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DJEDEFRE'S WATER MOUNTAIN: PHASES OF DEGRADATION

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Abstract. The landscape 60–90 km west of Dakhla is characterised by many isolated mountains. Some are decorated with rock art, in general petroglyphs. There is one with hieroglyphic inscriptions and cartouches of Pharaohs as well as petroglyphs. Its discoverer Carlo Bergmann called it Djedefre's Water Mountain; others name it after Khufu. The mountains themselves represent a stage of weathering, which converts the sedimentary layers back into fine-grained material. In the course of the natural destruction of the rocks the petroglyphs are also degraded. In addition, various groups of humans, from pre-Pharaonic visitors to modern archaeologists and tourists, have contributed to the deterioration. Certain aspects of the degradation can be assigned to specific groups of people.

Ancient degradation

Djedefre's Water Mountain (DWM; Fig. 1) is one of many isolated mountains (Zeugenberge) about 70 km west of Dakhla in Egypt. The mountains are the remains of sedimentary layers composed of sandstones, shales, siltstones etc., of Cretaceous age. (Meissner et al. 1993; Pachur and Altman 2006: 298–299). In contrast to fluvial erosion during humid periods in the past, aeolian erosion predominates today. The decomposition of the isolated mountains follows the lines of fractures. Figure 2 shows some fractures at a Zeugenberg near DWM. In the case of massive banks of sandstone this process may generate large, nearly vertical rock surfaces rising above horizontal platforms. DWM exhibits one such exposure. Figure 3 gives an impression of the

platform and the vertical rock surface in December 2004. The natural destruction of the mountain along sedimentation planes and fractures is clearly visible in Figures 1 and 3.

The platform at DWM is on the eastern side of the mountain. It gets the warmth of the early sun after the cold night and provides shade during the second half of the day, thus inviting humans to use it. In Figure 3 the view is towards the south, and on the left, part of a man-made wall is visible. The former use of the platform by humans is confirmed by petroglyphs, hieroglyphic inscriptions, by the construction of walls and by archaeological finds in the sediments on the platform.

Figure 4 shows a niche in the vertical wall in 2004 prior to the main phase of archaeological excavations.



Figure 1. Djedefre's Water Mountain from east.



Figure 2. Fractures on the top of a mountain.



Figure 4. Niche on the platform, 2004.



Figure 3. Platform at Djedefre's Water Mountain, view south.



Figure 5. Hieroglyphic inscription on an area with patina variation.

There is a dark patina of different shades in several places, which is lighter on the lower part of the wall (Fig. 5). This seems to indicate that this part of the wall had been covered by debris from the erosion process, which was removed probably to level the platform. The debris must have been removed before the application of the hieroglyphic inscription (Kuhlmann 2005: 252–253) and before the niche in the corner was cut out, i.e. in the early phase of the visits of Pharaonic Egyptians or even before their arrival.

The relative age of some of the activities is demonstrated by the rock art, for example in Figures 6 and 7. In the lower

part of Figure 6 an abraded petroglyph is visible, probably a 'giraffe' because of its long neck. The legs are only partly preserved. Superimposed there is an engraved 'giraffe' expressed in straight angular lines. The hind legs cut into the abraded giraffe and the upper part of the front legs cut through its neck. The hooves of the engraved giraffe are indicated by dots on each side of the lower part of the legs.

The head of this second giraffe was erased when the surface of the rock was cleaned and smoothed before the red image of a Pharaoh (Fig. 7) was painted. This process eliminated several other petroglyphs, remains of which are visible in the space below the painted Pharaoh. A straight vertical line runs through the body of the Pharaoh and ends under his jaw. De Cola et al. (2009), after digital processing of an image, identified this vertical line as a banner. In addition they interpreted several other petroglyphs to the right of and below the painted Pharaoh. To his left there is a petroglyph of a person, the lower part of which is engraved. It



Figure 6. Sequence of two 'giraffes' in different styles; the head of the later one was erased.



Figure 7. 'Giraffe' with erased head (left), red Pharaoh (right), partly erased. Engraving, completed by pecking to a second Pharaoh, paper sticker.



Figure 8. Wall with petroglyphs and hieroglyphic inscriptions, heavily damaged.



Figure 9. Mountain symbol as cartouche for the name of Djedefre, eyelet, pecking mark, degradation.

was partly eliminated during the 'cleaning' process. Later it was re-completed or converted into another picture of a Pharaoh. The picture is not complete; his arms are missing.

