

# Fossils and flowers

Extinct and extant in Estcourt

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TOP LEFT: *Aloe marlothii* makes a vivid splash of orange in the brown winter landscape. ABOVE LEFT: Members of BotSoc's KwaZulu-Natal Inland Branch admiring the spectacular azalea-like shrubs of *Barleria greenii*. RIGHT: The beautiful dark pink form of this rare endemic *Barleria greenii*. Photos: Isabel Johnson.

On a hot February day earlier this year a few members of the KwaZulu-Natal Inland (Pietermaritzburg) Branch of the Botanical Society gathered at Fort Durnford just outside Estcourt to visit the *Barleria greenii* localities and the fossil sites on Dave Green's farm. We were met by Dave, a well-known amateur botanist and local farmer.

After driving along a farm track through valley bushveld on 'Van der Merwe's Kraal' farm, an amazing sight met us - spectacular azalea-like shrubs covered with large pink blooms. This was *Barleria greenii*, a narrow endemic occurring naturally in a small area in the Estcourt region in open rocky areas along drainage lines or streams in heavy, black clay soils on doleritic rock. It was only recently discovered and was officially named in 1984 by Kevin and Mandy Balkwill after Dave Green who was the first to collect these beautiful flowers. The population we visited showed considerable colour variation, ranging from deep rose pink to pure white. Regarded as endangered because of its very localized distribution and specific habitat requirements, these plants are wonderful garden subjects, easily grown from cuttings. The large pale flowers and evening scent suggest that hawk moths are the pollinators. Also flowering was the extraordinary bulrush poker *Kniphofia typhoides* with its purplish-brown inflorescences looking very much like bulrushes.

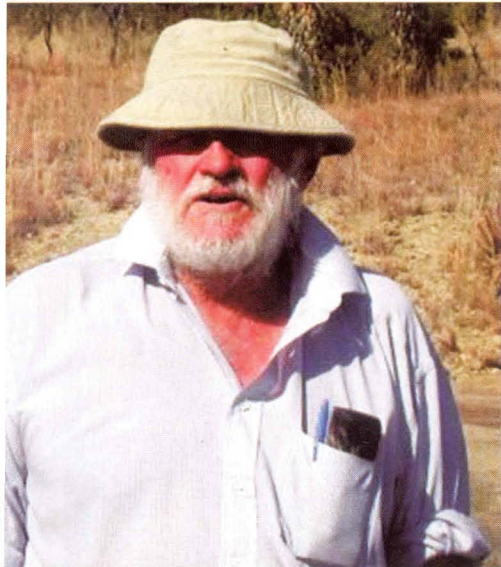
We lingered so long amongst the barlerias that we ran out

of time to visit the fossil beds and planned to come back in July.

Returning to Estcourt on a sunny midwinter's day in July, the group met at the Fort Durnford Museum, built as a frontier post after alarm caused by the Langalibalele Rebellion in 1873 and now the home of the Estcourt museum. Dave gave a fascinating tour of the museum exhibits, in particular the fossils and more recently excavated human artifacts. It also houses an amazing collection of bird's eggs donated by Godfrey Symons.

We didn't expect to see much plant life in the arid midwinter bushveld on the way to the farm 'Rensburgspruit' but were greeted by trees and shrubs festooned with the fluffy seed heads of traveller's joy *Clematis brachiata*. Close up, these 'fairytale' seed heads have brilliant red seeds with long persistent styles covered with silvery white hairs for wind distribution. It is thought that the common name, traveller's joy, originates from the many different uses this plant had for weary travellers in the days before motor travel. Leaves packed into shoes and under saddles prevented blisters and saddle sores, and packed into hats lessened the effects of the sun. Leaves were also used to make tea and added to baths to ease aching muscles. This plant is also used extensively in traditional medicine to treat abdominal disorders, intestinal worms, colds, syphilis, snakebite and as a good luck charm!





Conspicuous in the dull vegetation were the brilliant orange inflorescences of the stately *Aloe marlothii* (formerly *Aloe spectabilis*) coming into flower and the subject of much bee activity. We also spotted cryptic cushions of closely packed stems of the succulent *Euphorbia clavarioides*, which has the rather descriptive common name of lion's spoor. The milky latex of this plant is used as birdlime, and when dried, by children as chewing gum.

Dotted around the *Hyparrhenia* grassland are 'islands of succession' where the pioneer scented thorn *Acacia nilotica* subsp. *kraussiana* provides a nitrogen rich nursery for seedlings of buffalo thorn *Ziziphus mucronata*, blinkblaar *Rhamnus prinoides* and crossberry *Grewia occidentalis* the seeds of which are deposited by visiting birds. These broad-leafed plants eventually kill the 'nurse' *Acacia* by shading it out.

