

From limestone to sandstone – building stone of Theban architecture during the reigns of Hatshepsut and Thutmose III

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Abstract

The paper reviews the monuments built in the Theban area during the reigns of Hatshepsut and Thutmose III, and their stone materials. This period witnessed a shift from limestone to sandstone in the second part of the coregency with Thutmose III, when the queen commissioned an ambitious architectural program. In his autonomous reign, Thutmose III reuses limestone in various monuments, possibly to distance himself from the queen's options, and to connect his reign with those of glorious predecessors, in the Middle Kingdom (Mentuhotep at Deir el-Bahari; Senusret III at Medamud) and in the early 18th dynasty (Thutmose I and II).

Keywords

Hatshepsut, Thutmose III, Theban architecture, limestone, sandstone, Karnak, funerary temples

Introduction

How can the choice of stone materials used for the building of sacred monuments in Ancient Egypt be explained? The answer to this question may seem straightforward but in fact it is

rather complex. With a large number of temples built over two millennia, ancient Thebes is a favorable spot to look into the question. The city is surrounded by impressive limestone cliffs, yet its architectural heritage has made little use of this local resource – save for tombs. Two materials are largely dominant in the Theban temples: limestone and sandstone. Limestone rarely comes from local quarries, as the Theban cliffs do not expose fine-grained, homogeneous limestone. Petrographical and geochemical analyses demonstrate that the limestone used in the Theban architecture in the Middle and New Kingdom comes from two main mining districts: the Dibabiya (E. Gebelein) region, some 30 km south to Thebes and the Tura-Maasara region, some 600 km north. Only one small-size limestone quarry is known locally, on the West Bank, i.e. the 'Hatshepsut quarry' near Qurna, yielding a low-grade porous limestone, which was used only in the New Kingdom. Sandstone, on the other hand, was exploited at Gebel el-Silsila, some 150 km to the south. Both Dibabiya and Silsila are located at places where the outcrops are close to the Nile, which probably facilitated the shipment of stone loads on transport barges. By contrast, the fact that at least one of the stone supply zones is located some 600 km downstream to Thebes (and hence required that the stone be shipped upstream) suggests that the answer to the initial question of this section is not simply that the stone supply zone was selected on practical criteria.

Here we focus on a very productive period in the Theban architecture in the 18th Dynasty: the two reigns of queen Hatshepsut and her successor Thutmose III. These two rulers sponsored the erection of a large number of sacred monuments which exhibit a progressive shift from limestone to sandstone. The architectural remains of this key period are not easily understood as several temples have been dismantled, particularly on the West Bank. Scatterings of limestone and sandstone blocks remain in the field, with stones from Dibabiya, Qurna and Silsila. The same building sometimes contains materials coming from no less than three supply sites. Below, we will trace the chronological use of building materials during the reigns of Hatshepsut and Thutmose III, focusing on the likely reasons for their selection and use in each temple. The implications in terms of stone supply, use and reuse will also be discussed.

The regency and coregency buildings

Few buildings dating from the Hatshepsut regency period are preserved. Limestone blocks with the names of Thutmose II, Hatshepsut and Thutmose III were excavated by G. Legrain in

the 'Cour de la Cachette' at Karnak.¹ L. Gabolde published these blocks and proposed to identify this monument to the *Netjery Menu*, cited in the texts; the author dates its construction from the regency period of Hatshepsut, after the death of her husband Thutmose II (whose mentions are therefore regarded as posthumous).² Three other blocks, found in other places at Karnak, are also attributed to the *Netjery Menu* by Gabolde: two sandstone lintels in the name of Thutmose II or Thutmose III, reused in the foundations of the Eastern obelisks of Hatshepsut³; a limestone block with the coronation name of Hatshepsut, *Maatkare*, re-used in the *Akhmenu*.⁴ The attribution of these blocks to the *Netjery Menu* is however questionable.⁵

Besides this sanctuary, a 'niche monument' with names of Thutmose II and Hatshepsut, was possibly also found in the 'Cour de la Cachette' and perhaps date from the queen's regency.⁶ More blocks in the name of Thutmose II and Hatshepsut⁷ possibly belong to a bark chapel built in Tura limestone.

These monuments, initiated by Thutmose II or by the queen during the first years of the reign of Thutmose III, make a 'traditional' use of limestone and sandstone at the time: limestone for the walls, which receive texts and reliefs; sandstone for the structural elements, platform, columns, and lintels. The queen simply enforced an architectural common practice dating back to the 11th dynasty⁸, at Thebes.

¹ L. Gabolde, *Monuments décorés en bas relief aux noms de Thoutmosis II et Hatshepsout à Karnak* (MIFAO 123; Le Caire, 2005), 5–8.

² Gabolde, *Monuments décorés*, 15–16.

³ Gabolde, *Monuments décorés*, 78–80, 89–90.

⁴ Gabolde, *Monuments décorés*, 96–8.

⁵ The existence of other monuments of the regency build at Karnak–East has been recently suggested by F. Larché, *La restitution en calcaire aux trois noms de Thoutmosis II, Hatshepsout et Thoutmosis III à Karnak* (Études d'égyptologie, 21; Paris 2020), 38–9.

⁶ Gabolde, *Monuments décorés*, 129–130.

⁷ Gabolde dates the monument from the reign of Thutmose II (Gabolde, *Monuments décorés*, 100). On the contrary D. Laboury attributes the construction of the chapel to the reign of Hatshepsut (D. Laboury, 'How and why did Hatshepsut invent the image of her royal power?', in J.M. Galán, B.M. Bryan, P.F. Dorman (eds), *Creativity and innovation in the reign of Hatshepsut* (SAOC 69; Chicago, 2014), 68–70).

⁸ For example, the temple of Mentuhotep II at Deir el Bahari.

The limestone used for the construction of the regency monuments comes from Dibabiya.⁹ This quarry was already **exploited** in the 11th dynasty and provided blocks for the temples of Mentuhotep II and III in the Theban area (West Bank, Armant, Tod). In the reign of Amenemhat I, this limestone was replaced in the Theban area by Tura limestone¹⁰, still used later on by Senusert I at Karnak¹¹ or Senusert III at Medamud.¹²

The beginning of the 18th dynasty marks a return to the use of local Dibabiya limestone, previously used in the Middle Kingdom, prior to Amenemhet I. However, when Hapuseneb, mentions the *Netjery Menu*, he still speaks of a building made ‘in white stone of Anu’¹³, which normally applies to Tura limestone specifically. In the New Kingdom, this mention is no longer a reliable indication of the provenance of a stone, and it rather turns out to designate any stone of excellent quality. It may also be an attempt to link a monument to the glorious tradition of the Old and Middle Kingdoms.¹⁴ Dibabiya limestone is actually, in most instances, such an excellent, homogeneous and fine-grained material allowing carvers to **achieve** a high level of finesse in the engravings. The Dibabiya stone is also easily carried from the quarry to the temple: quarries are located close to the Nile (less than 2 km) and its northward transportation involves a c. 30 km-long downstream shipping to Thebes. Sandstone most probably came from Gebel el-Silsila, a site whose systematic exploitation **had not** yet begun in the Middle Kingdom.¹⁵

⁹ T. De Putter, C. Karlshausen, ‘Provenance et caractères distinctifs des calcaires employés dans l’architecture du Moyen et du Nouvel Empire à Karnak’, *CahKarn* 11, 2 (2003), 376.

¹⁰ C. Karlshausen, T. De Putter, ‘To build a temple in the beautiful white stone of Anu. The use of Tura limestone in Theban architecture’, in: G. Rosati, M.C. Guidotti (eds), *Proceedings of the XI International Congress of Egyptologists, Florence, Italy 23–30 August 2015* (Oxford, 2017), 308–12.

¹¹ De Putter, Karlshausen, *CahKarn* 11, 2, 377.

¹² F. Relats-Montserrat, C. Karlshausen, T. De Putter, ‘L’usage du calcaire dans l’architecture du temple de Médamoud à la lumière des autres temples thébains’, *BIFAO* 121 (forthcoming).

¹³ Statue Louvre A 134 ; *Urk* IV, 476, 7–8.

¹⁴ On the appellation ‘good white stone of Anu’ in the New Kingdom, see C. Karlshausen, T. De Putter, in: G. Rosati, M.C. Guidotti (eds), *Proceedings of the XI International Congress of Egyptologists*, 308–12.

¹⁵ M. Nilsson, A. Faraman, A. Said, ‘Some rock inscriptions from Gebel el-Silsila’, *JEA* 104 (2018), 71–9.

