Adélie is the only true Antarctic species, living in areas where sea ice can be relied on to last throughout the winter. Chinstrap and gentoo penguins evolved in sub-Antarctic habitats so do not depend on the sea ice as a platform to access krill. And they breed later, after the snowstorms. They are prospering in the changing climate.

We meet a colony of Adélies on Brown's Bluff, our first continental landing. For some in the group stepping foot on Antarctica proper is a big deal. They exclaim they have achieved their goal of visiting all seven continents. Larry, our evangelist lecturer whose

speciality is marine mammals and who loves even the most hideous of seals, notices my eyebrow lifting. Giving me a broad smile that reveals his perfectly straight but yellowing teeth, he reassures me that once they look around them, the tick on a bucket list becomes a whole lot more. I wonder now if they have joined the ranks of IAATA's Antarctic ambassadors.

That afternoon on Brown's Bluff it was sleeting but the inclemency did nothing to deter us following the Adélies up and down the shore. Penguins have right of way over humans in Antarctica and, it seems, no qualms about red-clad intruders (us) who ooh and ahh at their every antic. The Adélies do fear leopard seals, so they swim — the term used is porpoise but it's more like flying underwater — in packs. Dozens line up at the water's edge and on some invisible (to us at least) signal they launch themselves into the sea, off to get krill for their offspring. It is charming to watch these little Charlie Chaplins but not to smell them. What none of the thousands of photos taken of these cute creatures can convey is the aroma of regurgitated krill. Its ammoniac stench gets up your nose, into your clothes and even your hair.

Krill is vital. That is our next lesson about Antarctic ecology. This five-centimetre crustacean is the staple in the diets of hundreds of types of fish, birds and whales: the lynchpin in the food chain. Since the 1970s Antarctic krill stocks may have dropped by as much as 80 per cent. I write 'may' because it's hard to get a handle on the consensus about this figure, which scientists calculate using hydroacoustic surveys that measure the biomass of krill. When you start to delve into all this, you cannot but be amazed at the ingenuity of human beings and the patience of scientists. Why the stocks may have fallen is also not clear. It is likely a combination of the revival of whale populations, of ocean acidification caused when the ocean absorbs carbon dioxide and of warming seas. Carbon dioxide in the ocean kills krill embryos. That is why scientists are measuring the chemistry of the water under the

sea ice, where juvenile krill congregate, eating algae and staying away from predators. A decline in sea ice means less ice-algae and less refuge. On the Antarctic Peninsula, the tiny western tip of the continent most tourists visit, mid-winter temperatures are now six degrees higher than in 1950. The ice shelves are in serious retreat. This does not just affect krill and the Adélies but the entire pattern of global weather. Antarctic warming triggers the hot dry winds that affect rainfall patterns and worsen droughts.

I suspect I was not the only one in the lectures to conflate these worrying signs of climate change with the whole of Antarctica. Elsewhere on the Antarctic mainland proper, according to the Commission for the Conservation of Antarctic Marine Living Resources, the krill are yet to be threatened, although the commission recognises the risk. Communicating to the layperson about this sophisticated eco-system is fraught with the danger of over-simplification or generalisation or, at the other end of the scale, detail over-load. That leaves the door open to climate deniers to select facts that fit their message and to be intolerant of disagreement between scientists, the very debates that take knowledge forward.

Researchers are not the only ones who need to translate complexities. Diplomats and policy makers must do so too. It's what I've tried to do during a varied career as diplomat, education lobbyist, research manager and historian. And it's the failed attempts to turn hard work and good intentions into positive action that I lament. I was never patient enough to survive in the arcane world of multilateral diplomacy, which entails negotiating text line by line to try to arrive at solutions acceptable to most. Yet, reading reflections on the health of the Antarctic Treaty, the bureaucratic system of meetings and consensus building has achieved something. For sixty years it has held territorial ambitions at bay and, so far, prevented exploitation of the continent's mineral and marine resources.

These days we must be vigilant about more than whales and krill. Scientists are exploring the potential of the Antarctic's microorganisms, plants and animals as genetic and

biochemical resources. When Jim McClintock told us about Palmerolide, ‘a chemical from a blob that is active against melanoma’, I thought wow! But reading more about this bioprospecting, now a lucrative industry, I realise the potential to deploy such a cure must be managed so, so carefully. What would be the consequences of harvesting that blob? Can the Antarctic Treaty’s provision for the free access to science stand up to commercial interest in patenting such bioactive material? Has the drive to maintain and extend human life become so strong that we are prepared to encroach on our planet’s last wildernesses and contemplate exploiting others in the solar system? Until this year when we watched ‘the greatest country on earth’ sacrifice lives for the sake of the economy – or was it some weird libertarian ideology or sheer idiocy? – it seemed that because we could prolong life, we would, despite the consequences for the individual and the planet. At the height of lockdown in 2020, I had glimmers of hope it might be possible to emerge from the pandemic with a different set of public policy principles: science before polls; health before wealth; climate before coal. That hope is spluttering.

