

The complex of the Bent Pyramid as a landscape design project

Nicole Alexanian and Felix Arnold

The Bent Pyramid of king Snefru at Dahshur is known as the first attempt to construct a geometrically “true” pyramid – though ultimately structural problems forced a change to be made in the angle that led to its characteristic “bent” shape. With a base length of 189 m, a height of 105 m and a total volume of more than 1.2 million m³, the Bent Pyramid is also the first in a series of extremely large pyramids, which includes the Red Pyramid of the same king at Dahshur and the pyramids of Khufu and Khafra at Giza.

Today the Bent Pyramid appears to stand in a pristine desert landscape. Its great distance from the fertile Nile valley and from other ancient settlements and cemeteries suggests a location more isolated than that of most other pyramid sites. Recent research conducted by the German Archaeological Institute at the site has revealed, however, that much of the landscape surrounding the Bent Pyramid is in fact man-made.

The main elements of this landscape are the huge pyramid itself with a cult installation in the east and a subsidiary pyramid in the south, a 26 × 47 m large valley temple of stone placed half-way between the pyramid and the alluvial plain, and a 95 x 145 m large harbor basin on the valley floor (Figs. 1, 4).¹ These distinct elements were connected by two open causeways, the 141 m lower causeway built of brick leading from the harbor to the valley temple and the 704 m long upper causeway built of stone leading from the valley temple to the pyramid. The construction of these elements entailed substantial changes to the natural landscape, including alterations to the topography. Thus, the limestone plateau on which the pyramid was erected was artificially shaped. The slopes of the valley leading up to the pyramid site were partly rectified and a huge water basin created at the valley floor. Most recently another feature of the complex has been identified: a large garden planted to the north of the valley temple, in an otherwise arid environment. The Bent Pyramid thus was not erected as a solitary building but in fact formed part of a very far-reaching landscaping project.

The following article is intended as a summary of the evidence that has led to a new appreciation of the landscaping efforts undertaken by king Snefru at Dahshur. At the same time, the magnitude and complexity of these landscaping measures raises new questions about the purpose and meaning of the pyramid complex as a whole. While many aspects

¹ Basic research executed at the complex of the Bent Pyramid was undertaken by Ahmed Fakhry 1951–1955 (A. FAKHRY The Monuments of Sneferu at Dahshur, Vol. I. The Bent Pyramid, Cairo 1959; id., The Monuments of Sneferu at Dahshur, Vol. II. The Valley Temple I. The Temple Reliefs, Cairo 1961; id., The Monuments of Sneferu at Dahshur, Vol. II. The Valley Temple II. The Finds, Cairo 1961) and by the German Archaeological Institute (J. DORNER, Form und Ausmaße der Knickpyramide, in: MDAIK 42, 1986, 43–58; N. ALEXANIAN/W. BEBERMEIER/D. BLASCHTA, Untersuchungen am unteren Aufweg der Knickpyramide in Dahschur, in: MDAIK 68, 2012, 1–30).

remain unclear, some of the implications of the new observations made at the site will be addressed at the end.

1. Pyramid plateau and quarries

The Bent Pyramid was erected on a natural plateau at the southern end of the Memphite necropolis. The architects that chose the site had apparently been looking for a location that satisfied several conditions. The site was supposed to be a high, well visible but distant point on the desert plateau. Second, there needed to be the possibility to extract stones from quarries in close proximity to construct the pyramid core. Third, the plateau needed to be well connected to the floodplain, to allow material to be transported to the site easily. And fourth the ground needed to be stable enough to carry the weight of the pyramid.²

It is very obvious that the area where the Bent Pyramid was erected was not left as it was, but was strongly modified by human hand. The plateau under and around the Bent Pyramid was levelled before the pyramid was built. Additionally direct anthropogenic relief forming influence is also recognizable to the northeast and to the east of the pyramid plateau. Although the area is covered by a great amount of eolian sand, a very sharp escarpment is visible on aerial and satellite pictures about 200 m to the north and 150 m to the east of the Bent Pyramid (Figs. 1, 3). It was already suggested by ALEXANIAN & SEIDLAYER in 2000 after a survey of the area that the escarpment and the trenches are artificial and the result of human mining activity and that the depression to the east of the Bent Pyramid is an ancient quarry.³

During a geomorphological survey of the area by Wiebke Bebermeier and Arne Ramisch in 2009 four round depressions were mapped to the north and east of the Bent Pyramid (Fig. 1).⁴ An interpretation as a quarry for the core stones of the pyramid was proven by two small excavation trenches in the depression directly to the east of the Bent Pyramid (depression II). Here, the bedrock is shaped in steps and furthermore, a lot of limestone chips and several remains from the building time of the pyramid were found. A calculation of the mined limestone from three depressions/quarries to the northeast and east of the Bent Pyramid showed that the volume of the quarries is twice as large as the volume of the Bent Pyramid (depressions I-III).⁵ This seems plausible because not all the material mined could have been used for the construction of a pyramid; there was a significant loss of material caused by the ancient mining techniques.

