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Gum grower's ark

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As a 16-year-old, Dean Nicolle dreamt of gathering all Australia's eucalypt species in one place. Twelve years on, Ashley Hay writes, the seeds of that dream have blossomed into an enchanted grove.

The trees are planted in clusters along rows - four of this species, then four of that - creating bands of different shapes and colours across the hill. All less than a decade old, some have huge grey-green leaves growing from branches less than a metre off the ground, while others dangle slender, dark glossy-green leaves from branches already pushing metres into the sky. Scarlet buds burst from fruit that look enormous and prehistoric alongside delicate cream buds poking out from small smooth caps. They are all eucalypts.

Below them, the Southern Ocean and Hindmarsh Island sit on the horizon, and an old red gum by the side of the road slowly dies. One of the best examples of the canoe trees left by the area's indigenous population, its trunk still shows the shape of the bark that was peeled off to curl and tie and set afloat. One night a couple of years ago, someone ringbarked it. It was an old tree, beginning to decline. Now, starved of the sugars it needs, it's only just alive, and struggling, while its young river red gum relatives up on the hill wait for their first flowers in the mixed company of purple-leafed mallees from Western Australia, alpine gums from Victoria, goldblossomed swamp mallees, and more.

On these 32.5 hectares of South Australia, just up from the mouth of the Murray at Goolwa, Dean Nicolle is realising the botanical fiction of Murray Bail's novel *Eucalyptus*. At 28, Nicolle, a PhD student from Flinders University, is well on the way to growing specimens of each and every eucalypt from within Australia at his Currency Creek Arboretum. There are between 800 and 900 species in the genus *Eucalyptus* by Nicolle's reckoning (the question of what is and isn't a eucalypt has been a perennial - and savagely fought - one in Australia's botany) and his planting tally stands at about 90% of all the species and sub-species he needs.

His reasons for starting such a huge project were straightforward: he wanted to try to grow as many species of eucalypts as possible, and no one else was doing the sort of systematic and long-term research that he knew such an arboretum would allow. Nor was he daunted by the scale of what he was proposing. "I didn't have as many contacts in the eucalypt world then," he says. "I was just doing my own thing - and you don't realise the size things can get to."

It was 1990 when he started looking for land to plant out - "somewhere between Mt Compass and Strathalbyn", he says. "It had to have no trees, and a particular soil type - well-drained so it could grow species from the West Australian sand plains, free of limestone, and with a neutral or slightly acidic pH."

This was always one of the more intriguing parts of Bail's premise: if all sorts of different eucalypts grow in such different places and need such different conditions from one end of Australia to the other, would it be possible to get them all going at the same place at the same time? Although Nicolle knows that he'd need a glasshouse to completely answer the question -

"And I'd like to," he says, "purely to say I had one of everything" - these 32.5ha of space come pretty close.

South Australia has a good history of eucalypt advocates. Hans Heysen celebrated them with portraits of the trees that grew around Hahndorf, near Adelaide, and the mighty river red gums of the Flinders Ranges. Harold Cazneaux photographed the *Spirit of Endurance* - a river red gum - on the edge of Wilpena Pound, and it became one of the country's best known images.

Australia's first school of forestry grew up in Adelaide and produced Max Jacobs, the forester whose eucalyptic enthusiasm lay behind much of the push to propagate the trees around the world in the years after World War II. (At the last count, there were more than 14 million hectares of eucalypts around the world, with the eucalyptus oil industry moving offshore altogether: Australia can't compete with the output of countries in Asia and Europe.) And Adelaide also produced Ian Brooker, a research scientist at the CSIRO (his card reads, specifically, "Eucalyptus Botanist"), the joint creator of the first computer key to identify eucalypts (EUCLID) and a particularly important part of Nicolle's story.

The two met more than 10 years ago when the 16-year-old Nicolle was in the thick of a hunt for a long-lost eucalypt, *E. rameliana*, a mallee collected by the explorer Ernest Giles during his 1870s trek through the Gibson Desert, named by the great German eucalyptographer and botanist Ferdinand Mueller in honour of Prosper Ramel (the man who thought gum trees might provide a "cure" for malaria) and not seen since.

Coming across this story, and the story of other people's failed searches for the tree, Nicolle suggested that he and his father, Bob, might go and have a look. "It seemed like a good thing to say, 'Let's go and find it'," he says. "After all, it was only 2000km to get into the desert ..."