We encountered icebergs on our first full day at sea, conicals of ice whose angular planes sometimes catch the light and become iridescent. When we came close to an 18-kilometre-long tabular iceberg, our French captain, generous because of the favourable weather, gave us a tour along this mass floating in the mist. Sailing its entire length helped us, a little, to grasp the magnitude of these errant pieces of the ice shelf, in this case part of a section that had broken off 2,000 kilometres away in 2008.

The scale of Antarctica is hard to comprehend. Seventy per cent of global fresh water is stored in its 14 million square kilometres (twice the size of Australia). The water has accumulated over five million years. To try to understand this place, you must accept the counter intuitive. The ice continent is also the driest. The average accumulation of snow over the continent is equivalent to about 150mm of water per year. Over the elevated plateau, it is

less than 50mm. Near the coast it generally exceeds 200mm. The snow doesn't melt, instead it builds up, year upon year. Ice shelves form when glaciers bearing all that frozen snow reach the coast and extend over the water, exposing the bottom of the ice to the ocean, now a warming ocean that melts the underside of the shelf. The latest news about the rate of that melt is alarming. Time-lapse satellite imagery dating back to 1973 reveals the ice front at Pine Island Glacier in western Antarctica is weakening, thinning, retreating, and breaking apart. That ice front had been quite stable between 1973 to 2014. Thirty per cent of the ice shelf disappeared in the next six years.

COVID-19 has made it impossible to ignore the implications of exponential rises. Now that we have grasped the idea of flattening the curve, perhaps it's time to popularise the Keeling Curve, the measure of the concentration of carbon dioxide in the atmosphere, which has been made from Hawaii's highest volcano, Mauna Loa, since 1958. Until 2019, the curve showed seven consecutive years of steep increases. While the pandemic did prompt a temporary reduction in carbon dioxide emissions, these have started climbing again. For the Keeling curve to flatten will mean permanent reductions in the use of fossil fuels. Would a daily broadcast of the numbers help change our behaviour?

Each day on board we learn more during the lectures that fill the time before it is our eagerly awaited turn (the IAATO guidelines state that a maximum of 100 passengers from a vessel may be ashore at any one time) to get into a zodiac and be off. These sturdy black rubber boats are crewed by amazing seamen, some from the tropical Philippines who assure me their dry suits, which keep out the icy water, keep them warm all day. Each excursion starts and finishes with a walk through a sanitising tray to guard against introducing non-native species and disease.

The zodiacs take us out among the icebergs and, one afternoon, the humpback whales, and to shore where we follow penguin highways to rookeries and climb to peaks where we

can marvel at the expanse of ice under a royal blue sky. The scientists are on hand to help us see our surroundings properly but I am floating away from the real world into a dreamscape, so pure that I have pangs of guilt about being part of the tourist invasion. On board the reverie continues as we sail into the Antarctic evening through ink-blue water until finally, around 11, dusk arrives, turning the sky not pink or grey but a lemon colour you will see nowhere else. The water shimmers like gold.

As we sit in a zodiac on the last day before heading north again, the sky is clear, the air still. We see double: jagged rock faces and pure white snowfields are perfectly reproduced in the water. Our zodiac moves through slush past Weddell seals sunning themselves on ice floes. A woman on board thinks out loud: ‘I can’t see what the problem [about global warming] is. There is just so much ice here.’ I hope Larry is too busy navigating to hear her. How disappointing that all his patient explanations haven’t got through. He does have other things on his mind, knowing we are approaching a spectacular set of icebergs, identical to those in the brochures, the ones I have presumed were photoshopped until I see them for myself. They float like Chihuly creations in aquamarine pools, illuminated from within by shards of fluorescent blue. Larry is also about to surprise us with a more worldly treat: a glass of champagne to toast the climax of the journey.

Looking back on that year of sixtieth anniversaries, I wonder how, over half my lifetime, we went from talking about Australia as a good international citizen and about tackling the ozone level to now, when our national government has no compunction about gaming its way to achieve its risible climate change targets. It appears that reduced greenhouse gas production during COVID-19 means Australia will no longer have to use Kyoto carry-over credits – an accounting loophole, not real reductions – to meet its Paris Agreement obligations. This is no remedy for the planet. What perplexes me is that this remained politically viable in the year that began with the Black Summer. Voters have not

forgotten the horror of red skies, naval evacuations from burning beaches, months of smoke, the decimation of forests and destruction of homes, the loss of human and animal lives. Yet the polls show Australians still put the economy and health before the climate. How much angrier does the planet have to become before we understand that, without serious action on climate change, we will no longer have to worry about jobs and growth?

