MASONRY

The third dynasty represents a transitional episode in the history of acquiring building material. The introduction of stone into a mainly sundried mud brick material for construction began a little earlier and in a few buildings dating to the 2nd dynasty. Furthermore a royal tomb at Umm el Giaab was paved with granite slabs. Stone sources are accessible and transportation by barges on the river enabled the ancient Egyptians to achieve their monumental wonders. There are large blocks and megaliths from far away quarries are found at 2 burial chambers and unidentified limestone megaliths at the *sed* festival court of the step pyramid complex. A magnificent burial chamber at Mastaba 17 at Meidum was entirely built of limestone megaliths. The robber's trench at the layer monument of Seila has partly exposed 2 large blocks at an eccentric passion; this is the only existence of megaliths at the layer monuments. The main construction material was collected locally loose or from the top layers of the bed rock. By the 4th dynasty the ancient builders found their way to the quarries flanking the Nile valley and were able to distinguish the variety of their quality. In one example at the pyramid complex of Khafra we see 3 types of construction on the 3 sides of the temenus wall. Collected stone from the surface crust, on the west side, nicely quarried limestone of regular size on the south side and megaliths on the north side.

At the layer monuments the types of masonry, building techniques and architecture, are typical of the third dynasty. The masonry is mainly supplied from thin beds of lime and sand stone, but some of these monuments were supplied with unshaped granite boulders and concretions. Some layer monuments were built on unlevelled bedrock at Elephantine, el Kula and on hard conglomerate at Seila. Others were built on roughly levelled desert surface at el Ghenimiya, Nubt, Sinki and Hebenu.

The site of Seila had an embankment to create an artificial terrace on the east side. Their architecture is composed of accretion layers, thus I have used the descriptive term "layer monuments". The exposed sides of these layers were ashlars for an outer facing. Generally 2 types of mortar were used: clay for the nucleus and gypsum for the outer facing.

The mud brick open court Shunet el Zibib dating to Khasekhemwy of the second dynasty at Abydos

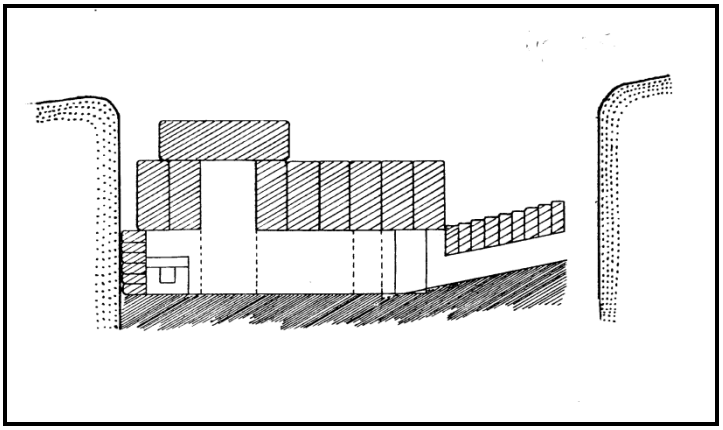
From tumuli of piled up small stones collected from the desert surface during the early Old Kingdom (Naqada, Nubt)

The step pyramid and other 3rd dynasty buildings at Saqqara are built of limestone blocks quarried from the east side of the plateau. These quarries are visible all along

