

Inscribed on ancient cacti in Peru's Pacific desert are lyrical love poems and fascinating comments from the past century. Kew's **Oliver Whaley** is studying these revealing insights into a changed landscape and a vanishing way of life



Messages from the past



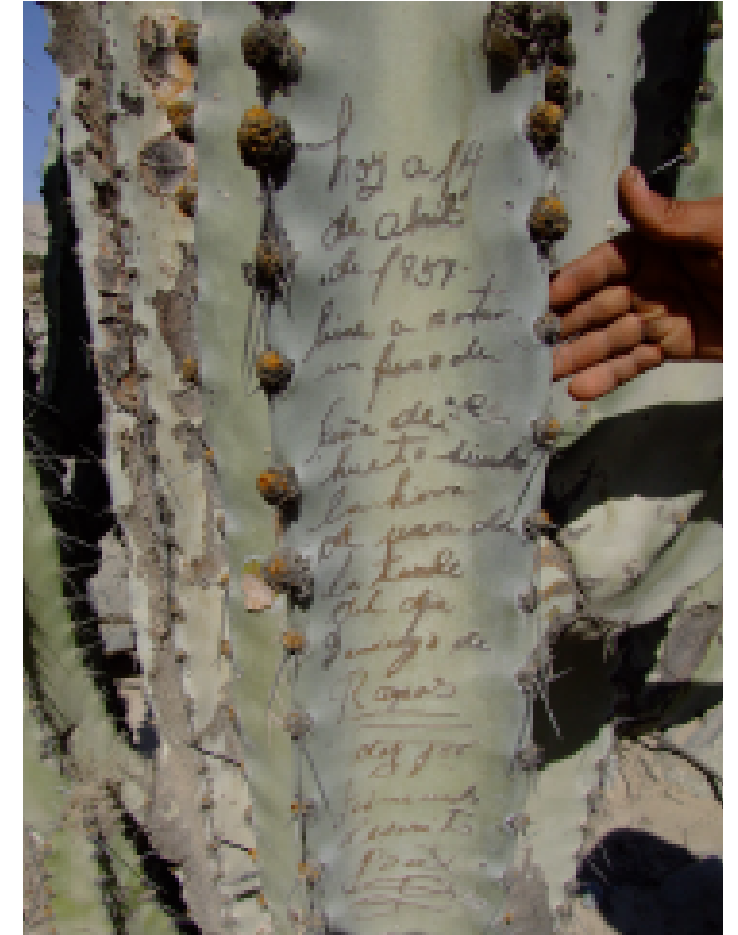
The writers of these remarkable messages have given us a unique insight into their lives

I am standing on a cusp of the Andes – a huge rib of dry rock jutting out into the Ica desert plain towards the Pacific Ocean 30 miles away, from where a pure, cool wind blows. Jagged stones around me seem freshly shaken loose by one of the earthquakes under these restless mountains. The place looks inhospitable to most life on earth, but strangely I don't feel alone – as far as the eye can see are 'figures' of one of the most extraordinary plants on earth – *Neoraimondia arequipensis*. Even on the driest mountain tops, these huge cacti stand defiant for centuries without apparent need for shade or water.

Working on habitat restoration here in the deforested desert systems of southern Peru, we're always on the lookout for indicators that can shed light on the fragmented ecological history, and *Neoraimondia* tells us things as no other does – literally. Even in the remotest habitats of *Neoraimondia*, someone has been there before us. We



Team members include Octavio Pecho, Kew student Sandra King and Consuelo Borda



In 1957, Pablo wrote of cutting reeds, but today reeds no longer grow in this region

know this from the remarkable messages left on these ancient cacti. Local people have plucked out a cactus spine and engraved inscriptions, signed and dated, on to the smooth stems. They're often in a delicate hand – a fine line that darkens with time, making it legible a century later.

The more you read, the more enthralling these cactus inscriptions become. The earliest one we've found so far is dated 1902, which corresponds with the arrival of a preacher, when people learnt to write. Studying these cacti with various members of our Darwin Initiative project team, including students from the University of Ica and Kew horticulture student Sandra King, I realise that the information could usefully add a little more resolution to the fading historical ecology – the position of the dates on the plants suggests some cacti could be at least 800 years old.

The inscriptions seem mostly to record moments of water and love – especially the

annual arrival of river water: '1934 ... waiting for the water', and less surprisingly the love affairs of the local community. The poems addressed to lovers and wives are sometime lewd, but more often romantic and beguiling: *AMOR Cuando por las mañanas te despierta el aire, no te asustes por que es un suspiro mío para ti ROSA* (LOVE, when in the mornings the wind awakens you, don't be afraid because it's a sigh of mine for you, ROSA).

