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# CONFLAGRATIONS AND CONSERVANCY

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THREE WEEKS IN SOUTHERN CALIFORNIA

CARLY GREEN  
4<sup>TH</sup>-25<sup>TH</sup> APRIL 2018

All photographs and images produced by the author

## ABOUT

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I'm a 24-year-old horticulturist living and working in Wales. Up until 2017, I was the first apprentice in the National Botanic Garden of Wales' newest Botanical Horticulture training scheme. After completing that and my RHS Level 2 diploma, I was hired as a full time propagator for the garden's outdoor Mediterranean Boulder Garden, as well as occasionally helping to propagate the Great Glasshouse collection. I also took on the Welsh Natives project with my new position, NBGW's ongoing conservation project that collaborates with gardens and organisations around the country to protect some of Wales' rarest species.

The irony of a girl from a quaint little English village working on a project called 'Welsh Natives' is not totally lost on me, but after living for 6 years now in Wales I've grown to love the dramatic landscapes and the incredible plants to be found in this part of the UK (even if I haven't quite grown to love the rain yet!). Outside of work, you can find me wandering around the countryside, spending all of my money in bookshops or mucking about on my yoga mat.

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## LEAVING WALES

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It's 4am and my feet hit the floor. I sit up in bed, unable to keep my eyes closed a moment longer. Where most people would be kept up by excitement the night before travel, I am awake due to pumping, pounding fear. When I sent two funding applications to the RHS and the Merlin Trust less than 5 months ago, my hand shook over the 'submit' button. There's no way I can do a trip like this, I thought. The proposal will be rejected and I'll have some useful feedback for when I try again next year.

Now, ten hours after I dragged my suitcase and backpack through the dark streets of Carmarthen to catch my train, I'm sat on the plane with my heart still pounding. This is too big for me. Trips like this are what other, more adventurous people do. I'm just a girl from a little village, I'm just a gardener, I'm just a girl.

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## GOING TO CALIFORNIA- THE OVERVIEW

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I think at this point it's important to explain what I was doing, sat on a plane trying to feel confident. I work as a propagator at the National Botanic Garden of Wales, after completing my apprenticeship there only 8 months ago. That apprenticeship was my first experience in horticulture, as in my previous life I had been a zoology student dreaming of tagging wild cats and writing literature reviews in the warm library.

The star of the show at Wales Botanic, sitting like a giant dew drop in the centre of the garden, is the world's largest single span glasshouse housing collections of plants from the six Mediterranean regions of the world; the Mediterranean Basin, South Africa, Chile, the Canary Islands, Western Australia and, finally, California. These regions are defined by their cycles of mild, wet winters with hot, dry summers and, in many cases, wildfires. Wildfires sweep through to leave behind fertile ash and empty space, ready to be filled with seeds that have been triggered into germination by the heat and smoke.

I chose to travel to California because I was fascinated by fire-adapted plants, and it was one of the regions in the Great Glasshouse at Wales Botanic that I knew the least about. In 2017, California's wildfire season broke all records and much of the state was on fire during summer and early autumn. I was intrigued by the chance to see communities in various stages of recovery, with greater chances of seeing ecosystems that had been burned recently by fires that were hotter and larger than usual. I also knew that California was home to a number of celebrity plants that I already worked with or wanted to meet in the wild- Sagebrush, Redwood, Manzanita and Joshua Tree (*Artemisia californica*, *Sequoiadendron giganteum*, *Arctostaphylos* spp and *Yucca brevifolia* respectively). In the 1960s and 70s many California growers began promoting the use of native plants, bred into more ornamental garden varieties, in order to work with the harsh Mediterranean climate and to conserve water in the drought season. To me, growing native plants in a completely different part of the world, the idea was intriguing and I thought of the beautiful plants growing in Britain's woods and hedgerows that would be well suited to our back gardens; providing more habitats to declining wildlife and requiring fewer pesticides, instead relying on the natural predators they would support. I wanted to learn more about the career I love, and meet other people doing what I do in a totally different context.

## LOS ANGELES

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My feet hit LA tarmac 22 hours after pulling myself out of my bed in Carmarthen, and I had just about enough energy left in me to get myself to my accommodation and crash face first into my pillow. My first full day in California had been set aside to recover from travel, and I headed to Venice to let the Pacific wash away the jet lag.

The next day, having a little bit more sleep, I was ready to meet my van. My home for these three weeks was to be Peggy- a huge Chrysler Town and Country people carrier. The two rows of back seats had been ripped out and replaced with a fold out bed, and there was space in her boot for a hand-pumped sink, cool box and a mini kitchen worktop. She was practical, and perfect.

After filling her up with food and water (and a small string of fairy lights to soften her up a bit!), I decided to stay in LA that night and leave for the mountains early tomorrow morning as my route on Google Maps was nothing but angry, red, squiggly lines of traffic. That night I slept in a Walmart parking lot surrounded by others also sleeping in cars or camper vans either by necessity or by choice. I was reminded of how privileged I was to be able to voluntarily 'rough it' for a short period of time, knowing that at all times I had people who, although they were halfway across the world, were keeping tabs on where I was and were on the end of a phone if I was ever in trouble.

## ANGELES NATIONAL FOREST

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SKETCHBOOK ILLUSTRATION OF CRYSTAL LAKE CAMPSITE

Cruising through the freeways of downtown LA, windows down and music blaring, I hardly cut the typical image of a botanist on their way to explore an unfamiliar plant community. As the roads got narrower and narrower however, and the Bougainvillea less and less common, I found myself winding my way into the San Gabriel mountains.

I would soon learn that there was just as much to see whilst driving as there is on a hike. I was grateful for the many pull-ins, as my drive was constantly interrupted by a quick stop to jump out and get a good look at plants I'd either never seen in the wild before, or never even heard of.

Outside of work, I'm especially interested in parasitic plants- it was a real treat to see dodder (*Cuscuta* sp.) growing wild for the first time, in fluorescent patches blazing orange on the roadside.

I had, by happy accident, timed my visit to coincide with the flowering of the *Ceanothus* bushes and so I was treated to the full spectrum of hazy greys, delicate lilac, intense blues and deep, dark purple. Frustratingly however, I was struck with the age-old predicament of a botanist who, finding themselves in a new country, is suddenly forced back to being a total beginner when it comes to plant identification! I had an advantage, having grown some of these plants at work, but even so I often had no way of putting even a family or genus to many of the plants I saw.