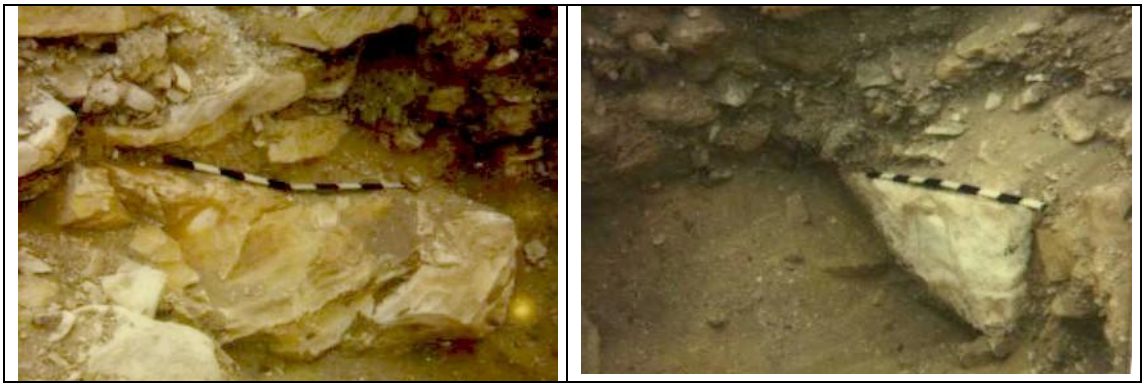
Brick masonry at mastaba K1 at Beit Khallaf

The phases of the Meidum pyramid project: in the fore ground are the blocks added to complete the true pyramid form over 2 successive step pyramids one imbedded in the other. In the background are two kinds of building: the outer facing of the mentioned step pyramids, exposed parts of their nuclei and a breach; in it one sees that the masonry was dry, with no mortar. This masonry was set neatly in horizontal courses.

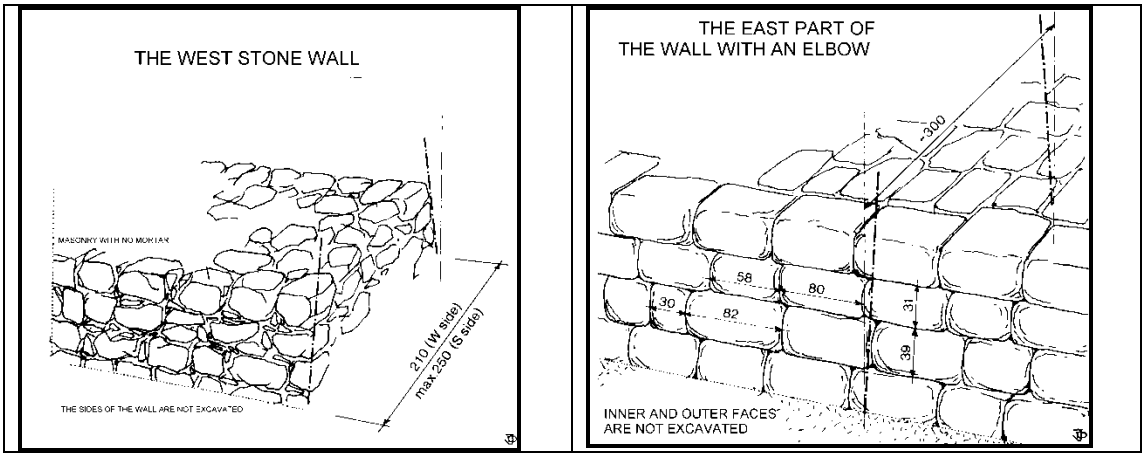
The nearby mastaba 17 was composed of a stepped rectangular nucleus of limestone chippings remaining from the builders of the Meidum pyramid builders and a brick embankment surrounding it. Building nuclei with dry chippings and small stones reappears during the 6th dynasty in the time of Pepi II. Outstanding are the gigantic limestone blocks of the burial chamber and a granite sarcophagus which may be the earliest of its kind