2 The fourth condition was only partially met. The tafl (shale) bands at Dahshur-South apparently caused problems at the Bent Pyramid and the Pyramid of Amenemhat III. Subsidence occurred at both pyramids, producing substantial cracks.

3 N. ALEXANIAN/S. J. SEIDLAYER, Die Nekropole von Dahschur. Forschungsgeschichte und Perspektiven, in: M. BÁRTA/J. KREJCÍ (eds.), Abusir and Saqqara in the Year 2000, Archiv Orientalni Supplementa IX, Prag 2000, 295.

4 W. BEBERMEIER/N. ALEXANIAN/D. BLASCHTA/A. RAMISCH/B. SCHÜTT/S.J. SEIDLAYER, Analysis of Past and Present Landscapes Surrounding the Necropolis of Dahshur, in: Die Erde 142.3, Contributions to Geoarchaeology, 2011, 333, Fig. 3, 345, Fig. 9, 347; W. BEBERMEIER, in: N. ALEXANIAN/W. BEBERMEIER/D. BLASCHTA/A. RAMISCH/B. SCHÜTT/S. J. SEIDLAYER, The Necropolis of Dahshur. Seventh excavation report Autumn 2009 and Spring 2010, in: ASAE, in print, or so far: <https://www.dainst.org/project/58761> (visited on June 16th 2015); for a plan mapping the quarries see also <http://dai.aegaron.ucla.edu>, plans 0056 and 0057 (visited on July, 4th 2015).

5 BEBERMEIER, in: ALEXANIAN et al., op. cit. The volume of the three quarries was calculated with 2.2 million m³.

It is striking and in contrast to the quarries of the Red Pyramid which are situated to the west of the monument that the quarries of the Bent Pyramid were installed only on the northern and eastern view sides of the pyramid. It seems that this was done deliberately and not only due to technical reasons.⁶ The place and shape of the quarries visually stress the monumental size of the pyramid when seen from the floodplain (Fig. 2). This is especially true for a person approaching the Bent Pyramid from the cultivated area. The escarpment and the deep depressions around the pyramid furthermore isolate the pyramid plateau from the adjacent area.

2. Valley and harbor

The wadi (valley) leading up to the Bent Pyramid represents the lower course of a much longer wadi channel that originates about 500 m to the southwest of the Red Pyramid (Fig. 3).⁷ The middle reach of the channel is running southeast of the Red Pyramid, the lower course continues directly to the east in the direction of the floodplain. It is here that the lower causeway and the harbor are situated.

In 2008 Helmut Becker undertook a magnetic survey for the German Archaeological Institute that led to the discovery of the lower causeway and harbor of the Bent Pyramid. This find came totally unexpected because today the valley appears as a pristine topographic feature, unchanged since the time of king Snefru. In reality, however, the wadi is filled by massive sand deposits of up to 7 m thickness. The sand came into the wadi by eolian processes since the middle of the Fourth/Fifth Dynasty and covers the ancient monuments. The question of how the topography changed since the Old Kingdom opened several new research perspectives for the project.

In the valley to the east of the Bent Pyramid landscape archaeological research including geomorphological, geophysical and archaeological surveys, drilling, remote sensing and excavations are executed by the German Archaeological Institute and the Geographical Department of the Free University of Berlin since 2009. The principal aim of the geoarchaeological project is a better understanding of the landscape evolution of the necropolis of Dahshur. Research topics are anthropogenic influence on the landscape, water management, climate changes, and visibility of the archaeological monuments.

The upper causeway built of stone leads from the “valley temple” to the southeastern corner of the pyramid plateau. It was built in a natural tributary of the main wadi channel. But the tributary was not left as it was. Tafl (shale) and other material were amassed to build an artificial ramp. The topography of the tributary was thus modified by human impact. Very probably the ramp was already used during the construction of the Bent Pyramid as a transportation road for building material. The upper causeway was erected later on top of this artificial ramp.