It wasn't their first expedition in search of gums. "Dean would find a herbarium specimen with a locality on it," says Bob Nicolle, "and off we'd go." The problem with this one was that the location given was disarmingly vague - "beyond the Alfred and Marie Range", Mueller had written - but, as Nicolle says, "That's the trouble with the old specimens: their locations are never specific. Something's marked as 'Swan River Valley', and that could be anywhere in all of WA. Trying to track the old things down by locality is almost impossible."

The two Nicolles drove off towards the Gibson. "The nearest track was 100km from the range and there was a cutline that went halfway out beyond that," says Dean. "We drove along it and then bush-bashed the rest of the way. Beyond that, we knew we'd have to walk westward for 100km before we met up with the next track.

"We went into training for six months, filling a backpack with bricks and trekking 15km every day after school - adding more and more bricks as we got fitter. And we contacted Ian Brooker. I wanted to meet him because he knew everything about eucalypts. I knew nothing, and I wanted to know everything."

If there was a single moment that committed him to eucalyptography, he says, it was this meeting.

They went back to the desert with Brooker, walked four days carrying 25 litres of water - "reckon we were the first people to go across the Gibson Desert since Giles", says Nicolle - but there was no sign of *E. rameliana*. What they did find was something else, with pink flowers,

smooth fruits and long, sharply pointed buds, which Brooker named *E. kingsmillii*, *ssp. alatissima*.

And Brooker found a convert: "I'd been collecting all day, and Dean had been watching me. He knew a bit about eucalypts, but nothing about collecting and herbaria. That night, I was cutting up my plants and pressing them, and there was this chin so close to me, watching what I was doing, that it was almost on my shoulder. That was where he started. Now, Dean's a euconut," he says. "That's what we're called, us people who are passionate about eucalypts."

By the time another collector, Nick Foote, had found the missing mallee - "five *hundred* km beyond the Alfred and Marie Range in the Little Sandy Desert," says Nicolle - Currency Creek was already in its first stages of development, and Brooker was Nicolle's mentor. Nicolle has both the *E. rameliana* and his *E. kingsmillii* subspecies growing there now. It's kind of something, he says of the latter, to grow a tree from seed taken from the species' type specimen. Something, too, to be able to show Brooker some gum blossoms growing at the arboretum from "a species he'd named, but never seen in flower before".

In Adelaide's eucalyptic past is another arboretum, the Waite Institute (part of the University of Adelaide), with more than 900 eucalyptus trees - almost half of the 2200 trees it grows overall - including an elegant avenue of sugar gums and lemon-scented gums. The Waite methodology puts trees in the ground, waters them to get them established then leaves them to grow as they will. Nicolle - because he wants to keep as many things alive as possible - is a bit more cossetting and the main outlay for his arboretum, beyond buying the land itself, has been on installing a windmill to pull water from 70m below the ground and an irrigation system to run along each of the rows. He leans over and picks up the dripper line. "I'm not sure if you'll want to say this but we did manage to get this a bit cheap," he says. "We bought second-hand line that had been ordered by, or reclaimed from, some of Adelaide's marijuana growers."

No one's ever done what he does at Currency Creek. Putting together an arboretum, Nicolle concedes, is "usually all a bit more ad hoc. But if you want information, do it in a way that's useful for research." He plants four of everything where most other collections plant one specimen which, if it dies, leaves a species unrepresented. And he marks all his collection points with a GPS location and a full herbarium voucher. Against this organisation, it's nice that some decisions sound haphazard. Like why choose four of the number of each species planted out? He can't remember, but he thinks it was something to do with how many seedlings fitted into one box. And how did he work out the spacing for his rows? Trial and error: the trees at the top of the hill - some of them already eight years old - were put in too close together and he's replanting them now.

But the method he applies to the specimens themselves is exact and unremitting. He keeps voucher specimens of seedlings because eucalypt seedlings can look very different to the adult trees. He keeps records of height and annual growth for every tree and grades their survival rates. He marks down at what age they first flower - information that's unknown even for most of Australia's ubiquitous trees. Other researchers from other universities are using his plantation to study potential dyes and oils. And while Nicolle's PhD is in an area of pure, systematic botany, he's enough of a big-picture man to keep his own eye on the economic possibilities of his trees. There are rows planted to trial species for the firewood market, and he

has the potential of the cut-flower market in mind, too. "There are a lot of strange eucalypts," he says, "and a lot of people want to develop all sorts of hybrids as ornamental plants. But it's too early for that - there are so many species in the wild that we still have to look at."

