

# *Tiburinus lapis*

## The use of travertine in Ostia

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### 1. INTRODUCTION

In the summer of 1999 a team of nine students<sup>1</sup> and the present writers measured and inventoried travertine building elements and non-architectural objects in Ostia, its cemeteries outside the *Porta Romana* and the *Porta Laurentina*, and in *Isola Sacra*. With the use of dBase III+, more than 3000 objects were marked on maps and registered, including the dates of buildings as proposed by G. Calza and others in *Scavi di Ostia I* (1953), P. Pensabene (1972), Thea Heres (1982), C. Pavolini (1983) and I. Baldassare (1996).

Travertine was used for stairs, thresholds (more than 1200), doorposts, lintels, door- and windowframes, foundation stones, substructures, stereobate, tomb walls, corner and pillar bases, buttresses,<sup>2</sup> bases, columns, capitals (Pensabene 1972), capital-cushions (It. *cunei/pulvini*), pillars, buffer stones (on the corners of buildings), corbels (consoles), springers, corner- (on the frontal corners of doorways or pillars) and bar stones (centralized at the inside of doorways or pillars to fix doorbars), keystones, floors, latrine seats, benches, gutters, small sluice pillars in drainage-channels, intramural blocks, pavings, sidewalks, curbstones, and centralized blocks in basalt streets.

Travertine was also used in non-architectural elements such as *cippi* (e.g. boundary stones), inscribed (usually funerary) panels, well mouths, *putealia*, small altars, socles for statues, reliefs, pounding blocks, weights,<sup>3</sup> and rectangular containers for ash urns.

### 2. WRITTEN SOURCES

Vitruvius defined travertine (Lat. *Tiburinus lapis*) as a middle-hard stone from the region of Tibur (modern Tivoli), able to withstand damage from heavy loads and bad weather, but susceptible to fire damage because of its dry and porous character (*De Arch.* 2, 7, 1-2):

*Tiburtina (sc. saxa) vero et quae eodem genere sunt omnia, sufferunt et ab oneribus et a tempestatibus iniurias, sed ab igni non possunt esse tuta.....*

Pliny (*N.H.* 36, 48, 167) gives similar information:

*Tiburtini (sc. lapides), ad reliqua fortes, vapore dissiliunt.*

(Travertine is split by heat, though it stands up to the other forces). He adds that when Cicero saw the marble walls of the Chians, which were meant as a show piece for their visitors, he remarked: 'I should be much more amazed if you had made it of stone from Tibur.' According to Strabo (*Geogr.* 5, 3, 11) travertine was easily transported by the Anio, a navigable river which flows into the Tiber. The references to travertine in the literary sources are very scarce. It is clear that Vitruvius and Pliny mention travertine because of its load bearing ability. Nowhere, however, do they discuss its use in buildings or any of its other functions. As we shall see, travertine was not only used for support.

### 3. QUARRIES

Roman age travertine quarries are located west of Tivoli 2.5 km from Tenuta del Barco, between Tenuta Martellone and the Tivoli Mountains.<sup>4</sup> In antiquity travertine blocks were transported by carriage over twenty-two kilometers to Rome on a road 6.5 m wide.

Travertine is a calcareous sedimentary rock. Hot springs deposited it in layers on the ground during the Quaternary period of the Middle Pleistocene

<sup>1</sup> Rebecca van de Berg (bases), Vincent Deurwaarder (corner-stones), Bart Corver (centralized streetslabs), Guiot C. Dürmeijer (thresholds with relief), Carl J.A. van Hees (columns), Giseke R.M. Hopstaken (thresholds without relief), Eric Norde (corbels), Gerdine M. de Rooij (staircases), Marloes P.H. van der Sommen (sidewalks) and some volunteers. Preliminary bibliographical research on travertine in ancient Rome was done by David Murray (Bowdoin College, USA). He and drs Gwen Tolud corrected the English text. Many thanks to all, and especially to Mrs. Dr A. Gallina Zevi, *Soprintendente di Ostia Antica*, who gave permission to the research and offered unforgettable hospitality. Thanks also to dottori Bedello, Belfiore, Germoni, Izzi, Marinucci, Miraglia, Panariti, Pellegrino, Vallocchia (*Sopr. Ostia Antica*). The research did not include *Palazzo Imperiale* which will be published by dr Joanne Spurza (New York; see *ArchLaz* 10 (1990) 157-163). All photographs have been made by the authors.

<sup>2</sup> Rickman 1971, 60, pl. 32.

<sup>3</sup> *CIL* XIV, suppl. I, 5316, 1, 4.

<sup>4</sup> Mari 1984, 359-370.



Fig. 1. Two boundary cippi, *Decumanus Maximus* (II.9.2)

Latial volcanism. The formation process involves a crystallization of calcium carbonate ( $\text{CaCO}_3$ ) from water containing calcium bicarbonate ( $\text{Ca}(\text{HCO}_3)_2$ ) while carbon dioxide ( $\text{CO}_2$ ) is released. This is a process comparable to the growth of stalactites and stalagmites. When first quarried travertine is soft, but as it dries it becomes more sturdy. The layers mentioned above vary in height from 45 to 60 cm. In Roman times cubic blocks with sides ranging from 120 to 180 cm were sawn from the rock. According to Lanciani the Romans would have transported c. 5.5 million tons of travertine to Rome. For the *Amphitheatrum Flavium* alone c. 1000 tons were transported daily by c. 150 carriages during a period of four years.

#### 4. TRAVERTINE IN OSTIA

The use of travertine in Ostia raises many questions:

1. When was it first used?
2. How long was it used?
3. When was it popular and why?
4. How was it used and in which context? What are the reasons for its use?

5. Is the use of travertine functional, decorative or both? Has it been a status-symbol?
6. Did it replace the more expensive marble?
7. Was there any standardization of building elements?

There is no evidence for the use of travertine in Ostia's earliest settlement, the so-called *Castrum*, which was recently dated to the end of the fourth or the beginning of the third century B.C. Travertine also fails to appear in the oldest known *domus* at Ostia, built after the second Punic War and before the period of Sulla.<sup>5</sup>

The oldest non-architectural objects may be six boundary stones (*cippi*), standing in one line along the northern side of the eastern *Decumanus*, between *Via dei Molini* and a place just to the east of the *Porta Romana*, one of the three main entrances of the so-called Sullan wall.<sup>6</sup> They stand c. 600 m (c. 2000 Roman feet) apart from one another at irregular intervals, more than one metre below the level of the street, which was raised in the period of

<sup>5</sup> See A. Martin, in: Gallina Zevi/Claridge (1996) 19-38.

<sup>6</sup> Meiggs 1973, 32, 472, 594. *NSc* 1910, 233.





Fig. 2. Temple of the Round Altar, interior (I.xv.6)

Domitian. They show identical inscriptions (fig. 1, to the right):

C.CANINIVS.C.F.  
PR. VRB  
DE.SEN.SENT  
POPLIC.IOVDIC

which means that Gaius Caninius, son of Gaius, *pr(aetor) urb(anus)*, based on a decision of the Senate, ordained that the area between the *cippi* and the Tiber was public, this means forbidden for private building (*CIL* XIV 4702). This (*ager*) *poplicus* (*publicus*) was later restricted by another travertine boundary stone, put directly beside the 5th Caninius stone (on the east), bearing the inscription (fig. 1, to the left):

PRIVATVM  
AD TIBERIM  
VSQUE AD  
AQUAM

which means: private area to the Tiber just to the water (*CIL* 4703). The Caninius *cippi* date from c. 150 to c. 80 B.C. Scholars disagree on a more specific date for the *cippi*, but travertine was first used at Rome in 109 B.C. in the Mulvian bridge.<sup>7</sup> So the date of the *cippi* may be restricted between c. 109 and 80 B.C.

The northern bank of the Tiber, now '*fiume morto*', had at least five travertine boundary stones, placed by C. Antistius Vetus and other *curatores riparum et alvei Tiberis* (surveyors over the banks and bedding of the Tiber). G. Barbieri dates them after 23 A.D., the year in which Antistius became consul.<sup>8</sup> Other early boundary stones have been found in the Sanctuary of the Four Republican Temples in reg. II (77 x 24 cm). The four *cippi* bear the inscription *I.O.M.S. (Iovi Optimo Maximo sacrum)* (*CIL* XIV 4292). They have been dated to the period between Caesar and Claudius.<sup>9</sup>

Another two exceptional *cippi* have been found to the west of the *horrea* (V, i, 2) which date to about 50 A.D. Both have the same inscription: SEMITA HOR P R I (cross-road/path of the *horrea*; the meaning of the unique abbreviation P R I is unknown).<sup>10</sup>

<sup>7</sup> J.B. Ward Perkins, *EAA* IV (1961) 864-5. About the *privatum-cippus*, see Meiggs 1973, 472.

<sup>8</sup> Meiggs 1973, 115, 594. *SO* I, 62.

<sup>9</sup> Meiggs 1973, 346.

<sup>10</sup> Bakker 1994, 197-8; Bakker (ed.) 1999, 113. Bakker suggests: '*principium regionis* I', or '*primae regionis initium*.' *CIL* XIV, 352 confirms that Ostia had at least 5 regiones. R.E.A Palmer



Fig. 3. Detail of threshold (IV.i.9)

Thus they mention the only name we know of an Ostian by-way, which runs north-south from the eastern *Decumanus* meeting the southern *Cardo Maximus* not far from the *Porta Laurentina*.