In the first years after her coronation, around year 7¹⁶, Hatshepsut **built** other monuments in Dibabiya limestone at Karnak. The initial location of these chapels¹⁷ and doors¹⁸ in the precinct is presently unknown as the early- and mid-18th Dynasty layout of the temple **underwent** extensive changes in the later history of the sanctuary. Hatshepsut's buildings **were** largely dismantled and re-used: for instance, Dibabiya limestone blocks bearing the coronation name of Hatshepsut (*Maatkare*) were reused under the temple of Ptah.¹⁹ South to Karnak, the construction of a temple within the Mut Precinct dates most probably from this early period also (**Fig. 1**). The building has apparently been built entirely of Dibabiya limestone, except for its platform and supporting elements (columns), which are made of sandstone.²⁰ A limestone door was built in front of the main temple platform, together with columns made of sandstone and bearing the names of Hatshepsut and Thutmose III.²¹ This porch shows no traces of Amarnian hammering and its dismantling could therefore date either from the coregency or, more probably, from the autonomous reign of Thutmose III.²²

[insert **Fig. 1**]

¹⁶ Year 7 is the date commonly accepted by most scholars following P. Dorman, *The monuments of Senenmut* (London, New York, 1988), 43–5.

¹⁷ Chapel discovered at Karnak North (L. Gabolde, V. Rondot, 'Une chapelle d'Hatshepsout réemployée à Karnak–Nord', *BIFAO* 96 (1996), 177–227), to which should probably be joined the 'Habachi' blocks now in the Karnak Open Air Museum (Gabolde, *Monuments décorés*, 141–4, 156–7).

¹⁸ Lintel fragment representing Hatshepsut in female clothing, with a cartouche '*Maatkare*' (Luxor Museum J 771, D. Laboury, in Galán, Bryan, Dorman (eds), *Creativity and innovation*, 72–3, fig. 5.20); Blocks from the 3rd pylon at Karnak (L. Gabolde, 'La cour de fêtes de Thoutmosis II à Karnak', *CahKarn* 9 (1993), 52–3; enclosure door with sandstone lintel (Gabolde, Rondot, *BIFAO* 96, 201–10).

¹⁹ C. Thiers, P. Zignani, 'The temple of Ptah at Karnak', *EA* 38 (2011), 20–4.

²⁰ R. Fazzini, 'Report on the 1983 season of excavation at the precinct of the goddess Mut', *ASAE* 70 (1985), 287–307; B. Bryan, 'Hatshepsut and cultic revelries in the New Kingdom', in J.M. Galán, B.M. Bryan, P.F. Dorman (eds), *Creativity and innovation in the reign of Hatshepsut* (SAOC 69; Chicago, 2014), 97.

²¹ Bryan, in Galán, Bryan, Dorman (eds), *Creativity and innovation*, 93–100.

²² Bryan, in Galán, Bryan, Dorman (eds), *Creativity and innovation*, 106.

Two high dignitaries mention their supervision of the constructions in the Mut Precinct, under the coregency of Hatshepsut and Thutmosis III: Senenmut²³ and Puyemre, second prophet of Amun, who, on his statue CG 910, states he has supervised the erection of monuments ‘in beautiful white stone of Anu’ for the goddess Mut.²⁴ As with Hapuseneb allegations on the *Netjery Menu*, this appellation does not anymore refer to Tura limestone as the stone used in the Mut precinct indisputably comes from Dibabiya.²⁵ Elsewhere in the Theban region, several blocks of Dibabiya limestone dating from the coregency²⁶ have been excavated in the temple of Montu at Armant.

During her regency after the death of her husband Thutmosis II and later on, in the first years of the coregency, Hatshepsut **pursued** the architectural tradition of her predecessors. However, on the West Bank, the construction of the temple of Deir el-Bahari testifies to the opening of a ‘new’²⁷ quarry, the first and only one at Thebes: it is presently known as the ‘Hatshepsut quarry’ and is located in a wadi parallel to the road leading to the Valley of the Kings.²⁸ This quarry exposes a dolomitic and relatively inhomogeneous stone, known as the ‘Qurna limestone’, of lesser quality **compared** to the Dibabiya limestone. Further, the deposit itself has a limited extension. Despite these shortcomings, the stone has been quarried and used in the nearby temple at Deir el-Bahari²⁹, where the preserved reliefs suggest that the workers draw the best of this local material. The date of the foundation of the temple is not

²³ Statue Cairo CG 579 (*Urk* IV, 409). The latter probably appears several times in the temple and in particular on the limestone door (Bryan, in Galán, Bryan, Dorman (eds), *Creativity and innovation*, 94–6).

²⁴ The nature of the building constructed is incomplete in the text. Sethe restores the term ‘doors’ (*sbAw*) (*Urk* IV, 521, 13), while Bryan sees rather the generic term of ‘monuments’ (*mnw*) (Bryan, in Galán, Bryan, Dorman (eds), *Creativity and innovation*, 96–7).

²⁵ De Putter, Karlshausen, *CahKarn* 11, 2, 374.

²⁶ S. Biston-Moulin, ‘Remplois du Nouvel Empire’, in *Ermant 2017* (Rapport de l’IFAO, 9).

²⁷ Or at least unused before, to our knowledge.

²⁸ R. Klemm, D.D. Klemm, *Stones & quarries in ancient Egypt* (London, 2008), 135–6. For the architectonic properties of this limestone (tensile strenght) see T. Dziedzic, M. Michiewicz, ‘Research of the Theban limestone: the case of Temple of Hatshepsut in Deir el-Bahari’, in L. Lichołai; B. Dębska, P. Miąsik, J. Szyszka, J. Krasoń, A. Szalacha (eds), *SOLINA 2018 – VII Conference SOLINA Sustainable Development, E3S Web of Conferences* 49 (2018), 1–9.

²⁹ De Putter, Karlshausen, *CahKarn* 11, 2, 374, 378.

precisely known. Its construction would have lasted between year 7 and year 16.³⁰ The opening of the 'Hatshepsut quarry' at Qurna has therefore taken place between the end of the regency and the start of the coregency.³¹ It constitutes a milestone in the stone supply policy of the queen and her coregent, who both commissioned a large number of temples at Thebes, including on the West Bank (see below). In a very pragmatic way, the queen's architects made use of a limestone which was never used before, to erect monuments in the immediate vicinity of the newly opened quarry.

Still on the West Bank, the coregency is marked by the construction – or possibly the renovation – of other memorial temples, dedicated to Thutmose I (*Khenemet Ankh*), Thutmose II (*Shesepet Ankh*) and Thutmose III (*Heneket Ankh*). Blocks, possibly relating to the *Kha Akhet* – a lost monument mentioned by several written sources³² – were also reused in the Ramesseum. Little subsists of these monuments, which are known by the geographic procession of the queen's Red Chapel at Karnak. This mention implies that they were still in use around the year 16, date of the construction of the chapel.³³ Scattered blocks from these monuments suggest that they were built in Qurna and Dibabiya limestone; sandstone was probably used for structural elements, as usually at the time. These monuments anyway underwent changes and enlargements in the autonomous reign of Thutmose III.

In summary, the temples constructed during the regency and the first half of Hatshepsut's coregency display a remarkable architectural homogeneity. They are built in limestone, from Dibabiya on the East Bank, from Qurna on the West Bank, with structural elements (columns, lintels, foundations) made of sandstone. With these monuments, the queen simply continued

³⁰ R. Tefnin, *La statuaire d'Hatshepsout* (Monumenta Aegyptiaca IV; Bruxelles, 1979), 56–7. Only the coronation name of the queen is mentioned in the temple (D. Laboury, *La statuaire de Thoutmosis III* (Aegyptiaca Leodiensia 5; Liège, 1998), 20.

³¹ As evidenced by the variation of the queen's titlatures on the scarabs in the temple foundation deposits (C. Roehrig, 'Foundation deposits of Hatshepsut's mortuary temple', in J.M. Galán, B.M. Bryan, P.F. Dorman (eds), *Creativity and innovation in the reign of Hatshepsut* (SAOC 69; Chicago, 2014), 154–5.

³² C. Leblanc, 'À propos du Ramesseum et de l'existence d'un monument plus ancien à son emplacement', *Memnonia* 21 (2010), 90–1.

³³ P. Lacau, H. Chevrier, *Une chapelle d'Hatshepsout à Karnak* (Le Caire, 1977), 74–5, 79–80.

the New Kingdom architectural tradition. However, she also innovated on the West Bank, with the opening of a new quarry at Qurna. This can be seen as an adequate response to a fast growing need for stone on the West Bank.