Other examples of degradation by natural and human forces are shown in Figure 8. Rock art that has survived can be seen on the left and at the bottom right. The surface of the rock was smoothed before these petroglyphs were drawn. Apparently these smoothed areas became re-patinated, indicating that the smoothing took place before this region suffered the current hyper-aridity. At the top the symbol for a mountain, i.e. a rectangle with two mountain-peaks on the upper corners, is engraved. Figure 9 shows it in detail. It was used as a cartouche for the name and attributes of Pharaoh Djedefre, the son of Khufu (Kuhlmann 2005: 254–256). To the left of this mountain symbol there is a hole which was made with a metal tool after the place had been marked with a cross by the



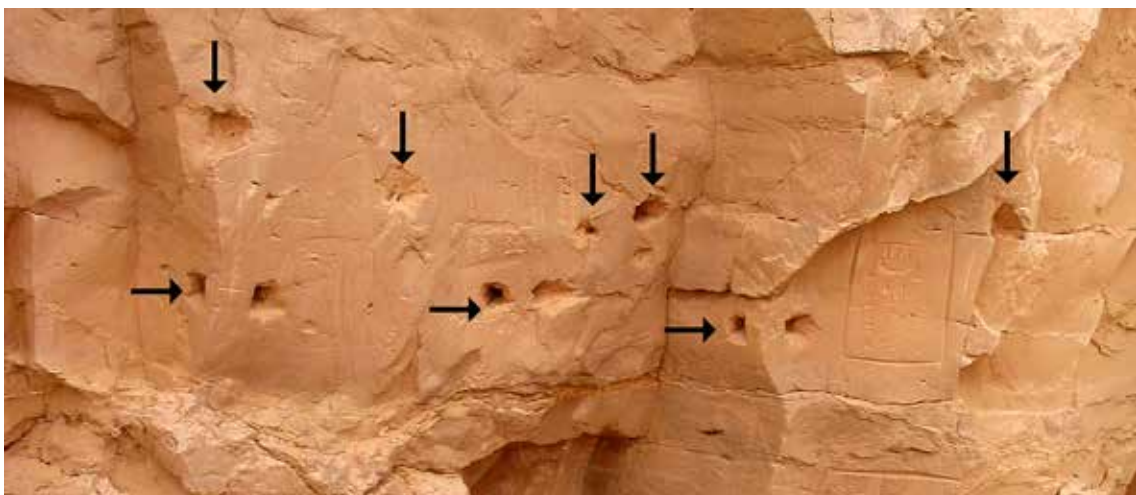
Figure 10. Water mountain symbol, zigzag lines replaced by horizontal and vertical lines, damaged by pecking; other petroglyphs.

stone mason. A rope can be pulled through it similar to an eyelet. Above and to the right of the mountain symbol, a piece of the rock has been knocked away and three marks made by a pointed tool are visible.

Below the mountain symbol with the name of Djedefre there is an engraved subdivided rectangular

area (Fig. 8). Parts of the area are painted red. The right side has been knocked away. Further down below this rectangular area there is another engraved symbol of a mountain, shown in Figure 10. This mountain symbol originally contained four horizontal zigzag lines. Either they were painted red or they have a stronger patina than the neighbouring area. Later these zigzag lines were overlain by two horizontal lines plus three vertical lines in the lower section. The symbolism of water and mountain was thus modified into a different, unclear symbolism (see also Le Quellec et al. 2005: Fig. 57). Later the mountain symbol was damaged by strong pecking marks that may represent a picture of a 'giraffe' — if they have any meaning at all. The other petroglyphs around the mountain symbol are not discussed here.

There are several additional examples of superimposition and degradation of rock art. The most severe effect was caused by the production of holes. There are two types of holes. The first type is a kind of eyelet and a rope can be tied to it. This type was made with a chisel and has typically a quadratic cross section of 4 cm by 4 cm. The second type may have been used to hold a peg. Figure 11 shows a line of four eyelets and two 'peg holes' on the left. Figure 12 shows another line of three eyelets with a line of five 'peg holes' above. The damage caused when they were



Figures 11 and 12. Eyelets and peg holes.



Figure 13. Detail of eyelet, damaged 'giraffe'.

made is clearly visible. Figure 13 is a detail of Figure 11, showing the damage to one of the two abraded and engraved 'giraffes'. The purpose of the holes is not clear. Schulz-Schaeffer (2001: 122–123) gives a possible explanation in his illustration, that they were used for the construction of a fabric roof. It seems that the holes are visible indications of some of the last human activities on the rock (Berger 2006). Figure 12 shows that the people who made them did not have any respect for the mountain symbol with the name of Pharaoh Djedefre. Apparently they were not Pharaonic Egyptians, but later visitors.