#### Fossils

After a short drive we reached an area where the surface layers of soil had been cleared away revealing a hard, patterned surface. Dave explained that during the Late Permian Era (250 million years ago) Estcourt was part of a shallow basin traversed by rivers meandering over wet flood-

plains and occasionally draining into shallow lakes. Once the shoreline of an inland lake, the sedimentary shales on Dave's farm show the rippled effect of the lake shallows.

The dominant vegetation around these swampy areas were sphenophytes (the equivalent of today's horsetails or *Equisetum*). These plants are believed to have been the most important food source for the herbivorous mammal-like reptiles that roamed these shores. Bulky herbivores from the group Dicynodontia moved through the swamp vegetation, feeding on the soft and juicy underground parts of large horsetails, probably using the canines in their upper jaws to dig up roots. The fossilized sediments still bear the footprints and drag marks of one such species, *Dicynodon lacerticeps*. They also clearly bear the imprints of worm burrows and the trail marks of some prehistoric mollusc.

A few metres from this open area the surface breaks up, revealing consecutive layers of shale, each representing a storm that would lay down another layer. The ripple size and direction differs in each layer, reflecting the severity and direction of the wind. Fossilized leaves are visible in some layers and white fish scales in others. One patch shows the imprints of a whole family of

TOP LEFT: The curious cushion-like 'lion spoor' *Euphorbia clavarioides*. CENTRE: Dave Green, farmer and expert naturalist, recently discovered *Barleria greenii*, which occurs naturally in a small area in the Estcourt region. It was named after Dave in 1984. BELOW LEFT: The fluffy seed heads of *Clematis brachiata* give a fairytale snow-like appearance to the veld in July. BELOW: Dave Green explaining the geological processes that led to the formation of this exposed prehistoric shoreline - the ripples that formed in the lake shallows are clearly visible. Photos: Isabel Johnson.

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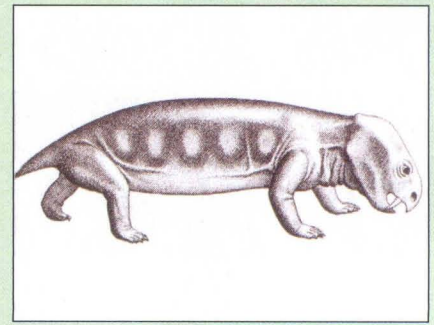
dicynodonts crossing the lake shallows. It is an incredible feeling to 'read' the shale surface and realize that these creatures stood where you are now, so many millions of years ago.

Back at the farmhouse Dave brought out a box of fossils from the site that included a *Dicynodon lacerticeps* head clearly showing the upper two canines, and a well-preserved foot. Other interesting fossils were *Glossopteris* leaves, a flattened amphibian skull with eyes set high up on the head (reminiscent of a crocodile), and various parts of fossilized skeletons and skulls that stir the imagination.

The Estcourt Formation of the Late Permian (which includes the sites on Dave Green's farm) is significant in that it preserves a good deal of the flora and fauna of Late Permian ecosystems. It is

an excellent record of what existed just prior to the end-Permian extinction, which was one of the most disastrous of the five major extinctions of the Earth's history (see Colin MacRae's book below). Therefore it is worrying to hear that the farms we visited are subject to various land claims. There were plans to include these farms into the Big Five Reserve that is being planned along the Bushman's River Valley, provided that the local communities that are laying the claims agree to be part of this deal.

It would be most unfortunate if these sites were not afforded official protection. We can only hope that the game reserve idea is a success and that local communities realize the benefits that these important fossil and *Barleria greenii* sites could bring.



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RIGHT: A fossilized dicynodont footprint.

Dicynodonts ranged in size from small mouse-sized animals to creatures larger than a hippopotamus, and dominated herbivorous niches for perhaps ten million years.

BELOW LEFT: The fossilized sediments still bear the footprints and drag marks of the mammal-like reptile *Dicynodon lacerticeps* in the ripples formed by wind action. CENTRE: A fossilized dicynodont foot from Dave Green's collection. BELOW RIGHT: Close up of the fruit of *Clematis brachiata*.

Photos: Isabel Johnson.



#### Further reading

MacRae, Colin. 1999. *Life etched in stone: Fossils of South Africa*. The Geological Society of South Africa, Johannesburg.

Scott-Shaw, C.R. 1999. *Rare and threatened plants of KwaZulu-Natal and neighbouring regions*. KwaZulu-Natal Nature Conservation Service, Pietermaritzburg.

#### Websites to visit

Turner, S. 2001. *Barleria greenii*. <http://www.plantzafrica.com>

Viljoen, C. 2002. *Clematis brachiata*. <http://www.plantzafrica.com>

For information on dicynodonts, go to the Iziko museums website, and visit these two pages: <http://www.museums.org.za/sam/resources/palaeo/cluver> and

<http://www.museums.org.za/sam/resources/palaeo/mystery>