The second part of the coregency brings a major change: the queen now erects sanctuaries entirely built in sandstone. This material is now used also for the decorated walls, which had never been done before in Thebes. Two main architectural complexes belong to this phase, on both banks at Thebes: the central part of the Karnak temple (sometimes called the 'Palace of Maat') and the small temple of Medinet Habu. Additionally, the 8th pylon at Karnak³⁴ and various buildings lining the processional way between the temples of Karnak and Luxor (temple of Amun-Kamutef, bark stations) are also made of sandstone. In the absence of written source, it seems likely that the queen's architects applied the same line of reasoning to these new buildings as they previously did to the sanctuaries on the West Bank: find a new quarry with sufficient stone supply for the ambitious program of the queen. Dibabiya was probably exhausted at the time and Qurna delivers a relatively poor stone, in limited quantity. Two options were possible: bring more fine limestone from Tura, in the North or look for another upstream stone source. The available evidence suggests that the second option was favored, and that Silsila – and sandstone – were found convenient. It is worth noting that the change was probably a serious challenge for carvers, who had remarkable skills with limestone and had to adapt to the coarser-grained material.

In year 16, Hatshepsut commissioned the erection of two large granite obelisks in his father's *iounyt*, at Karnak. This project, linked to the celebration of her *sed* festival³⁵, implied major works in the temple and were the opportunity for a substantial restructuring of the temple of Karnak. The buildings built in front (i.e. to the west) of the Middle Kingdom temple, including those made by Amenhotep I, as well as the *Netjery Menu* and the 'niche monument', were all

³⁴ This sandstone pylon has a low wall of Dibabiya limestone around its perimeter. Such use of limestone in the lower part of pylons is also found in the monuments of Amenhotep III (3rd pylon at Karnak or Kom el-Heitan).

³⁵ Mentioned on the North obelisk (*Urk* IV, 359, 1). The historicity of this *sed* feast has been much debated (see for example Dorman, *The monuments of Senenmut*, 174; J. Karkowski, 'Pharaoh in the Heb-Sed Robe in Hatshepsut's Temple at Deir el-Bahari', *Et Trav* 19 (2001), 81–112).

dismantled to give way to new rooms in the central part of Karnak, and to the Red Chapel.³⁶ The precinct wall of the northern rooms dates from year 17.³⁷ With another date at year 15 for the extraction of the obelisks at Aswan³⁸, we can therefore constrain the development of the central part of Karnak temple between year 15 and 20, the last mention of the queen. Further, the construction of the ‘small temple’ at Medinet Habu, which was unfinished at the death of the queen, also dates from the second half of the coregency.³⁹ It goes probably the same for a building constructed entirely in sandstone during the coregency, at Medamud.⁴⁰

It seems thus likely that the shift from limestone to sandstone results from a major campaign of works, notably in the heart of Karnak and along the processional axis leading to Luxor, as suggested by the 8th pylon and bark stations. It is worth mentioning that little is known on the monuments dating from the early 18th Dynasty at Luxor. Sandstone blocks bearing the names of Hatshepsut and Thutmosis III and reused by Ramses II in the triple shrine⁴¹ however suggest that the queen and her successor also left their imprint there. Large limestone blocks under the bark sanctuary⁴² and under the columns of Amenhotep III in the courtyard of the temple⁴³, are in Dibabiya limestone but their date is uncertain, though obviously anterior to Amenhotep III.

³⁶ J.-F. Carlotti, ‘Modifications architecturales du ‘grand château d’Amon’ de Sésostris I^{er} à Karnak’, *Egypte Afrique & Orient* 68 (2012–2013), 37–43.

³⁷ *PM* II/2, 93.

³⁸ Texts on the North obelisk (*Urk* IV, 367, 3–5).

³⁹ U. Hölscher, *The Excavation of Medinet Habu, Volume 2: The Temples of the Eighteenth Dynasty* (OIP41; Chicago, 1939), 46; S. Biston-Moulin, ‘L’épithète HqA mAa (. t) et l’activité architecturale du début du règne autonome de Thoutmosis III’ in A. Gasse, F. Servajean, C. Thiers (éd.), *Et in Ægypto et ad Ægyptum, Recueil d’études dédiées à Jean-Claude Grenier* (CENIM 5; Montpellier, 2012), 96–7.

⁴⁰ Inv. 6683–6718 (F. Relats-Montserrat, *Les fouilles françaises de Médamoud. Synthèse historique et archéologique d’un temple thébain* (PhD thesis, Université Paris-Sorbonne, Paris, 2016, 618–26). See also, Relats-Montserrat, Karlshausen, De Putter, *BIFAO* 121, forthcoming).

⁴¹ A. Cabrol, *Les voies processionnelles de Thèbes* (OLA 97; Leuven, 2001), 519–522.

⁴² W.R. Johnson, ‘Monuments and monumental art under Amenhotep III: evolution and meaning’, in D. O’Connor, E.H. Cline (eds), *Amenhotep III. Perspectives on his reign* (Ann Arbor, 2001), 67, n. 23.

⁴³ Seen by the authors in October 1995.

The temple of Amun Kamutef and the bark station facing it, between the precinct of Amun and that of Mut, are more problematic. The foundation deposits of the bark station bear the name of Thutmosis III albeit sandstone blocks bearing the cryptogram of Maatkare, as well as a door socket with the name of the queen still in place, have been discovered.⁴⁴ Ricke suggested that the temple was founded at the beginning of the reign of Thutmosis III but built by Hatshepsut after her coronation.⁴⁵ This hypothesis implies a foundation around year 6 or 7, just before the coronation of the queen. The other buildings dating from this pivotal period (i.e. *Netjery Menu*, 'niche monument') are all built in limestone. Three hypotheses can be considered to account for these sandstone blocks at Kamutef:

- The temple was built entirely of sandstone in the early years of coregency and modified after the coronation of Hatshepsut (Ricke's hypothesis);
- A limestone building was founded by Thutmosis III at the end of the regency and built after the coronation of Hatshepsut.⁴⁶ It is then modified in sandstone under Thutmosis III;
- The whole monument was built in sandstone in the second half of the coregency and it is linked with the new emphasis put on the North-South axis on the occasion of the Opet festival. Indeed, the resting place is generally regarded as the first station of the Amun's bark mentioned in the Red Chapel.⁴⁷ The presence of foundation deposits with the names of Thutmosis III would result from a later 'appropriation' of the building by the king at the end of his reign, thanks to major transformations.

The first hypothesis seems unlikely. All the buildings of the regency years and the beginning of the coregency are made of limestone, with only a few elements of sandstone. The second hypothesis is possible but an argument rather supports the last hypothesis: the multiple hammering of the names and representations of the queen, in the temple as in the bark station, indicate that they suffered the *damnatio memoriae* of the queen at the end of the reign of Thutmosis III. With the arguments at hand, we would rather favor the hypothesis of a

⁴⁴ H. Ricke, *Das Kamutef-Heiligtum Hatshepsuts und Thutmoses' III on Karnak* (Glückstadt, 1954), 19, 24, 28.

⁴⁵ Ricke, *Das Kamutef-Heiligtum*, 21. Hypothesis followed by Dorman, *The monuments of Senenmut*, 39 and F. Schmitt, 'Les dépôts de fondation à Karnak, actes rituels de piété et de pouvoir', *CahKarn* 16 (2017), 362.

⁴⁶ The blocks of the chapel with the name of Hatshepsut discovered are made of sandstone but they are part of the top part of the walls, which does not exclude the existence of limestone walls.

⁴⁷ Cabrol, *Les voies processionnelles de Thèbes*, 514–17.

construction of the Kamutef complex in the 2nd major construction phase of the coregency, besides the inner part of Karnak temple and the 8th pylon.

Monuments of the autonomous reign of Thutmosis III

After the queen's disappearance – between years 20 and 23 – Thutmosis III proceeded to complete the monuments in the heart of Karnak (southern rooms in the central part, courtyards and central pylons).⁴⁸ He also undertook the construction of the temple of Ptah.⁴⁹ Still at Karnak, year 24 marks the foundation of the *Akhmenu*.⁵⁰ In the Mut Precinct, the king dismantled part of the limestone constructions and completed the temple by additions in sandstone.⁵¹ On the West Bank, he continued the architectural development of buildings undertaken during the coregency: his own funerary temple (*Heneket Ankh*), the memorial temples of Thutmosis I and Thutmosis II, as well as the small temple of Medinet Habu.⁵² Finally, at the end of his reign, he undertook the construction of the temple adjacent to that of the queen at Deir el-Bahari, the *Djeser Akhet*. In the rest of the Theban region, Thutmosis III also deployed an intense architectural activity at Armant, Tod and Medamud, another temple dating from the last decade of his reign.⁵³

Most of the monuments of the autonomous reign of Thutmosis III are built exclusively in sandstone but, in some instances, the same building combines sandstone and limestone. Such is the case with the *Akhmenu* at Karnak. The first three courses of the perimeter and the enclosure walls are made of Dibabiya limestone, surmounted by sandstone courses. Conversely, inside the temple, the upper walls are made of limestone, with some rooms

⁴⁸ D. Laboury, 'Royal Portrait and Ideology. Evolution and Signification of the Statuary of Thutmose III' in E. H. Cline, D. O'Connor (eds), *Thutmose III: A New Biography* (Ann Arbor, 2006), 269–71; Biston-Moulin, in Gasse, Servajean, Thiers (éd.), *Et in Ægypto et ad Ægyptum*, 82–7.