As Figures 1 and 3 show, the platform is protected by a wall. Some of the stones which were used for its construction carry petroglyphs. Figure 14 shows an example. The sedimentary bedding planes confirm that the stone has been turned through 90°.

Modern degradation

Djedefre's Water Mountain is situated about 70 km west of the Dakhla oases. The inhabitants of the oases provide no information about DWM or other rock art sites, except for some nebulous stories. These concern 'Zerzura', the lost oasis, which, in one version, is located west of Dakhla. The clearest account, obtained by Harding King (1925: 153–156; Ball 1927: 123–124), was about a stone temple eighteen hours west of the Gedida oasis of Dakhla. As there are numerous rock art sites and several playas in the neighbourhood of DWM this information could equally well refer to this



Figure 14. Fallen or moved block, turned through 90°; paper sticker.

or some other site.

The explorers in the last centuries missed DWM. Rohlfs' 1874 route from Dakhla to the west, with Kufra as a target, took a course about 10 km north of DWM (1875/1996). Harding King went from Mut in Dakhla to the south-west in 1911, and missed DWM by approximately 60 km. Later explorers with motorcars preferred the southerly routes towards the west, which have fewer hills and better driving conditions. Carlo Bergmann found the site on 9 December 2000 on a walking tour with two camels. He left an engraved notice on a rock south of the platform.

Bergmann informed archaeologists and Egyptologists about his discovery and guided them to the site. With Kuhlmann's assistance, Bergmann chose the name 'Djedefre's Water Mountain' for the location (Bergmann and Kuhlmann 2001: 126–127; Kuhlmann 2005: 254–258). The source of the name 'Djedefre' is explained above (Fig. 9). The primary source for the term 'Water Mountain' was probably given by Figure 15. This painted petroglyph is on a detached and broken slab, which was found face-up on the platform in front of the petroglyphs shown in Figure 8 (pers. comm. C. Bergmann). Archaeologists have since removed it from the site and it is probably being kept in an archaeological storehouse. The petroglyph consists of a symbol for a mountain within which there are several parallel zigzag lines. The alternate spaces between them are painted red, creating a sequence of



Figure 15. Water mountain symbol (photograph by Carlo Bergmann).



Figure 17. Paper sticker (left), note with black felt pen, petroglyphs, cartouches with the names of Khufu.



Figure 16. Excavation trench, re-opened and material dispersed, 2004.

coloured and uncoloured zigzag bands. The hole on the left was probably caused by the same people who made the holes on the wall.

There are more symbols of this type at DWM and at other sites in the neighbourhood (Berger in press). This interpretation of water mountain, or mountain with water, or mountain of water, can be explained with symbols of the hieroglyphic script. More recently several similar water mountain symbols have been

reported from a site west of Dongola in the Sudan (Kröpelin and Kuper 2007), without the context of hieroglyphic inscriptions. The geographically wider distribution of the water mountain symbol may indicate a greater age compared to the age of the hieroglyphic script. At present no method for direct dating of the petroglyphs is available for testing this possibility.

Bergmann had chosen the name 'Djedefre's Water Mountain' because of the beauty of the petroglyph. Archaeologists have not accepted this name. They name the site after Khufu (see for example Kuper and Förster 2003). If the reasoning for the re-naming was a matter of the time of the earlier visits by people, prior to the reign of Djedefre, then the visits of pre-Pharaonic people to the platform were ignored.

In Spring 2002 a first trench was excavated on the platform (Kuper and Förster 2003: 27). The excavated sediment was placed in bags, which were carefully deposited in the trench with a view to continuing the excavation at a later visit. In November 2003 Zboray noted during his journey with Le Quellec and the de Flers that the trench had been opened and the content of the bags had been spread over the platform (www.fjexpeditions.com/expeditions/past/nov03/KH3.jpg). Figure 16 shows the situation at our visit in December 2004. Kröpelin (2006: 187) blamed off-road tourists for this action. It is, however, unlikely that tourists were aware of the geographical location of DWM at that time. Our group of tourists was probably the first to find DWM on 19 December 2004 after a thorough analysis of Bergmann's reports (2001; www.carlo-bergmann.de), but for the last kilometres of our approach to it we followed car tracks. Possibly members of the Egyptian police or army had inspected the bags in search for equipment such as had been installed by archaeologists and geoscientists earlier at other places in the Western Desert of Egypt. These scientists had posed during this installation for a film, which was



Figure 18. Detached block, 2004.

transmitted on television (Westdeutscher Rundfunk) for the first time on 29 December 1999.