The lower course of the main wadi channel, between the “valley temple” and the floodplain, was also heavily modified by human impact. On aerial photos and satellite pictures a striking difference between the appearance of the valley to the northeast of the Bent Pyramid and neighboring wadis is recognizable (Fig. 3).⁸ The slopes of the wadi to the

6 ALEXIAN/SEIDLAYER, in: Abusir and Saqqara 2000, 295.

7 Compare also in the following BEBERMEIER et al., in: Die Erde 142.3, 2011, 333, Fig. 3, 336.

8 The Corona aerial photos (Corona; DZB00402400058H020001, 23/01/1966, resolution: 2 to 4 feet) and the following interpretation were generously provided by W. Bebermeier and A. Ramisch.

northeast of the Bent Pyramid are straight. By contrast natural channels show a fractal pattern of the wadi sides – a tree shaped pattern that includes again and again smaller patterns of exactly the same shape – caused by fluvial processes.⁹ Arne Ramisch carried out an analysis of a digital elevation model (DEM) of the surface. He showed that there is a high correlation between fractal patterns of channel networks and natural surface topography. The low correlation of fractal patterns of channel network and surface topography in the vicinity of the Bent Pyramid shows, however, that the relief development was “disrupted by human impact”. Ramisch concluded that “quarrying and intentional landscape architecture are major possibilities” for this disruption.¹⁰

Subsequently it could be proved that the southern wadi slope was indeed rectified.¹¹ An excavation trench in the southern harbor wall and several drill cores at the southern side of the valley showed that the natural shale of the southern wadi slope was straightened. This was done to gain space for the erection of the southern harbor enclosure wall. Additionally, it is probable that the valley sides were rectified to open a direct view on the valley temple and the pyramid. So far no evidence for a comparable rectification of the northern valley side was found during the excavations. However, some satellite pictures show a striking straight structure on the northern wadi side (Figs. 1, 3). Parts of this structure might have been artificially built against the natural wadi, but this hypothesis still needs to be verified in the field.

Excavation trenches and auger sondages in the valley itself also attest the massive human intervention in its natural topography. Under the lower causeway of mudbrick that connects the “valley temple” and the harbor basin a ramp of compact shale and mud including pottery sherds and limestone chips was found. Before the causeway was built the ramp may have been used to transport the pyramid casing blocks arriving from the quarries of Maasara up to the building site. The lower causeway was later built on top of the existing ramp.

To the east of the “valley temple” and the lower causeway a huge harbor basin measuring 145 m in length from east to west and 95 m in width from north to south was constructed in the valley (Fig. 4).¹² The basin was bordered by mudbrick walls on all sides but had entrances to the west and east.¹³ Several drill holes attest the partial levelling of the wadi floor by a layer of gravel and/or shale mixed with limestone chips. Other drill holes show that the basin itself was surrounded by a terrace as is the case in the harbor basin of Khentkaus at Giza.¹⁴ Towards its central part the basin follows the natural wadi slope and gradually declines from its northern and southern sides.

9 A. RAMISCH/W. BEBERMEIER/K. HARTMANN/B. SCHÜTT/N. ALEXANIAN, Fractals in topography: Application to geoarcheological studies in the surroundings of the necropolis of Dahshur, Egypt, in: *Quaternary International* 266, 2012, 34–46.

10 RAMISCH et al., in: *Quaternary International* 266, 2012, 45.

11 ALEXANIAN/BEBERMEIER/BLASCHTA, in: MDAIK 68, 2012, 1–30, 10, Abb. 5, 7, 18, regarding the foundation of the lower causeway and 23–24, Abb. 22 regarding the rectification of the southern wadi slope. Compare also N. ALEXANIAN/W. BEBERMEIER/D. BLASCHTA, The Discovery of the Lower Causeway of the Bent Pyramid and the Reconstruction of the Ancient Landscape at Dahshur (Egypt), in: BdE, in print.

12 ALEXANIAN/BEBERMEIER/BLASCHTA, in: MDAIK 68, 2012, 3–5 and 22–27.

13 That the harbor was – at least partly – also closed by a mudbrick wall on the eastern side could be shown by a magnetic survey and drillings in spring 2015.

14 M. LEHNER, KKT-E+: The Buried Basin and the Town Beyond, in: *AERAGRAM* 12.1., 2011, 10–13.

A canal may be assumed to be located along the middle of the basin. Indications for such a canal were gained so far only by electric resistivity measurements to the east of the basin but not inside the harbor and also not further to the east.¹⁵ In the middle of the harbor basin the deepest drill hole (B 133) still only reached sand and not the wadi floor at 13.18 m above sea level (about 12 m under the present surface). The natural shale ground of the wadi was only reached in drill hole B 81 east of the basin at 13.80 m above sea level. Since the level of the floodplain at Memphis/Saqqara is estimated between 13.00 and 14.00 m above sea level – with maxima between 14.50 and 15.50 m above sea level – water must have entered the wadi during the inundation, especially if the assumed canal was cut even deeper into the valley floor.

3. Garden enclosure

During his work at the Bent Pyramid from 1951 to 1955, Ahmed Fakhry discovered the so-called “valley temple”, a stone building lying about 800 m northeast of the pyramid. Unlike valley temples of later kings, the building is not located at the edge of the alluvial plain but in the desert, about midway between pyramid and alluvial plain, some 17 m above the ancient level of the fields.