As for the funerary use of *cippi*, the tombs in the cemetery outside *Porta Laurentina* offer the most interesting examples. Standing in front of tombs, they are rounded on top and they mention the names of the deceased. The cemetery can be dated roughly from the end of the Republican period to the end of the first century A.D. As an alternative, inscribed panels inserted into the facade, have also been used. Travertine panels frequently occur in the cemetery outside *Porta Romana*, usually mentioning the name of the deceased and the measures of the front and sides (in Roman *pedes*) of the tomb.<sup>11</sup> Most tombs can be dated between the period of Augustus and c. 100 A.D. Marble panels are rare here. A socle of travertine inscribed with the words *Herculi Hermogeniano Sacrum* and dating to about 50 A.D. was found at a short distance from the Tomb of Hermogenes.<sup>12</sup>

It should be noted that in *Isola Sacra*, which was in use mainly during the second century A.D., travertine *cippi* are completely absent and only marble inscriptions occur.

This implies that c. 100 A.D. there must have been a shift from travertine to marble panels.

The oldest travertine building elements are visible in the monumental Temple of Hercules (I.xv.5), which R. Meiggs dates to the closing years of the second century B.C.<sup>13</sup> The temple's *terminus ante quem* is c. 70 B.C., which is the latest possible date for the famous haruspex-relief, one of the marble ex-votos found near the temple. The two steps of the *crepidoma* on the sides and on the back, and the eight wide steps of the stairs on the front are of travertine. The rest of the exterior of the podium has been built in *opus quasi-reticulatum*. To the south-west of the Hercules temple, in the triangular area, stands the so-called Temple of the Round Altar, which also may date to the first century. On a lower level, just in front of the temple and partially under it, three reused blocks of travertine flank a tufa altar (now replaced by modern copies). They bear Greek inscriptions<sup>14</sup> and were originally used as statue socles. Zevi dates them to the period of Sulla.<sup>15</sup> In order to be transported from Greece to Ostia, the three statues were removed from their original socles and were replaced with new travertine socles inscribed with their original texts once they reached Ostia. In the Augustan period, the threshold and doorposts at the entrance of the temple were restored to marble. However, for the substructure of the threshold, travertine was used. The threshold's ends are distinctly raised (fig. 2) like separate side blocks, a phenomenon occurring frequently in later centuries (fig. 3). Even in the fourth century A.D. travertine side-blocks flanked marble thresholds. Other Republican temples do not show travertine elements probably because they underwent modifications during the Imperial period.

Of particular interest are the remains of a Sullan *domus* behind the (later) *Sede degli Augustali*. The peristyle has slender Tuscan columns of tufa, but the columns on the four corners are travertine.<sup>16</sup> A similar phenomenon of aesthetic corner accentuation is

(JRA 1996) suggests: *pri(vata)*. F. Coarelli suggests: '*populi Romani iussu*'.

<sup>11</sup> Funerary inscriptions on travertine *cippi* or panels from Ostia are mentioned in *CIL* XIV, 707, 717, 718, 978, 1094, 1120, 1301, 1387, 1477, 1477a, 1685, 1757, 1871; *CIL* XIV, *Suppl.* I, 4287, 4494, 4778 (?), 4874, 4881, 4882, 4893, 4919, 4921, 4938, 5034, 5099, 5170, 5182, 5228.

<sup>12</sup> Meiggs 1973, 350. *CIL* XIV, 4287.

<sup>13</sup> Meiggs 1973, 581-2. Zevi 1976, 54.

<sup>14</sup> W. Helbig, *Führer* IV (1972), nr. 3388.

<sup>15</sup> Zevi 1976, 60.

<sup>16</sup> *SO* I, 111.





Fig. 4. *Horrea of Hortensius* (V.xii.1)

visible in the Claudian *Horrea of Hortensius* (fig. 4).<sup>17</sup> It was evidently a tradition which lasted more than a century.

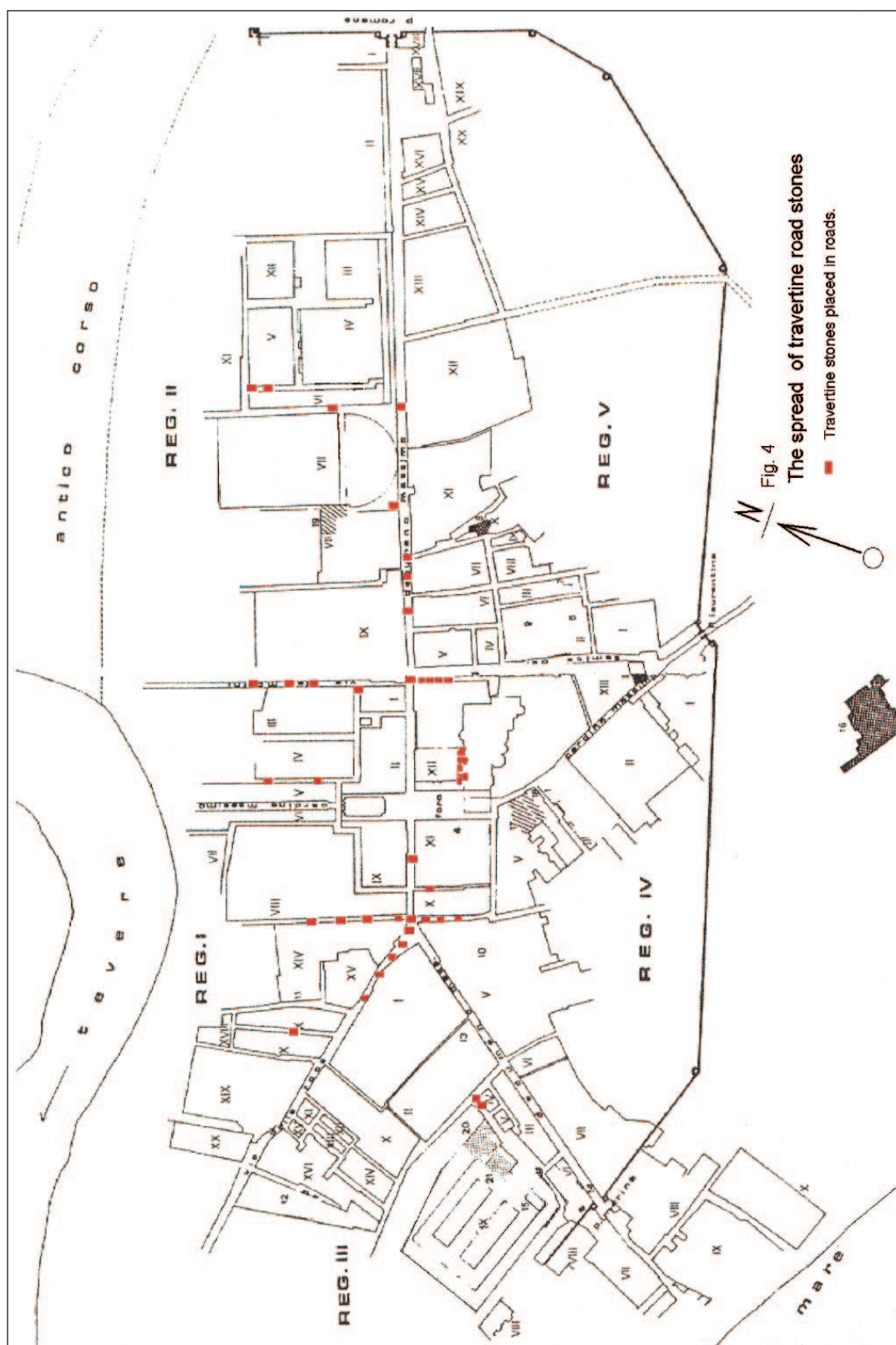
It should be noted that the Temple of Roma and Augustus, one of the first temples built in the Imperial period under Tiberius, incorporated *opus reticulatum* and marble, but no travertine. It is evident that later temples use relatively little travertine. The *Capitolium*, built during the Hadrianic period, has split windows of travertine only. The theater built by Agrippa in 12 B.C. shows a strikingly ambiguous use of marble and travertine. Enlarged in about 196 A.D. the outside of the theater's *cavea* has travertine pillar bases and stairs but the seats inside are marble. This is an example of selective and hierarchic use of building materials. Marble accentuates the interior while the use of travertine on the exterior is more economical and limits the risk of damage from the street. This type of design may occur as early as the Augustan period. Supporting this argument are two tombs outside *Porta Marina* which show a similar combination of materials. The famous monumental Mausoleum of C. Cartilius Poplicola, which dates between c. 30 and 25 B.C., has travertine sides, a tufa back, and a marble facade

with inscriptions and reliefs.<sup>18</sup> On one hand travertine works as a substitute for more expensive marble, while on the other hand it was considered more prestigious than tufa. The other contemporaneous mausoleum, just outside the *Porta Marina* and unfortunately without an inscription, is almost entirely travertine. Only the lost tholos was of Luna marble. Here too the most eye catching part was accentuated by the most expensive material.