We visited DWM on 19 December 2004, 12 January 2006, 14 January 2007, 29 February 2008 and 9 February 2009. The duration of the visits was always one to two hours. The purpose initially was to record the rock art by photographs, later to obtain detailed images and other views in different lighting conditions (morning versus afternoon), and finally, as a matter of curiosity, to observe the progress of the excavations. We never met anybody at the platform, neither archaeologists nor other visitors, but we noticed the progress of the excavation over the whole platform. As a result of our visits to DWM and the surrounding area, several articles were published (Berger 2006, 2008a, 2008b, 2009; in press). In February 2009 we formed the impression that the excavations were completed and only the northern end of the platform seemed to be untouched.

Natural forces gradually destroy the rocks and the rock art at the site. To avoid more incremental destruction by human activities than has been done in the past it is best not to touch the rock art. We have adhered to this principle. In contrast a photograph of Kuhlmann was taken when he was copying the hieroglyphic inscription on plastic foil (Bergmann and Kuhlmann 2001: 126). At the International Symposium in Poznań, 2–5 July 2007, Heller, Schönfeld and Wagner presented the methods whereby they copied the rock art at DWM on plastic foils with the assistance of a foldable ladder. It was said that the rock art has to be copied, with all its details, onto foils, as a supplement to photographs which only give a coarse picture. The method has been used by Pager (1971: 81–82) in



Figure 19. Detached block, 2009.

southern Africa for paintings, but at DWM there are only petroglyphs, except for the red Pharaoh (Fig. 7). There is a risk that during the copying process the surface of the rock and of the petroglyphs may have been modified or damaged. This may jeopardise the future application of analytical procedures as yet unknown, for example for the direct dating of petroglyphs and hieroglyphs.

At several places we found paper stickers on the walls, in one case on a petroglyph, and notes with a black felt pen. As an example, Figure 17 shows from left to right a paper sticker, a note with a felt pen, and some petroglyphs and cartouches with the names of Khufu (Kuhlmann 2005: 254).

Figures 8 and 18 show the condition in 2004 of some of the petroglyphs described above. The block at the bottom has clearly become detached from the main rock. The same block is shown in Figure 19 as it was in 2009, after the excavation. It is not clear from comparison of the pictures whether the block has begun to move. However, if its support has been lost the two wooden beams will not survive to keep it in place for the next thousand years. The whole mountain is certainly not in a stable condition. Figure 20 from 2009 seems to indicate a small rock fall after the excavation.

While most parts of the platform have now been excavated the archaeological work seems to be incomplete in 2009. Several blocks have been left on the floor of the platform. Two are shown in Figure 21. That on the left has a hole and the one on the right carries petroglyphs of 'arrow-men' (Berger 2008b: Fig. 13). Future visitors may stumble over them and/or damage them.

Archaeologists had already taken visitors to DWM



Figure 20. Possibly a recent rock fall, 2009.



Figure 21. Two blocks on the floor of the terrace.



Figure 22. Access path at the southern end.

before 2008 (Baumann, see www.sahara-club.de/index_new.php?contentId=61). In 2004 we approached DWM from the south-west and during the following years from north. In 2009 we travelled from Mut (Dakhla)

and found a heavily-used track leading to DWM. The officer of the Border Police who accompanied us (tourist groups need a permit for travelling in the desert and they are obliged to take an officer of the Border Police with them) told us that he had visited DWM already three or four times with three different Egyptian tour operators. He knew about the importance of the site and he had been instructed that tourists should not take anything away. When he reached the site he jumped over the wall. The only 'protection' for the site is a board with explanations and instructions in Arabic and English. Two of the instructions are: 'Enter the terrace only by the path at the southern side', and 'Do not climb the slope or the wall'.

The path up to the platform is a weak point for conservation and protection. It is not immediately visible to someone standing in front of the mountain (Fig. 22) and careless visitors may be tempted to climb directly over the wall. This could be avoided by creating an artificial path between two lines of boulders, left and right, on the ground in front of the mountain, leading to the foot of the existing path on the southern (left) side of the platform. The lower flattish section of this path may need a railing or some boulders placed on the outer side. In the upper, steeper section it would be necessary to fix the loose material to prevent it from sliding down. This could be arranged by means of a few palm tree trunks fixed firmly across the path as steps.



Figure 23. Newly engraved symbol under the red Pharaoh (see Figs 4, 7).