⁴⁹ Biston-Moulin, in Gasse, Servajean, Thiers (éd.), *Et in Ægypto et ad Ægyptum*, 88.

⁵⁰ Biston-Moulin, in Gasse, Servajean, Thiers (éd.), *Et in Ægypto et ad Ægyptum*, 89–92.

⁵¹ Bryan, in. Galán, Bryan, Dorman (eds), *Creativity and innovation*, 103–6.

⁵² Biston-Moulin, in Gasse, Servajean, Thiers (éd.), *Et in Ægypto et ad Ægyptum*, 94–8.

⁵³ F. Relats-Montserrat, *Les fouilles françaises de Médamoud* (PhD thesis, Université Paris-Sorbonne, Paris, 2016), 685–6.

entirely built in sandstone.⁵⁴ The same pattern is used for the construction of the temple of Montu at Medamud, erected at the end of the reign: lower parts of the building are in sandstone, decorated walls are in limestone.⁵⁵ A peculiarity of this latter temple is the exclusive use of Tura limestone, ensuring a remarkable and exclusive homogeneity with the adjacent Middle Kingdom architecture.⁵⁶

Another monument of Thutmose III at Karnak combines limestone and sandstone: the sanctuary dedicated to the goddess Ipy Uret, whose blocks were discovered under the forecourt of the temple of Opet.⁵⁷ Most of the blocks unearthed there are of sandstone, apart from a limestone door jamb and a few additional blocks in the same material.⁵⁸

Interestingly, the dedication texts of the *Akhmenu* and the temple of Ipy Uret both mention the use of the two materials. On its architraves, the *Akhmenu* is described as being sometimes in ‘beautiful white stone of Anu’⁵⁹, sometimes in sandstone.⁶⁰ Likewise, the sandstone lintel discovered in the forecourt of the Opet temple mentions the construction of a temple ‘made of Anu stone’⁶¹. In the case of the *Akhmenu*, and very probably also in the sanctuary of Ipy Uret, the limestone used came from Dibabiya⁶², despite the designation of ‘white stone of Anu’.

Another building of Thutmose III, the *Netjery Menu*, is said to be built sometimes in sandstone, sometimes in limestone. On the one hand, Hapuseneb oversaw the construction of a *Netjery*

⁵⁴ J.-F. Carlotti, *L’Akh-menou de Thoutmosis III à Karnak* (Paris, 2001), 29–30. For the origin of the limestone, see, De Putter, Karlshausen, *CahKarn* 11, 374, 376.

⁵⁵ Relats-Montserrat, Karlshausen, De Putter, *BIFAO* 121 (forthcoming).

⁵⁶ Relats-Montserrat, Karlshausen, De Putter, *BIFAO* 121 (forthcoming).

⁵⁷ D. Valbelle, E. Laroze, ‘Un sanctuaire de Thoutmosis III à la déesse Ipy Ouret édifié à Karnak par le premier prophète d’Amon Menkhéperréseneb’, *CahKarn* 13 (2010), 401–28.

⁵⁸ Valbelle, Laroze, *CahKarn* 13, 419–21.

⁵⁹ *Urk* IV 855, 17, 858, 14, 859, 3, 863, 5.

⁶⁰ *Urk* IV 856, 9, 17, 857, 7, 858, 11

⁶¹ Valbelle, Laroze, *CahKarn* 13, 410.

⁶² De Putter, Karlshausen, *CahKarn* 11, 2, 376.

Menu of Thutmosis II ‘in beautiful white stone from Anu’.⁶³ On the other hand, the ‘Text of youth’ of Thutmosis III mentions the foundation by the king himself of a *Netjery Menu* built ‘in beautiful white stone of sandstone’.⁶⁴ These texts apparently raise a double contradiction: first, on the date (Thutmosis II or III); second, on the material (limestone or sandstone). According to Gabolde, these texts actually refer to one and same building, the *Netjery Menu* built during the years of regency (year 1 to 6; see above), and the apparent contradiction of the texts is explained by the joint use of sandstone and limestone in the building, as for the *Akhmenu*.⁶⁵ There is however a difference between the first *Netjery Menu* built during the regency, and any later building of the autonomous reign of Thutmosis III: the first one is a limestone building with structural elements in sandstone while the *Akhmenu* combines courses in limestone and sandstone within the same wall. Further, the first *Netjery Menu* was dismantled in Hatshepsut’s reign (see above) and it is therefore extremely unlikely that it has been modified using a combination of stones typical of Thutmosis III’s reign. There is perhaps another explanation for the apparent contradiction in the texts. The exact location of the *Netjery Menu* is **not** given in the documents. Some scholars **locate** the initial *Netjery Menu* to the east of the temple⁶⁶, but their hypothesis is based on arguments which are not decisive.⁶⁷ Other scholars **locate it** in the central part of Karnak⁶⁸ and this location better explains the

⁶³ Statue Louvre A 134, *Urk* IV 476, 7–8.

⁶⁴ *Urk* IV 166, 7–9.

⁶⁵ Gabolde, *Monuments décorés*, 22–5.

⁶⁶ Laboury, *La statuaire de Thoutmosis III*, 551–60; Gabolde, *Monuments décorés*, 20–1, 25–6.

⁶⁷ The authors base their hypothesis on blocks bearing the names of Hatshepsut, Thutmosis II and Thutmosis III reused under the Eastern obelisk and under the *Akhmenu*, and on the existence of a recess in the enclosure wall, but none of these blocks are indisputably linked to the *Netjery Menu* (let us remind that the other blocks of this monument have been found in the ‘Cour de la Cachette’), and the recess possibly indicates the existence of a (vanished) building at this location but nothing proves that this monument was actually the *Netjery Menu*.

⁶⁸ C. Wallet-Lebrun, ‘Contribution à l’étude de l’histoire de la construction à Karnak. La substitution du grès au calcaire comme matériau de construction dans le temple d’Amon-Rê’, in M. Dewachter, A. Fouchard (éd.), *L’égyptologie et les Champollion* (Grenoble, 1994), 235–36; P. Laskowski, ‘Monumental architecture and the royal building program of Thutmose III’, in E.H. Cline, D. O’Connor (eds), *Thutmose III. A New Biography* (Ann Arbor, 2006), 186–9; F. Larché, ‘Nouvelles observations sur les monuments du Moyen et du Nouvel Empire dans la zone centrale du temple d’Amon’, *CahKarn* 12 (2008), 490–1 and, more recently F. Larché, *La restitution en calcaire aux trois noms de Thoutmosis II, Hatshepsout et Thoutmosis III à Karnak* (Études d’égyptologie; 21; Paris 2020). This location is reinforced by the presence of elements of decoration which appear only on the main axis

discrepancy of the texts: at the beginning of the regency, Hatshepsut built (or achieves) a monument in Dibabiya limestone in the central part of the temple, the *Netjery Menu*, coupled with a bark chapel built in Tura limestone. In the second half of the coregency, this sanctuary was dismantled and replaced by sandstone rooms, and the bark chapel in Tura limestone was replaced by the Red Chapel. Amun' discourse, in the 'Historical text' of the Red Chapel, commands the queen to replace the monuments 'in white stone of Anu' by buildings in sandstone and granite, and seems to correspond perfectly to the actual building activity of the queen at the heart of Karnak.⁶⁹ This architectural complex, left unfinished at the death of the queen, was 'refounded' (i.e. completed)⁷⁰ by Thutmosis III, who built southern rooms in sandstone. The apparent contradiction of the texts is here explained by the fact that the same building *was* constructed in limestone and then later replaced by a sandstone building. The coexistence of sandstone and limestone in the *Netjery Menu* thus results from diachronic construction phases and not to a deliberate use of both materials, as in the *Akhmenu*.

