

Lessons learned? The conversion of the Ostian forum in Hadrianic times

Traces of catastrophe resilience measurements in the construction of the main forum and the so-called Capitolium

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Cities of Roman civilisation by their specific topographic location and individual outline were frequently victim of certain catastrophes as the implication of political counter measurements seem to be a reaction to these events. One of the best known laws in this regard is represented in the Augustan obligation for the construction of insulae not to exceed 70 roman feet height in order to prevent fire from getting out of control. The re-affirmation of this law by Nero and Trajan points to the constant thread of fire in dense cities. Besides the implementation of this law it is possible to identify constants in construction techniques and diachronic insistence of buildings within the archaeological record of Ostia's forum that have survived only with slight modifications until today. Their intentional usage therefore seems to be logical consequence out of already made experience concerning natural and human caused catastrophes.

Naturally, all kinds of catastrophes have been known already for centuries, but the human reaction and behaviour towards it seemed to remain the same as people saw them as religious phenomenon and acting by the gods (Sonnabend 1999, 4566; 109110). Despite that, a classification of the strength of earthquakes is transmitted through Pausanias descriptions from the 2nd century A.D. and he also refers to the resilience of the building and the attacking points in a building where the earthquake sets the object in to motion (Sonnabend 1999, 111113). How and in what extend this knowledge found its application in ancient and specifically roman architecture is a question that formed itself to be in a process of answering until today (Guidoboni 1994, 5455).

If only the known catastrophes from the first century A.D. are taken as background information for the urbanistic conversion of Ostia and Portus - that certainly was initiated by the construction of the Trajanic harbour and incorporated the complete city of Ostia in order to produce enough storage room in anticipation to a growing capacity for incoming ships and cargo and a monumentalization of the forum finally in Hadrianic times -, the fact that the so called Capitolium temple is still preserved with a considerable height of roughly 17m should be enough argument for the application of such knowledge. The second constant intervenes in the same manner like the first, the general construction of the temple out of mortar with a brick facing; it is a layer made of lime/mortar with stone fillings (ital.: calcestruzzo) that was found in several spots during the archaeological works on the northern forum plaza (Pavolini 2018, 103). This preparation layer dating to Hadrianic times certainly served as a level raising measurement, not only to cover older forum structures, but also to prevent floodings of the near running Tiber and seems to be as resistant that it was several times reused to bear the

marble pavements of several centuries until today. Both, the temple and the calcestruzzo survived several natural and human made catastrophes as there are partly still today the traces visible proving this fact. Despite the archaeological evidence it has been denied for a long time that earthquakes brought damage to the ancient city of Ostia. This is caused by absence of such information in ancient literature and epigraphical sources. Furthermore, the explanation is to be found in the fact, that for a certain time archaeology in Ostia wasn't sensitized for typical appearance of earthquake damage. And even more importantly, it is to realize that archaeologist of the 19th and 20th century had destroyed easy visible earthquake evidence, as for example the folded (wavy) pavement of the north-eastern forum portico was removed without proper recording in favour of deeper excavation. The marble floor was later than reconstructed and naturally appears today with a flat outline. Of its typically by earthquakes caused condition *in situ* only a photograph taken during excavations in 1913 is bringing the evidence. Luckily, among the porticos with partly well preserved marble floors only the eastern one was part of the deep excavation in the forum area (Gering 2018, 191192). As a consequence, the Ostia Forum Project was able with surface cleaning and punctual excavation to continue the archaeological work in the forum porticos where the former excavations had left it. In the years 2009-2013 a lot of repairing traces were uncovered and proved several consolidation measurements undoubtedly as consequence of earthquakes and other catastrophes (Gering 2018, 213222; Gering 2011). Additionally, of high energy events, such as tsunamis that are caused by marine earthquakes, were evenly sediments found in Ostia (Vött et al. 2020) and the city's underground is known to be very vulnerable for movement through seismic activity (Pecchioli 2022, Marra et al. 2022).

With regard to the so-called Capitolium temple there are no ancient repairs in the pavements traceable. But, inside the high podium that forms the substructure and fundament for the cella with a pronaos (prostylos esastylos) consisting of 10 columns of Pavonazzetto marble the floor made of opus spiccatum is to be found as folded, just like the analogy from the forum already has shown it. Indeed, several repairs of the marble décor, incrustation and revetment of the temple were detected during the campaigns of the Ostia Forum Projekt from 2019 until today. Furthermore, a reinforcement of the podium with brick arches and a conversion of the statue podium inside the cella are to be found. With the help of historical documentation it appears clear that the temple kept a functional roof and parts of its cornices for a long time and that the major damage was caused by humans disassembling the parts they could reach easily.

For both cases, the temple and the forum porticos it became clear that easy maintenance with relatively small effort on a resistant ground during antiquity made it very difficult for the former excavators to identify the dating and the phases of the monuments.

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