A PALE *CEANOTHUS* SP. FLOWERING BY THE SAN GABRIEL CANYON ROAD

After my winding drive, I pulled into the campsite for my first hike in California. The Windy Gap trail led up from the main area into the mountains, where it would eventually meet with the legendary Pacific Crest Trail. I was out of practice hiking, but I at least wanted to put a foot on the trail, which I had read about and was fascinated by. Hiking those hills, it was evident that a fire had been through very recently- I asked later and discovered that the campground had in fact only just been reopened after an enormous blaze had swept the entire basin two years ago. It was a dramatic visual- the ground was white with ash, with jagged, blackened tree trunks still pointing at the sky. It had been just long enough for regrowth to have occurred, and I took the hike as an opportunity to acquaint myself with the two main categories that fire-adapted plants fall into- Seeders and Sprouters.



ASH-COVERED HILLS AROUND CRYSTAL LAKE CAMPSITE

Seeders survive wildfires in the seed bank of the soil, lying dormant until the danger has passed. Many species rely on this mechanism to reproduce- the entire parent plant will be completely killed in the fire, and their seed will not grow at all until it has been exposed to heat or smoke or some combination of the two. The first rain that falls after a fire will germinate thousands of seeds, no longer shaded out by large trees and able to enjoy an open space with a layer of nutrient-rich ash on the soil. Sprouters survive by developing resilient, below-ground buds that sit with the root stock, toughing out the heat. They keep a store of food underground that fuels rapid growth whilst most seedlings are still only tiny. After the fire, the buds burst and the plant has enough carbohydrates stored in those roots to immediately feed this new growth.

As with all nature of course, not all plants fall neatly into each camp and the majority exhibit a little bit of both strategies, but this was a good framework for me to use whilst exploring the vegetation for the first time. For example, on my hike I came across a small stand of Manzanita bushes (*Arctostaphylos spp*). The floor was totally covered with the bone-bleached, contorted stems of what must have been very large, old Manzanitas that filled the whole area pre-fire. At the nexus of these piles of wood, where the base of the old plant had been, there were very fresh, neat little bushes already with one or two years of solid re-growth on them. They had obviously come back immediately after the fire has passed. Being able to use what I knew about their survival adaptation gave me a little boost of confidence as I set about exploring the unfamiliar terrain.



THE MANZANITA GROVE, WITH FRESH YOUNG PLANTS RESPROUTING OVER  
THE DEAD BRANCHES, ACCOMPANIED BY NEWLY GERMINATED *YUCCA*

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## MEETING PASCAL BAUDAR

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FIELD SKETCH OF *DICHELOSTOMA CAPITATUM*

Although not necessarily tied into my theme of wildfires and conservation, I knew that I couldn't miss the opportunity to learn about the wild food and foraging available in California. Back in Britain I was a keen forager- I believe that the quickest way to get to know a flora is to relate it to your own human experience. Somewhere deep within me I had the fundamental understanding that if you know how to feed yourself in the middle of a wild place, then you're able to become part of that ecosystem rather than just a clumsy, human intruder.

In March, I got in touch with food journalist Clarissa Wei after watching an interview with her in the LA mountains, where she spoke about de-colonising food and connecting with the plants that grow in your local area (see appendix). She would be in Hong Kong during my visit, but she was able to put me in touch with one of her foraging heroes; Pascal Baudar.

Fast forward a few weeks, and I was standing in front of a wall filled with jars of various concoctions quietly bubbling away, helping Pascal strip leaves off of an invasive *Malva* species to use in a green hot sauce he was in the middle of inventing for his new book. We spent the morning chatting about the wild plants that he uses in his recipes, and his theory that encouraging people to harvest and eat invasive species might help towards their control. Pascal explained how he took inspiration from events happening in the natural world, and the intense wildfire season has inspired him to experiment with using ashes from different tree species (he had to collect them from directly below the trees immediately after the fire, before the wind or rain could mix them up) as rinds for the vegan cheese he is known for.



ABOVE: THE REMAINS OF OAK WOODLAND AT THE CREEK FIRE SCAR, WITH THE FIRST HINTS OF GREEN BEGINNING TO COVER THE GREY ASH  
BELOW: A SNAPSHOT OF INITIAL COLONISERS- MINER'S LETTUCE (*CLAYTONIA PERFOLIATA*), CHERVIL (*ANTHRISCUS CAUCALIS*), CHICKWEED (*CERASTIUM SP*) AND MANROOT (*MARAH MACROCARPA*)

After our conversation, Pascal took me to forage with him at the scar left by the Creek Fire- one of the most destructive wildfires that had raged in the area in 2017. The blaze had covered over 15,000 acres, destroyed 123 buildings and forcing around 115,000 residents to evacuate their homes. As well as a chance to try a delicious cold tea made with sticky Yerba Santa leaves (*Eriodictyon californicum*), this was a golden opportunity to witness the very first stages of recovery post-fire. Much of the ground was bare and covered with a thick layer of grey ash, but

there was a carpet of lush annuals already growing in shady spots. Pascal was amazed by how quickly the area had become green again, and we were buzzed by troupes of hummingbirds moving back in to take advantage of the newly opened space. Two of the plants he showed me that morning came to be very familiar during my time in California. The first was Miner's Lettuce, *Claytonia perfoliata*- I've since discovered that this actually occurs in Britain as well, but at the time I loved the strange, saucer-like leaves cupped around a tiny cluster of delicate white flowers, as well as the fact that it was a tasty salad leaf! The second plant became my favourite of the trip; an unassuming species of Mugwort, *Artemisia douglasiana*. This plant had regenerated unexpectedly well after the fire, and there were stands of fresh, young, fragrant plants in dried up river beds and growing beneath charred oaks. I definitely have a soft spot for the *Artemisia* genus, and this species in particular had one of the nicest scents of any that I've encountered. It came to become a familiar friend during my trip, and every time I came across it I would rub a leaf between my hands for a refreshing pick-me-up.

That evening, I made my way back into the mountains to escape the heat and find somewhere to try dispersed camping (sometimes known as wild or free camping) for the first time. I found a large, roomy pull-out on the Angeles Crest Highway and lay on my bed watching the stars slowly wink into existence through my van's open door, trying not to think too much about bears.

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## RANCHO SANTA ANA BOTANIC GARDEN

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I spent two days at Rancho Santa Ana, and couldn't believe how welcoming they were to a very scruffy, dusty young horticulturist sleeping in her van in the staff car park. My visit happened to coincide with a two-day heatwave in LA, and being able to get out of the van and into their staff building to make lunch, use their Wi-Fi and even to have a shower (the luxury!) was wonderful.

I began my visit in my favourite place of any garden- the nurseries! Very early on in my horticultural education I knew that I was totally in love with propagation, and I can never resist the opportunity to have a peek around 'backstage'. I met with Bryce Kunzel, the nurseries manager, and was quickly impressed by how stringent their hygiene was in the nursery. Most of the growing done behind-the-scenes at RSABG is solely for reintroduction programmes, and so they are incredibly careful about spreading diseases that could potentially decimate native plant populations.