As a resource for academics, he is unrivalled. "I can send people material from anything," he says, "and they can extract the DNA they want. I can help them in terms of the morphology while they look at the DNA, and all of that saves them a lot of travel time. Even just having all the material side by side is really beneficial - and at eye level: at places like the Waite, so many of the trees are so far up in the air now that it's hard to take specimens."

In lots of ways, he's an information junkie. He embraces the DNA technology that some classic botanists reject because he recognises that this will provide another part of the picture - "you need sequences as well as fieldwork". And in watching the trees grow under cultivation so carefully, he is gathering the sort of basic knowledge about eucalypts that no one has ever collated, or compared, before. "I've got a fairly large database," he says, understated. "Now I just have to get it out to the people who need it."

Currency Creek has been entirely funded by Nicolle and his family. Not only has his father driven him all over Australia to collect the seed for his trees - "Dean and Bob would have virtually driven around Australia several times," says Brooker - but they helped him with the substantial set-up costs of the land and irrigation.

As Brooker sees it, the issue of finding funding becomes more important if Nicolle finishes his PhD and takes a position somewhere else in Australia. "I hope he leaves Adelaide," says Brooker. "He's probably sick of me saying that - but there's not that much left to collect in the south, whereas so much in the north is still unknown. If he could get a job in Townsville, or Darwin, and collect up there ... He's a good laboratory scientist, and a superb field botanist, but you can't live in Goolwa and become an applied scientist."

"But the arboretum must be kept going. It's the best in the world, and it would be a tragedy if no one looked after it - it's a resource for all sorts of laboratory projects, apart from the industries that could be interested in it. If someone could be given a half-salary to live nearby, to maintain it, curate it, and take visitors through ... it would be a disaster if Dean left town and the place went to the pack."

As for Nicolle himself, if he could go anywhere, he'd head for Timor or Papua New Guinea, "but the logistics of collecting there are complex, and the costs involved ... it's a big unknown up there: if those countries were interested in finding out what eucalypt species they have, maybe they'd fund it. And it's important to find out, because it's all part of the picture. The *Flora Australiensis* doesn't look at eucalypts north of Australia, so we're missing a part of the picture."

He is walking through his trees, reaching for a leaf here, a blossom there, moving dead branches out of the way. This one's huge yellow puffs of flower - it's from the granite islands of Western Australia, he says, and this next one's from up near Mt Kosciusko. This one's pollinated by small mammals, he says, but it grows in the wheatbelt and there's nothing left to pollinate it - it's down to surviving on roadsides and in a couple of remnant patches. And this one's a scribbly gum, "although we don't get the scribbles here at Currency Creek", he says. "We don't have the insects that make them in South Australia." He points out a grey ironbark

from near Mt Isa, and the eucalypt that has the thinnest leaves. "I don't know the names of all of them by looking at them," he says unconvincingly, having rattled through the specifics of several dozen. "Only the spectacular ones." There are no labels - and no plans to get any: he can't afford labels, he says, "and anyway, the names keep changing".

For the sake of Currency Creek, and against other factions of botany, Nicolle's "eucalypts" still include trees that are now officially known as *Angophora* and *Corymbia* - "it's all eucalypts, it's the eucalypts that people get passionate about". The best part of the job, he says, is taking open-day visitors through all the different colours and sizes and shapes of trees and undoing stereotyped ideas of what gum trees look like.

At the moment, Dean Nicolle's land holds 6000 plants from 2000 seed collections, mostly made by him. He looks across to the smallest seedlings, just planted, and the rows already marked out next to them and sprayed for weeds, ready for the next lot to go in. He's got a couple more months to finish his PhD, and a family - a wife and two small children - to think about as well. "This wouldn't be a bad place to live," he says, squinting towards the ocean, "nice view, nice trees ..."

- *Ashley Hay is the author of Gum: The Story of Eucalypts and Their Champions, Duffy & Snellgrove, \$25*