The temple was not the first building to be constructed at the site, however. A reinvestigation of the valley temple begun in 2012 led to the discovery of a large brick enclosure which predates the temple and was partially dismantled when the temple was built. A geomagnetic survey conducted by Tomasz Herbich in 2013 revealed the outer limits of the enclosure. In 2014, about half of the total surface area of this enclosure was uncovered (Fig. 5).¹⁶ The building remains are preserved below a layer of windblown sand that is rarely more than 10–15 cm deep. Of the original structures very little is preserved, sometimes only last traces of their foundations. The building was constructed directly on the natural surface of the desert, in the north on shale, in the south on a compact layer of sand.

The rectangular enclosure measures about 80.5 m from north to south and 55.8 m from east to west. Of the wall itself only a 5 m wide foundation layer of compact earth remains. Only at the southwest corner some of the original brick work is still preserved. No entrance could be detected for certain. At least two gates are likely to have existed, one near the south end of the east side and one in the center of the south side.

Much of the area encompassed by the enclosure wall was occupied by a garden. Along the west side, four rows of 26 tree pits each could be detected. The pits are about 2.2–2.4 m apart and have a diameter of 50–100 cm. Where ever preserved, the pits are surrounded by a circular irrigation channel, enabling water to filter to the roots of the plants. In most cases, the space between the pits was covered by a thin layer of earth, allowing smaller plants to grow. Only in one segment the earth was limited to narrow strips, possibly serving as flower beds. Additional rows of tree pits were arranged along the east side of the enclosure, though apparently more densely spaced. On the north side only two rows of plants are preserved.

15 T. HERBICH, in: N. ALEXANIAN/F. ARNOLD/T. HERBICH, The Necropolis of Dahshur. Tenth excavation report Spring 2013, in: ASAE, in print, or so far: <https://www.dainst.org/project/58761> (visited on June 16th 2015).

16 F. ARNOLD, Ein Garten des Königs Snofru in Dahschur, in: Sokar 29, 2014, 6–13, id., Ein Garten bei den Pyramiden, in: Antike Welt 3/2015, 46–54, id., A ceremonial building of king Snofru at Dahshur, in: M. BIETAK/E. CZERNY (eds.), Palaces and residences in Ancient Egypt, Vienna, in print.

Studies conducted by Reinder Neef on the botanical remains have shown that a variety of plants grew in the garden, including palm trees and sycamore trees. More surprisingly, also coniferous trees were planted, a type of cypress tree (Fig. 6). These must originate from outside of Egypt, possibly from Syria.¹⁷

In the center of the enclosure an area of about 30 x 50 m was left free of plants. The ground level was not entirely horizontal. In the south the ground is more than 1 m higher than in the north (about 29.5 m above sea level in the south, about 28.5 m in the north). On this elevated ground a brick building was constructed, part of which had already been studied by Ahmed Fakhry. The southern part of the building was occupied by three entrance rooms, the northern part by a courtyard. The northern limit of the courtyard is not preserved. Its location can be inferred, however, from two rows of plants placed along the outside of the wall. Several column bases were found in this area which originally must have been arranged along the north side of the courtyard. The western half of the courtyard was occupied by a sunken area, possibly a water basin. The bottom and the sides of the 5 m wide, 7 m long and 20 cm deep basin were furnished with lime plaster.

The garden enclosure cannot have been used for a long time. Probably it was erected when king Snefru moved his residence from Meidum to Dahshur. According to the Palermo Stone this appears to have taken place in the year of the 8th counting, which corresponds to the 14th regnal year of the king. The “valley temple” was constructed in the year of the 15th counting, the 28th regnal year, as is shown by control notes on the foundation blocks of the temple.¹⁸ About the same time work on the northern “red” pyramid of Dahshur was begun and the design of the southern “bent” pyramid was changed, resulting in its characteristic shape. The garden enclosure can thus have existed no more than 14 years. This corresponds well with the botanical evidence of the garden, which indicates that the plants took root, but did not grow for long.

During this short period, the brick building was repeatedly refurbished and altered. At some point a wing of rooms was added to the west, giving the building a square ground plan. The extension occupied an area that formerly had been part of the garden, the plants now being covered by the floor of the building. In a third stage, the new wing was subdivided into at least two spaces and an entrance added at the south end of the west side. Additions were also made in the area surrounding the building. In the east an additional building was constructed, abutting to the enclosure wall and again covering some plants of the original garden. Another, smaller structure was built into the southwest corner of the enclosure.

While the placement of the stone temple appears to respect the location of the brick building, the earlier structures do not seem to have been used after the temple was completed. Most brick walls are covered by the building debris of the temples. The thick enclosure wall was entirely removed and replaced by a new, much thinner wall. The new enclosure wall did encompass most of the space formally occupied by the brick enclosure, however. The

¹⁷ According to the Palermo stone King Snefru undertook an expedition to the Levant to gain wood in the year after the 6th counting, just two years before he appears to have moved his residence to Dahshur. H. SCHÄFER, Ein Bruchstück altägyptischer Annalen, Berlin 1902, 30.

