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PALMS, CYCADS AND GEOLOGY: A TOUR OF THE WESTERN GULF AREA OF QUEENSLAND AND INTO THE NORTHERN TERRITORY

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In June 1991, we set out from Mount Isa in the far north-west of Queensland, prepared to camp under the stars for nine or ten nights. Travelling in a north-west direction, we came to the Riversleigh fossil deposits, a remarkable assemblage not discovered till recent years, and from which over 100 new species of animals have been described.

Close by is the Gregory River, and it is here that we saw for the first time *Livistona rigida* in its natural habitat. It is a magnificent palm which grows here in profusion, even standing in shallow water in the sandy bed of the river. This species must be one of the most robust of the native livistonas, and possibly one of the easiest to grow.

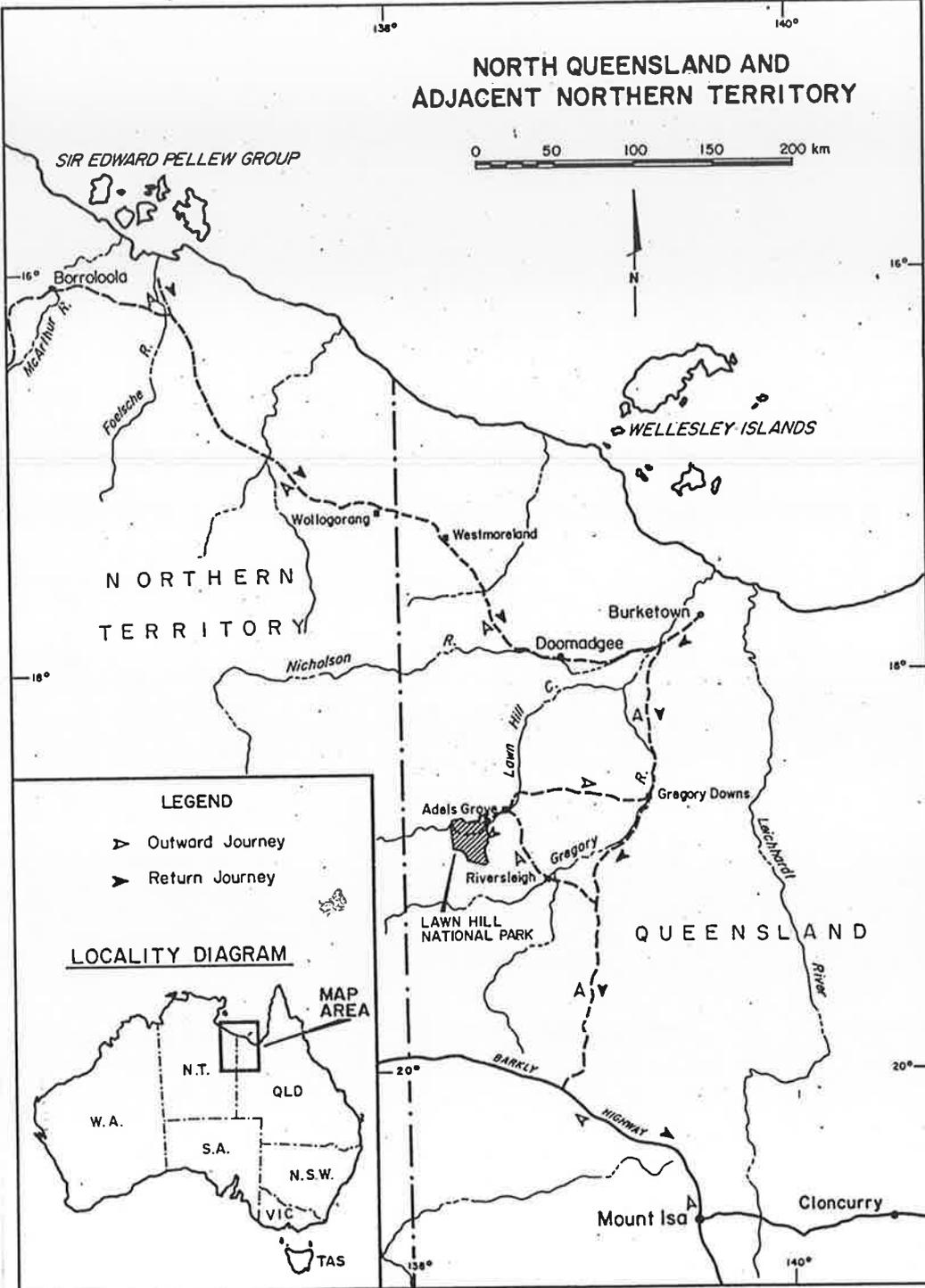
Our journey then took us on to Lawn Hill National Park. We were allocated a camp spot in the well kept camping area close to Lawn Hill Creek, a picturesque water-way with *L. rigida* on the banks accompanied by a *Pandanus* sp. and a variety of large trees growing closely together. Planted and self-sown *L. rigida* seedlings were evident all through the camping area, the leaves dark maroon red in the juvenile stage.