Up until the age of Augustus porticoes were made using tufa. Although the Emperor found Rome as a city of bricks and left it as a city of marble, the same cannot be said of Ostia. Nevertheless some indications of face lifting the streets can be seen at this time. At least three porticoes with columns of travertine were built: 1) just in front of the (later) *Terme del Faro* along the southern *Cardo Maximus* (IV.ii.1; SO I, 108), 2) on the corner of the western *decumanus* and the *Via degli Aurighi* (III.iii.1; SO I, 109) and 3) at the western side of the *Via Epagathiana* (I.xiv.9; SO I, 111) in front of the later *Terme di Buticoso*. A facade with Tuscan columns was built

<sup>17</sup> Meiggs 1973, 45.

<sup>18</sup> Zevi 1976, 56-9.



in the first half of the first century A.D. in front of a row of shops (I.x.2) along the eastern side of the *Via Pomeriale* facing the *Macellum*.<sup>19</sup> A second portico along the eastern side of the southern *Cardo Maximus*, which was incorporated into the later Trajanic *horrea* may date to c. 50 A.D. (I. xiii.4).<sup>20</sup>

The following architectural elements will be discussed separately: centralized streetslabs (cover stones), sidewalks, corner and pillar bases, thresholds with and without relief, stairs, corner and centralized bar stones, springers and corbels. Complete door-frames, especially those in the tombs of the *Isola Sacra* cemetery will be discussed more fully because of their interesting proportions.

#### 4.1 Centralized streetslabs

Streets in Ostia, both from the Republican and Imperial periods, have been made of basalt stones. The streets of the higher, present day level date to the time of Domitian, about 100 A.D. In the middle of the streets about fifty rectangular travertine slabs, with an average size of about 83 x 42 cm, can be seen; usually two to four slabs lie side by side. Marble slabs can also be seen in isolated incidences or incorporated into the travertine paving. They may date to the third century or later when marble was cheaper. The largest concentration of marble slabs is in and near the city center, most frequently in the eastern part of the *Decumanus Maximus* (fig. 5). Because some slabs have openings and are lying above holes, it seems likely that they cover drain shafts. An isolated slab next to the Baths of Mithras (I.xvii.2) and a cluster of drains situated in the *Via della Forica* near the public toilet at the rear of the *Caseggiato dei Triclini* have a similar function. Some slabs are situated at a crossing and therefore have a strategic function in the drain control.

The following is a count of travertine streetslabs and their specific locations: *Decumanus Maximus*: 10, *Via degli Aurighi*: 1, *Via delle Corporazioni*: 2, *Via di Diana*: 1, *Via della Foce*: 5, *Via delle Volte Dipinte*: 1, *Via della Fontana*: 2, *Via dei Molini*: 5, *Via delle Terme del Mitra*: 1, *Via Epagathiana*: 5, *Via del Pomerio* 4, *Via dei Cippi* 5, of which 4 are side by side, and *Via della Forica*: 8 (in an irregular cluster). Therefore, streetslabs are most commonly found in and near the city center, and especially at crossings. While they are frequently found in the eastern part of the *Decumanus Maximus*, they are absent in the *Cardo Maximus*. Possibly the latter street had no drain. The lengths of the blocks vary from 41 to 118 cm and the widths from 11 to 87 cm. There are no fixed relations between lengths and widths. The ratio of their measures vary from 5:1 to almost 1:1. The measures have no relation to the Roman foot.

Because there is no trace of standardization, the cover stones must have been made *ad hoc*. Aside from the rectangular examples small round travertine stones have been used to repair broken basalt stones in the *Via del Tempio Rotondo*, *Via di Diana* and *Via dei Corporazioni*. In conclusion, rectangular travertine streetslabs were used because of their white color to cover and mark drain shafts. They could evidently support the weight of carts.

#### 4.2 Sidewalks

Unfortunately sidewalks of travertine, complete or partial, have been preserved in a rather fragmentary state. If several materials have been used, the curb may be travertine, while the rest is tufa, brick, tiles or basalt. Sometimes sidewalks begin with travertine and end with basalt blocks and they may have a foundation of brick.

It is difficult to see whether they correspond to a building or part of a building as is often the case in Pompeii as Catherine Saliou has recently demonstrated.<sup>21</sup> Sometimes this is the case (see hereafter, survey nrs. 9, 10c); but this is not necessarily true, especially when the sidewalk is longer or shorter than a parcel. If the sidewalks belong to a building they would have the following functions: a) the protection of building, b) ornamental, possibly related to status.

If they are part of the urban lay-out they would have the following functions:

- a) separation of pedestrians from mobile traffic, and
- b) restriction of the number of vehicles. Remains of sidewalks, that is to say raised paved areas alongside the facades of buildings, are visible in the following streets:
  1. *Decumanus Maximus*, along the *Caseggiato dei Triclini* (I.xii.1).
  2. Ibidem, near *Porta Marina*, along the *Domus del Ninfeo* (III.vi.2) and along the Inn of Alexander Helix (IV.vii.4).
  3. Ibidem, along the *Portico degli Archi Trionfali* (V.xi.7) and along the Theatre.
  4. *Via degli Aurighi*; by the corner of the *Via delle Volte Dipinte* (III.ix.23).
  5. *Via delle Corporazioni*, along the *Insula dell'Ercole bambino* and the *Insula del Soffitto dipinto* (II.vi.4; II.vi.6 (fig. 6) and the theater; originally this street probably had complete sidewalks on both sides. A series of high travertine blocks, possibly of a pavement, remains at the crossing with the *Via della Fullonica*.
  6. *Via di Diana* (I.ii.6).

<sup>19</sup> SO I, 111.

<sup>20</sup> SO I, 125. Meiggs 1973, 45.

<sup>21</sup> Saliou 1999, 161-218





*Fig. 6. Sidewalk (II.vi.4)*



*Fig. 7 Via Epagathiana. Left side: bases and bar stones (I.xiv.8-7)*



7. *Via delle Volte Dipinte* (III.ix.22).
8. *Via della Fortuna Annonaria* (II.vi.7).
9. *Via delle Terme del Mitra* (I.ii.17).
10. *Cardo Maximus* (IV.iii.1; V.i.1 and I.vi.1).
11. *Via dei Balconi* (I.iv.1).
12. *Via della Caupona* (IV.ii.2).
13. *Via del Tempio Rotondo* (I.xi.1 and IV.iv.7).

From this survey it becomes clear that most sidewalks occur in *Regio I*. The *Decumanus Maximus* has the largest number of curbs. This can be explained by the heavy traffic that used this thoroughfare. Because the streetlevel was heightened under Domitian, the *terminus post quem* for most sidewalks is c. 100 A.D. There are no traces of standardization. The width varies from 3.75 to 5.7 *pedes* and the height varies from 0.3 to 1.5 *pedes*. If only the curb is travertine, its width is about 1 *pes*, like the small stairs which sometimes interrupt the curb. The longest remaining travertine sidewalk measures c. 7.7 m.

#### 4.3 Corner and pillar bases

Eight premises have bases at one or more corners of the facade of one or more buildings. Most examples are visible in *Regio I*, along large, busy streets and date to the period of the big building boom, the time of Hadrian. These bases may have had three functions. First, if there are two corner bases in line, they may have been intended to indicate the beginning and end of the facade of a building. Thus, they earmarked the front side of a parcel and its building(s). They tend to project at the front and slightly at the sides and sometimes at the rear. In this case, the second function may have been to protect the building against the damage of passing traffic. And finally they supported the corner walls. Since not every building from the Hadrianic period has corner bases, status may have also played a role. In some cases the corner bases flank a line of pillar bases in a *porticus*.

##### Survey.

1. The oldest corner base can be found on the left corner of building I.xiv.8 (near the *Terme di Buticoso*) on the western side of the *Via Epagathiana*. In line with it are pillar bases in front of I.xiv.8 without panels and I.xiv.7 with cut out panels (fig. 7). At the end of the *porticus*, there may have been a now lost second corner base to mark the parcel of two buildings. The pillar bases have vertical grooves, which may have been for drainage. The following five places show items from the Hadrianic period (ca. 120 A.D.).
2. Three items, which are in-line, are visible on the left corner of the rear side of the *Caseggiato del Termopolium* (I.ii.5), the right corner of the so-called

*Basilica* (I.ii.3) and the right corner of I.ii.1 (overbuilt by the *Ninfeo*), and all along the northern part of the *Decumanus Maximus* in the center.

3. Two items in-line are on the left and right corners of the *Caseggiato del Larario* (I.ix.3).<sup>22</sup>

4. Two small items are in-line on the southern side of a building to the west of the *Domus di Amore e Psiche* (I.xiv.5).

5. Three items are in-line on the western side of the *Via della Foce* on left and right corners of III.xvi.6 and on the left corner of III.xvii.5. The latter two flank the opening of the *Via del Serapide*.

6. Probably from the Hadrianic period are two corner and two pillar bases in a lost building, V.xiii.1, along the southern side of the *Decumanus Maximus*.

7. Dating to the Antonine period are the corner bases on the ends of a curved *porticus* with pillar bases along the *Cardo Maximus*, on the northern corner of I.xii.7 (two blocks) and on the northern corner of I.xii.14 (three unequal blocks) and all along the south-western side of the *Terme del Foro*. The pillar bases have vertical grooves.

8. The corner bases in-line with the left (two blocks) and the right corner (three blocks) of the longer southern side of the *Tempio Collegiale* (I.x.4) date to the end of the Severan period.

