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Angola

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In December I was lucky enough to visit Angola. It's a huge country, the seventh largest in Africa, covering about 1,250,000 km² from the Congolian tropical rainforests in the north to the Namib desert in the south. To the west, miombo forest extends to Zambia. Three things spring to mind about Angola: it has a wealth of poorly documented biodiversity, it is rich in oil and minerals, and it suffered a devastating civil war from 1975 to 2002. Twenty seven years of war has left much of the country ungoverned with a legacy of poverty in stark contrast to the riches generated by natural resource exploitation. If you want to take a holiday there, it's not an easy country. There is a lack of infrastructure for tourism and getting a visa requires an elaborate lengthy process.

A recent book by Brian Huntley, a former Director of the South African National Biodiversity Institute who was the national park ecologist in Angola from 1971 to 1975, describes the history, ecology and conservation efforts of the country (Huntley, 2017). I made a pilgrimage to see the subject of one of the chapters in the book, the extraordinary plant *Welwitschia mirabilis*, which is only found in the Namib Desert of southern Angola and Namibia. It's a long way from Luanda south to the desert, but the journey is a fascinating vegetation transect as the rainfall declines. A quick side trip at Lubango takes you to stunning views across the mountains and plains of Huila from Tundavala Gorge, before dropping down the hairpin bends of the Serra de Leba escarpment to Namibe. Seeing *Welwitschia* in the wild is breathtaking. In Brian's book, he includes a quotation from Dr Friedrich Welwitsch, the first western scientist to find it "I could do nothing but kneel down on the burning soil and gaze at it, half in fear lest a touch should prove it a figment of the imagination." When the botanist Joseph Hooker formerly described the plant in 1863 he said "A discovery that I do not hesitate to consider the most wonderful, in a botanical point of view, that has been brought to light in the present century...".

Welwitschia looks like a life form from another world. Huge sprawling plants in the desert consisting of only two leaves growing from a basal meristem with the ends of the leaves splitting and fraying in the harsh arid climate. They are gymnosperms, and the fruits are cones on separate male and female plants, with only one extant species in the order Welwitschiales. The fossil record testifies to their ancient lineage, there is a fossil seedling from northeastern Brazil that has been placed in the order, dated to 110 million years ago. The larger living specimens are probably more than a 1000 years old: phylogenetic relicts surviving in what is probably the oldest desert in the world.

Can *Welwitschia* tell us anything that is important for policy? Firstly, that there is enormous biological diversity on our planet, some of which is incredibly ancient. Conservation needs to think phylogenetically as well as in terms of numbers of species. Deep relictual nodes require special attention as they tell us about the history of evolution of life on Earth. Secondly, iconic species attract public interest. *Welwitschia* only grows in the Namib, but it is world famous and is given due prominence in marketing for tourism in Angola. There are *Welwitschia* hotels and restaurants, and remarkably the airport in Namibe is called

'*Welwitschia mirabilis*'. Thirdly, plants and animals adapt to survive in the harshest of environments, the Namib desert has a wealth of species, many of which are unique to the area. However, like so many places, these habitats are fragile, easy to disturb and impossible to restore.

And what of ecological science in Angola? Decades of civil war had a terrible effect on Angola's wildlife, training of ecologists and ecological field work. I did a search in the African Journal of Ecology for recent papers on Angola and they are starting to emerge, for example on vegetation (Rejmánek et al., 2017; Revermann et al., 2017; Smith and Figueiredo, 2017); birds (Cáceres et al., 2016); and large mammals (Baptista et al., 2013; Chase and Griffin, 2011). A group of naturalists based in Angola and elsewhere have a Facebook group 'Angola Ambiente' that posts pictures and observations on Angolan natural history. National parks are being restored and tourism is developing, though there is still a way to go. There is a lack of trained staff, infrastructure was destroyed, visas are complex and larger wildlife was almost completely wiped out. But change is coming. There can't be a better signal of increasing ecological awareness than an airport being named with the Latin binomial of an iconic plant.

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