One of the most unusual things I saw that day, which I had never even heard of before, was the Phytophthora Pear Test. On top of constantly disinfecting every tool and surface with bleach and never allowing plants to touch the floor, the nursery team conduct regular tests for soil-borne pathogens as a preventative measure. They had a mesh bench set up, with plants on top that were watered every couple of hours and then a polythene sheet underneath to catch the runoff and funnel it into a catchment container. After a day of this, a green pear (that had already been washed and sterilised) was soaked in the water that had been collected, then sealed into an airtight bag and incubated for 5 days. The team were able to use the resulting lesions to detect any threats of disease in their stock, and all of their records, including a comprehensive photo record of past pear tests, were saved on Google Drive to create a valuable reference.



THE PHOTO RECORD OF PEAR TESTS CONDUCTED AT RSABG; THE TOP LEFT AND TOP CENTRE PHOTOS SHOW LESIONS THAT MAY INDICATE PHYTOPHTHORA

I was so inspired by the dedication the team showed in making sure that their stock was disease free, although I questioned the environmental impact of the sheer quantity of bleach that they used on a daily basis to keep everything clean!

That day I was also treated to a tour of their seed bank (my second favourite place to snoop around in gardens). The seeds stored there had been used by a volunteer, who also happened to be a talented microscope photographer, to create a detailed photographic record. The book contained photos of what each seed looked like, how to clean it ready for storage and a difficulty rating for the volunteers who would be doing the seed cleaning. It was all I could do not to grab that binder and run off with it! Back at Wales Botanic I knew that we were beginning to set up our own seed bank, and I left with so many ideas for what we could do once it got up and running.

Whilst I was swapping notes with the team about smoke treatments, potting mixes and stratification, I made sure to ask about the specific challenges of reintroducing native plants in California. Back in the UK, the largest frustrations I had in the reintroduction programmes I was involved with usually had to do with grazing- either by rabbits in Powys or Kashmir goats on the Great Orme. However, the team soon made me realise that conservation in South California is a much more complex operation than I'd considered. For example, when the team plants *in-situ*, they have to hire and drive a water tanker into the field with them. They fill each planting hole with 2 gallons of water first, then plant, then water again with an additional 2 gallons all to ensure that the plant has a better chance of surviving the hot Californian sun. They even told me a story of one reintroduction site that had burned down 3 times in two years! The team had to keep revisiting the area to water and hope for the plants to return (which they fortunately did). I suddenly felt a great rush of affection towards the 6 months of continual Welsh drizzle that I had left behind 10 days ago!



ABOVE: THE REINTRODUCTION SITE IN RECOVERY AFTER THE FIRST TIME IT BURNED  
BELOW: THE AREA ACTUALLY EXPERIENCED A SUPERBLOOM THIS YEAR, AND WAS SPARED FROM ANOTHER FIRE IN 2017 DUE TO THE AMOUNT OF WATER THAT HAD BEEN GIVEN TO THE SOIL

Whilst I was waiting to visit the seed bank, I was suddenly hit by a huge wave of gratitude for my chosen career- there was something about the mix of dedicated, super-cool young horticulturists, the sound of Red Hot Chili Peppers blaring through the radio in the potting shed and the huge collection of native plants grown with care. I had been so lucky to find horticulture, to work in this industry where almost everyone I meet is kind, helpful and down-to-earth, and where there is so much freedom and creativity that works alongside the science and conservation.

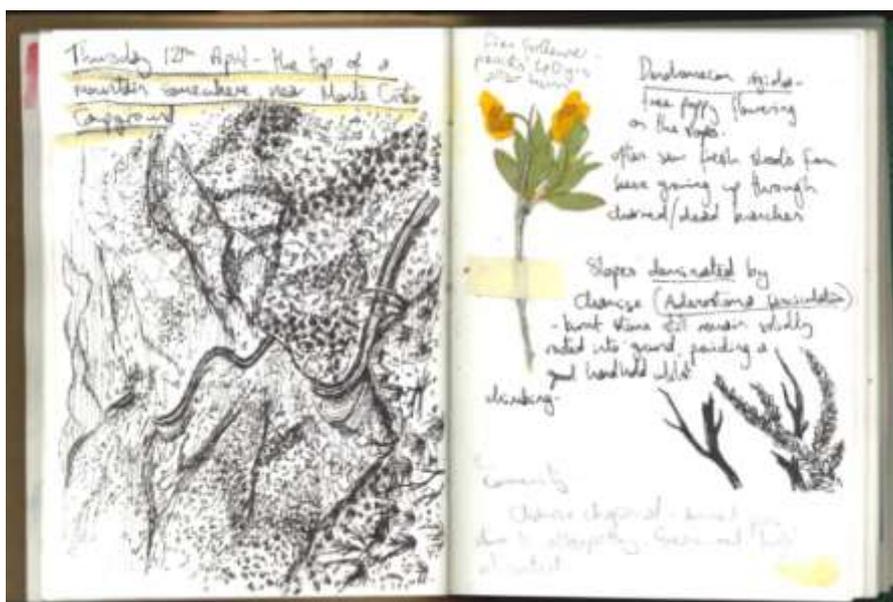
On my second day at Rancho Santa Ana, I was driven around the garden by the Director of Horticulture, Peter Evans. This was an incredibly valuable opportunity to chat about all of the plants I had seen in the garden the day before and not been able to put a name to. I also learned that the garden had a rich history of plant breeding, including the most beautiful tree of the whole trip- an intergeneric hybrid called  $\times$  *Chiranthofremontia lenzii*. Not the catchiest of names I'll admit, but it had been named after the garden's ex-director Lee Lenz, who had been about to turn 103 at the time. I was totally blown away by its liquid-gold, cup shaped flowers containing alien, splayed stamens, balanced on what looked like felted maple leaves. The whole plant was alive with bees, and I came back after my tour with Peter to sketch and paint to my heart's content.



× *CHIRANTHOFREMONTIA LENZII*, AN INTERGENERIC CROSS BETWEEN THE NATIVE FLANNEL BUSH *FREMONTODENDRON* AND THE MEXICAN HAND TREE *CHIRANTHODENDRON PENTADACTYLON*

Peter was kind enough to take me around every part of the garden that I hadn't had the chance to explore, and during my tour I saw a lot of plants that I was able to identify in the field later on, thanks to the notes I took at RSABG (such as Hummingbird Sage *Salvia spathacea* and Wild Chia *Salvia columbaria*). Our chat to the herbarium curator Mare Nazaire was especially illuminating, as we chatted about how the California climate manages to protect her collection from a lot of the pests and moulds that usually plague dried specimens, although she does occasionally have a problem with Tobacco beetle. The gardens are currently working to digitise their whole herbarium using new imaging equipment, and Mare told us a recent horror story where an Australian collection of type specimens had been destroyed by customs, all because the officer hadn't heard of herbariums before and didn't understand what they were! Such is the need for educating people about the work of botanic gardens and herbaria.