Memorial temples on the West Bank

The reconstitution of the monuments built under Hatshepsut and/or Thutmosis III on the West Bank is rather complex: they are poorly preserved and often known by scattered blocks; building materials (sandstone and Dibabiya limestone) are supplemented by the local Qurna limestone *already* used by the queen at Deir el-Bahari. Monuments are listed below in decreasing order of the abundance of architectural remains.

of the temple (see C. Karlshausen, 'L'ombre du dieu à la porte du temple: šwt nTr comme image et matériel de culte', in F. Doyen, R. Preys, A. Quertinmont (éd.), *Sur le chemin du Mouseion d'Alexandrie. Études offertes à Marie-Cécile Bruwier* (CENIM 19; Montpellier, 2018), 165–6.

⁶⁹ Lacau, Chevrier, *Une chapelle d'Hatshepsout à Karnak*, 124–9. The monuments in 'white stone of Anu' can refer to the 12th dynasty temple but also to the *Netjery Menu*, described as such by Hapuseneb and of course to the bark chapel of Thutmosis II/Hatshepsut, which is actually in Tura limestone.

⁷⁰ On a dedicace lintel of the Red Chapel, Thutmosis III is said to be the builder of the *Netjery Menu* (Lacau, Chevrier, *Une chapelle d'Hatshepsout à Karnak*, 258–63). For the reallocation of Hatshepsut's buildings to Thutmosis III at the beginning of his autonomous reign, see Laboury, in Cline, O'Connor (eds), *Thutmose III*, 269–71.

The funerary temple of Thutmose III (*Heneket Ankh*), built during the coregency, is made of two materials: Qurna limestone for the main bark chapel; and sandstone for the ceilings, adjacent rooms and the additions of the autonomous reign of the king.⁷¹ It seems likely that the construction of the limestone building started at the opening of the Qurna quarry, around year 7, simultaneously to the construction of the queen's temple at Deir el-Bahari (*Djeser Djeseru*). Both sanctuaries share a comparable 3-terraces structure.⁷² By contrast, the sandstone rooms of the *Heneket Ankh* could date from the second half of the coregency and the autonomous reign of Thutmose III.⁷³

Other memorial temples probably existed on the West Bank, prior to Hatshepsut's reign but they are not known. Temples by Thutmose I and II are generally regarded as memorial temples, which were not built in the reign of these rulers. However, it is not impossible that these kings started the erection of these monuments in their lifetime.

Near Medinet Habu, the memorial temple of Thutmose II (*Shesepet Ankh*) was possibly built after the king's death, during the coregency of Hatshepsut and Thutmose III.⁷⁴ This monument is entirely made of limestone, on sandstone foundations⁷⁵, and hence probably dates from the first half of the coregency, between year 7 and year 16. The temple underwent several modifications which are hardly dated. It seems however likely that Thutmose III made modifications and enlargements of the temple⁷⁶, under his autonomous reign. During the

⁷¹ M. Seco Álvarez, A. Radwan et al., 'First season of the Egyptian-Spanish project at the funerary temple of Thutmose III in Luxor', *ASAE* 84 (2010), 29–30, 35.

⁷² M. Seco Álvarez, 'Excavations in the 'temple of millions of years' of Thutmose III', in G. Rosati, M.C. Guidotti (eds), *Proceedings of the XI International Congress of Egyptologists, Florence, Italy 23–30 August 2015* (Oxford, 2017), 581.

⁷³ An *ostrakon* mentions works at the temple in year 49 of Thutmose III (W.C. Hayes, 'A Selection of Tuthmoside Ostraca from Dēr El-Bahri', *JEA* 46 (1960), 47–8, n° 21, pl. XIII).

⁷⁴ L. Gabolde, 'Les temples 'mémoriaux' de Thoutmosis II et Toutânkhamon (un rituel destiné à des statues sur barques)', *BIFAO* 89 (1989), 128–139; Gabolde, *Monuments décorés*, 175–6.

⁷⁵ Sandstone for pavement, ceiling, columns and an enclosure door, limestone for foundations and walls (B. Bruyère, *Rapport sur les fouilles de Deir el-Medineh 1926. Sondage au temple de Thotmès II (Hat ankh shesepet)* (FIFAO IV, 4; Le Caire, 1952), 32–33).

⁷⁶ Bruyère, *Rapport sur les fouilles de Deir el-Medineh 1926*, 31; Gabolde, *BIFAO* 89, 176.

excavation of the monument, Bruyère **noted** the presence of two different limestones: a hard and homogeneous limestone looking comparable to the stone ‘which comes from the quarries located north of the Valley of the Kings’⁷⁷, and another limestone ‘of poorest quality’. For Robichon and Varille, the temple has been built in ‘good’ limestone under Thutmosis II and later reworked in ‘poor’ limestone under Thutmosis III.⁷⁸ From the blocks still in place, it appears that there are indeed two different limestones: a compact limestone and a powdery one (**Fig. 2**). However, the compact (i.e. ‘good’) limestone is not, as stated by Bruyère, the limestone found in the Hatshepsut’s quarry but rather Dibabiya limestone, while the ‘poor’ limestone is actually the Qurna limestone. From the evidence at hand in other monuments, we initially proposed that Hatshepsut used, in her initial project, a stone of reputed good quality (i.e. Dibabiya limestone) and that Thutmosis III enlarged the monument with ‘poor’ limestone taken from the Qurna quarry.⁷⁹ However, a closer look at the spatial-temporal distribution of monuments dating from the reign of Hatshepsut, suggests that the only stone used by the queen, on this bank, is the Qurna limestone. It is the case at Deir el-Bahari and also in the *Heneket Ankh* (see above). In this context, the presence of Dibabiya limestone in the *Shesepet Ankh* looks awkward and has to find an explanation. Two possible explanations are: the building reuses blocks dating from the Middle Kingdom⁸⁰ or from a first state of the temple, built under Thutmosis II; or the Dibabiya monument results from a later construction phase, most probably attributable to Thutmosis III in his autonomous reign. In the absence of convincing arguments for the reuse of blocks, we rather favor the 2nd hypothesis, especially as Dibabiya limestone is also the main material of the temple of Thutmosis III (*Djeser Akhet*) at Deir el-Bahari (see below).

[Insert **Fig. 2**]

⁷⁷ Bruyère, *Rapport sur les fouilles de Deir el-Medineh* 1926, 33.

⁷⁸ C. Robichon, A. Varille, *Le temple du scribe royal Amenhotep fils de Hapou* (FIFA 11; Le Caire, 1936), 32.

⁷⁹ T. De Putter, C. Karlshausen, C. Dupuis, ‘Les blocs en calcaire remployés au Ramesseum et l’utilisation du calcaire sur la rive ouest de Thèbes au Nouvel Empire’, *Memnonia* 24 (2013), 89.

⁸⁰ No traces of previous decoration were found on the blocks, but we know that there must have been a monument of the 11th dynasty in the vicinity of the temple of Thutmosis II (Dibabiya limestone blocks were reused in the small temple of Medinet Habu. See Hölscher, *The Excavation of Medinet Habu*, 2, 4–6). This is the only limestone used in the 11th dynasty in Thebes (De Putter, Karlshausen, *CahKarn* 11, 2, 381).

The memorial temple of Thutmosis I makes use of the same three materials: Qurna and Dibabiya limestone, and sandstone. The blocks of this building were discovered in the 1970s by Barakat, north to the temple of Thutmosis III (*Heneket Ankh*).⁸¹ The author identified this building with the *Kha Akhet* known from written sources. However, more recently, Iwaszczuk discovered another block from this temple in the storeroom of tomb MMA 828, and this new document mentions the name *Khenemet Ankh*.⁸² As with the memorial temple erected for Thutmosis II, the monument was built during the coregency, in limestone with structural parts in sandstone.⁸³ It also underwent later modifications, and the name of Hatshepsut was erased and replaced by that of her husband Thutmosis II⁸⁴, by Thutmosis III. Iwaszczuk further mentions the existence of two varieties of limestones.⁸⁵ According to this author, none of the blocks would be in Qurna limestone but one of the materials resembles the limestone used in the *Djeser Akhet* (which is, as we will see, Dibabiya limestone). Published figures seemingly support this statement but the absence of Qurna limestone in this sanctuary would be surprising, as the queen used this stone quite systematically in her other monuments of the West Bank. Waiting for an opportunity to examine this material, we propose that this temple had an architectural history similar to that of the temple of Thutmosis II: built in Qurna limestone and sandstone (for the structural parts) under the coregency, and later modified in Dibabiya limestone under the autonomous reign of Thutmosis III.

The Thutmoside blocks discovered in the Ramesseum are a third example of the combined use of two different limestones and sandstone, on the West Bank. Numerous limestone and sandstone blocks with the names of Hatshepsut and Thutmosis III were discovered under the temple of Ramses II.⁸⁶ Leblanc proposes to identify the monument they come from to the *Kha*

⁸¹ B.A. el-Ayn, 'The temple of kha'-'Akhet in Western Thebes', *MDAIK* 2537 (1981), 29–33.

