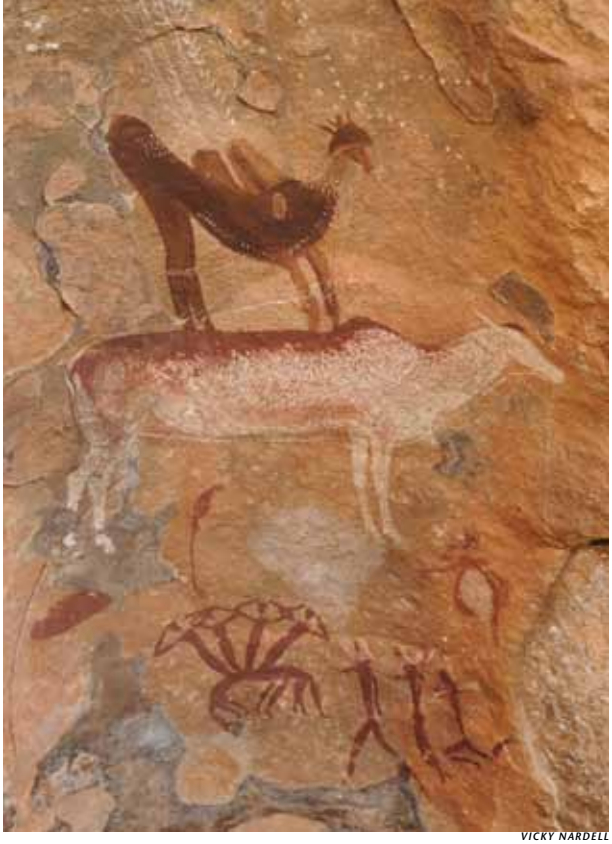
# on the record

ANGUS FORBES



VICKY NARDELL

**There's a spectacular mountain range linking South Africa and Lesotho that is known in some quarters as the Drakensberg, 'dragon mountain', and by Bantu-speakers as *uKhahlamba*, 'the row of upward-pointing spears'. But it is the San people who left the greatest legacy in these mountains: a treasure trove of priceless art. Michelle Dye describes how cutting-edge technology is helping to preserve this legacy.**

THE SAN PEOPLE LIVED IN THE uKhahlamba Drakensberg range for about 4 000 years, during which time they adorned more than 600 known sites with 40 000 individual paintings, the largest and most concentrated collection of rock art in sub-Saharan Africa. The paintings are outstanding in their quality, their diversity of subject and their exquisite depiction of animals and human beings, and their worldwide significance contributed to the uKhahlamba Drakensberg Park being listed as a UNESCO World Heritage Site in 2000.

Without doubt the finest and most accomplished rock artists in the land, the San painters worked in exceptional detail and with an extensive colour palette. For paint they used a mixture of red and yellow ochre, charcoal, manganese oxide and clay, which was bound together with blood, fat, plant extract or egg; their brushes were feathers, animal hairs or grass stems.

It is rare to see poor art in the Drakensberg, which suggests that not just anyone had the right to paint on the rock walls. These were sacred places, reserved for the masters to record deeply meaningful statements. The paintings depict hunting, dancing, fighting, food gathering and ritual or trance scenes of hunting or rainmaking. The animal that appears most often is the eland – the San not only relied on the large antelope for meat, but believed its blood and fat had a mystical potency.

Unfortunately much of the rock art has been damaged, with vandalism, fire, encroaching vegetation and natural weathering the culprits. Exposed to the elements, the fragile paintings are gradually deteriorating as time passes. As it is not possible to restore them, it is of the utmost importance to digitally preserve the art so that the San legacy will not be lost.

The University of KwaZulu-Natal and the African Conservation Trust have just completed a three-year project to create the first digitised archive of the San rock art in uKhahlamba Drakensberg. It was a great success: more than 500 rock shelters and caves were documented and their condition assessed, and focused exploration led to the discovery of no fewer than 80 new sites.

3D scanning was used to create a permanent, millimetre-accurate record of the paintings so that future generations will still be able to appreciate them. By sending out light beams and calculating the time it takes for a beam to reach the rock and bounce back, the scanner is able to mark the point where the beam touches the rock. It records millions of these 3D points, which are displayed on a computer monitor as a 'point cloud' so dense that it looks like a solid surface. Multiple scans are taken all around the rock shelter so that the scanner can 'see' all the angles of the art, and these are later stitched together to form a single point cloud of the whole site. Digital photographs taken from each scanner position are used to colour the point cloud, transforming the yellow-and-orange raw-scan data into a real-colour computer model.

A virtual tour, a 360-degree digital 3D video, 3D terrain modelling and GPS plotting complete the technology package for each site, and GIS web-based mapping systems have been produced for the project as a whole. The extensive collection of data is housed at the KwaZulu-Natal Museum and shared with the province's heritage agency, Amafa aKwaZulu-Natali, and Ezemvelo KZN Wildlife, which manages the World Heritage Site.

ABOVE At one of the rock art sites scanned by the project, a red-and-white eland is painted below a mythical figure with human, antelope and praying mantid features. Says archaeologist Vicky Nardell, 'The feathered white lines emerging from the top of the figure may be seen as lines of energy or supernatural power. The simple lines connecting the figure and the eland probably signify the complex relationships between San shamans and "potent" animals, like the eland. Below the antelope, several human figures are dancing.'

ABOVE, LEFT Land surveyor Kwanele Mbatha sets up the Leica C10 scanner in a rock shelter decorated with San paintings.