The corner bases are 74 to 180 cm long, 63 to 146 cm wide, and 32 to 52 cm high. The pillar bases are 60 to 197 cm long, 56 to 181 cm wide, and 13 to 120 cm high. In both cases there are no fixed relations between the three measures, which may be due to differences in the level of terrain, the size of available blocks, and the building speed. There are no traces of standardization. Both types of bases have a liminal function in common. The distances between corner bases vary from 1420 to 6377 cm. The distances between pillar bases range from 300 to 700 cm, dependant on corridors and shops or other rooms.

The phenomenon of corner and pillar bases disappears after c. 220/230 A.D.

#### 4.4 Thresholds without relief

Flat thresholds, without edges, grooves or pivot holes, can be found chiefly in *horrea*, guild buildings, and (larger) dwelling complexes. Flat thresholds did not support doors. They mark transitional places where people could move unhindered from one space to another. They are level with one or two floors. Travertine thresholds seldom appear in the same building with marble ones. It is evident that the architects chose between travertine and marble. Unprocessed

<sup>22</sup> L. Socca, Nuovi elementi per l'interpretazione del *Caseggiato del Larario* a Ostia, *AC* 46 (1994) 421-440.

thresholds are often found with travertine thresholds which have reliefs. Flat thresholds are most frequently found in the Regions I, III and IV. Generally they can be dated to the second century A.D.

Flat thresholds are found in the following contexts:

1. the official main entrance of a main building;
  2. the entrance of a lane or corridor which divides two complexes;
  3. between two rooms indoors;
  4. on the border of a complex as delineation;
  5. the edge of a *porticus* on the border of a building and a street;
  6. the entrance of a vestibule giving access to a staircase leading to the first floor; or
  7. the entrance of a room without another entrance.
- The measures of flat thresholds were not standardized. Their measures depended mostly on that of the entrance. The flat threshold functioned liminally marking the entrance.<sup>23</sup>

#### 4.5 Thresholds with relief

Processed thresholds are the most common type. They all have a raised edge (4 to 10 cm thick) at the front and one or two pivot holes in the corners often directly behind the edge.

Sometimes there are raised edges on the smaller sides or the thresholds may be framed by raised travertine blocks. The most frequent type, which consists of several slabs, occurs in the facades of *tabernae* (shops, workshops, bars and so on). Usually, there is a round pivot hole on the right where the *cardo* of the door turned. Behind the raised edge is a groove into which the boards of a shutter could be pushed.<sup>24</sup> The groove ends where the space of the door begins. The slab, where the door could be turned, has a cut-away level. In this manner the boards could be inserted into the groove.<sup>25</sup> The boards were held together by a horizontal bar which was fixed into a bar-hole in the left wall of the entrance.<sup>26</sup>

There are three other types of thresholds:

- 1) small thresholds with one pivot hole, usually only one door, occurring in small rooms without other doors like in bedrooms;
- 2) larger thresholds with two pivot holes, for two doors, have been used at main entrances of buildings and corridors;
- 3) the largest thresholds have two pivot holes and two square holes in the centre for vertical bars. This type occurs in buildings where safety was very important, for example in the main entrances of the *Caserma dei Vigili* (II.v.1) and the *Caseggiato del Larario* (I.ix.3).

Finally, *horrea* present another type of threshold. In the *Horrea of Hortensius* (V.xii.1; c. 40-50 A.D.) the entrances to the storerooms show blocks with a pivot hole on both sides. In the centre a connecting

piece of travertine is absent. Rickman and Meiggs presume that bricks, which are now missing, were used for the central part.<sup>27</sup> It seems more probable that the central space under the doors was left open for fresh air. In the *Grandi Horrea* (II.ix.7) the thresholds are solid, with a marginal check, two pivot holes, and one or two bar holes.<sup>28</sup> These thresholds, framed by raised side-blocks, may have been influenced by an older type.

An exceptional threshold occurs in the *Caseggiato dei Molini*, in the passage between rooms 7 and 19 (fig. 8). The side slabs have a pivot and bar hole, while the central part is basalt. This may have been done to withstand the exceptional pressure of donkeys, loads of grain, etc.<sup>29</sup>

In general, there are no fixed standards for the length of thresholds. These depend on the width of the doorway. The width, however, may correspond with the thickness of a wall which is often two *pedes* (c. 60 cm).

#### 4.6 Stairs

The oldest and most monumental stairs in Ostia are those on the front of the Hercules temple (c. 100 B.C.) mentioned above. The smallest stairs can be found in the curbs of the sidewalks, which were also mentioned above. The buildings of the second century A.D. have small external stairs corresponding with larger stairs which lead to the first floor. The small steps, varying in length from 60 to 130 cm, bridge the gap between the street and groundfloor-level. One of the latest external stairs can be found in front of the entrance of the *Domus of Amore e Psiche* (c. 325-350 A.D.). Inside this domus only small capital cushions are travertine, while marble dominates the floors and walls. As for the internal stairs in second century houses, some interesting features of standardization can be noted. The width or depth of most treads varies from 27 to 33 cm, while the measures of 28, 29 and 30 cm, about one Roman *pes*, are the most frequent. This is logical because the *pes* corresponds with the average length of a Roman foot. Most risers are between 17 and 23 cm high, with the highest measuring 30 cm and the peak being 20 cm. This

<sup>23</sup> Giseke Hopstaken will carry out further research on this type of threshold.

<sup>24</sup> For an older type from Augustus' time in Rome see Rickman 1971, 94-5, fig. 21.

<sup>25</sup> Cf. Rickman 1971, 60-61, fig. 16.

<sup>26</sup> Adam 1999, 320-321, figs. 730-731.

<sup>27</sup> Rickman 1971, 68. His statement that this 'example of the sparing use of travertine in the early Empire when it was employed only (sic!) at points of stress' is rather simplistic. The corner columns in the same *Horrea* for example have an esthetic function. The same holds good for travertine capitals on tufa columns. Meiggs 1973, 72.

<sup>28</sup> Rickman 1971, 48.

<sup>29</sup> Bakker (ed.) 1999, 150 (ad room 7, west).





*Fig. 8. Cassegiato dei Molini: threshold (I.iii.1)*



*Fig. 9. Cassegiato dei Triclini (I.xii.1)*





Fig. 10. Bath of Mithras, external staircase (I.xvii.2)



Fig. 11. Horrea Epagathiana, corner stones (I.viii.3)

measure is most convenient when a person is going up and down stairs. The length of the treads, on one staircase of the same length, are less standardized. They vary from 120 to 180 cm or from 4 to 6 Roman feet. Most examples vary from 140 to 160 cm, with an average of about 5 Roman feet. This can be explained by the need for two persons to be able to pass each other on the stairs. If the average width of a person was about 60 cm, then on average about 30 cm of space would be free. Usually the blocks of one or two pieces of travertine are resting on brick steps. In many cases only the lowest steps or those which would have been visible to the visitor are travertine, while the remaining steps are brick or even wood (*fig. 9*). If the steps are travertine, their number varies from 5 to 23. Usually the staircase rises at an angle of 43-47 degrees.<sup>30</sup> In the Baths of Mithras only the superior level of brick layers of the external and corresponding stairs carry slabs of travertine (*fig. 10*). Often times a small vestibule, marked by pivotoles in the threshold, could be

closed off by one or two doors which preceded the real staircase. If a second staircase rests on a higher level or on the first floor, a square landing connects the two staircases at a 45 or 90 degree angle. Below the staircases were toilets or rooms for storage, as in modern houses. Light and air was afforded by a small square hole in one of the steps. Large stairs can be found in the Theater, *Schola del Traiano*, some temples and other monumental buildings that saw a lot of human traffic. Here the length of the stairs varies from 400 to 1500 cm. Very small stairs can be found in subterranean spaces of baths.

#### 4.7 Corner-stones

These small blocks, one or more above each other, often in a symmetrical scheme, are visible on the frontal corners of doorways (*fig. 11*) and piers or pillars of porticoes (*figs. 12 and 13*). Sometimes square

<sup>30</sup> Boersma 1985, 154.





*Fig. 12. Via della Foce, western side: small corner stones (III.xvi.6)*



*Fig. 13. Ibidem, small corner stone (detail)*



or round holes for the insertion of bars can be found on the inside of the doorway. The measures of the blocks are not standardized in any of the buildings. They occur most frequently in the *Caseggiato del Larario* and the *Horrea Epagathiana* where on average they are 26 to 27 cm long, 15 to 20 cm wide, and c. 14 cm high. But it is interesting to note that the vertical distance between the stones is c. one Roman foot or a multiple of it. The following table shows the presence of one or more blocks at the height of one or more Roman feet. Blocks may be on other levels too, at a level different 1/2, 1/3 to 2/3 foot from the indicated heights. If the lowest block is 20 cm, then the next block may be 20 cm + one or more feet high. Not all level-differences can be measured in feet; distances may be 50, 75, 100 and 125 cm.<sup>31</sup>

	30	60	90	120	150	180	210	240
Domus fulminata (III.vii.3)	x	x	x					
Domus del decumano (III.ii.3)	x	x	x					
Cas. Misuratori (I.vii.1)	x		x					
Cas. Larario (I.ix.3; fig. 16)	x			x			x	
Cas. balcone ligneo (I.ii.6)	x		x	x				
Case a Giardino (II.ix.1)					x	x		
Casa di Annio (III.xiv.4)	x	x						
Cas. degli Aurighi (III.x.1)		x			x		x	
Cas. con portico (I.xii.7)					x		x	
Horrea Epagathiana (I.viii.3)		x			x			
Portico dell'Ercole (IV.ii.2)					x	x		
Portico Archi trionf. (V.xi.7)		x				x		

Most corner-stones do not have bar holes. Because of their irregular, non-standardized form, corner-stones are not needed to strengthen walls. Therefore, they were principally aesthetic and may have emphasized the status of buildings. They most frequently date to the period between c. 65 and 180 A.D.