The words also record moments in people's lives, some simple: 'I was hunting pigeons... food, 12 April', and some more momentous: '10 January 1975, last day of work, going to Lima to submit to the army while passing here this afternoon, writing in the presence of Don Ezequiel already 60 years old having had his birthday on 10 April and Hipolito... born 13 August 1960, today 17 years old, eligible for military service.'

From an ecological point of view, the spontaneous inscriptions that conjure up a

past landscape are the most interesting: 'Today 14 April 1957, I came to cut a bit of reed from the orchard when it was one in the afternoon on the day of Palm Sunday, Pablo'. Pablo was probably gathering reeds along the edge of an irrigation channel to repair his house; today, houses are still made of quinchá – reeds covered with mud and dry leaves.

But why are there no reeds or orchards in the area now, and why are there so many abandoned terraces? All is now windblown, with telltale indicators of desertification and overgrazing. Old people in the valley wistfully remember collecting cactus fruit, but today the same cacti produce no fruit, and many of the inscriptions have shrunk back into deeply concave stems. Clearly these writings were scribed in times when the stem was more swollen and able to bear fruit.

On the Pacific coastal desert of Peru, agriculture and vegetation depend on the lifeline of annually flowing rivers bringing



Many scripts refer to water, this one telling of the arrival of 'a good increase of brown water'



Top: shards of Nazca pottery litter the ground, often decorated with cacti fruits



Above: only when it's swollen with water does *Neoraimondia arequipensis* bear fruit



Right: *Corryocactus brachypectalus* guard the source of the flood water, high in the Andes

Oliver Whaley with a *Neoraimondia* that has suspended its growth in its long wait for water

Neoraimondia arequipensis was first described by the German cactus collector Curt Backeberg in 1937. It is the largest South American shrub cactus, with thick stems that grow to more than 8m tall. The columns are protected with spines up to 20cm long, arranged in vertical rows. The flowers (pictured below) have lemon-sorbet-like petals fringed with rose pink and exude a sweet evening fragrance. They offer nectar to bees, but fail to develop into fruit unless the rivers flood.



water from the high Andes between January and April. The rivers are laden with nutrients and are recharging aquifers, flooding and nourishing the land, often through a complex system of irrigation canals developed over at least 3,000 years.

Unsurprisingly, *agua* (water) is the most common word in the cactus scripts – one from March 1921 records '*Vino un buen aumento de agua colorada*' (There came a good increase of brown water). The dates of the arrival of river water are the single most recorded information, and they provide us with insights into hydrological systems and corresponding plant phenology. For example, the inscriptions show that between 1917 and 1957 the water tended to arrive during January or early February, whereas today it usually arrives significantly later, in April.

Today, advanced desertification has set in, and the villages and irrigation canals are largely abandoned, but the inscriptions tell of better times. We know that much of the highly sophisticated stewardship of the land was lost after the Spanish conquest, and in the last generation mining for copper and gold has drawn away the workforce necessary to maintain the irrigation. Around the cacti there are disused pre-Columbian terraces littered with pottery – for hundreds of years this was a productive area, and the cacti tell us that as recently as 1957 water flooded the lower valley. One inscription, made 55 years ago, says: 'The water came here', indicating the 1953 water level. Today, the riverbed is 10m below this mark.

Follow the unpaved tracks up precipitous flanks of the Andes to the verdant heads of the valleys, and at about 3,500m you reach

the watershed between Pacific desert and Amazon. Here, like sentinels between clouds and earth, the cactus *Corryocactus brachypectalus* grow centuries old, grasping the rock while the land around plunges into gorges so deep that a raging torrent only whispers. Here, at the source of the desert's water, they stand with a skin and flesh, distinct from other plants around.

There is striking evidence that in the Ica region, over thousands of years, pre-Columbian cultures assimilated cacti closely into their culture. Cactus forms abound in the iconography of the Nazca people, perhaps as divine representatives of water. Our recent ethno-botanical study revealed that people of the *quebradas* use cacti to 'clean' water. They stir cactus sap into muddy water and the sap attracts the mud particles, leaving the water crystal clear. This act of

using cacti to turn brown water to sweet is probably an ancient tradition. As so often in historical ecology, there is no absolute certainty, but as sand dunes form where once forests stood, and the burning sun and winds of climate change make our ecosystems shudder, the writing is on the cacti and we are compelled to listen. 🌵

Oliver Whaley manages Kew's Darwin Initiative project Habitat Restoration and Sustainable Management of Southern Peruvian Dry Forest, which is also supported by Bettys & Taylors of Harrogate Trees for Life project (www.treesforlife.co.uk) and London-based Trees for Cities (www.treesforcities.org) [ck with foundation]

How is your Spanish? Help us decipher the cactus inscriptions – go to www.kew.org/tropamerica/peru/cactuscript [CK]