¹⁸ R. STADELMANN, Neue Forschungen an der Knickpyramide. Die Kampagnen des DAI Kairo in den Jahren 2005 und 2006, in: Sokar 14, 2007, 10, fig. 8. Two additional control notes with the date of the 15th counting were found in 2012. For the chronology of the reign of king Snefru see R. GUNDACKER, Untersuchungen zur Chronologie der Herrschaft Snefrus, Beiträge zur Ägyptologie 22, Wien 2006.

garden was even extended in the north, along the slope of a low hill. Two additional rows of plants were added here. In several cases the roots of bushes are preserved in this part of the garden. How much of the original garden remained in use is unclear. In some areas plants were added, sometimes replacing earlier ones.

The purpose and meaning of the garden enclosure is not known. All available evidence suggests a use within certain royal rituals conducted during the life-time of the king, possibly in the context of the renewal of his kingship.¹⁹ The ritual performed here may have been comparable to, but not identical with those conducted in the jubilee festival of the king. The celebration of the jubilee festival in fact starts with the construction of a festival building and a garden.²⁰

Apart from its meaning and function, the design and execution of the garden at Dahshur represents an act of landscaping. Within an arid environment a substantial number of trees and shrubs were planted, in effect altering the character of the environment in a radical manner. Just how artificial this garden was can be judged by the fact that the plants did not survive for long.

Function and meaning of the artificial landscape

The recent research conducted at Dahshur shows that the Bent Pyramid was part of a much greater landscaping project. The plateau on which the pyramid was erected was artificially given a geometric shape. The valley leading from the cultivated land up to the pyramid plateau was rectified and a harbor was built at the valley floor. In the desert between the pyramid and the water basin a large garden was planted. These measures transformed the preexisting environment into a man-made landscape. There can be little doubt that this transformation was intentional, and the result of a grand design.

To a greater or lesser degree the landscaping measures were the result of practical considerations. The shaping of the pyramid plateau was the consequence of the quarrying activity necessary for gaining the building material for the erection of the pyramid core. The alteration of the valley and the construction of a harbor may have been needed to create a supply route to the construction site. And the garden may have been part of a wider effort to create suitable housing in the desert environment. The manner in which these measures were executed – for example the geometric shape given to the pyramid plateau and the valley or the massive enclosure built around the garden – suggest, however, that a meaning was attached to them which surpassed their practical use. In other words, the landscape design was not only intentional, but meaningful.

What specific religious meaning the artificial landscape created at Dahshur had is not known. The pyramid plateau, the valley, the garden and the harbor are likely to have held a mythical meaning, and to have been associated with a ritual purpose. This meaning cannot be reconstructed from archaeological evidence alone, without recourse to relevant texts. Such texts have either not survived, however, or their relevance for interpreting the pyramid complex was not properly understood, making an interpretation impossible, or at least premature at the present state of research.

19 ARNOLD, in: Sokar 29, 2014, 12; id., in: Antike Welt 3/2015, 51–53.

20 W. KAISER, Die kleine Hebseddarstellung im Sonnenheiligtum des Niuserre, in: G. HAENY (Hg.), Aufsätze zum 70. Geburtstag von Herbert Ricke, Beiträge zur ägyptischen Bauforschung und Altertumskunde 12, Wiesbaden 1971, 87–105, pl. 4.

Some aspects of the landscape design of the Bent Pyramid – such as the harbor, the garden and even the valley – recall certain aspects of the funeral rites (*Begräbnisritual*) of the early Old Kingdom.²¹ The Sacred Enclosure (*Heiliger Bezirk*) mentioned in the funeral rites – with its gardens and water basins – bears some resemblance to the landscape created at Dahshur. The landscaping efforts were certainly not executed for these specific rites, however. The garden, for example, ceased to exist long before the end of the king's reign and thus before his funeral. The landscape was certainly not intended for a single occasion, but for a longer term, or even eternity. The funeral rites do give an indication of the category of ritual and mythological meaning the landscape design may originally have been associated with. Given its cultural context, the landscape at Dahshur is more than likely to have been ritual in purpose and mythical in meaning.