## VISITING THE THEODORE PAYNE FOUNDATION



FIELD SKETCHES FROM MONTE CRISTO CAMPGROUND, ANGELES NATIONAL FOREST

I had enjoyed my two nights with access to power sockets, Wi-Fi, a small kitchen and a shower, but the next morning I was ready to hit the road again. The day began mundanely enough- it was time to do some laundry, and whilst my quarter was doing its work in the laundrette I popped into a thrift shop for an extra blanket before I headed north. I had one more day to spend around the LA area before leaving, and so I decided to explore the western side of Angeles National Forest, entering it from La Cañada Flintridge rather than Azusa this time.

I pulled up into a tiny, *tiny* campsite that was deserted except for a pair of bikers looking contemplative over a barbecue. I chose it because it was shady, pretty and cheap, and because from the road I could see trails leading up into the desert along the mountain ridges. When I took myself hiking along them, I soon learned that these were not walking trails but dry gulches made by running water. They were steep, meandering and at points so narrow that I could only fit one boot-width at a time. Still, despite the heat and wind, I really enjoyed my climb and the view was spectacular.

It's hard to convey the vastness of landscapes you see in America, and before this trip I'd not really grasped it myself. Untold miles of mountains the colour of pale stone, with uniform Chamise bushes (*Adenostoma fasciculatum*) dominating the area; this area too had been burned recently. The tree poppy *Dendromecon rigida* was flowering amongst the Chamise, and I later learnt that it is a fire follower that can be present for 40 years after a burn. During my climb I found blackened, charred Chamise stumps and learned that they were perfectly solid hand and foot holds, as the plant roots very deeply into the rock. The Chamise was so dominant in the area because it exhibits allelopathy; the plants give out chemicals that prevent any other species from growing near them. They are also commonly referred to as Greasewood, as they contain very high amounts of oils in the wood that makes them combust very quickly. The climb down was tricky and involved an awful lot of bum-shuffling that I'm sure the bikers found hilarious, but I was so proud of myself for getting right to the top.



SOME MUPPET SITTING IN THE DESERT

The next morning, I drove back down from the mountains in search of my next destination- the Theodore Payne Foundation for Wild Flowers and Native Plants.

Dedicated to continuing the work of plantsman Theodore Payne (who, by a strange coincidence, was born not far from where I was in Northamptonshire), the Theodore Payne Foundation was founded in 1960 as part of a larger movement that aimed to promote the use of native plants in gardens across California. I met with Tim Becker, the current director of horticulture, to talk about the foundation's aim of making native plants accessible to the public. He gave me a tour of the propagation facilities as well as the seed bank, which not only provides the shop with seed to sell but is also a resource used by botanic gardens and conservation projects throughout California. I had expected the foundation to be very scientifically-minded like a botanic garden, but Tim told me that the foundation focuses mainly on amateur gardeners- their main aim is to get regular people growing native plants at home in their own back yards.



PART OF THE RETAIL NURSERY AT THEODORE PAYNE

The Foundation's headquarters in Sun Valley were split into three distinct areas; a collection of small display gardens grouped around the main building providing examples of how to use

native plants in various types of garden, the huge main retail nursery where customers could buy native species and cultivars, and then sprawled around the site and heading up into the surrounding hills were the propagation areas and holding nurseries. I was really impressed by how much care had gone into making sure that people wouldn't be intimidated by growing natives. By each species for sale, there was a comprehensive information sheet not just describing the plant's height, spread and bloom time but also giving advice on the types of wildlife it might attract, its preferred conditions and water requirements. At the paying desk, there was a huge array of A4 sheets offering more information on a wide range of topics, from ways to reduce the chances of wildfires on your property to food plants to grow for your desert tortoise. These were all free of charge, concise and easy to understand.



LEFT: THE RETAIL NURSERY'S PAY DESK, COMPLETE WITH INFORMATION SHEETS FREE TO TAKE  
 RIGHT: EACH PLANT WAS ACCOMPANIED BY INFORMATION INTEDND TO HELP THE CUSTOMER  
 CHOOSE THE BEST PLANT FOR THEIR GARDEN

I left Theodore Payne very inspired by what I had seen- I grow native plants back at home, and although many species are commonly grown in gardens I had never seen a dedicated nursery that promoted gardens planted with *only* natives. As soon as I got home I found myself trawling through field guides, noting down plants that might do well in domestic gardens and looking at the species I was growing at work with a whole new perspective.

That evening, I camped in Malibu Creek State Park on Tim's recommendation. It was a total contrast to the mountains and scrub I had been used to- the park was lush and green, with tiny wildflowers hidden in the meadows and Valley Oaks (*Quercus lobata*) growing at the southernmost reach of their range.



SKETCHES OF WILDFLOWERS GROWING IN THE MEADOWS AT MALIBU CREEK (FROM LEFT- *AMSYNKIA SPECTABILIS*, *LUPINUS BICOLOR* AND *SISYRHYNCIUM BELLUM*)

## HEADING NORTH

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SKETCHES OF (LEFT TO RIGHT): *CRYPTANTHA* OR *PLAGIOBOTRYS*, CRANESBILL (*GERANIUM SP.*) AND *LESTHINIA* FROM MY CAMPSITE BY LAKE ISABELLA

I spent much of Saturday driving north. I had left the LA valley, and once I passed through the mountains I came out into an area that was impossibly flat and incredibly huge- the central farmland of California. It's a cliché that's repeated by everyone who's ever driven across America, but you really can't comprehend the vastness of the skies until you see them for yourself. I reached Bakersfield to refuel, and then turned east towards the foothills of Sequoia National Forest, following the Kern River. The road from Bakersfield towards Lake Isabella, a large lake and campground that I had seen on my map and decided to head towards, ran through groves of orange and almond trees and the smell was so incredible it made me giddy with joy. This drive was in total contrast to the dry scrub I had seen in Angeles National Forest- the slopes here reminded me of Switzerland or the French Alps. They were dominated by wildflowers, gnarled oaks and enormous boulders that looked as though they'd been casually scattered into the white-water river below. Some of the slopes had been razed by recent fires, and the sides of these bare hills blazed orange with California poppies.



