NEW EVIDENCE OF ROMAN QUARRYING FROM THE
EL-MINYA BASALT FLOW,
TILAL SAWDA, MIDDLE EGYPT

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THE DISCOVERY

During a survey of Egyptian basalt outcrops in June 2002 a small quarry was found in the El-Minya basalt flow at Tilal Sawda near El-Buhaisa and the former Graeco-Roman city of Oxyrhynchus in Middle Egypt. As evidenced by pottery scatters, the quarry appears to have been opened in the Roman period and its small size suggests that only a very short extraction campaign was carried out at the site. However, modern quarrying may have destroyed similar, nearby quarry sites. Thus, the discovered quarry may have belonged to a larger group of quarries at Tilal Sawda.

The discovery of the Tilal Sawda quarry is important insofar as it widens the picture of Roman basalt quarrying in Egypt. Until recently the only known basin quarry in the country was the Old Kingdom Wadin El-Farás quarry in the northern Fayum desert. This quarry provided stone for mainly Old Kingdom mortuary complexes (Harrell & Bowa 1995, Malley-Greenough et al. 2000, Błomax & Storemyr 2002). Surveys carried out in 2001 and 2002 show that the Romans reopened a part of this quarry, as evidenced by pottery scatters, quarry layout and the presence of a few Roman wedge marks (Błomax & Storemyr 2002). Together, these discoveries suggest that Roman basin sculpture found during excavations, especially in the Fayum (Roman) and at Oxyrhynchus, may also have been worked from "fresh" basalt and not from re-use of Old Kingdom blocks, of which there were many suitable at the pyramid fields in Giza, Saqqara and Abu Sir, as well as in the vicinity of the Wadin El-Farás quarry.

Basalt in Ancient Egypt

Predynastic and the Old Kingdom

Basalt was an important material to the ancient Egyptians. It was initially used for a great number of vessels in the Predynastic and Early Dynastic periods (ca. 3100 BCE). The basalt in basalt occurrence spanned during a 150-170 year period between the 4th and 5th dynasties. This period was used for floors, retaining walls and other architectural elements in four pyramid complexes: Khufu at Giza, Ushabat at Saqqara and Snefru and Nyuserre at Abu Sir (Malley-Greenough et al. 2000, Błomax & Storemyr 2002). Basalt use in this period may have had aesthetic and symbolic reasons: perhaps symbolizing the earth, identified with the god Geb or Horus (Hoffmeyer 1993).

Middle Kingdom to the Graeco-Roman Period

Although it is not documented a quantity of perhaps 2,400 m³ (Błomax & Storemyr 2002, the Old Kingdom use of basalt was never equaled. Some statuettes and reliefs are known from the Middle Kingdom. Middle Kingdom and the Late Period (Asmar et al. 2010), although it is likely that these were carved from re-used Old Kingdom temple blocks or downed blocks by the main basin quarry at Wadin El-Farás. In the Graeco-Roman period basalt use was again on a somewhat larger scale. Now it is used predominantly for statuary, of which there are many fine examples in the Graeco-Roman Museum in Alexandria and in the Egyptian Museum in Cairo.

Basalt and other stone

The use of basalt in Ancient Egypt has sometimes been overestimated. One reason is the difficulty of distinguishing between basalt, black granite from Aswan and dark graywacke from Wadi Hammamat by visual inspection (Harrell & Bown 1999). Other characteristics indicate, for instance, that many sapphire and Pandora, often believed to have been from basalt, were rather produced from other dark stone.

Sources of Basalt

There are many basalt flows in Egypt. Most of the flows, which are relevant as possible sources of artifacts and building stone, are of Tertiary (Cenozoic) age (Momney 1980) and occur as shown on the map in fig. 1. The Oligocene (c. 25 m.y.) Haddadin flow, with the Wadin El-Farás quarry, in Northern Egypt is until now the only one that has been positively identified as a source for vessels building stone (Malley-Greenough et al. 2000, Greenough et al. 2001). Although no other quarries have been found in the Haddadin flow, it is likely that outcrops e.g. Abu Basalt and Abu Zabad (now inaccessible or destroyed) would have produced stone, at least for vessels. Based on visual inspection it appears that many Greek and Roman sculptures on display in the Egyptian Museums have been carved from Haddadin basalt. The likely sources are thus the newly discovered Roman quarry at Wadin El-Farás and reused Old Kingdom blocks. No statuary, visually looking like basalt from the newly discovered quarry at Tilal Sawda has yet been located.

Petrography and geochemistry

The Tilal Sawda and the Wadin El-Farás basaltus are mineralogically and geochemically quite similar; both are olivine, plagioclase, clinopyroxene (enstatite, orthopyroxene and Fe-Ti oxides as their primary minerals. Texturally, however, they differ significantly. The Wadin El-Farás basalt displays a porphyritic texture with interstitial groundmass. The characteristic clinopyroxene mesomorphs measure up to 10 mm, while the plagioclase has the groundmass radar. Scattered patches of glass and alteration products from glass are common. The Tilal Sawda basalt displays a porphyritic texture with inters interstitial groundmass. In addition to the textural differences between the two, Malley-Greenough et al. (1999) have shown that one is of greater use for differentiating between the two basalt sources. The microphotographs to the left show the two basalt types.

Detraction of the basalt quarries

Like many ancient architectural sites in Egypt, the basalt quarries are heavily threatened by modern quarrying. Parts of the Tilal Sawda quarries may have been destroyed by modern quarrying (fig. 12) and we will never know how large those quarries once were. Recently, modern quarrying also commenced in the basalt quarry at Wadin El-Farás (fig. 13). Significant parts of the quarry have already been heavily damaged, but efforts are now undertaken to try to stop the works in the actual ancient quarry site. There are vast amounts of good basalt just nearby.

The great problem with ancient quarry sites in Egypt— and elsewhere—is that they are rarely registered as archaeological sites. Moreover, they are very rarely excavated by laymen and companies wanting to develop such areas, as well as by authorities giving permissions for such developments.

The Supreme Council of Antiquities recently launched the Egyptian Antiquities Information System (www.rais.org), which aims at establishing a Geographic Information System to aid the management of historical sites in Egypt. This is the first step in trying to protect also the ancient quarry sites and the authors therefore co-operate with EIAS in order to achieve this aim.

Fig. 1: The Roman quarry site is located on the top of the small hill. Black pebbles along the slop. Weathering of the basalt flow has given black pebbles uneven along the slope. Note the larger basalt blocks along the slope below the Roman quarry

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Fig. 3: The face of the Tilal Sawda quarry, showing well developed columnar jointing

Fig. 4: Pottery fragments from the quarry, probably belonging to one Roman elevator

Fig. 5: Remains of basalt flow at Uselah's pyramid in Sakara. The Step pyramid in the background

Fig. 6: Greek statue in the Egyptian Museum. The piece Hierakonpolis 599 BC, found at Abydos. H. 0.88 m

Fig. 7: Basalt relief in front of the Egyptian Museum, probably from the New Kingdom (Amoysډhli 391, from the Pith Temple at Memphis)

Fig. 8: The Roman part of the Wadin El-Farás quarry

Fig. 9: Roman wedge hole used for splitting at Wadin El-Farás

Fig. 10: Wadin el-Farās basin-borne marble

Fig. 11: Tilal Sawda basalt (revised model)

Fig. 12: Modern local quarry by Tilal Sawda