Over my eclectic career did I place too much faith in diplomacy and the United Nations, in evidence-based policy and good communication? Have we become so hooked on instant gratification that we prefer not to heed the warnings? The wheels turn slowly when we are striving for collective action across the globe. But they can turn. In 1987, the Montreal Protocol, an international agreement to phase out ozone-depleting substances, came into effect. In January 2012, South Sudan ratified the protocol, thus making this agreement the first international environmental treaty to achieve complete ratification. Furthermore, it did change behaviour and has curbed the amount of harmful ultraviolet radiation reaching Earth's surface. It would be dangerous though to let this modest achievement lull us into thinking humans can harness the forces of nature or that technological progress will overcome the ill-effects of global warming. We cannot vaccinate ourselves against the awesome power of nature.

In 2019, Australia came equal fifth with Russia on the list of the world's climate polluters, behind India, the European Union, the USA and China. Whenever I see a headline like that or another report pops up on Google because 'they' know I'm interested in the melting ice sheet, I feel a stab. What am I doing about it? I drive the car less, reduce our use of plastic, check the label on the tuna tin. We've put solar panels on the roof. I still research and write about policy matters, although most of those missives drown in the tsunami of words and opinion produced daily. It's easy to be pessimistic about the usefulness of these little things, especially without global, let alone national, policy action. That can also make it

easier to put things off, as the wife of one of those hand doctors articulated after one morning lecture. Loudly she told her companion, and all those sitting behind her, that she'd be willing to donate to the cruise's philanthropic fund, and she'd just bought a Prius because she had liked the look of it, but it was up to her children to change their ways; she was too old. It irked me at the time that she hadn't been inspired by all we had heard and the magnificent pristine vistas we had witnessed. But it would be hypocritical not to admit that sometimes it does all seem too hard, futile; much easier to mix hedonism and fatalism together and, for me, to retreat into our tiny patch of remnant rainforest, saved from the flames by a change of wind direction and flourishing after the La Niña rains.

At the beginning of 2020, as I obsessively checked my phone to survey the mass of overlapping diamonds denoting fire all along the NSW east coast, the frozen continent seemed very remote. Now, as I obsess about the 11 o'clock updates on COVID numbers, memories of that exhilarating journey have resurfaced. It is partly nostalgia for the days of travel and exotica that I yearn to have again to rejuvenate the spirit, carbon miles notwithstanding. It's also the heightened sense of how important it is for us to grasp what Antarctica, the continent of peace and science, is telling us: we can't wait for another generation to cope with the fact we have prodded a sleeping ice giant, who is reacting fast and unpredictably. While the splendour of blue-and-white Antarctica no longer appears in my dreams as it did when I first got home, I now have a better sense of why people say the trip changed them. Antarctica makes you consider life on a different scale; it brings the finiteness of things into focus. I now know that more than nearly anything else I want a good death, something our highly sophisticated and prosperous society has yet properly to countenance. Instead, we valorise youth and incarcerate the old. No life-prolonging drugs for me once I've decided it's time.

I still hear the urgency in Larry's voice when he warned us in his final lecture that if humans don't take heed, we could be the first species to document its own extinction. We don't have decades ahead of us anymore; every year counts and you don't have to have turned sixty to know that.

References

Australian Antarctic Division: <http://www.antarctica.gov.au/>

Commission for the Conservation of Antarctic Marine Living Resource:

<https://www.ccamlr.org/en>

Griffiths, Tom, *Slicing the Silence*, Harvard University Press, 2007

Jones, Barry, *Getting Antarctica on the domestic and global agenda*, 2nd Annual Phillip Law Lecture, Hobart, 21 June 2003

Kirk, Karin, *Bleak views of melting Antarctic ice, from above and below*, October 6, 2020

<https://yaleclimateconnections.org/2020/10/bleak-views-of-melting-antarctic-ice-from-above-and-below/>

McCann, Joy, *Wild Sea, A History of the Southern Ocean*, New South, 2018

McClintock, James, *Lost Antarctica*, New York, 2012

Rothwell, Donald R, *The Antarctic Treaty at Sixty Years: Past, Present and Future* (August 15, 2019). ANU College of Law Research Paper No. 19.16.

Secretariat of the Antarctica Treaty: https://www.ats.aq/index_e.html