HILLSIDES COVERED WITH ORANGE CALIFORNIA POPPIES

That afternoon I pulled into a large lay-by and hiked down to the river, where I was treated to the most idyllic place I had seen on my trip. Coming up between the boulders were masses and masses of white *Allium*, with tall, lilac *Triteleia laxa* bobbing in the breeze and even succulent *Dudleya* growing in mossy crevices on the rocks. In shady parts, I saw a fern that I immediately recognised from the nursery at Rancho Santa Ana Botanic Garden as *Pellaea andromedifolia*. I stayed at the river until the sun set and spent the night in the lay by, surrounded by wild buckwheat (*Eriogonum fasciculatum*).



BESIDE KERN RIVER

I woke early the next morning after a bad dream, and took some time to call home and check in with my family. As beautiful as the previous day had been, I had no idea what to expect from this leg of my journey and had only the blue splodge of Lake Isabella on my satnav to aim towards, trusting that I might find something interesting along the way. When I eventually reached the lake I was shocked to find a barren shore, home to nothing but Jet Ski fumes and squabbling families. I ate my lunch quickly, keen to leave the depressing campsite, and pushed on to see if it would improve. I sank lower in my seat as the route took me through creepy, small towns that

looked as though not a soul lived in them and berated myself for not researching this area more thoroughly. However, as I pulled up to the north shore I was relieved to see an oasis of green. Here the lake had flooded its banks and vehicle tracks had made a network of waterways, criss-crossing through willow trees and blooming all over with docks and yellow mustard- primary colonisers of riparian habitats. Where the waters were only lapping at my feet, the ground was covered with thousands of tiny, papery cotton-batting plants (*Pseudognaphalium stramineum*), yellow *Acmispon strigosus* and pink cranesbills. It wasn't the most diverse or healthy habitat I'd seen, but it was alive with birds and frogs and was a welcome relief after my morning.



A LAKESIDE WETLAND AT LAKE ISABELLA

Something about Sequoia forest seemed foreboding and uneasy the whole time I was there. I spent much of the following day at my campsite (which I had to myself) as the weather had turned. I had time in between rain to sketch the tiny, fragile wildflowers which had turned areas of previous fires into a bright yellow, white and pink turf, but I soon gave up on the thought of hiking the area. I headed towards Bakersfield with the intention of finding a shower and a campsite closer to the city, and ended up turning back on myself, back towards the mountains as I failed to find either. I could feel a bleak mood settling over me as I pulled into another lay-by by the river to camp, and consoled myself with the fact that this was the first, and hopefully only, lacklustre day of my trip.

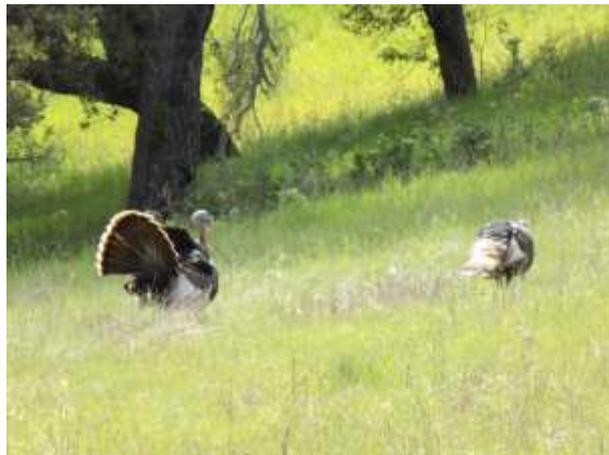
## THE CENTRAL COAST



FIELD SKETCHES FROM THE DUNA VISTA HIKE

My last night in Sequoia was restless and uneasy, as the rain thundered so hard against the van roof that I was terrified the roadside would be washed into the river below. In the morning I finally gave up on finding a shower and hiked down for a freezing cold wash in the Kern- it did do a good job of jolting me out of my mood though! I abandoned central California, and drove back towards the west coast to restock the van in San Luis Obispo, on a tip from one of my contacts. San Luis Obispo turned out to be my favourite city that I visited, and I spent a happy afternoon there making use of coffee shop Wi-Fi, buying groceries and wandering around the town whilst my laundry spun dry. I camped at Pismo Beach that night within earshot of the Pacific, and prepared myself to make the most of my last week in California with renewed energy and optimism.

My next stop was Los Padres National Forest, and I pulled into yet another empty campground to set up camp at Lopez Lake. I never minded being on my own, as the lack of tourists had meant that the animals had moved into the camping spots. I was joined for lunch by two curious deer who got close enough for me to hear them breathing, whilst gangs of California Quail *Callipepla californica* roamed the park shouting and bickering between themselves. Lopez Lake had the best hiking maps I'd seen so far, and each route was accompanied by a description and difficulty rating. I felt like I had been short-changed in Sequoia, so I chose the Duna Vista Trail- the longest hike from the list that would take me through oak woodland and around a good portion of the Lake's north shore.



ABOVE: HUMMINGBIRD SAGE GROWING UNDERNEATH OAKS DRAPED WITH LICHEN  
BELOW: WILD TURKEYS

I hiked for 13km, which was the longest I'd ever walked in one sitting and it took me nearly twice as long as it should have as I had to stop every 10 minutes or so to take photos of a new plant or gorgeous view. The oaks were draped with masses of old man's beard lichen (*Ramalina menziesii*), which I had never seen before and couldn't get enough of! Inside the shade of the woodlands, I found *Salvia spathacea* growing wild with plenty of seedlings nearby and maidenhair fern growing below the trees (*Adiantum* sp) which, although not particularly rare, is always a special plant for me to find as I have a tattoo of it on my upper arm. Between the clumps of woodland, I passed through steep scrubby meadows with fantastic shrubs such as bush lupins (*Lupinus albifrons*), *Artemisia californica*, black sage (*Salvia mellifera*) and Chamise (*Adenostoma fasciculatum*) growing on the slopes. In the open grassland, I saw deep blue wild Chia (*Salvia columbariae*) looking incredible against the California poppies and *Primula clevelandii*, which I originally mistook for tall cyclamen, waving amongst the grass.