Rulers of many cultures around the world have invested in great landscaping projects. A comparison with these projects gives some indication of what function such a landscape may have served. The garden of the Taj Mahal in India, for example, was constructed as a reference to the after-life – in this case paradise as described in the Quran.²² Other landscapes have been designed as a means to preserve the memory of a ruler. The tombs of the Tang emperors at Xian (China) were built as a reflection of their actual palaces. At the same time, the incorporation of natural mountains was intended to make the memory of the emperors endure as nature endures.²³ In a similar way the memory of President Theodore ("Teddy") Roosevelt was perpetuated by an island in the Potomac River, within the capital city of Washington, D.C. On the island, a "wilderness" was artificially created, as a means to recall the efforts of President Roosevelt in creating national parks. Both functions – the landscape as a reference to the after-life and as a means to preserving memory – may have played a key role in the design of the landscape at Dahshur.

The creation of the artificial landscape at Dahshur played a vital role already during the life-time of the king, however. That the garden, for example, existed only for a short time within the king's life-time indicates that it was connected to rituals enacted by the living king, not in honor of the dead king. Such rites may have been related to the establishment and renewal of kingship, rather than to the preservation of his memory. In this sense the landscaping project may be seen as a part of the ongoing efforts of king Snefru at constructing a centralized state and creating order, one of the main challenges of this king in particular.

The landscape created by the king certainly conveyed also a social meaning. The whole complex of the Bent Pyramid within this landscape is extremely impressive. The Bent Pyramid was built at a very distant point in the desert. In social terms this reflects and symbolizes the distance of the king in relation to the other people.²⁴ The mastabas of the high officials were built half way between the pyramid and the floodplain on well visible hills or escarpments but in a great distance of about 1 km from the pyramid. The smaller tombs of the officials lie close or inside the floodplain. That means that social status is translated into distance or proximity to the world of the living. The erection of the Bent Pyramid on a

21 SETTGAST, Bestattungsdarstellungen.

22 Cf. E. KOCH, The Complete Taj Mahal and the Riverfront Gardens of Agra, London 2006.

23 N. SHATZMAN STEINHARDT, Liao Architecture, Honolulu 1997, 264–281; T. ECKFELD, Imperial Tombs in Tang China 618–907, The Politics of Paradise, Abingdon/New York 2005.

24 Compare also in the following ALEXANIAN/SEIDLAYER, in: Abusir and Saqqara 2000, 295–296.

very high point of the plateau and the quarrying of the trenches on the western and northern view sides of the pyramid plateau stress the monumental appearance and the distance of the pyramid from its surrounding. This is especially perceptible if one approaches the pyramid from the east through the valley. But the monumentality of the pyramid also bridges this great distance. The pyramid is visible even from very distant points, symbolizing the omnipresence of the king. In sum one can state that social hierarchy is imprinted on the landscape and is highlighted by certain landscape modifications.

Summary

The landscape at Dahshur may be seen as an essential step in the evolution of the “classical” pyramid complexes. For the first time, the attempt was made to erect a geometrically “true” pyramid. The pyramid complexes at Meidum and Dahshur are also the first in which a polarity exists between a harbor and a valley temple situated close to the floodplain on the one hand and the pyramid erected in the desert on the other. Meidum and the Bent Pyramid are furthermore the first instances in which these poles were connected by a causeway.

The pyramid complex of the Bent Pyramid is in many ways unique, however, and not only because the king was never buried here. Part of this uniqueness is the role the landscape plays in the design. The pyramid was placed square within the desert, at a great distance from the cultivated fields. The landscape surrounding the pyramid was transformed more extensively than at any other site. A possible precursor is only the Djoser complex at Saqqara, with its huge ditch.²⁵ The Red Pyramid was surrounded by a garden, recalling the garden planted in the valley leading to the Bent Pyramid.²⁶ The access route leading to the Red Pyramid was not transformed in the same way as it had been at the Bent Pyramid, however. Only at Giza is there an indication for a landscaping design of a similar scale, though with very different features.

The treatment of the landscape may be the single most unusual feature of the Bent Pyramid, the feature that sets it apart from other pyramid complexes. This observation casts a new light on the evolution of the first “true” pyramid. Essentially, the pyramid may be considered as an element of landscape design – an artificial mountain erected within an artificial landscape.

25 N. SWELIM, The dry moat of the Netjerykhet Complex, in: J. BAINES (ed.), *Pyramid studies and other essays*, presented to I. E. S. Edwards, EES Occasional Papers 7, London 1988, 12–22.

26 R. STADELMANN et al., Pyramiden und Nekropole des Snofru in Dahschur, Dritter Vorbericht über die Arbeiten des Deutschen Archäologischen Instituts in Dahschur, in: MDAIK 49, 1993, 261, fig. 1a–b; M. HAASE, Tempel und Gärten, in: C. TIETZE (Hg.), *Ägyptische Gärten*, Weimar 2011, 187–188, fig. 239–240.