We made enquiries of the ranger as to the whereabouts of a supposedly undescribed species of *Cycas* that we wished to find the next day. Craig Walker of the NT Palm & Cycad Society had told B.B. of these. Next morning we followed the National Park

Below: *Livistona rigida*, Lawn Hill, part of a dense grove beside the creek.

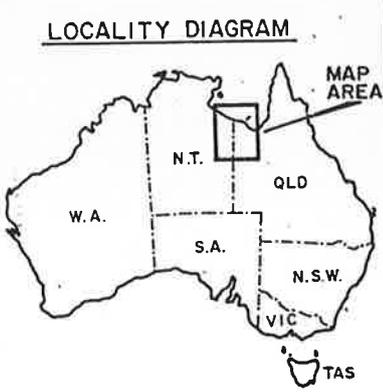


NORTH QUEENSLAND AND ADJACENT NORTHERN TERRITORY



LEGEND

- ▷ Outward Journey
- ▷ Return Journey





Above: *Livistona rigida*, with roots in water.

walking track for about six kilometres passing by red sandstone cliffs, clean white-trunked snappy gums and spinifex. *Grevillea dryandri* and the spectacular low-growing 'mulla-mulla' (*Ptilotus* sp.) added to our interest along the way.

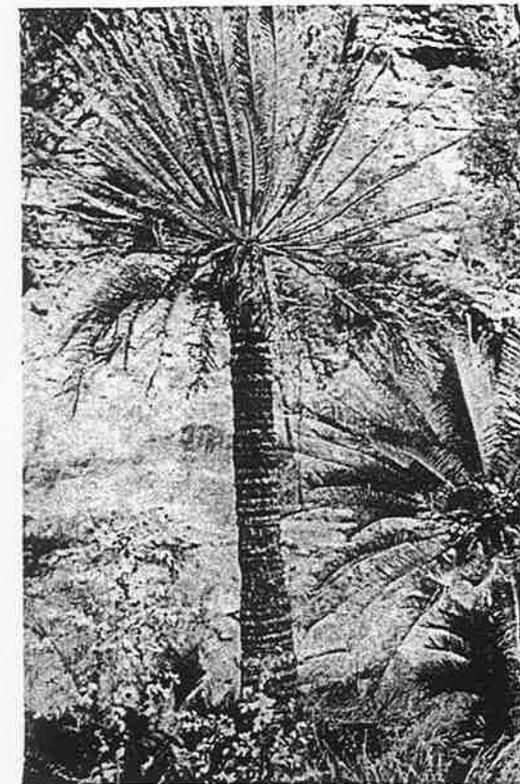
As we worked our way west we could clearly see the line of the unconformity between the underlying Proterozoic sandstones and siltstones and the overlying younger Cambrian limestones and calcareous sediments. We soon left the cleared track and struck off along the creek walking through dense groves of *L. rigida*. In places, large quantities of fruit were lying on the ground with evidence everywhere that wild pigs eat the fruit. We had now passed into the area of Cambrian rocks and we followed a high scarp for some distance before realizing we had taken a wrong direction. But we were soon on the right course again, waded across Lawn Hill Creek and on again.

At last the blue cycas came into view; the long walk, the scramble over rocks and through spinifex was worth every step. They were a beautiful sight to behold.