#### 4.8 Centralized bar stones

Centralized bar stones, dating between c.112 and 150 A.D., are visible in a limited number of buildings: *Portico* (I.xiv.8; fig. 7), *Portico del Piccolo Mercato* (I.viii.1), *Caseggiato dei Misuratori di Grano* (I.vii.1) and *Horrea Epagathiana* (I.viii.3). These buildings with commercial characters are all situated in *Regio I*. The bar stones occur on the insides of doorways or pillars, but never in a symmetrical scheme. The round central holes, often with rests of lead or iron, indicate that bars could be inserted into this type of stone. The horizontal bar must have been attached to a vertical one, because there is no corresponding bar stone on the opposite side. The levels of the bar stones are not standardized. They have been found at heights of c. 60, 75, 125, 175, 200 and 225 cm. Their average length is c. 21 cm and average height c. 15 cm.



Fig. 14. Springers, small corner stones, staircase (I.xii.4)

#### 4.9 Springers

Horizontal springers or springstones are rare in Ostia. They occur in the *Caseggiato del Larario* (I.ix.3; c. 120 A.D.), in I.xii.4 (fig. 14) and in the entrances of the complex of the *Case a Giardino* (III.ix; c. 128 A.D.; fig. 15). Their function may be twofold. First, their sloping sides support a lintel arch of bricks on the left and right. Second, many examples have a pivot hole in the left or right frontal corner corresponding exactly with the pivot hole in the threshold of the same doorway. The level and measures of springers are not standardized. In the *Casa del Larario* (fig. 16) they are c. 300 cm (ten feet) high and in the *Case a Giardino* they are c. 258 cm high. The average measures are: 58 cm long, 57 cm wide, and c. 42 cm high. The width (c. 2 feet) corresponds with the width of the wall of the doorway. The oldest examples of horizontal springers can be found in the Forum of Caesar at Rome.

<sup>31</sup> E.g. in *Regio III.xvi.6* (50 and 75 cm); in I.xx.1 (125 cm).





Fig. 15. Case a Giardino, entrance, springers (III.ix)

#### 4.10 Corbels

Corbels occur in at least 13 buildings, mainly between c. 100 and c. 170 A.D.<sup>32</sup> Corbels carried the wooden joists, which supported the planks making up the first floor. Usually they occur in houses, flats and apartment buildings. They are most frequent in the shops to the right of the *Horrea Epagathiana* (I.viii.3) and in the *Caseggiato del Larario* (I.ix.3; fig. 16). Their level is not fixed, but they are on the same level in the *Horrea Epagathiana* (288 cm high), the *Insula del Bacco* (I.iv.3) (295 cm high), and in *Casa del Bacco* (I.vi.2) (379 cm high). Only the ends of a corbel are visible because its central part is in the wall.<sup>33</sup> The extremities are c. 30 cm long, c. 22 wide, and c. 22 cm high. The distance between corbels was not fixed and varies from 105 to 285 cm. Within one room the distances are usually identical. Small corbels sustaining marble latrine benches (usually *spolia*) are visible in the *Forica* (IV, iv, 4; fig. 17).

#### 4.11 General conclusions and observations

Travertine was used primarily to bear weight, but it also had liminal, marking, corner accentuating, pro-

tective, substituting, layout- and aesthetic and status-functions. Travertine was first used in Ostia at the end of the second century B.C. and was most popular in the second century A.D., the time of the biggest building activities. In patrician houses of the third and fourth centuries A.D., it occurs rarely: only in small external stairs, some internal stairs, entrance thresholds, small blocks flanking internal marble thresholds (fig. 18), small isolated blocks with a pivot hole (fig. 19), and capital cushions.<sup>34</sup> In these dwellings marble was lavishly used. The contemporaneous use of marble in bars and baths demonstrates that marble was far more available than in the first and second centuries A.D. Travertine building elements were used up until c. 500 A.D., but mainly as *spolia*. For example corbels were used as foundation stones, irregular blocks were used as

<sup>32</sup> In *Regio* I: i.4; iii.3; iv.3; iv.4; vi.2; viii.3; ix.3. In *Regio* III: i.8; ix; xiv.4. In *Regio* IV: ii.2. In *Regio* V: iii.3.

<sup>33</sup> Some complete items can be seen in the Baths of Mithras and in IV.vii.1 (used as *spolia*) and in the southwestern part of the *Caseggiato del Larario*.

<sup>34</sup> Becatti 1949, 3, 8, 9, 11-12, 15, 20, 21, 23, 26, 29, 32-33, 35. See also P.F.B. Jongste, *Het gebruik van marmer in de Romeinse samenleving*. Diss. Leiden 1995.



Fig. 16. Caseggiato del Larario, springers, small corner stones and corbels (I.ix.3)

buffer stones on the corners of buildings. The oldest examples of travertine *spolia* are thresholds and a funerary slab<sup>35</sup> reused as foundation stones for the *Porta Romana* when it was rebuilt c. 100 A.D. (fig. 20). Generally, travertine has more than one function as the introduction and short survey of architectural elements has shown above. Before c. 200 A.D. elements like corner-stones may have been status sym-

bols; after c. 200 A.D. travertine lost its prestigious character, which is confirmed by Pensabene's research on capitals.<sup>36</sup> Not many standardized building elements have been found. We must conclude that much of it was made *ad hoc*. However the

<sup>35</sup> *CIL* XIV, suppl. I, 5228.

<sup>36</sup> Cf. Pensabene 1972, 186 (and *passim*).





Fig. 17. *Forica*, corbel (IV.iv.4)



Fig. 18. *Side blocks* (VII.8)

following analysis shows that more specifically in tombs some standardization was practiced.

##### 5. TRAVERTINE DOORFRAMES IN THE CEMETERIES OF ISOLA SACRA AND OF PORTA LAURENTINA AND IN OSTIA<sup>37</sup>

###### *Introduction*

Preserved complete or partial travertine doorframes in Ostia are very rare, hence so are specimens of travertine. Each entrance has its own peculiarities. Travertine doorframes are more numerous in the *Porta Laurentina* and *Isola Sacra* cemeteries. The first has six completely preserved doorframes (tomb 4, 13, 30, 32, 33, 46) dating from the end of the first century B.C. until c. 100 A.D. Many of the monumental tombs of *Isola Sacra* (c. 100-200 A.D.) have similar travertine doorframes.<sup>38</sup> This resemblance makes it worthwhile to investigate whether there is a system: is there any relation between measures, proportions and dating? Was there a preference for specific measures, even when there is no relation with dating? Further, did the type of tomb influence the measures of doorframes? For our research we studied c. forty completely intact monumental doorframes in *Isola Sacra*. Next it is interesting to compare the doorframes of both cemeteries. Together they comprise a period of the first century B.C. until c. 200 A.D.; the question is whether they had the same architectural tradition or whether both cemeteries have to be considered separately. Because of the number of doorframes we deal first with the *Isola Sacra* necropolis hoping to discover a system. Then the question rises whether the doorframes of the *Porta Laurentina* necropolis can be related to it.

Finally, we pay attention to the few, heterogeneous doorframes in Ostia.

##### 5. 1. *The necropolis of Isola Sacra*

###### 5. 1.1 *General observations*

The necropolis of *Isola Sacra* lies along the *Via Flavia*, a road connecting *Portus* with Ostia. The date of this road (c. 70 A.D.) gives a *terminus post quem* for the tombs, which apart from some exceptions are turned with their entrance towards the road.<sup>39</sup> The position of the necropolis is completely in accordance with the Roman custom to situate cemeteries along or next to a road away from the city.<sup>40</sup> There are no monumental tombs in isolated position but rows of tombs, separated by paths and open spaces, give the impression of a city, a city of the dead (fig. 21). The buried were members of the middle class: artisans, shopkeepers, merchants, predominantly *liberti* and descendants of *liberti*. Not a single tomb belonged to members of the upper-class. There is, however, a 'campus of the poor', situated behind the second row of tombs in the northern zone of the necropolis, originally with urns, amphoras, *fossae* in which the unprotected body was buried, wooden chests, terracotta sarcophagi, and *tombe alla cappuccina*.<sup>41</sup> Most of these objects are no longer in situ. There are some non-monumental and semi-cylindrical tombs dispersed over the terrain. The necropolis underwent an enormous development in the second and in the first half of the third

<sup>37</sup> Studied and written by Natalie Stevens.

<sup>38</sup> Doorframes of much smaller size, which are present in non-monumental tombs, have been left out of consideration.

<sup>39</sup> Baldassare 1996, 17. For a map see Pavolini 1983, 260-261.

<sup>40</sup> Meiggs 1973, 455.

<sup>41</sup> Baldassare 1996, 23.