⁸² J. Iwaszczuk, 'Unique Temple of Thutmose I', *Annual Reports. PAN* 2011, 23.

⁸³ J. Iwaszczuk, 'The Temple of Thutmosis I rediscovered', *PAM* 21 (2012), 275.

⁸⁴ Iwaszczuk, *PAM* 21, 271–273.

⁸⁵ Iwaszczuk, *PAM* 21, 270–271.

⁸⁶ C. Leblanc, 'À propos du Ramesseum et de l'existence d'un monument plus ancien à son emplacement', *Memnonia* 21 (2010), 68–108, pl. VI–LVII; De Putter, Karlshausen, Dupuis, *Memnonia* 24, 81–90. Limestone blocks in the name of the queen have also been discovered reused in the nearby temple of Merenptah. They

Akhet, mentioned on a block of the Ramesseum.⁸⁷ The blocks bearing the name of Hatshepsut, originating from the temple kitchen sector (STB–STD), are all made of Qurna limestone.⁸⁸ Dibabiya limestone blocks, though without cartouche, have also been discovered in several areas. The structural elements (lintels, columns, door jambs, slabs), with the names of Hatshepsut and Thutmosis III, were mostly made of sandstone. The queen is said to be ‘loved by Amun of *Djeser Djeseru*’ on a foundation pebble discovered in the excavated material of the Ramesseum.⁸⁹ If the pebble actually refers to the temple built by the queen under/before the Ramesseum, this sanctuary was thus posterior to the construction of the queen's temple at Deir el-Bahari.

The *Djeser Akhet*, built under Thutmosis III at Deir el-Bahari, is the last large monument to be considered in this section. As with the other Thutmoside temples on the West Bank, sandstone is used for the structural elements and for some chambers, and limestone is used for the walls.⁹⁰ Several *ostraca* discovered under the access road to the temple mention works at the temple in years 43 and 49, which allows dating its construction from the end of the autonomous reign of the king.⁹¹ Some *ostraca* further mention stones used for the construction of the temple. Unfortunately, none specifies the nature of the stone used, nor a precise source (quarry). The *ostrakon* Berlin P 10615 mentions works in year 43, ‘to the west side in the *Djeser Menu*’ (another name for the *Djeser Akhet*⁹²), and ‘bringing stones from the

may belong to the same temple (S. Bickel, *Untersuchungen im Totentempel des Merenptah. III. Tore und andere wiederwendete Bauteile Amenophis' III* (Stuttgart, 1997), 159–61, pl. 52).

⁸⁷ Block STE-267. For Leblanc's arguments in favor of the *Kha Akhet*, see C. Leblanc, *Memnonia* 21, 101–5.

⁸⁸ De Putter, Karlshausen, Dupuis, *Memnonia* 24, 87.

⁸⁹ C. Leblanc, *Memnonia* 21, 87–90.

⁹⁰ J. Lipińska, ‘The architectural design of the temple of Tuthmosis III at Deir el-Bahari’, *MDAIK* 25 (1969), 85–9; J. Lipińska, *Deir el-Bahari II. The temple of Tuthmosis III. Architecture* (Varsovie, 1977), 13–4.

⁹¹ Hayes, *JEA* 46, 43–52; J. Lipińska, ‘Names and History of the Sanctuaries Built by Tuthmosis III at Deir el-Bahri’, *JEA* 53 (1967), 27; J. Wiercińska, ‘The change of dimensions of the bark of Amon in the light of recent studies on the temple of Tuthmosis III at Deir el-Bahari’, in M. Dolińska, H. Beinlich (Hrsg.), 8. *Ägyptologische Tempeltagung: interconnections between temples. Warschau, 22.–25. September 2008* (KSG 3, 3; Wiesbaden, 2010), 223–5.

⁹² For this designation as another name for *Djeser Akhet*, see among others Wiercińska, in Dolińska, Beinlich (Hrsg.), 8. *Ägyptologische Tempeltagung*, 224.

mountain'.⁹³ For Helck, the 'west side' refers to the West Bank.⁹⁴ For Hayes, it is rather the west side of the temple, namely the artificial platform made from roughly dressed stones.⁹⁵ In the latter case, bringing stones 'from the mountain' makes sense. Another *ostraca*, dated from years 44 and 45, just mentions the delivery of 'stones' (*inr*)⁹⁶, sometimes designed as 'white stone (*inr hD*) for the *mi*'.⁹⁷ This last name is only attested on two *ostraca* and would designate, according to Hayes, a part of the temple.⁹⁸ The terms *inr hD* are not conclusive as they apply to limestone but also to sandstone.⁹⁹ The text however refers to 'white' stone (as indicated by the epithet *hD*) and thus probably also to 'fine' stone, to be used in visible parts of the monument (reliefs).

The limestone used in the *Djeser Akhet* comes from Dibabiya¹⁰⁰ (**Fig. 3**), although some blocks of Qurna limestone, reused from the nearby temple of Hatshepsut, also exist.¹⁰¹ As with the *Shesepet Ankh* of Thutmosis II, Thutmosis III makes use, in his *Djeser Akhet*, of a limestone which differs from the material used in the nearby temple of Hatshepsut. This may result from various circumstances/options: a depletion of the small quarry at Qurna; a reuse of blocks from a preexisting Middle Kingdom monument; or a deliberate choice to depart from the queen's options. The reuse of Middle Kingdom blocks is not unlikely as Mentuhotep's temple is just nearby. However, a temple entirely built with reused blocks is not probable, especially as there are no traces of reuse on the preserved blocks. The latter hypothesis is all the more plausible as the construction of the *Djeser Akhet* coincides with the **initiation** of the queen's

⁹³ *Urk IV 1374*, 10.

⁹⁴ W. Helck, *Urkunden der 18. Dynastie. Übersetzung zu den Heften 17–22* (Berlin, 1961), 67, n° 414.

⁹⁵ Hayes, *JEA* 46, 51. For this platform, see Lipińska, *Deir el-Bahari II*, 14–15.

⁹⁶ Hayes, *JEA* 46, 43–52 (*ostrakon* 16–21); *Ostrakon Gardiner 51* (J. Cerny, A.H. Gardiner, *Hieratic Ostraca* (Oxford, 1957), pl. 56,5).

⁹⁷ *Ostrakon* 16–17 (Hayes, *JEA* 46, 43–44).

⁹⁸ Hayes, *JEA* 46, 44.

⁹⁹ J.R. Harris, *Lexicographical studies in ancient Egyptian minerals* (Berlin, 1961), 69, 71.

¹⁰⁰ We are grateful to M. Dolińska, who has confirmed this origin, and provided conclusive pictures.

¹⁰¹ Blocks from the temple of Hatshepsut were discovered in the masonry of the walls bordering the causeway of the temple of Thutmosis III and under the latter (Lipińska, *Deir el-Bahari II*, 24; Laboury, in Cline, O'Connor (eds), *Thutmose III*, 283, n. 19).

damnatio memoriae.¹⁰² The use of Dibabiya limestone by the king would thus result from a deliberate return to the canonic (i.e. pre-Hatshepsut) tradition, referring explicitly to the older 'classical' pattern prevailing in the Middle Kingdom and in the beginning of the 18th dynasty. This option is however costly, as it requires the transportation and use of a variety of limestone virtually absent on the West Bank since the 12th Dynasty.

[insert **Fig. 3**]

Further thoughts on the limestone-to-sandstone shift

The **diminishing reserves of stone** in the Dibabiya quarry, which has been in use since the 11th Dynasty, is a likely reason for the shift to sandstone in the second half of the Hatshepsut–Thutmose III coregency.¹⁰³ The ambitious architectural program of the two rulers made it unavoidable to look for an alternative source of fine-grained stone to erect the planned monuments – and this was Silsila, and sandstone. The evidence suggests that Hatshepsut made use of other alternative sources of stone, such as the Qurna quarry, on the West Bank. This limestone was however used in the immediate vicinity of the quarry, by the queen only. For any reason, Thutmose III never used it in his monuments.¹⁰⁴

¹⁰² Lipińska, *Deir el-Bahari II*, 62; Dorman, *The monuments of Senenmut*, 8, 65; Laboury, in Cline, O'Connor (eds), *Thutmose III*, 263.

¹⁰³ T. De Putter, C. Karlshausen, 'Provenance du calcaire de l'architecture thoutmoside à Thèbes', *GM* 142 (1994), 103–7.