The cycas were growing in the sandy bed of a valley between limestone scarps and were in a particularly vigorous condition. There were numerous female trees with massive bunches of seeds, these were large, but green and immature, mostly six or seven seeds on each sporophyll measuring about 38 cm long. The apex of the sporophyll was finely and sharply toothed. Except for an old one that had fallen, no male cones were seen. Many of the cycas had recently put out new leaves. These were at first very pale brown, slightly velvety, becoming a soft blue as they aged, eventually turning to blue-green in mature fronds. North-west Queensland was experiencing a very good growing season following heavy rains and floods early in the year. This may have been responsible for the vigorous growth of the cycas, new leaves and large quantity of seeds. There was no evidence of fire in the valley for several seasons and this again would have contributed to the healthy nature of the population. The tallest cycas plants were up to four metres in height but the average would

have been only one to two metres. There were some branched specimens, two or three branches only, and some plants had swollen bases. Though the main population grew in the loose sandy bed of the valley, some specimens grew among the rocks at the base of the scarps, and where there was a more gentle slope, the cycas grew amongst other vegetation. We did not have time to follow the valley very far so we did not determine the extent of this colony of blue cycas, but here at least it was confined to the narrow valley. According to the ranger this was the best stand with another smaller group in another nearby gully, but our deadline to check-in with the ranger had to be met. We left Lawn Hill National Park with its beautiful gorges and scarps, palms and cycads, well content with our brief visit.

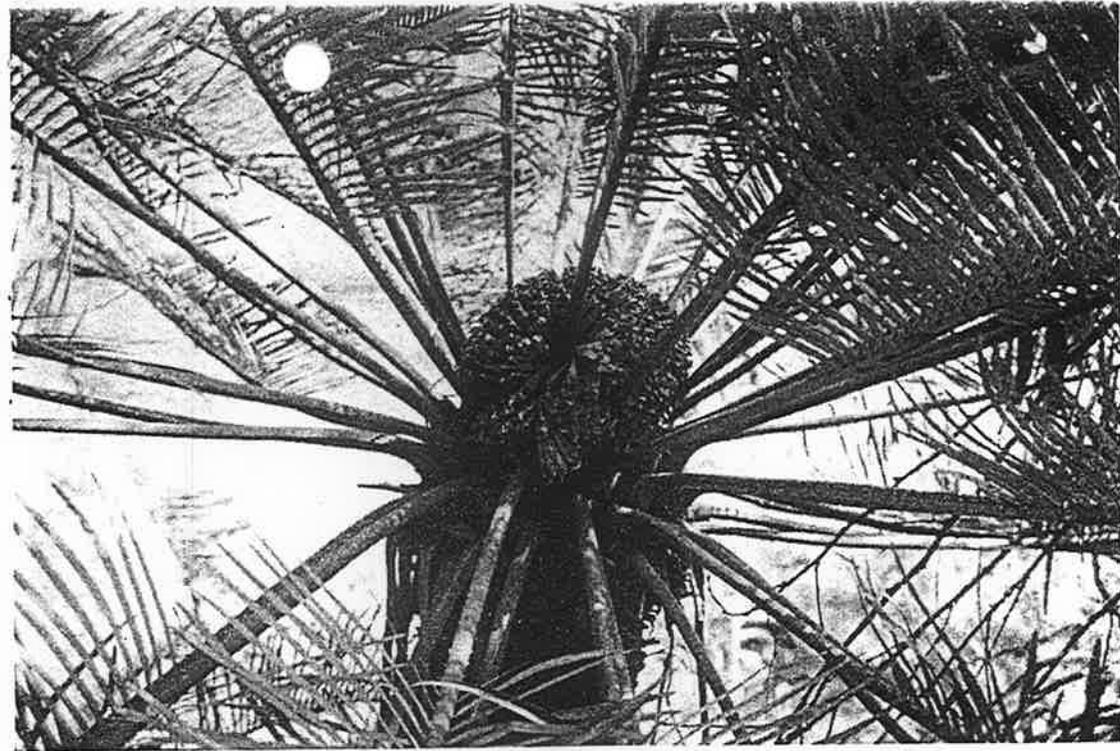
On our way again, we crossed the Gregory River at Gregory Downs and onto Westmoreland Station, where three years ago J.B., ever observant, had noticed the attractive small palm, *Livistona inermis*, a species previously unknown in Queensland.



