DIETER EIGNER

MEROE JOINT EXCAVATIONS: EXCAVATION AT SLAG HEAP NW1 IN MEROE[1)]

About fifteen slag heaps of different sizes[2)] are situated on the eastern periphery of the city of Meroe. They are the relics of an iron industry which had its golden season from about 200 B.C. to 300 A.D. The lion temple was built around the year 255 A.D. on top of the heap SE 1 and is therefore a *terminus ante quem* for this area of production. The ironwork was not restricted to the city of Meroe; during the pre-campaign in 1992, the MJE team has also investigated neighbouring archaeological sites, and iron slag was found at Hamadab and Sayal Sirag.

Since the outer appearance of the heaps today is defined by the yellow desert sand, the slag pieces (up to 15 cm in diameter) can only be seen at certain parts. Especially the foot of the heap is covered by sand, which renders precise measurements impossible. The diameter is about 10 m to 100 m with a hight of several metres. None of the heaps still retains its original form, all show signs of digging or excavations, be it by treasure-hunters or archaeologists. However, there are no reports about archaeological investigations of the slag heaps. The heap SE 2 is cut through by the railway line.

One of the main objectives of the MJE is the investigation of the role of iron-technology in ancient Meroe, its technical means, technological processes and economic factors. Until today the slag heaps of Meroe have obviously not yet been archaeologically investigated; therefore, the first and most basic step of the MJE is the investigation of a slag heap by archaeological experts, with an exact documentation and analysis of the findings, especially as concerns archaeo-metallurgical findings.

For this purpose, the heap NW1 (= north: western mound 1, ref. to R. F. Tylecote 1970, Fig. 1) was selected. There are several reasons: the original shape of the mound has mostly been preserved, while all other heaps have been dug into or dug under to a great amount. The size of the mound roughly corresponds to the average volume of the slag heaps of Meroe. The results of the archaeological investigation could therefore be considered to be typical and can be achieved within a reasonable period of time (about 4 campaigns).

During a test-excavation in 1969-70, R. F. Tylecote has found the remains of smelting-ovens at the southern foot of the heap. The MJE excavations shall – in their last phase – provide the junction to this section, whereby a fundamental broadening and completion of Tylecote's findings it to be expected.

The present base of the heap is rather circle-shaped, with a diameter of about 35 m.[3)] The highest point is not located in the middle, but shifted 3-4 m to the east and is elevated about 3 m above the adjoining sandy plane in the east. The level of the adjoining area in the west is about 1 m higher. It can therefore be assumed that the original base of the heap is located further west than the one visible now. Thus, the heap would have an oval ground plan, as can also be observed at other mounds. In the west, the peak of the mound has got a dent, which is brought about by a horizontal plane, about 1 m lower than the highest point. It could be the traces of an archeological excavation. In the South, the foot of the mound is cut through by Tylecote's excavation, as well as by running water, due to heavy rainfall. The northern side shows some irregular excavations, whereas the eastern side of the heap is completely intact. In the north lies the irregularly-shaped slag heap 1 a, which could be the result of an excavation attempt.

The two smaller heaps 1b and 1c are situated in the south; their circle-round base suggests antique piling-up. The eastern foot of the heap

1) Translated from MittSAG 4, 1996, pp. 23 - 27. For cited literature see the German version of this article. - Several Sudanese colleagues asked us to publish some of the more important articles in MittSAG in English. This is the first of a planned series.

2) See fig. 1 on page 23 of MittSAG 4.

3) See fig. 2 on page 24 of MittSAG 4.

is covered by sand-drifts, which, further towards the east change into an uniform sandy plane. The adjoining areas in the north and the west show a thick cover of broken pieces of pottery (ceramics), broken bricks and slag lumps. Fragments of hand mills complete the picture.

The surface findings lead to the conclusion that a settlement area was situated next to the heap. The original base of the heap is nowhere visible.

