

APPENDIX D

RECONSTRUCTION OF BUILDING OPERATIONS AT THE TEMPLE OF CHEPHREN

DR. HOELSCHER, after describing the marks and the excisions found by him in the floors and the stones of the Chephren temple, bases on these marks two reconstructions of building operations so different from those described in Chap. V of this book, that I feel obliged to discuss them in detail. The three suppositions are as follows:

- (1) That the Chephren masons used a sort of metal-shod wooden tongs drawn upwards and lifting the dead weight of the block of granite in order to set it in place in the wall.
- (2) That the Chephren masons used a simple wheel pulley.
- (3) That the raising of monoliths was accomplished by means of a wooden platform.

The evidence cited for the use of tongs¹ consists of:

- (a) A series of holes in the pavement under the front edge of granite casing similar to those at the Mycerinus pyramid temple and a series of holes under the back edges of the same.
Comment: The second series of holes which Dr. Hoelscher assigned to the granite are actually, as shown by his detailed plan (Blatt XVIII), under the front edge of the limestone core and were lever holds for adjusting the core stones just as the front series were for adjusting the granite casing blocks. The theory of the tongs requires that the holes of the two series should be opposite each other, while as a fact they are seldom or never opposite.
- (b) Holes on the backs of the granite blocks and bosses on the front afforded holds for the tongs.
Comment: Evidence is actually given of only one hole low down on one side (front?) near the end of a block. The idea of the bosses was, I think, taken from the granite casing of the Third Pyramid. Now of all the stones of the pyramid casing handled by us, not one had bosses suitable for such a grip or had holes on the back or sides. Nor did a single one of the black granite blocks found in the Mycerinus pyramid temple have bosses sufficient for the use of tongs or any holes whatever. Moreover, the hollowing of the core-wall to take the rough back of the stone in the Mycerinus pyramid temple made the use of tongs as described quite impossible.

Thus the theory of the use of tongs is in reality not justified even by the evidence at the Chephren temples and is flatly contradicted by the evidence of the Mycerinus temple. It may be added that the lifting of a dead weight of 5 to 7 tons of granite by the use presumably of simple wheel-pulleys and a scaffolding is not worked out by Dr. Hoelscher beyond a single rope attached to the tongs, and certainly presents difficulties too great to appear plausible, in the face of the actual evidence.

For the use of the simple wheel-pulley, no evidence whatever is adduced. This pulley merely changes the direction of the pull exerted, and I would be willing to admit that the Egyptians may have used a granite beam with polished grooves for changing the direction of the pull.

The scaffolding which Dr. Hoelscher reconstructs was based on a very regular system of holes in the foundation floor around the twelve statues in the upper court of the Chephren pyramid temple. Now there can be no doubt that these holes were used to take the upright posts of a wooden scaffolding. The question arises whether they were used to erect the statues or for some other purpose:

- (a) The statues were probably erected after the construction of the granite wall against which they stood with the back plate of the statue in a niche in the wall; a bearing stone with polished and greased grooves set on top of this wall would have served the purpose of changing the direction of the pull as well as one attached to a scaffolding. If the statues were erected first, the wall further west must, in any case, have already been in place and would have served equally well for setting the bearing stone.
- (b) The sockets in the floor show that the monolithic statues were erected in the same manner as the monolithic pillars — (1) tilted to an angle of 35°–45° with the front end resting on the front edge of the socket, and (2) then pulled over, revolving on that edge. The fact that the Chephren sockets have no slopes would not materially affect the operation. Of course the use of a construction plane is not excluded.
- (c) The statues were certainly in an unfinished state when erected, probably not further advanced than our statue V (see Statues).
- (d) Scaffolding is known to have been used by the sculptors in working on the finishing stages of large statues.² The finishing of these large statues, requiring months of labor, demands the use of scaffolding.

It is for these reasons that I have felt compelled to reject Dr. Hoelscher's ingenious reconstructions mentioned above. They seem to me in themselves impossible, and all the holes which gave rise to them can be explained logically and clearly by the use of levers, ropes, man-power, and sculptors' scaffolding; things which are beyond doubt.

¹ See Hoelscher, *Chephren*, pp. 74–76, Ills. 62–67.

² See Newberry, *Rekhmara*, Pl. XX.