The complex of the Bent Pyramid as a landscape design project

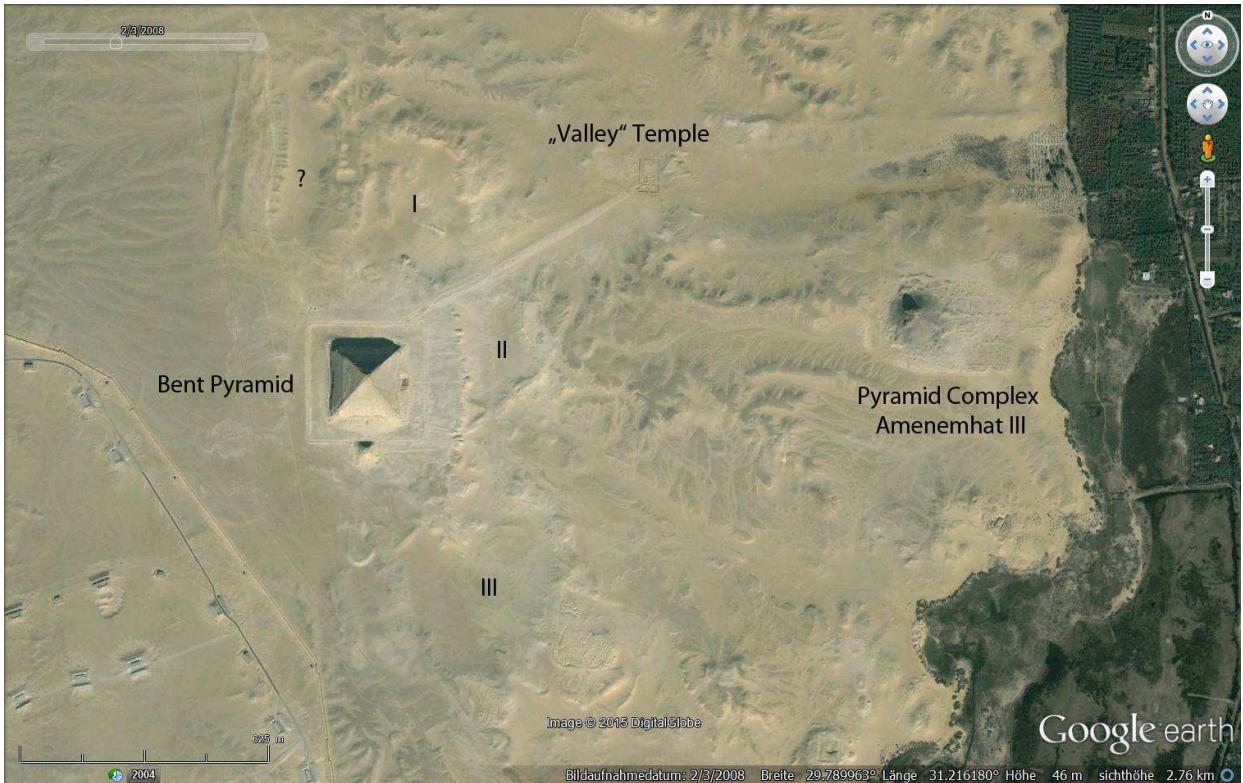
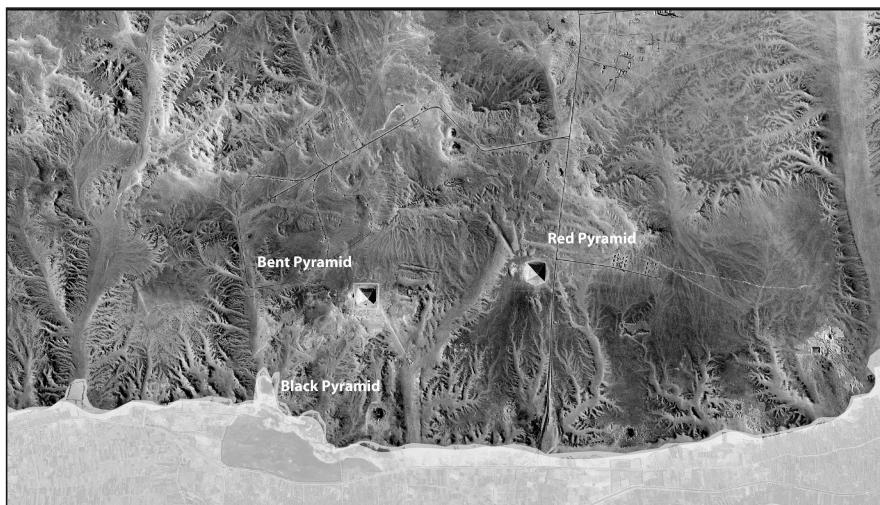


Fig. 1: Distribution of limestone quarries I–III surrounding the Bent Pyramid
(Google Earth satellite picture 2/3/2008, mapping of the quarries by W. Bebermeier).



Fig. 2: The Bent Pyramid at Dahshur, the upper causeway and the so-called valley temple. The edges of the pyramid plateau are well visible (© DAI Cairo, Photo D. Härtrich).