It was decided, first to excavate the south-eastern quarter of the heap, without following a 10 m-square-grid pattern, to direct the section direction, however, according to the system introduced by MJE. The east-west section was performed along the line x=1032, cutting through the highest point of the heap; the north-south section was along the line y=866, about 2,5 m to the west of the highest point. The southern boarder line of the digging area at x=1019 corresponds to the currently very irregularly broken out north limitation of Tylecote's excavation. In the east, line y=883 was preliminarily chosen as a boarder line. Thus, in horizontal projection, an excavation area of 17 m by 13 m was established. Base point for the elevation measurement was point 840/1010, which had been concreted by MJE, the level of which was preliminarily assumed to be 10,00 m. For the deposition of the excavated material, the rubble-heap made by Tylecote, about 40 m east of the excavation area, continued to be used. Planning, carrying out and documentation of the archeological findings was done by the author and Barbara Wewerka. Thilo Rehren dealt with questions of archaeo-metallurgy. The actual excavation job was accomplished by 20 locally recruited workers. These were mostly nomads, who had only recently settled in the Nile valley, and to whom this kind of work was completely new.

However, under the guidance of Ahmed Abdallah, who already had worked with P. Shinnie in Meroe, they showed excellent teamwork in course of time, and some of them even exhibited a good talent as excavators. Within the framework of the pre-campaign there was merely a period of time of just 3 weeks for the actual excavation works, from 6.2. – 25.2.1992.

A working concept was chosen, which planned the digging off of the chosen heap area, level by level, starting from the highest point. The levels to be excavated should follow the original slope of the heap as much as possible. Their thickness was on the one hand governed by the archeological findings, on the other hand by work-requirements of a technical nature. At the end of the short excavation period, the digging area was deepened by 1,10 m – 1,40 m.

The work started with the removal of a layer about 20 cm thick, which let expect the uncovering of a surface, free of sand drifts.

At the foot of the heap, much thicker sand layers had to be taken away, in order to get to the original surface of the heap. The uncovered surface showed surprisingly little slag, but a great proportion of brown-red sandy cinder material, mixed with charcoal and scattered pieces of broken pottery. Slag in concentrated form only appeared at a few points and was otherwise evenly and loosely distributed.

At the top of the heap, some accumulations of burnt brick and clay pieces were observed, leading to the assumption that foundries could have existed there. Excavation proceeded therefore with special care at these spots; there were no indictions, however, that furnaces had been situated there.

In the further process of excavation it was shown that such accumulations of burnt brick and clay could in actual fact be the fragments of furnaces (acc. to T. Rehren), which were deposited on the waste-heap after the clearing of the furnaces.

A cavity appeared on the top in about a depth of 30 cm, filled with white cinder, obviously the filling of a pit. In order to document and analyse the finding, an intermediate section was performed along the line x=1030, 2 m south of the excavation boarder line; it was drawn after the end of the excavation works.[4)]

At the eastern foot of the heap appeared in this phase of the excavation the remains of clay-brick walls: two walls, at least two bricks wide, form a corner; three layers can be distinguished, the bricks are 20 cm wide. - The walls were covered again with sand. The further handling shall be performed when this level has been reached in all the excavation area, i.e. when the heap has been excavated. Tylecote found huts containing furnaces in his section. The present finding could be similar to his, the floor level could then be

4) Fig. 3 on page 24 of MittSAG 4.

expected to be about 1,5 m below the present wall top.

On the level of planum 3 (about 50 cm below the original surface) a rather homogeneous consistency of the heap could be observed: a fine mixture of slag lumps and charcoal, slaggy material, brown cinders and sandy material, sporadically broken brick material. At the foot of the heap, rough slag pieces and fragments of furnace coating were found (positions 6 - 11 in Fig. 3).

The process of "peeling off" level by level was further continued. No changes concerning the characteristics of the heap were observed and work went on speedily. A level thickness of 15 cm proved to be technically the most favourable; it can be excavated in a single operation with the hoe "Turia". This tool is much better suitable for the establishment of a smooth surface than are shovel and pick-axe, which the workers are not acquainted to anyhow. Starting with planum 3, another 5 levels were excavated (Fig. 4), until the excavation works came to a preliminary end at planum 4. The profile x=1030 was kept in place, in order to keep the profile x=1032, which is specially threatened by strong winds, in good condition.

As much as possible, the excavation of the heap proceeded parallel to the original surface. Following the surface of the old dumps was hardly possible in the loosely piled-up material and it would have been asking too much of the inexperienced workers.

At profile x=1030 it then became evident that the old pilings are considerably steeper than the surface established by us, which follows the contour of the heap.[5] At the western excavation boundary, however, the levels of the single pilings run parallel to the surface. This shows that piling-up was done from west to east.