Right: Lawn Hill Cycas, against the cliffs.



Above: Lawn Hill cycas, growing close to limestone cliffs.



Above: Lawn Hill Cycas, with old male cone.

We spent two days at Westmoreland. It was not easy to pick up old tracks but we did find *L. inermis*. Though they were mostly in small groups of three or four, and even solitary specimens, there was one large community in a valley between high sandstone scarps. Many of the palms seemed to grow out of cracks in the rocks, and to see them right at the base of a cliff in the full sun one wonders how they manage to survive the heat of summer intensified by reflection from the rocks and with no rain for months on end.

Livistona inermis is a dainty graceful palm, the trunk measuring up to 50 cm in diameter at the base to 35 cm at the apex. Some individuals were up to about 19 metres high. It was amazing to see these tall palms perched atop bare 200 metre high sandstone cliffs, solitary against the sky. The very tallest palms were uncommon and seemed to be a distinct subset. If they are, the reason may be ecological or genetic.

The petioles are mostly free of spines and red in colour. The loose fibre near the apex is almost white, the finely segmented leaves

green to grey-green, making a quite colourful display. The costapalmate leaves are divided almost to the petiole. Leaf-bases remain attached to the trunk for the lower one and a half to two metres, and in some instances make a pleasing pattern. Above this the leaves are completely shed, leaving a smooth trunk. As there had not been a fire in the area for several seasons, there were heaps of fallen leaves on the ground beneath the trees and persistent 'aprons' on the young palms – a fire hazard should one eventuate.

Although J.B. had found fresh fruit on her previous visit, also in June, there were none to be found this time, except for two very small immature bunches. Only one panicle of flowers was observed; J.B. used all her ingenuity to climb a close by small palm to reach them to obtain a sample for the Queensland Herbarium. Barefooted and balancing on the petioles, she was very glad that these *livistonas* were indeed 'inermis'. Flowers are cream and very small; some old fruit on the ground were oval and relatively

small for a *Livistona*. Perhaps the 'bumper' wet season earlier in the year had sent the palms into vegetative growth instead of producing flowers.

Livistona inermis would make an ideal palm for a garden if it could submit to cultivation. B.B. had seedlings growing for six years. Two of these were planted in her garden near Ingham, N. Queensland, in good, well drained, sandy loam soil. They were well established and thriving with a thick base and leaves over a metre high. However, the continuous rain of the late wet season in 1990 was apparently too much for this semi arid species and they succumbed to the constantly wet conditions.

In the course of collecting and photographing, we had time to admire the magnificent scenery of Westmoreland with its ancient red sandstone and conglomerate scarps that glowed in the light of the setting sun; the intriguing shapes and patterns of the weathered rocks were a sight to behold. Various species of *Acacia* bloomed everywhere and a curious bush that resembled a cactus had us baffled as to its identity until we found a plant with yellow pea flowers and recognized it as *Bossiaea*

bossiacoides (guminosae) a species endemic to Northern Territory and north west Queensland.

From Westmoreland we drove on across the Queensland/Northern Territory border at Wollgorang then on to Manangoora. Our interest here was to see the stand of *Cycas angulata* of which we had heard such glowing accounts, once again from Craig Walker. Yes, they did present a spectacular sight with some specimens to 15 metres tall, being very impressive with the large crown of leaves so high up. We saw scattered specimens after crossing the Robinson River, then we turned off the Borroloola road at the Foelsche River to follow that for over 20 km to where it became tidal. All this distance we saw *C. angulata* growing in very flat sandy country. At the tidal reach of the river this species was the dominant vegetation, in some places forming very dense colonies. Here a large number of trees, with trunks one and half to three metres tall, had enormous bunches of seeds which were large, but immature. The seeds numbered about eight to a sporophyll, the latter being up to 50 cm long with a pointed, smooth-grained apex. It was unusual that there were

Below: *Livistona inermis*, Westmoreland. The most palms in one place that we saw. Usually they are more scattered.