Postscript

On 3 March 2010 we visited again DWM. On that occasion we found that all paper stickers had been removed. The notes on the rock with black felt pen had been scratched out with one exception. The support beams (Fig. 19) had been taken away. We did not meet anybody at the site, but possibly this was the final activity of the archaeologists. The board with the information and the instructions in front of the mountain was missing. On the floor of the platform we found an empty tunny can, some mango stones, pieces of foreign ceramics, some pieces of charcoal and a bundle of fire wood. We removed them. At the northern side of the platform a new path had been developed leading up and down from the platform. On the top of the mountain there is now a tall *alam* (road sign). The officer of the Border Police who accompanied us mentioned that he had joined a group of students from a university in Cairo for several days at this site a short while ago. Near the site we noticed tracks of motor cycles, which our tour operator assigned to treasure hunters from the Dakhla Oases, who are active at other archaeological sites closer to the oases.

The worst modification of the site was an engraved symbol under the red Pharaoh (Fig. 23).

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REFERENCES

- BALL, J. 1927. Problems of the Libyan Desert. *The Geographical Journal* 70: 21–38, 105–128, 209–223.
- BERGER, F. 2006. Relative chronology of rock art at Djedefre's Water Mountain, SW-Egypt. In K. Kroeper, M. Chłodnicki and M. Kobusiewicz (eds), *Archaeology of early northeastern Africa. In memory of Lech Krzyżaniak*, pp. 195–212. Poznań Archaeological Museum.
- BERGER, F. 2008a. Another interpretation for Zerzūra. *Les Cahiers de l'AARS* 12: 7–14.
- BERGER, F. 2008b. Rock art west of Dakhla: the 'women' from Dakhla. *Rock Art Research* 25: 137–145.
- BERGER, F. 2009. Roads in the desert. Comments to some recent publications and own observations in the Western Desert of Egypt. *Les Cahiers de l'AARS* 13: 7–30.
- BERGER, F. in press. Rock art west of Dakhla: 'Water Mountain' symbols. *Proceedings of the conference 'Prehistory of Northeastern Africa – new ideas and discoveries'*. Poznań Archaeological Museum, 2007.
- BERGMANN, C. 2001. *Der letzte Beduine. Meine Karawanen zu den Geheimnissen der Wüste*. Rowohlt, Reinbek bei Hamburg.
- BERGMANN, C. and K. P. KUHLMANN 2001. Die Expedition des Cheops. *GEO Special*, Nr. 5: 120–127 (with an illustration by R. Schulz-Schaeffer).
- DE COLA, L., M. E. PEROSCHI and F. CAMBIERI 2009. Il sovrano della Water Mountain e i suoi prigionieri. Osservazioni su un dipinto in ocra rossa nel Deserto Occidentale egiziano. *Sahara* 20: 140–142, Pls E1–E3.
- HARDING KING, W. J. 1925. The Dakhla-Owenat road. *The Geographical Journal* 65(2): 153–156.
- KRÖPELIN, S. 2006. Discovery of an ancient fortification in northern Sudan. *Sahara* 17: 186–190.
- KRÖPELIN, S. and R. KUPER 2007. More corridors to Africa. *Cahier de Recherches de l'Institut de Papyrologie et d'Égyptologie de Lille* 26 (2006–2007): 219–229.
- KUPER R. and F. FÖRSTER 2003. Khufu's 'mefat' expeditions into the Libyan Desert. *Egyptian Archeology* 23: 25–28.
- KUHLMANN, K. P. 2005. Der 'Wasserberg des Djedefre' (Chufu 01/1). Ein Lagerplatz mit Expeditionsinschriften der 4. Dynastie im Raum der Oase Dachla. *Mitteilungen des Deutschen Archäologischen Instituts, Abteilung Kairo* 61: 243–290.
- LE QUELLEC J.-L., P. DE FLERS and P. DE FLERS 2005. *Du Sahara au Nil – peintures et gravures d'avant les pharaons*. Fayard/Soleb, Paris.
- MEISSNER, B., U. RIPKE and P. WYCISK 1993. Lithology map. In B. Meissner and P. Wycisk (eds), *Geopotential and ecology analysis of a desert region*. Catena Supplement 26, Catena-Verlag, Gremlingen.

- PACHUR, H.-J. and N. ALTMANN 2006. *Die Ostsahara im Spätquartär. Ökosystemwandel im größten hyperariden Raum der Erde*. Springer Verlag, Berlin/Heidelberg.
- PAGER, H. 1971. *Ndedema. A documentation of the rock paintings of the Ndedema Gorge*. Akademische Druck- und Verlagsanstalt, Graz.
- ROHLFS, G. 1875 (reprint 1996). *Drei Monate in der libyschen*

- Wüste*. Theodor Fischer, Cassel / Heinrich-Bahrt-Institut, Köln.
- SCHULZ-SCHAEFFER, R. 2001. Illustration to an article by C. Bergmann and K. P. Kuhlmann 'Die Expedition des Cheops'. *GEO Special* 2001(5): 120-127.

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