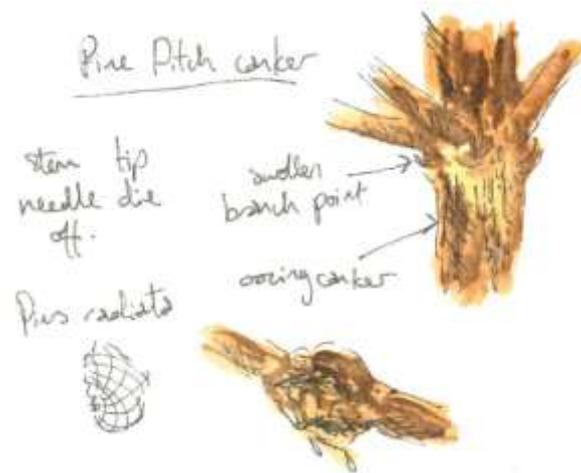


SLOPES OF SAGEBRUSH *ARTEMISIA CALIFORNICA*, BUSH LUPIN *LUPINUS ALBIFRONS* AND CALIFORNIA POPPY *ESCHSCHOLZIA CALIFORNICA*

The Duna Vista hike was magical, even to the point where I stumbled upon a pair of wild turkeys in a clearing –I couldn’t resist making turkey noises at them and then laughing myself silly when they responded. I had gone from a scared girl from a village to this mad, dirty, happy woman hiking alone in the wilderness. By the time I got back to camp I was struggling to even walk from the van to the camp stove to cook dinner, but it was all worth it. It gave me more to laugh at, as I became very glad to be alone in the campsite so no-one would see the ridiculous way I was hobbling around on my ruined feet!

In the morning I was just able to move about again, and I packed the van up to drive to Morro State Park. My contact there, Lisa Andreano, is the environmental scientist for San Luis Obispo County and the coordinator for many of the controlled burns in the area. It also turned out that she was an incredibly helpful, welcoming woman who shared my love for ethnobotany, and we bonded over lunch commiserating over Trump and Brexit. Luckily for my feet, we embarked on a classic botanist’s road trip (which involves screeching to a halt whenever you see something interesting on the side of the road) around the San Luis Obispo coastline for the next two days. The first day, Lisa took me to see the federally rare endemic *Sueada californica*, a succulent shrub growing along the coastline. She told me how the plant is endangered, like many coastal species, due to the popularity of beach houses being built right along much of its range. Nearby, we found another rare endemic Morro Manzanita (*Arctostaphylos morroensis*) that is threatened for the same reason.

Lisa was a valuable source of information about the importance of fire to the California ecosystem- I had never realised before how integral the wildfires were to all habitats from dense forest to open grassland. The fires don’t just germinate seed, but also keep down diseases, weed out invasive species and regenerate old forests that are losing fertility. One example of this was a forest of endangered Monterey Pine (*Pinus radiata*) that was growing close to Cambria Town. These trees were succumbing to Pine Pitch Canker with the number of standing dead trees approaching 70%, compared to San Simeon which only had about 30% dead standing. This was because the rangers were unable to burn the forest so close to the town, and so they had to manage the disease themselves by removing and burning infected trees using sterilised chainsaws. This would take up to 8 years, whereas a fire could sweep through and do the same job in hours. Lisa told me “fire is a very cheap and effective management tool for us.”



FIELD NOTES DESCRIBING THE SYMPTOMS OF PINE PITCH CANKER AND THE BASIC CONE STRUCTURE OF MONTEREY PINE, *PINUS RADIATA*

Lisa also broke down exactly how fires are planned, executed and controlled as a land management technique, which was something I had previously been clueless but curious about. Regular fires in an area prevent the build up of thatch- flammable, dead material. If an area has been left unburned for too long then thatch can build up and, when it finally catches, the resulting fire is uncontrolled, hotter, faster and much more likely to spread to properties and residential areas. The timing of a wildfire is also important- areas that have been freshly burned in winter don't have enough time for the vegetation to re-sprout and stabilise the soil before it rains, increasing the risk of landslides. Lisa told me how fires are kept contained; the first choice for her is to identify natural fire barriers such as creeks, rivers and mountains. Failing that, control lines can be set up by establishing a 'wet line' using fire trucks or by physically removing fuel from the fire's path. Traditionally, this was done by simply ploughing through the line in a bulldozer and grubbing out whole swathes of vegetation, however these days her team prefers to use masticators, which will shred the plants in their path but leave the stumps and root balls to re-sprout. She also has to consider the wind when deciding whether to burn an area, as a sudden change in direction can send smoke drifting towards populated areas within minutes.

Lisa and her team also work to eradicate the many invasive species that are threatening the survival of native plants. One of the most insidious, South African Veldtgrass (*Erharta calycina*), was described by her as 'a perennial that seeds like an annual'. This red-looking grass is also allelopathic and spreads so quickly that diverse grassland can quickly be replaced by a monoculture of Veldtgrass within a few years. After a controlled burn took place at nearby Valencia Peak, the critically endangered endemic *Poa diabolii* that had not been seen for over 100 years was found in the recovering grassland. The species is one of those threatened by Veldtgrass, and fire is the only successful way to halt its spread (with the exception of mass spraying herbicide). Interestingly, the story is turned on its head in the desert, as invasive grasses have *increased* the frequency of wildfires, which desert plants are not adapted to cope with.

That evening, Lisa hooked me up with two free nights camping, shower tokens (during those weeks I spent a lot of time thinking about when I could next get clean!) and a book about the Oak species of California. She also told me about a night market happening in San Luis Obispo that night and, although I was itching to return to town, once she dropped me off back at camp I discovered that my feet still hadn't recovered from the Duna Vista hike! I spent the evening trying not to think about street food and bright lights, as I tended to my blisters with a tin of soup and a mug of tea.

On my second day at Morro Bay, we were joined by her colleague Mike Walgren to continue touring the area. Yesterday, Lisa had started the day by taking me to see the Sea Otters at Morro rock, and I could never have believed that she'd top that but she managed it! We ended up side by side, edging to the top of a sand dune on our bellies at San Simeon to watch Elephant seals undergoing their annual 'catastrophic molt'. It sounds scary, but it mainly involves the whole colony doing absolutely nothing for a month except shedding fur and blowing snot bubbles out of their noses.



ABOVE: A CALIFORNIA SEA OTTER *ENHYDRA LUTRIS* CARRYING A PUP ON ITS BELLY  
BELOW: A BEACH FULL OF ELEPHANT SEALS *MIROUNGA ANGUSTIROSTRIS* WITH YELLOW *ABRONIA LATIFOLIA* FLOWERING IN THE FOREGROUND

Once Mike had met up with us, we travelled to what Lisa and he agreed was the most diverse grassland in their jurisdiction. On the top of the sea bluffs in San Simeon, we stepped out onto a piece of land that looked to me less like a grassland and more like an enormous patchwork quilt. I couldn't believe how many different species were beneath my feet- it wasn't in full flower yet, but I still found tiny, delicate *Calochortus splendens* and the aptly-named chocolate lily *Fritillaria biflora* bobbing their heads in the breeze. Among the huge array of species, we saw the wavy-edged leaves of soap bulb *Chlorogalum sp.*, an adorably chubby species of *Dudleya*, low-growing bushes of *Ceanothus maritima* that had been pushed flat by the sea breeze and the state rare *Arctostaphylos cruzensis*. Lisa was also desperate to find a tiny species of *Dudleya*, *D. blochmaniae*, that we eventually spotted on our hands and knees growing right on the edge of the cliff in the cracks and broken areas where some of the soil had fallen into the ocean below.

