# QUICKTIME VIRTUAL REALITY (QTVR) AND THE DOCUMENTATION OF ROCK ART LOCALITIES

CONNY MEISTER
UNIVERSITY OF CAPE TOWN
MEICON@WEB.DE

BASTIAN ASMUS
UNIVERSITY OF CAPE TOWN
BASTIAN@SCIENCE.UCT.AC.ZA

ABSTRACT

The Cederberg Rock Art Survey Project (CRASP) aims to record, and therefore preserve, South African rock art, particularly that of the Cederberg. The preservation of this unique world cultural heritage was attempted through the help of various methods and techniques, including traditional documentation, as well as a newly-introduced fully digital recording system. The visualisation of archaeological results for the public is becoming a predominant aspect of archaeology. This is primarily because successful funding often depends on the way results are presented, and also because we, as archaeologists, owe the publication and visualisation of the results to a broader spectrum of non-professionals. Therefore we feel that finding ways of visualising our results for the general public in order investigate and disseminate knowledge about the past, is one of the main principles of archaeology.
To present the unique rock art of South Africa within the landscape where these sites are found, we sought a way to amalgate the aspects of publication and visualisation. Quick Time Virtual Reality (QTVR) panoramas make it possible to achieve these two aims using a low-cost recording system. This article demonstrates the relevance of QTVR as a supplementary tool to the traditional way of documenting, preserving and visualising rock art, and also discusses the equipment required for the task.

## SETTING AND BACKGROUND

The Cederberg is a hilly to mountainous area stretching about 200 km from north to south and 100 from east to west dominated by outcrops and cliffs of reddish sandstone, derived from the Table Mountain Formation. It is situated about 200 km north of Cape Town in the western Cape region of South Africa (Fig.1).

The research project area covers 35 km2 and is located about 5km south of Clanwilliam stretching southward along the Olifantsriverdam and eastward into the tributary Rondegatvalley (Fig.2). To date, through a survey of the project area, we have identified and recorded 65 rock art sites, such as shelters, caves and painted boulders. Found within the Cape vegetation that consists mostly of drought-resisting sclerophyllous fynbos scrubs, these shelters and caves exhibit a great number of rock art paintings, mostly in the style of the fine-line tradition.

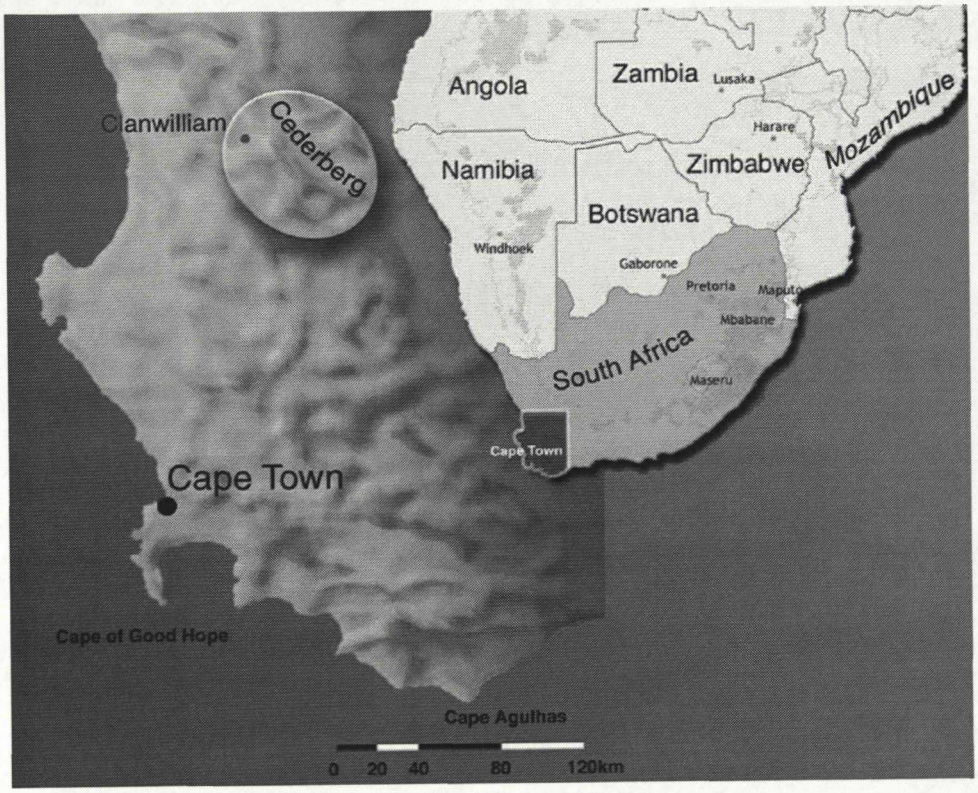


Figure 1 Southern Africa and the location of the Cederberg

Generally speaking, the rock art of South Africa can be grouped into three distinct categories: fine-line paintings (which also might be referred to as representational art with a conceptual component which cannot be omitted (Lewis-Williams 1981)), handprints, and the colonial/historical period paintings. The fine-line paintings have also been referred to by other researchers as detailed representatio-