Below a very sandy slag level along the west profile y=866, observed in planum 3, further sand levels without slag appeared,[6] partly with lots of broken pottery and animal bones (cattle?), as well as fragments of hand mills. These are obviously household waste. Now and then some slag is scattered. The evident conclusion is that this is household waste of the iron workers whose dwellings can be assumed a little bit more to the east.

Components of the heap and single findings which originate from iron production and processing: furnace slag (flow slag) in pieces of different sizes, fragments of slag-tapping, forge clag (firing slag, drop-shaped), iron-ore, oolitic iron-ore, charcoal, cinder (white, grey, brown, sandy).

Fragments of blast pipes ("wind pipes" or "tuyeres" to blow in the air into the furnaces) made of clay in different shapes and sizes. Pieces of burnt clay (reddish-brown to orange) from furnace coating. Fragments of burnt bricks from the wall structure of the furnaces. There remains to be mentioned 1 piece of copper slag and 1 piece of corroded copper of amorphous shape from the sand drifts at the foot of the heap.

During the excavations works, T. Rehren collected samples for archaeo-metallurgical analysis (refer to report of T. Rehren in MittSAG 3), and furthermore carried out a preliminary quantitative calculation.

For the homogeneous part of the heap, the weight proportion of slag turned out to he maximal 40%, nearly half of which is furnace slag, the rest is forge slag. The volume proportion of charcoal is 10 %; considering the proportion of household-waste, the proportion of furnace slag for the mound as a whole is only about 10 %. It is rather probable that this value is also valid for the other slag heaps.

Thus, a completely new basis for the calculation of the total volume of iron production in Meroe has been established.

Other components and findings (in the first place household waste): sand, partly drifted, partly piled-up, clay-like sand. Ashy sand. Sandy cinder. Lumps of clay. Broken bricks. On fragment of a special brick for a torus-mould. Fragments of ceramics, containing parts of big storage vessels, sherds of "mat-impressed ware" and one sherd with engraved pattern. Fragments of grinding stones. Fragmented bones, partly burnt. Large animal bones (cattle?). Three fragments of archer's rings made of stone (granite, gneiss) from the sand drifts at the foot of the mound. Some beads made of faience, stone, ostrich-egg.

5) See fig. 3 on page 26 of MittSAG 4.
6) See fig. 3 on page 26 of MittSAG 4, positions 14 - 22.

ANGELIKA LOHWASSER

MILLE FIORI – TAUSEND BLUMEN AUS OMDURMAN[1)]

"Beads are such intriguing objects that one must ask the basic questions of what, where, when and how whenever an interesting bead is encountered. They are miniature bundles of secrets waiting to be reveiled: their history, technology, cultural context, economic role, and ornamental use are all points of information one hopes to unravel. Even the most mundane beads may have traveled great distances and been exposed to many human experiences. For example, in the eighteenth and nineteenth centuries many glass beads were shipped from Venetian and Bohemian factories to African destinations and then were traded through middlemen before reaching their tribal owners. During the past three decades they have been sold again to bead traders for re-export to the Western world. They were always treated as valued personal adornments, until economic conditions and changing cultures caused them to be sold to a new appreciate market of western museums and collections." (Robert K. Liu; in: Dubin 1987: 9-10)

Jeder, der einmal auf dem *suq* von Omdurman war, kennt die Verkaufsstände mit den Bergen von Perlen (Farbabb. 1). Ein buntes Meer von tausenden Blumen – millefiori – jeder Verkäufer bietet noch schönere, noch größere, noch buntere Stränge von Perlen an (Farbabb. 2). Welche soll man kaufen? Sind das wirklich die alten venezianischen Millefiori? Wurden damit tatsächlich die Sklaven bezahlt? Viele Fragen drängen sich auf. Mit diesem kleinen Beitrag möchte ich versuchen, einige dieser Fragen zu beantworten.

1. DIE GESCHICHTE DER GLASPERLENKUNST

Glas kommt als Rohstoff in der Natur nicht vor, sondern besteht aus einem Gemisch von Kieselerde, Alkali (Flußmittel) wie Soda, Natron oder Pottasche und Metalloxiden zum Färben. Dieses Gemisch wird bei hohen Temperaturen geschmolzen und im zähflüssigem Zustand geformt. Im erkalteten Zustand wird das Glas starr (Holm 1984:7; Stern/Schlick-Nolte 1994: 19).