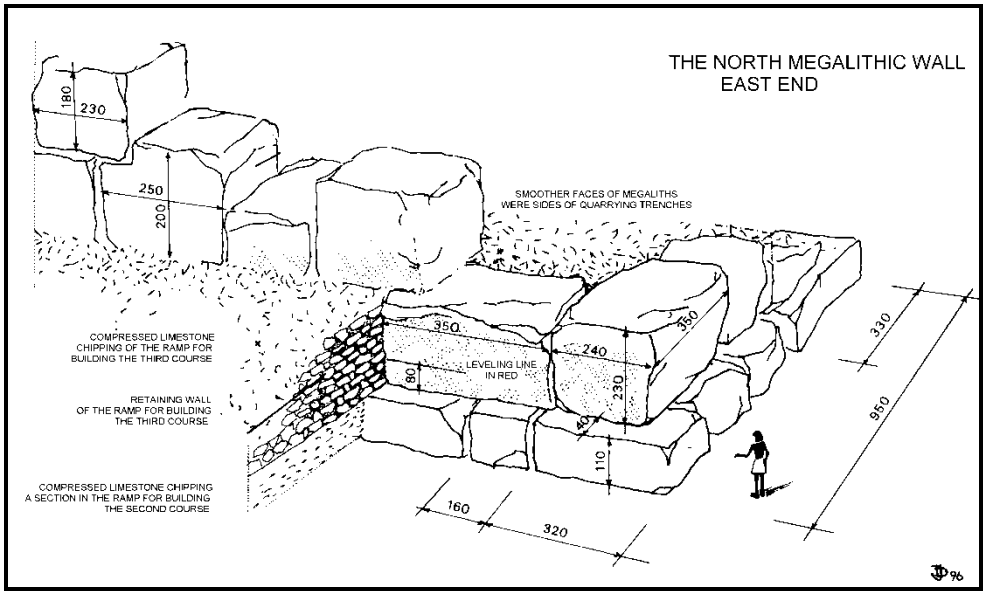
The burial chamber under mastaba 17



Two megaliths at the bobber's trench at Seila



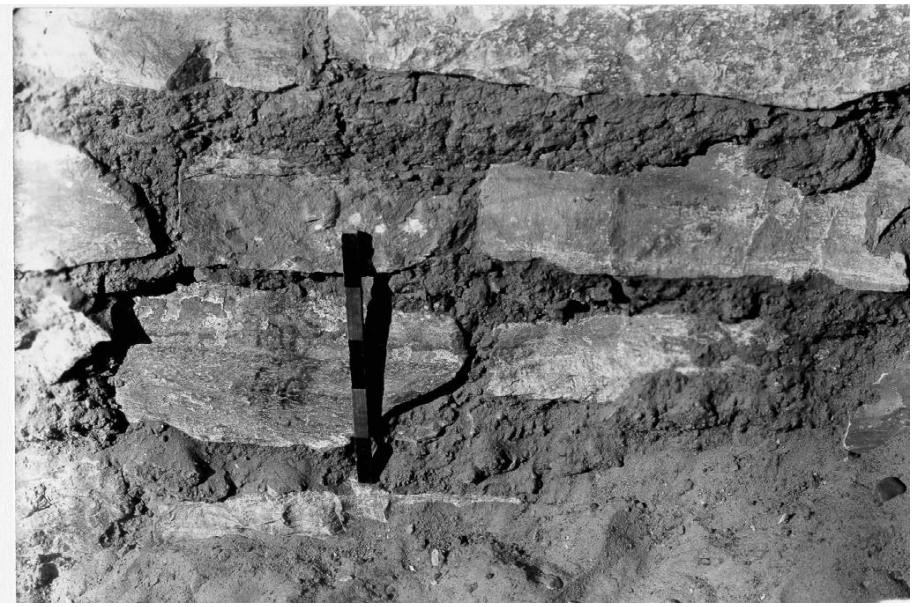
Several examples at the temenus wall of the pyramid complex of Khafra



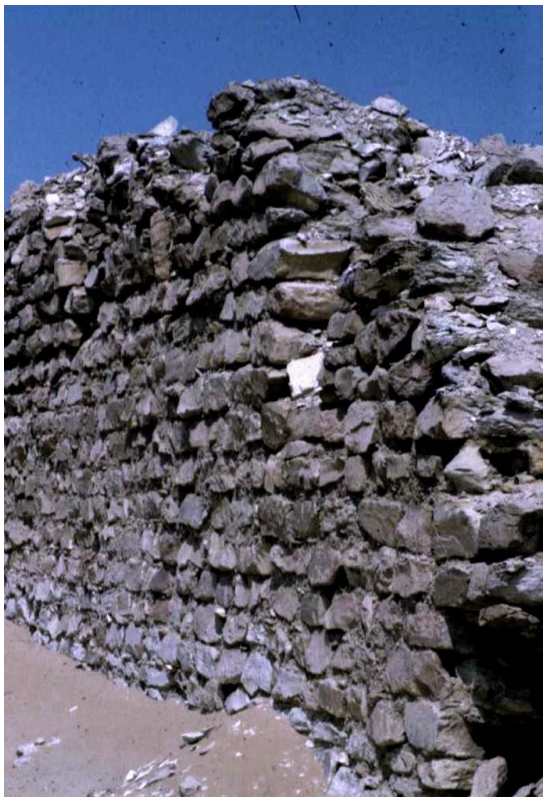
Including the noth megalithic construction of the temenus wall. Thus representing live examples of selction of masonry