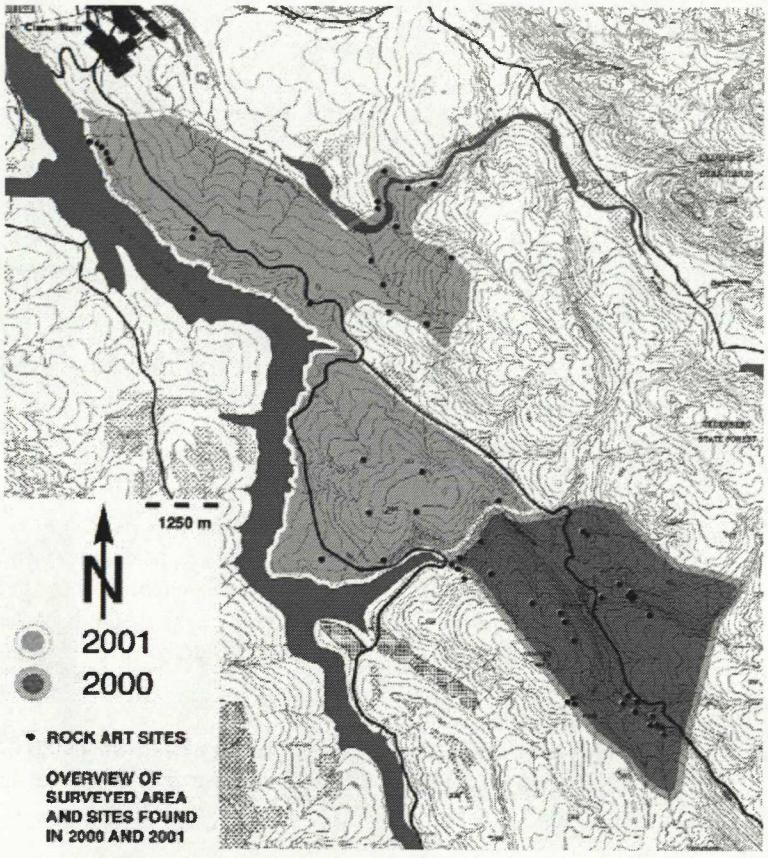


Figure 2 Surveyed area of the CRASP until 2003

nal paintings (Yates et al. 1993), finely detailed paintings or fine-line imagery (Manhire 1998) as well as fine painting or representational painting (Yates et al. 1994). These paintings were created by using a thin instrument, possibly a stick or a brush, applying the paint to elaborate, resulting in fairly naturalistic drawings of animals, humans, as well as objects of everyday use, such as bows, quivers, bags, nets and sticks (Asmus and Meister 2001, Yates et al. 1994). These occur in various colours, predominantly shades of red, yellow, white and black. Apart from this, the paintings are often painted in a bichrome and polychrome manner, especially those of humans and various animals, such as eland, elephant, hartebeest and others. (Asmus 2003, Asmus and Meister 2001, Yates et al. 1993).

While these paintings occur almost anywhere suitable rock surfaces can be found, handprints are primarily found in the western Cape. These prints "...are often grouped in clusters or are displayed in lines and seem to be secluded from other images. Multiple handprints and fine-lined paintings rarely occur in the same place, as handprint sites are ordinarily quite segregated" (Meister 2003). Due to these and other differences in repetitiveness, size, style, age, intra-site and general distribution of fine-line and historical paintings, handprints should be considered as a category of their own (Manhire 1998, Meister 2003).

Also in contrast to the detailed representational paintings are the crude finger painted colonial applications, which differ not only in quality, but also in subject matter. Most of these images are depictions of horses, cattle, other unidentifiable animals and humans with typical attributes of the European settlers, like brimmed hats, high-heeled shoes and guns, as well as images of ships, wagons and crude grid symbols (Yates et al. 1993). The crudeness of finger-applied artistical expressions, including graffiti, corresponds most closely with the printing of hands rather than with the fine-lined drawings of traditional images. It is possible, however, to find crude finger-painted signs, symbols or depictions of animals which are not necessarily attributed to the colonial style or context. For more information about the background of the rock art of southern Africa, see Willcox 1984, Yates et al. 1994, Lewis-Williams and Dowson 1999.

## Recording Rock Art Digitally

The project set out to document rock art of the Cederberg digitally, linking a low-cost, low-tech recording system with a relational database in which to store and access the collected data. A handheld GPS-receiver to map the sites, and a digital camera, together with a conventional 35 mm camera and recording forms, were used to record the rock art images (Asmus and Meister 2001). The suitability of this relational database for rock art is demonstrated by Asmus (2003).