*Fig. 19. Isolated block with pivot hole (III.ix.12)*



*Fig. 20. Porta Romana, substructure of spolia*





Fig. 21. *Isola Sacra* (tombs 80-77)

century A.D. The first rows of tombs were built directly along the *Via Flavia* (c. 70-100 A.D.). In the second phase (Trajanic period) new groups of tombs were placed behind the first rows. In the third and fourth phase (Hadrianic-Antonine period, respectively third century A.D.) tombs were built again along the *Via Flavia*, either using or superimposing on the older rows. Burials ceased at the second half of the third century A.D.<sup>42</sup>

Until the Hadrianic period cremation was the burial rite, thereafter inhumation. During some time both rites occurred simultaneously. In the Trajan and Hadrianic periods the *columbarium* was the predominant type of family tomb. With the introduction of inhumation, *columbaria* were adapted by adding special niches, *arcosoli*. In a later phase tombs were built exclusively for inhumation.<sup>43</sup>

The *columbarium* type, to which all our complete travertine doorframes belong, can be subdivided in a) tombs with *cella* (29.3 %); b) tombs with *cella* and with *klinai* at the outside (14.6 %); c) tombs with *cella* and enclosure (36.6 %); d) tombs with a combination of b and c (14.6 %) (fig. 22); e) tombs with an upper floor (4.9 %) (fig. 23).<sup>44</sup>

#### 5.1.2 Travertine doorframes

The c. 40 selected doorframes mainly date from the Trajan and Hadrian-Antonine periods.<sup>45</sup> The tombs situated directly alongside the *Via Flavia* dating back to the third century A.D. have fragmentary doorframes. They are not included in our studies, neither are the non-accessible tombs to the east of the *Via Flavia*.

Generally, the selected doorframes consist of the following elements (fig. 24): a) two doorposts, flat at the outside, with an average width of c. 23 cm, a depth of c. 45 cm, and a height of c. 147 cm;<sup>46</sup> the left doorpost (seen from the outside)<sup>47</sup> has a barhole at a height of c. 60-100 cm; the space between the two doorposts measures 60-90 cm; b) a threshold of

<sup>42</sup> Baldassare 1996, 17-18.

<sup>43</sup> Meiggs 1973, 464-465.

<sup>44</sup> Calza 1940, 63. Category d is our addition.

<sup>45</sup> The selection consists of doorposts in tomb nrs. 10-11, 13-21, 25, 29-31, 42, 54-55, 72, 75-80, 85-87, 89, 92-95, 97.

<sup>46</sup> The dimensions mentioned are only the most frequent measures.

<sup>47</sup> Left and right mean: as seen by the onlooker standing in front of the tomb.





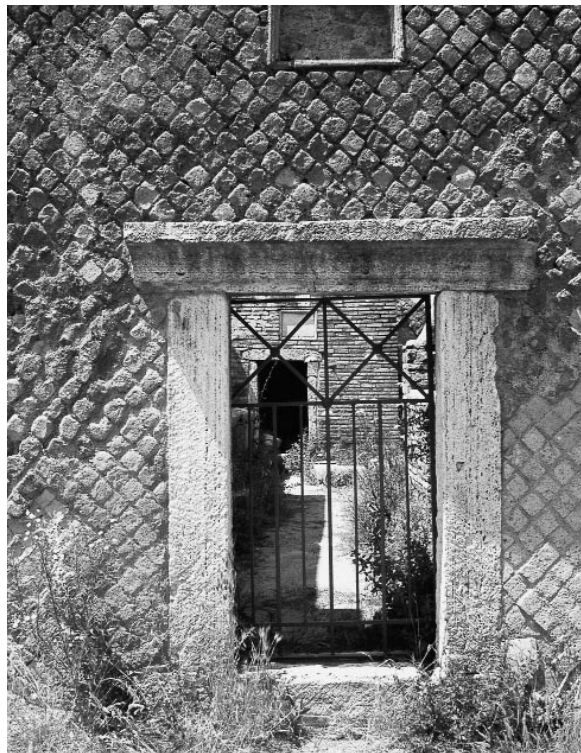
*Fig. 22. Isola Sacra, tomb 87*



*Fig. 23. Isola Sacra, tomb 41 (below) and 42 (above)*



*Fig. 24. Isola Sacra, tomb 11*



*Fig. 25. Isola Sacra, tomb 89*





Fig. 26. Ostia, Laurentine cemetery, tomb 32

one block of very varying length, with an u-formed raised edge and a pivot hole in the right frontal corner; and c) a lintel, which, with some exceptions, has the form of a corbel (as frequently used in Ostia city). In the right frontal corner is a second pivot hole, corresponding to the first one in the threshold. The doorposts and the lintel are usually framed by a one-brick layer. Often there is a marble slab with a funerary inscription framed by terracotta, sometimes flanked by two slit-windows above the door-frame.

#### 5.1.2.1 Doorposts

There is no obvious relation between the measures of the doorposts and the date of the relevant tomb. The smallest width measured is 14 cm, the largest 33 cm. During the manufacturing of doorposts the Roman *pes* (ca. 29.77 cm) has been used, but not in a perfect way.<sup>48</sup> Within slight margins each measure can be converted to Roman measures.<sup>49</sup> Of all our selected doorframes 58.2 % has a width of c. 0.75 *pes*, 24.1 % of c. 0.5 *pes* and 17.7 % of c. 1.0 *pes*. Throughout all periods the most frequently chosen width is c. 1.5 *pedes*, that is in 62.5 % of all doorposts. The percentage of widths of 1.75 *pedes* is

17.25 %. The most frequent height of doorposts is between 4.5 and 5 *pedes*, 28.6 % measuring 4.75 *pedes* and 32.5 % 5 *pedes*.

As for the raised edges, throughout all periods there seems to have been a preference for a height of 5 cm (41 %; against 24 % of 6 cm and 23 % of 4 cm). The first measure which does have a relation to the date, is the width of the edge. When one compares the percentages of the various widths occurring in the first half of the second century A.D. to the percentages in the second half of the second century A.D., it can be concluded that the edges become more slender in the later period. Until 150 A.D. a width of 15 cm prevails (28.8 % of all doorpost until 150 A.D. against 7.7 % after 150 A.D.), after 150 A.D. edges of 13 cm. prevail (30.8 % of all doorposts after 150 A.D. against 15.4 % until 150 A.D.), of 11 cm (26.9 % against 9.7 % until 150 A.D.) and of 12 cm (23.1 % against 5.8 % until 150 A.D.).

<sup>48</sup> There is still some uncertainty about the length of the Roman *pes*. Calculations vary from 29.34 cm (R. de Zwarte, in: *BABesch* 69 (1994) 129, 142) to 30 cm (Heres 1982, 25). See also J.-P. Adam 1989, 41 (29.57 cm). We prefer 29.77 cm (cf. J. de Waele, in: *BABesch* 59/1 (1984) 1-5).

<sup>49</sup> We have taken into account quarter and half *pedes*.

The measures and the height of the barholes, holes in the left doorpost, making part of the locking system, are neither bound to a period nor are they standardized. The barholes have a more or less square form. There is a preference for a width and height of 7 cm, though 6, 8 and 9 cm also occur frequently. The smallest one measures 4 x 4 cm, the largest 8 x 30 cm. The height, measured from the threshold, strongly varies: the lowest point is 56 cm, the highest 121 cm. There is preference for a height between 75 and 79 cm. Of the 41 barholes 11 (26.8 %) belong to the latter category. To the adjacent categories of 70-74 cm and 80-84 cm belong 17.1 % respectively 12.2 % (7 respectively 5 barholes); 14.6 % (6 barholes) are at the height of 90-94 cm.

#### 5.1.2.2 Lintel

As for the lintel, just as in the case of doorposts, no relation can be discovered between measures and date. The most frequent width is 5 *pedes*: 34.2 %. Also 5.25 (21 %) and 4.75 *pedes* (13.2 %) occur. The favourite depth throughout the periods is – just as the depth of doorposts – 1.5 *pedes*, that is 64 %, while half of this depth is the most frequent height: 59 % of the lintels is 0.75 *pes* high.

As for its form the raised edge corresponds with the edge of the threshold (see below) and as measures correspond with the edge of the doorposts. The widths are between 11 and 19 cm; widths of 13, 14, 15 and 16 cm prevail. The height of the edge is in most cases 5-6 cm. The corbel-like relief protrudes between 10 and 24 cm: measures between 16 and 17 cm occur most frequently. The narrow edge at the front of the corbel-like architrave varies in height from 4 to 15 cm. Maybe the edge becomes more slender during the second half of the second century A.D., though there are too few data to be certain. The pivot hole in the right corner, corresponding with that in the threshold, in which the pivot of the door turned, has a diameter of 8-9 cm.

#### 5.1.2.3 Threshold

The threshold with u-formed edge and a pivot hole of 7-9 cm in diameter has a width between 3.5 and 9.75 *pedes*. Again there is no relation between width and date. 61.9 % of the measured thresholds has a width of 4.75-5.25 *pedes*. Thresholds with a width of 5.75-7.5 *pedes* are missing completely. As for the depth 1.5 and 1.75 *pedes* (45.5 respectively 27.3 %) have been preferred throughout all periods; the most frequent heights are 0.5 *pes* (44.8 %) and 0.75 *pes* (41.4 %). The u-shaped edge has a height of 3-7 cm, while 4-6 cm are the most frequently occurring measures. Until 150 A.D. 6 cm was preferred, after 150 A.D. 4 cm. The width of the edge varies from 8-18 cm, with a preference for 11, 12, 13, 14 and 15 cm. In the

case of 15 cm 6 of the 7 edges date from before 150 A.D.