Above: *Livistona inermis*, Note few dead leaves hanging on mature trees compared to the heavy 'skirt' on younger specimens. Brien standing by the tall tree in mid-picture gives an idea of scale.



masses of seeding trees at this point close to the river, we saw only two other trees with seeds, these being very sparse. No male cones were seen in either locality.

We camped among the cycas that night. The trees were eerie in the moonlight, a strange sight to us who were more used to camping among the eucalypts. Many *C. angulata* were branched from two to three times, thus making some very large plants. Others had several small suckers emerging from the trunk. This may have been the result of injury to the main growing point because in some cases the head had died. However this was not always so.

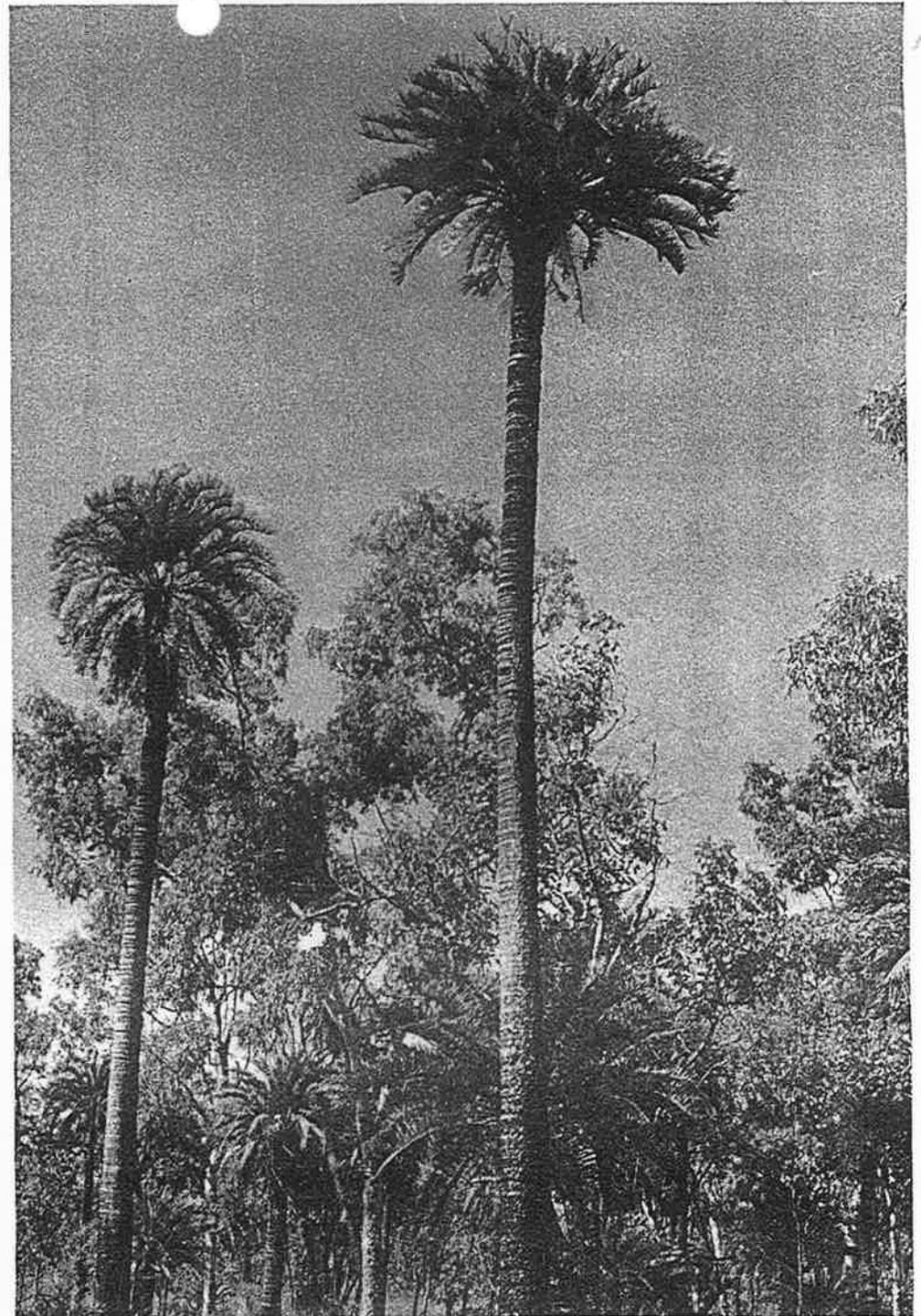
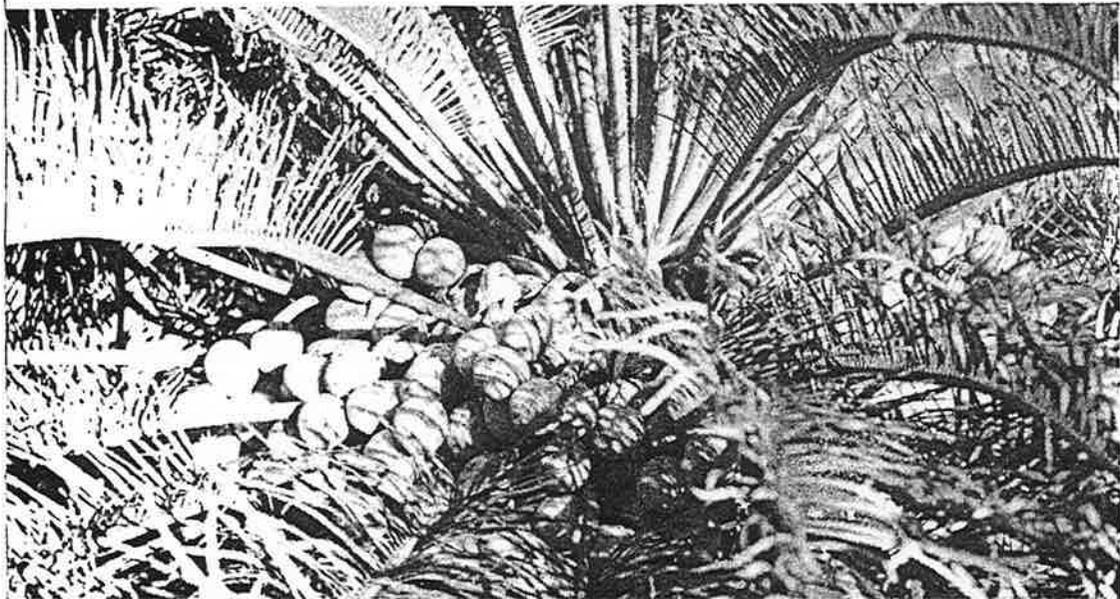
New leaves, which come in flushes, are dull blue, but soon change to grey-green in the mature leaf. The stout trunks are grey to black. This cycas dominates the vegetation for many kilometres, although the red-flowered *Grevillea heliosperma*, the yellow-flowered *Acacia* species and the white-trunked *Eucalyptus* species added colour and contrast. Throughout these sand plains species of *Pandanus* were common, and often the cycas and pandans were growing adjacent and inter-mixed, the two striking symmetries would have appealed to Escher!

The coastal area of the Gulf of Carpentaria are prone to the effects of tropical cyclones, and this may account for the many tall cycas which have severe slants. In fact we were told that the really tall cycas growing near the homestead on the tidal reach had all been blown over in a cyclone some years ago but the reputed height of these former giants stretched our powers of belief.

It is hoped that this area of cycas will be left as it is to be enjoyed by visitors for generations to come. It was worth the long trip just to experience the sight of so many thousands of grand cycas. Our search for *livistonas* and cycas was now complete for this trip and we were well satisfied with what we had seen. We returned eastward via Burketown and Gregory Downs. Rain had fallen on the black-soil plains from there, making the road a quagmire. We decided to visit Lark Quarry south of Winton. Here we saw the fossilized footprints of a dinosaur stampede, a fitting climax to our trip, leaving us wondering if some of those ancient animals had fed on the forebears of *Cycas angulata*. With the respective authors' combined knowledge of geology and botany, we found western Queensland and a little of the Territory to be of immense interest and beauty.

All photos by the authors.

Below: *Cycas angulata*, female plant with seeds.



Above: *Cycas angulata*, a majestic specimen.