Nonetheless, we feel that these tools have their limitations in terms of their visualisation of the images and the culturally important landscape where they are found. This aspect has been neglected in previous rock art recordings in the area (Asmus 2003). Due to this, we saw the need to connect the rock art in context with its surroundings to make this unique human heritage available to everyone. At the same time the visual recording would shelter the fragile art from destruction, an inevitable process of the revelation of cultural monuments and heritage to the public. These intertwined aspects of documentation and touristical exposition gain more importance as exposure of archaeological sites to the public increases in the late 20th and early 21st century. Moreover funding of archaeological projects often depends on the publicity gained from such.

There are no safe guidelines for the protection of sites, but a project which combines research, education and preservation will not only offer scientific results for archaeologists and interrelated research colleagues, but also help to establish public awareness of the fragility of our heritage and its need for protection. Archaeology therefore needs to be informative and interesting to a layman, which is most easily accomplished visually. To secure the aspects of visualisation and information in the CRASP we used "3D"-panoramas, utilizing Quicktime Virtual Reality Authoring Studio®, which were generated within the rock art sites and the surrounding landscape.

## Introducing Quicktime Virtual Reality (QTVR) Panoramas

QTVR-panoramas are composed of 12 to 16 single images, whose edges slightly overlap. The images were recorded on a

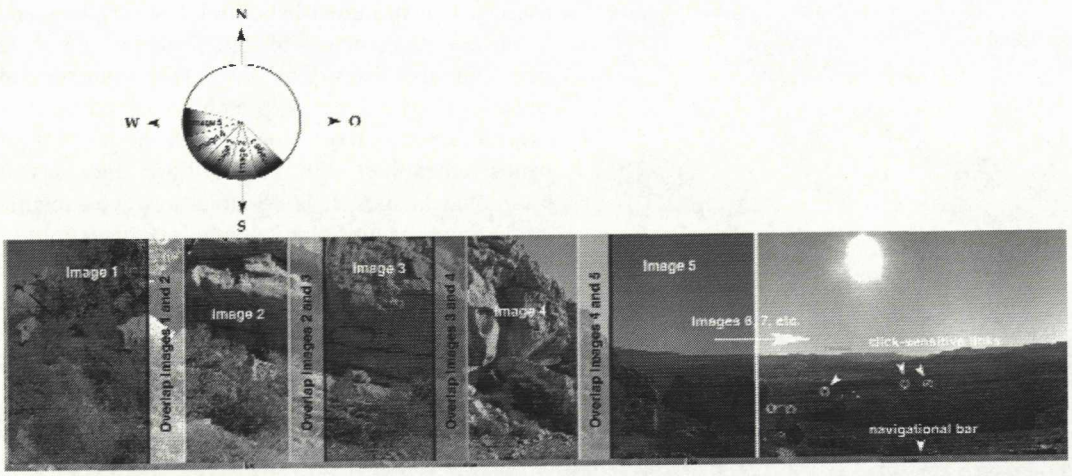


Figure 3 Part of a panorama, showing click-sensitive links (hotspots) and navigational bar (bottom). Also visible here are the aforementioned single images mended into a single panoramic image

levelled tripod. The overlap makes it possible for the Quicktime Authoring Studio application to mend all the images together into one large image file. The appearance of the resulting image-file was further modified with image-processing software. This allowed us to include indicators for other sites in the vicinity that can be seen from within the panorama (Fig.3). These "click-sensitive" areas or "hotspots" connect either one panorama with another, or refer to previously defined URL-links, to directly access rock art sites and images thereof. Furthermore, for orientation purposes we included a navigational bar to the mended image-file to indicate direction of view, such as northing and southing (Fig.3). The modified image-file was then flexed, warped and mended together at the ends, to create a cylindrical image in whose virtual centre the viewer stands. The final Quicktime®-movie, in which the "hotspots" function as interactive links, can be used with the Quicktime Player®.

## Summary: Use of QTVR

The finished Quicktime Movies can be utilized as modules for Multimedia-CDs in combination with other multimedia applications or components, such as Flash or Internet-Browsers, which exploit web-based interactive links. This allows for a new range of visual exposure, as Quicktime Movies can be published on the internet, empowering many people with virtual access to the rock art within its environment. Such Multi-media-CDs (Parkington, Asmus and Meister 2003) and Internet sites provide substantial help to preserve sites, as laymen are educated and able to experience archaeological sites without destroying them through ignorance. Furthermore such applications are by far more informal and accessible for laymen, who are potential sponsors, than scientific publications. Apart from this, is it conceivable that local people will benefit from the visualisation by both selling the products (e.g. multimedia CDs) and learning about the value and need for their protection of the nearby heritage sites.

We therefore encourage archaeologists to utilize the media of visualisation and offer a affordable low-tech application in this article.

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