#### 5.1.2.4 Ratios

The relation between the width of the doorframe and the width of the facade of the tomb is not fixed. It varies from 1:2.9 to 1:4.1. It is not possible to draw conclusions about a development throughout the periods. In many doorframes the left and right doorpost do not have the same width. In 30 % of the doorframes the width is identical. The right doorjamb is longer in 21.5 % and shorter in 48.5 %. It is worthwhile to examine how the horizontal elements – threshold and lintel – are related to each other. The percentage of doorframes having a lintel with the same length as the threshold is 16.7; 30 % of the lintels is longer and 53.3 % shorter than the threshold. Although the data are few, it seems that a longer lintel was more in vogue in the first half of the second century A.D. (89 % against 11 % in the second half of the the second century A.D.). The width of the doorway varies from 1.75 to 3.5 *pedes*. Most frequently occur the categories 2.5-2.75 (41 %), 2.25-2.5 (28 %) and 2.0-2.5 (15 %). A development throughout the periods cannot be discovered. The width of the doorframe, the width of the doorposts included, measures between 3.25 and 4.75 *pedes*. The studied items are regularly divided over all interlying quarter *pedes*, with the exception of 4.0-4.25 and 4.5-4.75 *pedes* which were preferred in the second (31 % against 8 %) respectively the first half of the second century A.D. (20 % against 0 %). An important reason why doorframes differ, is the fact that lintel and threshold sometimes are wider and sometimes not wider than the width of the doorframe. Both types of horizontal elements show gradations: they protrude 1) not, 2) a little bit, 3) rather much, and 4) much. Horizontal elements both protruding over or under the the vertical ones were preferred.

#### 5.1.2.5 Preferred measures

From the foregoing it can be deduced that the most frequent measures are the following:

*doorpost:	width:	0.75	<i>pes</i>
	depth:	1.5	<i>pedes</i>
	height:	5.0	<i>pedes</i>
*threshold:	width:	5.0-5.25	<i>pedes</i>
	depth:	1.5	<i>pedes</i>
	height:	0.75	<i>pes</i>
*lintel:	width:	5.0	<i>pedes</i>
	depth:	1.5	<i>pedes</i>
	height:	0.75	<i>pes</i>

We may conclude that the same preferred measures have been used for all elements. Thus the question





Fig. 27. Ostia, Laurentine cemetery, tomb 4



Fig. 28. Ostia, Domus delle Gorgoni, doorframe (I.xiii.6)

risks whether there are doorframes in *Isola Sacra* which have been built to the standard of the measures mentioned and whether these standard doorframes can be connected with a tomb type. Within our selection three doorframes completely correspond to the preferred measures, namely tomb 20, 21 and the enclosure door of tomb 89 (fig. 25). One doorframe (tomb 13) is responding within a few centimetres. It is astonishing that tomb 20-21 and tomb 89 date from 160-170 A.D. and tomb 13 from 150-160 A.D.<sup>50</sup> The number of standard doorframes is too low to draw hard conclusions. Tomb 13, 20 and 21 belong to the *columbarium* type a, tomb 89 to type c. The type of tomb has not influenced the measures of the doorframe. Probably the standard measures  $0.75 \times 1.5 \times 5.0$  (- 5.25) *pedes* were used during the whole period of the second until the beginning of the third century A.D. with slight variations. The placing of prefabricated elements varied per tomb; this gave each facade its own appearance.

## 5.2. The necropolis of Porta Laurentina

### 5.2.1 General observations

The necropolis is situated along the *Via Laurentina*, which runs from *Porta Laurentina* in Ostia to the southeast. A number of tombs lies along a sidepath and round a square to the east of the *Via Laurentina*. From c. 50 B.C. to c. 100 A.D., just as in the *Isola Sacra* necropolis, mainly small merchants and artisans, for the most part *liberti* and some free born, found their last resting place.

### 5.2.2 Travertine doorframes

Because of the low number of measure data it is not useful to give percentages like we did for *Isola Sacra*. We limit ourselves to a comparison between the doorframes of both cemeteries. The tomb entrances in the *Porta Laurentina* cemetery are less

<sup>50</sup> The dates are proposed by Baldassare 1996.



Fig. 29. Ostia, Tempio dei Fabri navales (III.ii.2)

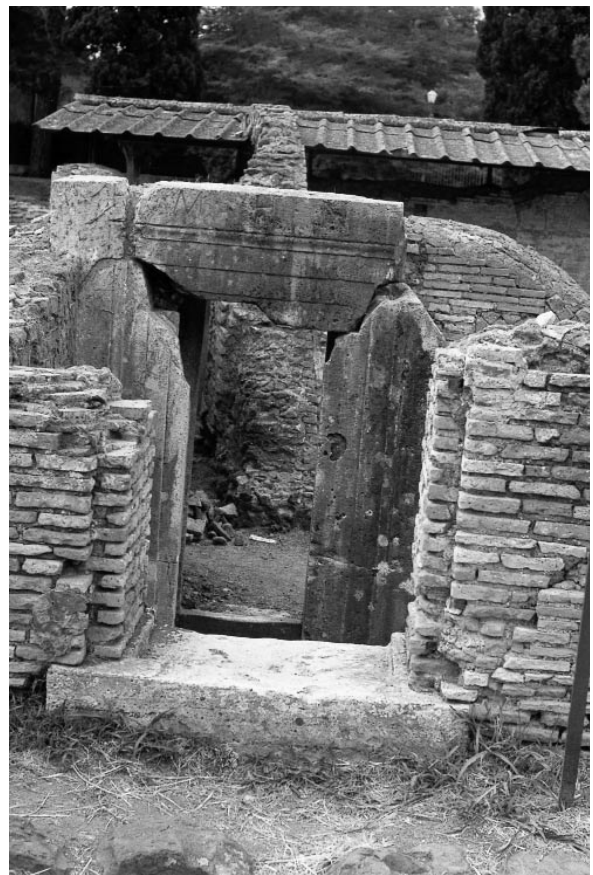


Fig. 30. Cemetery outside Porta Romana, tomb 17

impressive (fig. 26). No doorposts are higher than 4.75 *pedes*; the measures 3.75 and 4.25 *pedes* seem to have prevailed. In *Isola Sacra* the standard height is larger (5.0 *pedes*). The widths of threshold and lintel, in *Isola Sacra* likewise 5.0 *pedes*, are in some cases 2.75 or 3.5 *pedes*. These measures are shorter than the shortest length measured in *Isola Sacra*. The corbel-like lintel which is characteristic for *Isola Sacra*, occurs only in tomb 4 (50-30 B.C.)<sup>51</sup> (fig. 27) and tomb 30. The frame of brickstones does not occur. All the same, the type of doorframe strongly resembles the type in *Isola Sacra*: the horizontal elements (threshold and lintel) protrude in most cases and the construction of the doorframes shows great similarities (cf. fig. 27). Most of the pivot holes are situated at the right side; the barholes are visible in the left doorpost. Because of the many congruences we conclude that there must have been a direct relation between the doorframes in both cemeteries. The doorframes in the *Porta Laurentina* necropolis should be considered as predecessors of those in the *Isola Sacra* necropolis.

### 5.3. Ostia

During our research in Ostia we found two complete doorframes, one monumental porch and some fragmentary doorframes, with which we shall deal briefly. Somewhat similar with the types in the *Isola Sacra* and *Porta Laurentina* cemeteries – flat doorposts and an u-formed threshold – are 1) a fragmentary doorframe belonging to the *Domus delle Gorgoni* (I.xiii.6) which may date from the end of the third century A.D.;<sup>52</sup> 2) a doorframe without the lintel in the *Casggiato dei Triclini* (I.xii.1) from c. 120 A.D.;<sup>53</sup> 3) the fragmentary entrance of a *taberna* (V.ii.6), probably from the Severan period.<sup>54</sup> Ad 1) The measures of the doorposts (width: 1 *pes*; depth: 1.75 *pedes*) and of the threshold width: 5.25 *pedes*; depth: 1.75 *pedes*) only slightly deviate from the average measures in *Isola Sacra*. Indeed, the

<sup>51</sup> Pavolini 1983, 238.

<sup>52</sup> Ibidem, 203.

<sup>53</sup> Ibidem, 108-109.

<sup>54</sup> Ibidem, 208.