¹⁰⁴ A new quarry was opened in the wadi under Amenhotep III for the construction of doors and cover basement of pylons in Kom el-Heitan but the tonnages extracted remain limited and the limestone used is much more inhomogeneous than the limestone used under Hatshepsut (S. Bickel, *Tore und andere wiederverwendete Bauteile Amenophis' III* (BÄBA 16; Stuttgart, 1997), 15–29, S. Nishimoto, S. Yoshimura, J. Kondo, 'Hieratic inscriptions from the quarry at Qurna: an interim report', *BMSAES* 1 (2002), 20–31).

Another reason for this change has been suggested by C. Wallet-Lebrun.¹⁰⁵ She analyzes a passage from the ‘Historical Text’ of the Red Chapel (blocks 285 + 24¹⁰⁶), in which Amun commands Hatshepsut to carry out work in his temple:

Irt kAt nn sXt Hr m rWDt m mAT kmt

Hwt nTr.i wHm n.s mswt m inr HD nfr n anw mAw

smnX n m-xt m kAt. Tn

Doing work without respite, in sandstone and black granite

As for my temple, renew for it its construction in beautiful white stone of Anu, again

Improving it in the future by this work¹⁰⁷

Wallet-Lebrun offers the following translation: ‘proceed to the complete repair of its (current) structures in beautiful white limestone, ensuring the future with the aforementioned materials’.¹⁰⁸

The text therefore suggests the replacement of the existing limestone structures with more resistant sandstone buildings. As it is carved on a monument dating from the second half of the coregency, it is an important document for our concern. Wallet-Lebrun goes further in her interpretation, however. According to the author, it seems likely that the architects considered that sandstone was more solid than limestone, notably in flooded temples¹⁰⁹ –

¹⁰⁵ C. Wallet-Lebrun, ‘Contribution à l’étude de l’histoire de la construction de Karnak. La substitution du grès au calcaire comme matériau de construction dans le temple d’Amon-Rê, in M. Dewachter, A. Fouchard (éd.), *L’égyptologie et les Champollion* (Grenoble, 1994), 223–34.

¹⁰⁶ Lacau, Chevrier, *Une chapelle d’Hatshepsout à Karnak*, 124–9.

¹⁰⁷ Author’s translation.

¹⁰⁸ Wallet-Lebrun in M. Dewachter, A. Fouchard (éd.), *L’égyptologie et les Champollion*, 228–29. This translation is followed by L. Gabolde: “<and concerning> my temple <it shall be> made anew for it what had (previously) been created in beautiful white limestone. <It shall be> made for the future something perfect of this work’ (L. Gabolde, ‘Hatshepsut at Karnak: a woman under god’s command’, in J.M. Galán, B.M. Bryan, P.F. Dorman (eds), *Creativity and innovation in the reign of Hatshepsut* (SAOC 69; Chicago, 2014), 42, 44). Renewal of the limestone structures can be an allusion to the structures of the Middle Kingdom (in Tura limestone) as well as those of the first half of the 18th dynasty (see above the discussion on the *Netjery Menu*).

¹⁰⁹ Wallet-Lebrun in M. Dewachter, A. Fouchard (éd.), *L’égyptologie et les Champollion*, 231–232.

which could explain its use in foundations and structural elements at Karnak. In such a case, sandstone actually 'ensured the future'. This hypothesis is not fully convincing, for two reasons: first, sandstone is more porous than limestone (which was however most likely unknown in the 18th Dynasty); second, this material was used also for structural parts of monuments which were less subject to seasonal flooding than the Amun temple at Karnak, as Medinet Habu.

It is likely that both supply issues and a desire to find a more robust material accounted for the abandonment of limestone in the Theban architecture. An abundant stone supply was needed in order to enforce and materialize the development of processional feasts in the queen's reign.¹¹⁰ The Opet feast is not attested before Hatshepsut's reign and it is very likely that the queen was the founder of this festival. Further, the multiplication of processional ways and constructions along them, leading to Luxor and Medinet Habu temples¹¹¹ (two sanctuaries which probably pre-existed), places a strong emphasis on the divine exits and builds a sacred perimeter which will persist during the whole New Kingdom.

All-in-all, a less anarchic use of materials than it seems

At first glance, the monuments constructed in the Theban region during the reigns of Hatshepsut and Thutmose III make a somewhat chaotic use of materials. Local limestone, Dababiya limestone and sandstone have all been used, sometimes concomitantly and without any apparent architectural logic. However, the interpretation of the use of stone is complicated by the fact that the architectural program of the two rulers is huge; and that these monuments were often remodeled, soon after their construction, either by Hatshepsut herself (as in Karnak) or by Thutmose III, in his autonomous reign (Karnak, West Bank). A careful examination of these monuments, of the stone used and of the possible reuses,

¹¹⁰ C. Karlshausen, *L'iconographie de la barque processionnelle divine en Égypte au Nouvel Empire* (OLA 182; Leuven, 2009), 312–13.

¹¹¹ For a discussion of the origin of Theban sacred geography in the Middle Kingdom, see M. Ullman, 'Thebes: origins of a ritual landscape', in P.F. Dorman, B.M. Bryan, *Sacred Space and Sacred Function in Ancient Thebes* (SAOC 61; Chicago, 2007), 3–25.

however reveals an internal logic, based on technical constraints and/or on ideological developments. Below, we review these monuments along a chronological sequence:

- During the short period of **regency**, at the death of Thutmosis II, Hatshepsut initiated a limited series of works at Karnak, where she perpetuated the architectural tradition of her predecessors. The Dibabiya limestone quarry, located some 30 km south to Thebes, provides a fine-grained limestone, **already** exploited in the Middle Kingdom and easily shipped downstream to Luxor (quarries and temples are located close to the river). Sandstone, a material which was used in structural parts of monuments from the 11th Dynasty onwards at Thebes, was exploited at Gebel el-Silsila.¹¹²
- **Around year 7**, Hatshepsut ascended the throne, establishing with the young Thutmosis III a co-regency that will last until the death of the queen, around the year 20. At the time of her coronation, towards year 7 or soon after, the queen **planned** a series of major architectural works, mostly on the West Bank. Her first major monument on this bank is her own 'temple of millions of years' at Deir el-Bahari, the *Djeser Djeseru*. In order to find a convenient source of stone in the vicinity of the temple, the queen **commissioned** the opening of a quarry near Qurna, in a wadi located east to Deir el-Bahari. The high quality of the reliefs in the *Djeser Djeseru* suggests that this quarry anyhow provided significant quantities of a reasonably fine-grained stone, even though the material found today in the quarry is of significantly lesser quality than the Dibabiya stone. More monuments were built in Qurna limestone, during the first half of the coregency: the memorial temples of

¹¹² An interesting observation was recently made at Gebel el-Silsila: limestone blocks inscribed with the names of Hatshepsut and Thutmosis III were found, in the immediate vicinity of the sandstone quarries (See M. Nilsson, J. Ward, 'Gebel el-Silsila through the ages, part 3: Thutmosid activity', *Ancient Egypt: the history, people and culture of the Nile valley* 115 (2019), 14–23). This suggests that even near a sandstone quarry, the "limestone reliefs on sandstone structural elements' pattern was enforced in a Thutmoside sanctuary, which implies either the upstream shipping of limestone blocks or the alleged use of a 'local limestone' from the nearby Fatira village (pers. comm. J. Ward, see also J.A. Harrell, New Discoveries in Ancient Limestone Quarries at Fatira, Hatnub and Tura-Masara, in: *The 68th annual meeting of the American Research Center in Egypt*, April 21–23, 2017, Kansas City (Abstract Booklet), 49, where this information is given in one sentence only (detailed published information on this limestone occurrence is needed). This use of limestone is all the more surprising as further south monuments from the beginning of Hatshepsut's reign in Elephantine are built in sandstone.

Thutmose I (*Khenemet Ankh*), of Thutmose II (*Shesepet Ankh*), of Thutmose III (*Heneket Ankh*), and a sanctuary which is perhaps the *Kha Akhet*, on the site of the future Ramesseum. The use of Qurna limestone under Hatshepsut remains strictly limited to the West Bank of Thebes. Anywhere else (temple of Mut, Armant), the queen **used** the Dibabiya limestone. In the absence of other arguments, it is likely that the use of Qurna limestone on the West Bank was mostly based on pragmatic elements, such as the vicinity of the quarry and the supply of good quality limestone, in reasonable quantity.

