

FROM SMALL QUARRIES TO LARGE TEMPLES – THE ENIGMATIC SOURCE OF LIMESTONE FOR THE APOLLO TEMPLE AT DIDYMA, W-ANATOLIA

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The temple of Apollo at Didyma, W-Anatolia, ranks among the largest buildings of the Greek world. Characteristically, marble was it's most obvious building material which was both quarried relatively near-by and imported. Less conspicuous but equally important for project planning and construction, however, were the large quantities of limestone used as dimension stones for the foundation and for the cores of the walls — not to speak of the other buildings within the sanctuary. The foundation alone required an estimated volume of more than 10.000 m³ or 27.000 tons.

Past and present scholars agree that this white to cream-coloured, dense, locally cavernous, marine limestone, has been mined from the Milesian Peninsula, i.e. the territory surrounding Didyma and belonging to the ancient city of Miletus. However, the question where precisely the limestone had been quarried has hardly been posed so far. The existence of a few small and isolated ancient quarries in the southern part of the peninsula has been acknowledged already by the beginning of this century. However, the volume of limestone used at Didyma does by far exceed the output of these comparatively minute quarries. Moreover, large Hellenistic tombs in the vicinity built from the same material prove an additional demand by other projects as well. Thus, the mass equation of the volume of limestone used at Didyma versus the volume of the few known quarries obviously does not balance.

The limestones of the Milesian Peninsula are of Upper Miocene and Lower Pliocene age and occur as up to 1.5 m thick strata in an interbedded sequence of limestone, marl, conglomerate and rare tuffaceous layers. The units are nearly flat lying, dipping slightly south with less than 5°. Since the natural fracture pattern of the limestone beds is more or less orthogonal the beds break up naturally into regularly shaped blocks. So, by their geological conditions the thicker beds form ideal raw blocks with sizes generally between 1.4 x 1.0 x 0.8 m and 1.4 x 1.2 x 1.3 m suitable as dimension stones for the temple. These beds cover large parts of the peninsula appearing right at the surface or immediately below the shallow soil cover.

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That the opportunity of using these natural raw blocks for building activities has indeed been taken, becomes obvious from the piles of limestone flakes, often with adjacent shallow pits, dispersed over large areas of the limestone plateaus. Generally, the pits are less than 3 m deep and do not exceed a diameter of 10 m. The associated piles of flakes occur either in a crude half-moon shape, partly surrounding the pits, or as linear embankments stretching locally to more than 100 m length. The piles and banks are up to 2 m high and consist predominantly of man-made limestone flakes displaying distinctive chipped surfaces with dimensions generally not exceeding 20 x 12 x 7 cm. Thus the leftovers from the first rough-hewing of stone are clearly distinguishable from walls or banks created by the collection of impudent rocks from cultivated fields. The piles and banks hardly rise above the height of the surrounding vegetation and are thus a rather inconspicuous morphological feature although bare of both soil and vegetation. However, aerial photography reveals that large parts of the limestone plateaus are covered by these features. Moreover, it shows two characteristic distribution patterns: (i) irregularly scattered small circular pits with half-moon shaped flake piles and (ii) grids of regularly spaced rows of piles and/or banks resulting from more systematic quarrying. Ensuing topographic features are either 'moon-landscapes' from irregular pitting or fields of relatively naked rock surfaces surrounded by flake banks, both worthless for farming.

The limestone plateaus surrounding Didyma have thus been used extensively for the mining of raw blocks by means as simple as they are efficient. After exposing the rock surface individual blocks could be extracted with simple levers. Subsequently, to reduce weight, the raw blocks were shaped roughly into dimension stones immediately adjacent to the small pits with the limestone flakes being left behind as waste piles. The blocks could then be transported to the respective building site.