Part of what makes this grassland so diverse is the 'split and swell' soil. In dry weather, the soil shrinks and large cracks appear over the whole area. When it rains, the soil swells and the

cracks close up. This simple mechanism means that seeds are able to reach exposed areas of soil and plant themselves deeper via cracks, then are sealed in and protected from drying out or predation when the cracks close. It increases the variety of niches available for different species to exploit, not just for plant diversity but provides myriad hiding places for invertebrates too. The secret of this grassland is that it had been left undisturbed almost since records began, and Lisa's team were being careful to keep it that way. Non-native prickly sow-thistle (*Sonchus asper*) grew in the grassland, but as it wasn't found to be out-competing the natives they chose to leave it there rather than weed it out and potentially upset the balance. The grassland is also a valuable place for Lisa and Mike to bring students, however they are very careful to limit these group visits as much as possible to prevent trampling and damaging the plants and soil. I couldn't get over the texture of the vegetation when I looked out over the bluffs, and Lisa and Mike do an incredible job to try and make more habitats that will be as valuable as this one.



A RED-TINTED *DUDLEYA* IN THE FOREGROUND, GROWING AMONGST *CHLOROGALUM* AND DIVERSE GRASS SPECIES

I had mentioned to Lisa that I had originally planned for my trip to take me through Big Sur, to see the coastal scrub and forests and the incredible vistas that that drive would yield. However, in May 2017 Big Sur was effectively completely cut off as a landslide of over 1 million tonnes of rock smashed into Highway 1, covering a 1500 foot stretch of road nearly 40 feet deep. The road closure was positioned a few miles north of Ragged Point, the Southern entry into Big Sur, and Lisa and Mike suggested that we drive as far north as we could so that I could at least get a glimpse of this beautiful stretch of California coastline. We got right up to the road closure and saw tantalising glimpses of redwoods on the horizon, however Mike was unable to convince them to let us drive further to see the landslide. Instead, we found a surprise orchid in full flower on the roadside! We had to do a quick U-turn and circle back to see an enormous *Epipactis gigantea* bobbing its head right next to the traffic, in true botanist style! The cliffs too had intriguing plant communities, and Lisa identified the resurrection plant *Selaginella bigelovii* growing on narrow outcrops above us.



*EPIPACTIS GIGANTEA* GROWING BY RAGGED POINT, BIG SUR

Towards the end of our day, Mike and Lisa treated me to dinner in a little restaurant that came complete with a deaf tabby cat who liked her ears being scratched. I was so grateful to the both of them for taking two whole days to give me a comprehensive tour of their district, and before I left them to return to my campsite Lisa pressed a paper bag into my hands containing soap she had made with her nephews that contained native plants, including my favourite *Artemisia douglasiana*! That night, I lit my own campfire for the first time without anyone taking over or telling me how I should be doing it, which until this point had been my only experience of campfires. I was so proud of myself that I stayed up to watch it until it had burned down to embers.

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## SANTA BARBARA

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My last stop in California was to be Santa Barbara, but first I wanted to visit a nursery that the National Botanic Gardens of Wales already buy plants from for the Great Glasshouse but have never visited in person- Las Pilitas. I left Morro Bay campground early in order to transfer and back up the photos on my memory card in yet another Starbucks, then made the hour-long detour East to meet Penny, who owns the nursery with her brother. Las Pilitas was built by her mother and father during the native plants movement of the 60s and 70s, and Penny grew up helping them to run it from a very young age. The nursery itself was all hand built by the family, and is an incredible example of using creativity and resourcefulness to get the job done with little or no money at times. I loved the buildings there, and Penny was so friendly despite the fact that I had forgotten to warn her I was coming!

She told me that the main struggle the nursery faces is to get people really excited about native plants, and to get them to accept the fact that many plants will go dormant in summer (in much the same way that most things die back in winter for us in the UK). Most nurseries that were established in the 1970's native plants movement have had to begin selling generic, non-native Mediterranean species like Lavenders and Cistus in order to cover costs, but Penny wanted to stay true to her father's ideals and stick to strictly Californian plants. When her dad was alive he introduced many varieties into cultivation, and much like Theodore Payne the plant material was often gathered from the wild and only sold once it has been propagated. Penny's mum still works in the nursery and takes care of all of the seeds and cuttings, and the only regret I have

from that visit is that she wasn't there that day- she sounded like a propagating rock-star in her old age!



LAS PILITAS HQ, HAND BUILT BY BERT WILSON AND HIS FAMILY

I wasn't due to visit Santa Barbara Botanic Garden till tomorrow, so instead I decided to follow up a couple of Lisa's suggestions from the day before. She had told me about a collection of beautiful baskets made by the Chumash people, the local Native American tribe, kept in the Santa Barbara Museum of Natural History. The baskets were so intricate, woven from very fine *Juncus* stems, and the museum had a garden exhibit containing only plants that were used by the Chumash people including these *Juncus* reeds and the species used to dye them. Lisa's other tip was to visit the Painted Cave, a small cave high in the hills surrounding Santa Barbara containing centuries-old Chumash art. I camped nearby, with a view over the whole of Santa Barbara, right out to sea.

The next morning I came into Santa Barbara much earlier than I had meant to, and so had a morning to myself before the Botanic Garden opened. For the first time, I made use of free Wi-Fi in a coffee shop that wasn't Starbucks! I sat in a much nicer, open-air cafe by the sea watching the hipsters collect their morning shot of caffeine whilst I typed up my notes. Santa Barbara Botanic Garden was worth the wait- it had the most beautiful planting of any of the gardens I'd seen on my trip. Each area was separated by habitat, much like Rancho Santa Ana, but they were presented in a way that seemed more ornamental, rather than naturalistic to me. The effect was lovely, to see native plants that most people would associate with 'wildlife' gardens instead planted in more traditional drifts of colour. A small creek runs through the garden, and it's this creek that creates a slightly moister microclimate for SBBG to grow California's southernmost grove of Redwoods! They had nothing on the monsters in the north, but I learned that the garden employs a dedicated member of staff to look after them in the punishing dryness of the South Coast.