Das bisher früheste bekannte Auftreten von Glas ist ein Fund im Südirak in einer Schicht des 21. Jh. v. Chr. Ob dieses Rohglas jedoch ursprünglich aus dieser Gegend stammte oder importiert wurde, ist unbekannt. Die erste Anwendung von Glas fand in der Gestalt von Perlen statt. Das Wissen um die Glasherstellung verbreitete sich rasch; in Ägypten ist es seit dem Neuen Reich bekannt. Syrien, Libanon, Israel und später Alexandria wurden die Zentren der Glaskunst. Die Glasperlen wurden weit verhandelt, einzelne Exemplare konnten sogar in China und Korea festgestellt werden (Francis 1994: 75). Auch nach dem Niedergang des Römischen Reiches lag das Zentrum der Glasperlenproduktion im vorderasiatischen Raum, von wo aus die Araber die Perlen weiter verhandelten. Durch die Kreuzzüge und Mongoleneinfälle wurden viele der Produktionsstätten zerstört, die Perlenmacher flüchteten, wobei vor allem Venedig ihr Ziel war. Venedig war nicht ohne Grund ein Anziehungspunkt in dieser Zeit: Nach der Spaltung des Römischen Imperiums bildete Venedig die Verbindung zwischen dem West- und dem Oströmischen Reich. Dabei erweiterten die Venezianer ihre Unabhängigkeit und sicherten sich die wichtigsten Handelsprivilegien. Bis zum 13. Jh. war die venezanische Glasindustrie nicht bedeutender als die von Resteuropa, obwohl die Glaskunst in venezianischen Klöstern bereits seit 882 belegt ist. Da die Stadt aber als Handelsstadt sehr interessant war, bildete sie einen Anziehungspunkt für Handwerker. Auch die Glasmacher aus Padua, Florenz und Griechenland zogen nach Venedig, um von den vielfältigen Möglichkeiten dieser Stadt zu profitieren (Jargstorf 1995: 33).

1292 wurden alle Glasfabriken Venedigs auf die Insel Murano verlegt. Dafür gab es zwei Gründe: erstens wurde so für Venedig die Gefahr des Brandes verringert – das Feuer zum Schmelzen von Glas führte immer wieder zu Großbrän-

1) An dieser Stelle sei meinen Kolleginnen im Museum für Völkerkunde Berlin gedankt, allen voran Frau Katrin Adler, M.A. Ihr sind befruchtende Gespräche und die wohlwollende Aufnahme in der Bibliothek des Museums zu verdanken.

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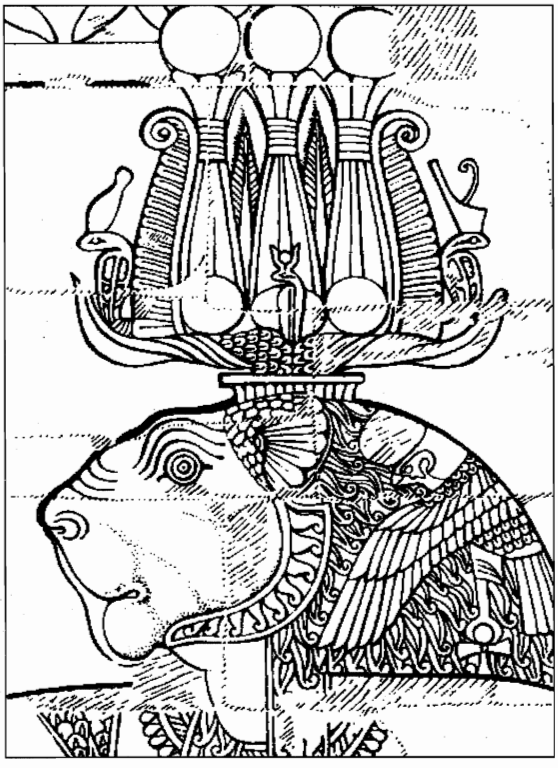

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Abbildung auf der Titelseite:
Blick auf die Terrasse des Zentraltempels der Großen Anlage von Musawwarat, 1994 (Foto P. Wolf)

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