Megaliths of several tons Quarried and transported during the 4th dynasty (See lower corner of Queen of Menkura, G3b) at the upper temple of Khafra is a block weighing 400 tons

Some examples of third Dynasty masonry



At Gisr el Modir, limestone from thin beds were disengaged by crow bars and set in rough courses where great quantities of mortar can be seen



We see the same at the north constructions within the step pyramid complex at Saqqara

And at an exposed part at the northwest corner of the complex of Sekhemkhet

SEILA was built of locally quarried limestone also. The nucleus blocks were quarried form the western Eocene limestone, 1.5 km, downhill. The blocks came from beds projecting out of the hill side. They were disengaged by drilling biggish holes through the projecting tongues followed by a heavy blow. The beds of masonry of the whole monument were inclined backwards.

Seila was built from these limestone formations several kilometres away at *Djebel el Rus* to the west

The blocks at Seila were disengaged by drilling large holes through the projecting tongs and applying a heavy blow to separate the block

HEBENU was built of quarried limestone and selected concretions from the slopes of the nearby plateau. Mud and clay mortar was used in great quantities. The beds of masonry are inclined backwards. It preserves a few courses of its fine outer facing. Vertical lines of erosion caused by rain can be seen on it all around.

Millions of concretions are engaged in the limestone formations or laying loose of the desert slopes flanking the Nile valley in Middle Egypt

Concretions were selected for size from the cliffs overlooking the Nile valley in Middle Egypt and used at Hebenu. The courses are laid horizontally showing more skilled builders

SINKI used irregular concretions; the largest reached l.6 x 0.6 x 0.4 meters in size and had a weight of 500 kilograms at most. The regular limestone blocks were much smaller and would weigh 75-100 kilograms.
The courses are of an average of 0.30-0.35 meters high, with a small irregularity in their levelling of 0.10 - 0.15 meters. The beds of masonry are inclined backwards.
A clay mortar was thickly applied filling in big gaps between the blocks and over the inclined courses.

Concretions were selected for size from the cliffs overlooking the Nile valley in Middle Egypt and used at Sinki

NUBT was built of quarried limestone and selected concretions from the slopes of the nearby plateau. Mud and clay mortar was used in great quantities. The beds of masonry are inclined backwards.

Concretions were selected for size from the cliffs overlooking the Nile valley in Middle Egypt and used at Nubt

EL KULA was built of limestone quarried locally from the surface bed rock surrounding the monument, mud and clay mortar was used in great quantities. The beds of masonry are inclined backwards.

Beds of thin limestone from the immediate site of el Kula were built with the same skill seen at Hebenu

EL GHENIMIYA was built of sandstone quarried locally; mud and clay mortar was used in great quantities. This is the only pyramid to be built of sand stone in ancient Egypt. The beds of masonry are inclined backwards.

Blocks quarried from thin beds of sandstone at el Ghenimiya

ELEPHANTINE was built of quarried and selected granite boulders; mud and clay mortar was used in great quantities. This is the only pyramid to be totally built of granite in ancient Egypt. The beds of masonry are inclined backwards.

Granite boulders were selected from the surrounding area by size for building Elephantine

From the above mentioned it is quite evident that the masonry of the layer monuments places them at an early date of building in stone before megaliths appeared/