#### TWO INDIVIDUALS FINDING THEMSELVES A LONG WAY FROM HOME

Snooping around the plant sales area I ran into Jill, a fellow brit who volunteers in the retail propagation department. She showed me around her glasshouse, and introduced me to Patrick- the friendly, soft-spoken nursery technician for the main garden. Unfortunately, he wasn't able to take me across the road to see the full behind-the-scenes facilities at SBBG, but since returning home I've stayed in touch with Jill, who insisted that we take photos together!

Heading back into town listening to the local radio, I heard about Earth Day celebrations that were happening in the city- I hadn't even realised what day it was! The celebrations turned out to be a huge festival in the local park, complete with live music, amazing food and an endless maze of stalls promoting amazing projects, big and small, local and worldwide. I sat in the middle of it all and soaked up the atmosphere, then headed back into the mountains to spend my last night in the van.

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## RETURNING TO LA

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The next morning, I jolted myself awake as I began to hear the time I had left with Peggy the van ticking away. It took me nearly three hours to pack up the temporary little home I'd made for myself and clean three weeks worth of dust and dirt. I headed back into town to donate clothes I had no room for and to give my leftover food supplies to a food bank, then treated myself to breakfast in a quaint little bakery, feeling very conscious of my scruffy shorts and black vest top amongst groups of people that were well-dressed, colourful and, well, clean.

For the drive south, I chose to take the slightly longer coastal route, following the Pacific Crest Highway and drinking in my last hours of open California scenery with the windows down, music playing loud and enjoying every minute. I entered LA through Malibu, goggling at the multi-million dollar beach houses that so often crowded out endangered plants. Had these beautiful homes helped to bring species like *Sueada californica* to the brink of extinction?

I'm so glad I chose to do this trip in a van. Having Peggy meant that I was totally free to follow whatever schedule I liked- I could be flexible according to the situation, such as leaving Sequoia a day early and instead having extra time to discover San Luis Obispo. It felt safer than a tent, and because it was a converted people-carrier it meant that I was able to fly under-the-radar, as I didn't look outwardly like a tourist. With the addition of a portable shower, I could easily have lived in that van for another three weeks! I waved goodbye to Peggy with a tear in my eye as I handed her back to the rental company, with the final tally of 1235 miles travelled in 17 days.

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## GOING HOME

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My last day in America was spent well- I stayed in my shorts and hoodie all morning, writing notes and processing photos with IHOP for breakfast (International House of Pancakes, it's incredible, trust me). It felt weird to no longer be travelling, and I was glad I had scheduled in a rest day before making the journey home. In the afternoon, I decided I had time for one more little adventure, and took myself to the James Irvine Japanese Garden in Little Tokyo. I was once again lucky, as it was cherry blossom season and the garden looked at its best as I wandered around with a sweet steamed bun. It's one of the best examples of a traditional Kyoto-style

garden outside of Japan, and was a great treat for me as Japan is a place I've been fascinated by since I was very little.



CHERRY BLOSSOMS AT THE JAMES IRVINE JAPANESE GARDEN, OTHERWISE KNOWN AS SEIRYU-EN OR "GARDEN OF THE CLEAR STREAM"

Two days later, my key found my front door in Carmarthen. I dragged my suitcase up the stairs and back into my bedroom, where I found myself standing still in the doorway, feeling as though I was looking at a room that used to belong to a different person. It's cliché to say that a trip has changed you, but never before had I had so much freedom. I had spent three weeks making snap decisions, following my instincts and enjoying more space than I'd ever experienced in a six-by-sixteen foot minivan. 2018 has been a hard year, and prior to this trip my family had been rocked by grief and divorce. I hadn't realised it at the time but there was a reason, beyond my job, that I wanted to go to a place where things could grow green again from scorched earth. I learned a lot about horticulture and I believe I became a much better botanist during this trip, but I also became a much stronger woman. In knowing that I could handle myself in the wild, I knew that I could take care of myself back home as well.

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## APPENDICES

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### ACKNOWLEDGEMENTS

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I am extremely grateful to the RHS Roper Bursary Fund and the Merlin Trust, as without their funding I would never have been able to make this trip. I'm also grateful to Lisa Andreano, Peter Evans, Mike Walgren, Bryce Kunzel, Tim Becker and the many, *many* people I met who made me feel welcome and took time to help me to understand this beautiful, interesting, vibrant section of the world.

### BIBLIOGRAPHY AND REFERENCES

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The California Chaparral- An Elfin Forest by Winfield Scott Head

*This is a fab little book that lived in my van door for the duration of the trip. It was very useful as a quick reference, and the way Head writes about exploring the chaparral is so charming that I often re-read bits to pass the evening when it got dark.*

Plant Life in the World's Mediterranean Climates: California, Chile, South Africa, Australia, and the Mediterranean Basin by Peter R. Dallman

Bringing Nature Home by Douglas Tallamy

*The 'bible' for Theodore Payne, which they recommend for all budding native plant gardeners*

Plants of Coastal San Luis Obispo County by Michael Walgren

*Written by Mike, who was showing me around with Lisa Andreano, this was also very handy to have in the car to identify the plants we saw as well as many of the plants I had sketched or photographed previously.*

Fire in California's Ecosystems by Sugihara et al.

*This is the textbook that Lisa Andreano prescribes to all of her students. There's not much you won't find in here about fire and California.*

Plant identification websites: [www.calflora.org](http://www.calflora.org) and [www.wildflowersearch.org](http://www.wildflowersearch.org)

*I used both of these websites to identify plants from my sketches and photos once I got home.*

Wildfire locations: <http://www.fire.ca.gov/general/firemaps>

*CalFire has mapped all of 2017's wildfires onto a Google map, which I was able to lay over the map of my route to see all the major wildfires I encountered.*

'Exploring Native California Plants with Journalist Clarissa Wei': Vlog by [Lavendaire.com](http://Lavendaire.com)

*You can find this video by searching Lavendaire's YouTube channel. It was a fascinating introduction to native Californian plants, and ended up putting me in touch with Pascal Baudar.*

## TRIP COSTS

	<b>RHS bursary amount</b>	<b>1600</b>
	<b>Merlin Trust bursary amount</b>	<b>1000</b>
	<b>Total bursary amount</b>	<b>2600</b>
	<b>Total amount spent</b>	<b>3236.386</b>
Pre-trip	Van Hire	1060.79
	Flights	518.5
	Train	158.1
	Travel insurance	33.06
	ESTA	9.99
	Airbnb 4th-6th	67.11
	Airbnb 23rd-25th	67.11
During trip	Transport	49
	Subsistence	606.452
	Accommodation	188.986
	Gas	289.744
	Entry, Parking, Passes etc	187.544

## FINAL ROUTE