Necropolis of Dahshur

Landscape modified by human impact



Fractal Landscape

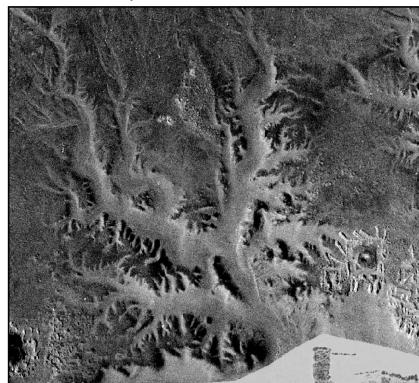


Fig. 3: Comparison of the valley leading to the Bent Pyramid with a natural desert wadi
(Corona aerial photograph, DZB00402400058H020001, 23.01.1966,
resolution: 2 to 4 feet; choice and composition by A. Ramisch).

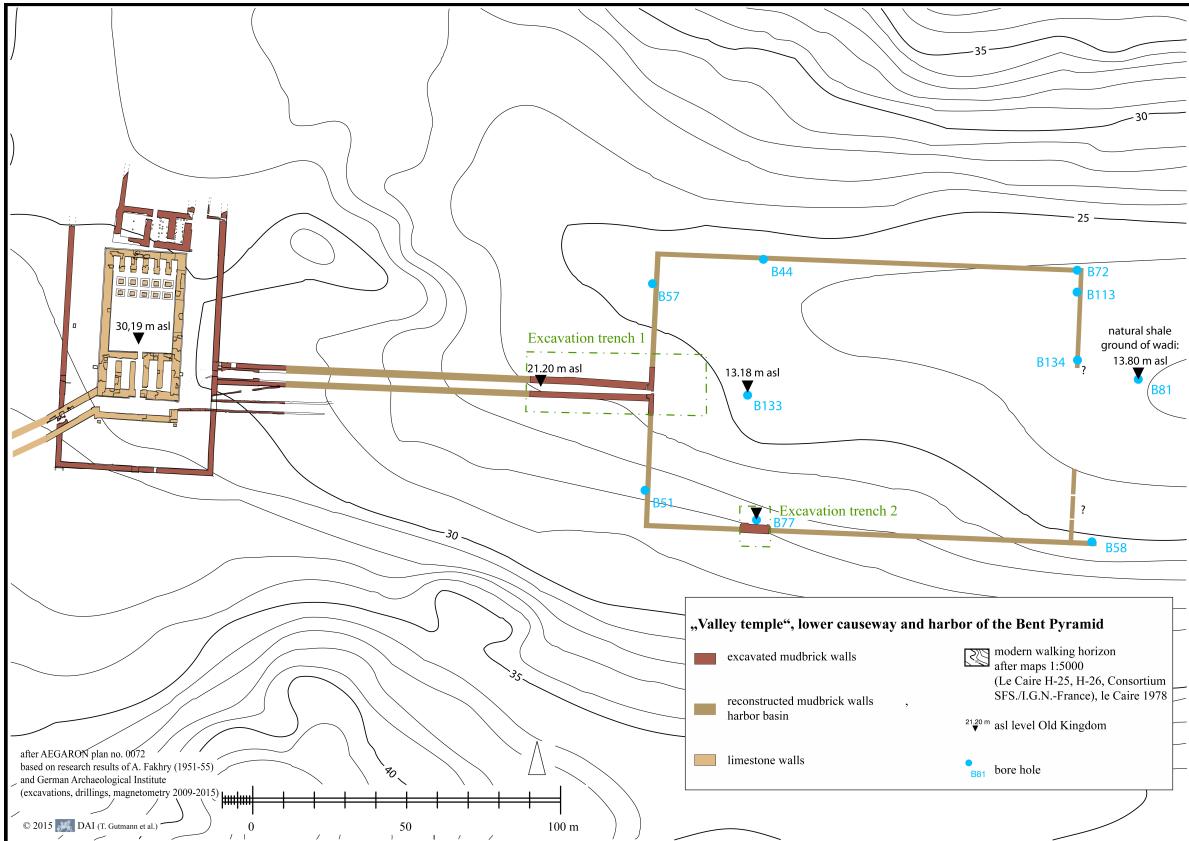


Fig. 4: Plan of the valley to the east of the Bent Pyramid with the upper causeway, the “valley temple”, the lower causeway and the harbor (© DAI Cairo, Plan T. Gutmann et al.).



Fig. 5: Garden enclosure at the valley temple of the Bent Pyramid (© DAI Cairo, Drawing F. Arnold).



Fig. 6: Roots of a coniferous tree in the garden enclosure at the valley temple of the Bent Pyramid (© DAI Cairo, Photo J. Pinke).