- A significant event of the reign, the celebration of a *heb sed*, occurs **around year 16**. On this occasion, the queen **planned** major changes in the heart of Karnak temple: obelisks **were** erected in the *wadjyt*; the northern rooms of the central part of Karnak and a new resting place for the bark of Amun, the Red Chapel (which possibly **replaced** a pre-existing chapel in Tura limestone), **were** built. Besides these works in the East–West axis, further monuments **were** built along the North-South axis: the 8th pylon; the temple of Amun Kamutef; and bark chapels lining the processional way to Luxor. These buildings create a monumental scenography for the Opet Festival, probably initiated by the queen. On the West Bank, a small temple, relating to the processions of Amun Kamutef, **was** built at Medinet Habu. In order to carry out this vast architectural program, the queen had to consider the issue of stone supply. Dibabiya probably came to an end and Qurna was no more than a local supply for temples built on the West Bank. Tura limestone was an alternative option but the evidence suggests that it was sandstone from Gebel Silsila which was found convenient. Indeed, the Silsila quarries supplied large quantities of a homogeneous material which was easily shipped northward, and possibly regarded as more durable than limestone (although this is not proved). Anyway, in the second half of Hatshepsut's reign, limestone is replaced by sandstone in Thebes, and this probably involved an adaptation period, notably for carvers who had gained remarkable skills with fine-grained limestone.
- After the queen's death, **around year 20**, Thutmose III **pursued** the constructions left unfinished in the heart of the temple of Karnak, in the temple of Amun Kamutef and the temple of Mut, on the East Bank; in the memorial temples and in the small temple at Medinet Habu, on the West Bank. The king further **deployed** an intense building activity in

the Montu temples of the Theban area, at Armant, Tôd and Medamud. Most of these temples are now, quite logically, built in sandstone. However, in some monuments, limestone unexpectedly reappears under the autonomous reign of Thutmosis III. On the East Bank, Dibabiya limestone is used in the upper part of the walls in the *Akhmenu*, at Karnak while Tura limestone is used in the upper part of the walls in the Montu temple at Medamud. On the West Bank, Dibabiya limestone is also used to complete memorial temples of Thutmosis I and II, and for the king's *Djeser Akhet* at Deir el-Bahari (its last significant use on both banks). Visually, the use of a combination of sandstone and limestone raised little issue, as walls were prepared with a white coating. Practically, the use of Dibabiya limestone on the West Bank however seems a curious option: indeed there was still a local stone supply source in the Qurna quarry, as demonstrated by later activity under Amenhotep III; further, sandstone could have been used in the memorial and funerary temples as it was at Medinet Habu. As the option favored by the king are counterintuitive and not supported by pragmatic arguments (as under Hatshepsut's reign, with the opening of the Qurna quarry), ideological arguments must be considered. It is not unlikely that the eviction of the Qurna limestone testifies to a king's desire to avoid the use of a material closely associated with Hatshepsut. Further, his return to the 'canonic' Dibabiya limestone, already used in the Middle Kingdom monuments built on the West Bank or in those built by the first kings of the 18th dynasty (Amenhotep I, Thutmosis I, Thutmosis II) on the East Bank, possibly materializes a will to re-connect to a pre-Hatshepsut architectural tradition still visible today in the memorial temples of Mentuhotep II, Thutmosis I and of his own father, Thutmosis II.

A careful study of the use of stone in the Theban monuments of Hatshepsut and Thutmosis III leaves us with both answers and challenges.

The reign of Hatshepsut seems dominated by pragmatic options regarding the selection of stone, including the opportunistic use of local limestone supply sources on the West Bank, and a shift from sandstone to limestone when the amplitude of architectural projects commanded. It is further quite clear that these options/changes were connected to major architectural projects, in turn linked to salient events in the reign (coronation, *heb sed*).

By contrast, the reign of Thutmosis III does not allow such a straightforward interpretation. Indeed, pragmatic arguments only do not account for the use of stone in his monuments on

the West Bank, or at Medamud. On the West Bank, the king makes use of Dibabiya limestone, unused there for centuries. At Medamud, the king rebuilds the temple in Tura limestone, another variety of stone unused in the Theban area since the Middle Kingdom (safe for a 18th Dynasty bark chapel at Karnak). In both instances, Thutmosis III obviously selects non-pragmatic options which are possibly motivated by a wish to refer to prestigious rulers of the Middle Kingdom, Mentuhotep II on the West Bank, and Senusret III at Medamud.

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Competing interests

The authors declare no competing interests

Figure captions

Fig. 1: remains of the limestone temple of the Thutmoside period in the Mut precinct. The stone used comes from the Dibabiya quarry (photo C. Karlshausen).

Fig. 2: blocks of the memorial temple of Thutmosis II, northeast to Medinet Habu. The large block on the right is made of Dibabiya limestone, the others of Qurna limestone (photo C. Karlshausen).

Fig. 3: Dibabiya limestone block coming from the *Djeser Akhet* (photo courtesy Zbigniew Dolinski).

Appendix – summary of the monuments mentioned in the text

Buildings of the regency/coregency	Datation	Main material	Reference/material identification
Thebes-East. Karnak. <i>Netjery menu</i> and ‘niche monument’	Regency of Hatshepsut (year 1–7)	Dibabiya limestone	CahKarn 11
Thebes-East. Karnak. ‘Habachi monument’ + Karnak-North chapel	End of the regency, modified during the coregency (year 7–8)	Dibabiya limestone	Author’s identification
Thebes-East. Karnak. Mut temple	Coregency (year 7–20)	Dibabiya limestone	CahKarn 11
Armant. Montu temple	Coregency (year 7–16)	Dibabiya limestone	Author’s identification
Thebes-West. Deir el-Bahari (<i>Djeser Djeseru</i>)	Coregency (year 7–20)	Qurna limestone	CahKarn 11

Thebes-West. Memorial temple of Thutmosis I (<i>Khenemet Ankh</i>)	Coregency (year 7–20)	Qurna limestone	To be confirmed
Thebes-West. Memorial temple of Thutmosis II (<i>Shesepet Ankh</i>)	Coregency (year 7–20)	Qurna limestone	Author's identification
Thebes-West. Temple of Thutmosis III (<i>Heneket Ankh</i>)	Coregency (year 7–20)	Qurna limestone	Author's identification
Thebes-East. Karnak, central part, (northern rooms)	Second part of the coregency (year 15–20)	Sandstone	Author's identification
Thebes-East. Karnak. North-South axis (8 th pylon, Temple of Amun Kamutef and bark stations)	Second part of the coregency (year 15–20)	Sandstone	Author's identification
Thebes-West. Medinet Habu. Small temple	Second part of the coregency (year 15–20)	Sandstone	Author's identification
Medamud, temple of Montu	Second part of the coregency	Sandstone	Author's identification

Buildings of Thutmosis III	Datation	Main material	Reference/material identification
Thebes-East. Karnak, central part (southern rooms), 7 th pylon	Year 21–24	Sandstone	Author's identification
Thebes-East. Karnak. Temple of Ptah	Year 21–23	Sandstone	Author's identification
Thebes-East. Karnak. <i>Akhmenu</i>	Year 24–30	Sandstone and Dibabiya limestone	CahKarn 11
Thebes-East. Karnak. Temple of Mut	Year 21 and later	Sandstone	Author's identification
Thebes-East. Karnak. Temple of Amun-Kamutef	Year 21 and later	Sandstone	Author's identification
Armant. Temple of Montu	Year 21 and later	Sandstone	Author's identification
Thebes-West. Temple <i>Heneket Ankh</i>	Year 21 and later	Sandstone. Still under construction in the last years of the reign (year 43)	Author's identification
Thebes-West. Memorial temple of Thutmosis I (<i>Khenemet Ankh</i>)	Year 21 and later	Modifications in Dibabiya limestone of a temple initially in Qurna limestone?	To be confirmed

Thebes-West. Memorial temple of Thutmosis II (<i>Shesepet Ankh</i>)	Year 21 and later	Modifications in Dibabiya limestone of a temple initially in Qurna limestone?	Author's identification
Thebes-West. Medinet Habu. Bark chapel of the small temple	Year 21 and later	Sandstone	Author's identification
Thebes-West. <i>Djeser Akhet</i>	Year 43–49	Sandstone and Dibabiya limestone	Author's identification
Medamud	Year 41–49	Sandstone and Tura limestone	Forthcoming BIFAO paper

Scattered blocks	Datation	Main material	Reference/material identification
Thebes-East. Karnak. Blocks under the temple of Ptah	Coregency (year 7–20)	Dibabiya limestone	Author's identification
Thebes-East. Karnak. Blocks from the temple of Ipet	Coregency ?	Sandstone with mention of a limestone monument	To be confirmed
Thebes-West. Ramesseum and temple of Merenptah	Coregency (year 7–20)	Dibabiya limestone, Qurna limestone and sandstone	Memnonia 24