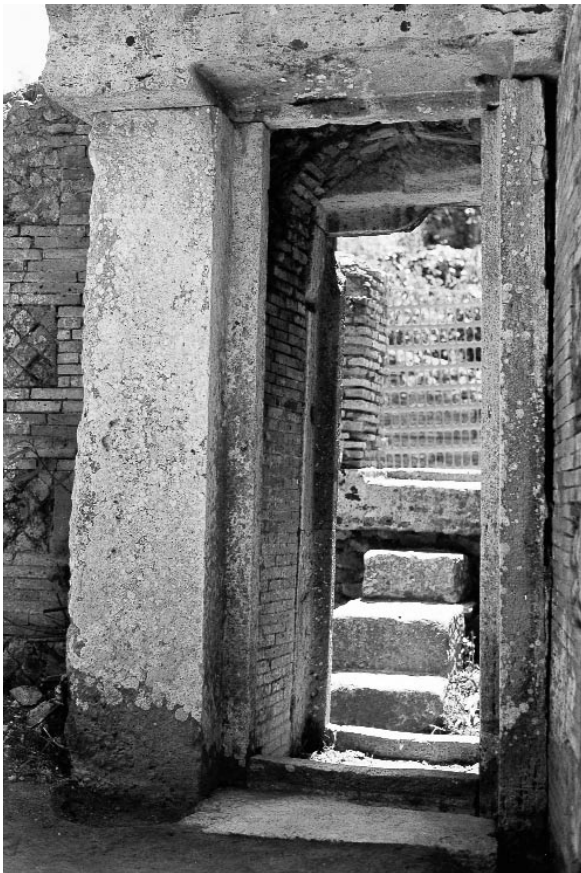


Fig. 31. *Ibidem*, tomb 17, interior doorframe

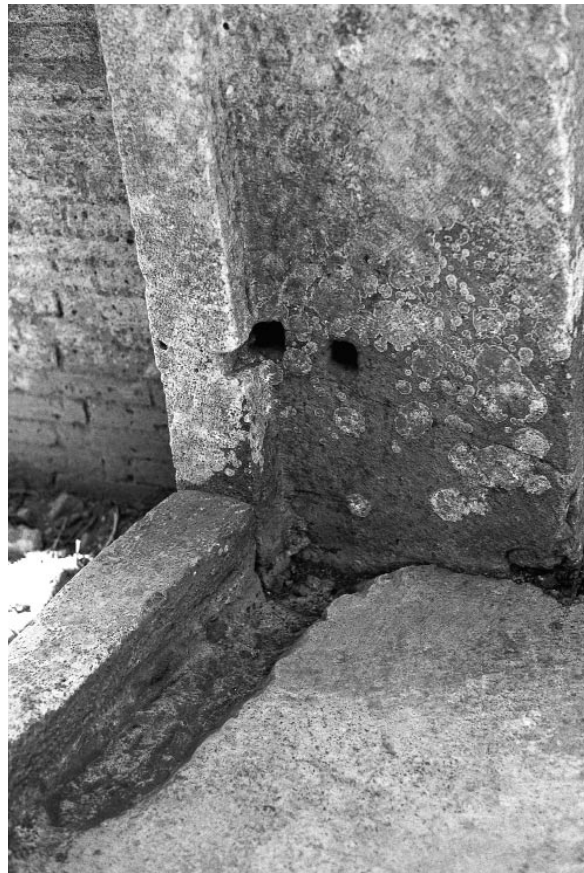


Fig. 32. *Ibidem*, tomb 17, interior doorframe (detail)

width of the doorframe is larger (6 pedes) and the threshold has a pivot hole both in the left and the right corner but these differences may be ascribed to different functions. It is remarkable that the threshold is shorter than the width of the doorframe, a phenomenon which does not occur in the cemeteries mentioned. Also the setting of the doorposts on the threshold is peculiar; in the frontal part of the threshold savings have been cut to contain the door-jambs for half (fig. 28).

Ad 2) The doorframe in the *Caseggiato dei Triclini* deviates from those in *Isola Sacra* insofar it has a construction of doorposts in two parts (fig. 9). The proper doorpost stands on a low sideblock with the same width (1.5 pedes high). Such side-blocks, albeit without doorposts, are present in the *Forica* behind the *Caseggiato dei Triclini* (3 respectively 2.5 pedes high), in the *Domus della Fortuna Annonaria* (V.ii.8) and in the *Insula di Giove e Ganimede* (I.iv.2). It is not certain whether these sideblocks really belonged to a doorframe, since the adjacent walls do not show traces of doorposts

which would have been placed against them.

Ad 3) The entrance of the *taberna* has a much broader opening (7.5 pedes), which is not surprising in view of its function. Here too sideblocks (2 pedes) are present. The width of the remaining doorpost is larger than the average doorpost in *Isola Sacra* or *Porta Laurentina*. The doorpost, however, has a shorter depth than the sideblock upon which it is resting.

A very curious doorframe is present in the *Tempio dei Fabri navales* (III.ii.2) from 180-190 A.D., consisting of a threshold and lintel, somewhat comparable to those in *Isola Sacra*. Only on places where barholes had to be made, blocks of travertine have been inserted into the *latericium*-wall (fig. 29).

Of a completely different type is the monumental entrance to tomb 17 in the necropolis along the *Via Ostiense*, which probably dates from the second century A.D.<sup>55</sup> The gate consists of two doorframes: one exterior and one interior. The external doorframe

<sup>55</sup> *Ibidem*, 42. For a map of the cemetery see Pavolini 1983, 38.



Fig. 33. Ostia, *Horrea Epagathiana*, doorframe (I.viii.3)

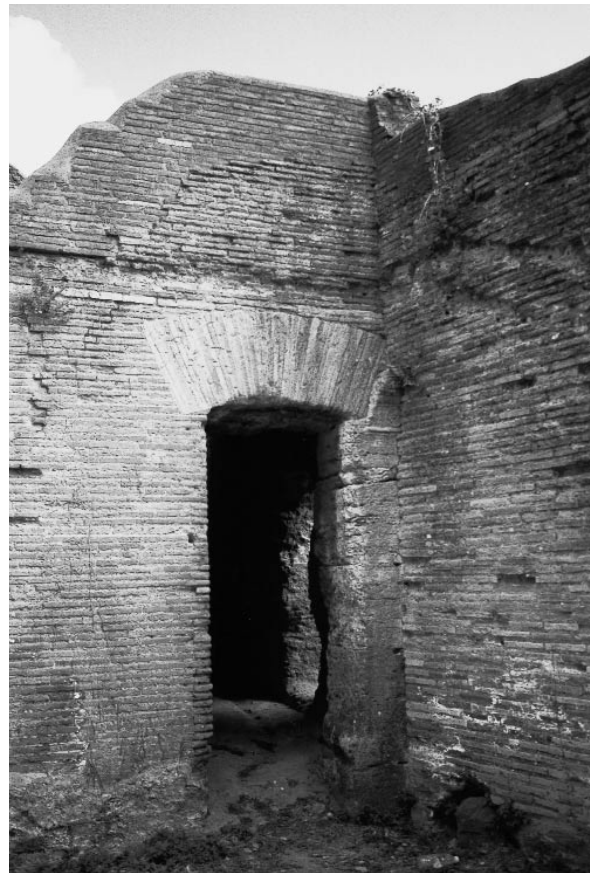


Fig. 34. Ostia, *Terme del Foro* (I.xii.7); travertine doorpost

is decorated with continuing reliefbands, in which the relief rises towards the outer edges (fig. 30). Parallels for this type can be found in the marble doorframes of the *Terme di Buticoso* (I.xiv.8)(122 A.D.) and of the Sanctuary of Attis (IV.i.3)(c. 200 A.D.) in the *Campus Magnae Matris*, and in the fragmentary doorframe in the *Tempio dell' Ara Rotondo* (I.xv.6). The marble items, however, do not show reliefbands rising in outward direction.<sup>56</sup> On the lintel of tomb 17 is an inscription: *H(oc) M(onumentum) H(eredes) N(on) [S(equetur)]*. Unlike the doorframes in *Isola Sacra* the doorposts are placed more against than into the wall. The raised edge of the threshold connects both doorposts. The walls of the small vestibule are built in *opus latericium*. The ceiling is vaulted. The interior doorframe is undecorated. Its main face is turned to the inside of the tomb (fig. 31). The lintel is a massive block of travertine with an u-like edge which protrudes. The pivot hole is – contrary to those in *Isola Sacra* – in the left corner, corresponding with a groove which deepens

toward the wall (fig. 32). This groove served to insert the door by which the deepest part functioned as a kind of pivot hole.

We end with two unique doorframes: the interior monumental entrance of the *Horrea Epagathiana* (I.viii.3) (140-150 A.D.)<sup>57</sup> and the entrance to a corridor with a dead end at the east side of the *Terme del Foro* (I.xiii.7). The entrance in the *Horrea Epagathiana* (fig. 33) is the only doorframe which can be called monumental: it is two times bigger than the monumental doorframes in *Isola Sacra*. The doorposts consist each of two relatively slender elements. The threshold likewise consists of more than one block. The lintel is in fact a lintel arch with cuneiform blocks. The second entrance mentioned has

<sup>56</sup> The reliefbands of the external (fragmentary) doorframes in the *Terme del Mitra* rise in outward direction. Probably they are not made of travertine; the material seems to be concrete with rests of shells. These items have been left out of consideration.

<sup>57</sup> Rickman 1971, 33, fig. 4.



only a doorpost of travertine at the right (fig. 34). This doorpost is incorporated in the east wall of the *Terme*, consisting of five blocks with a height of 1-2.25 *pedes*, a width of 1.25 *pedes* and a depth of 2.25 *pedes*. A superior block is decorated with a *patera umbilicata*. The doorpost may be reused material or an element of a (sacral?) building anterior to the *Terme*. The left (lost) doorpost has been replaced by a *latericium* wall; the lintel consists of an arch of *bipedales* and the threshold is missing completely. The dooropening enlarges in upward direction: the smallest width is 2.75 *pedes*, the largest 3 *pedes*. To resume: it may be concluded that the similarities between the doorframes in *Isola Sacra* and *Porta Laurentina* cemeteries and those in Ostia are too few to assume an identical workshop or tradition. Possible similarities in measures can be explained by the use of Roman *pedes*. Similar elements as u-shaped thresholds, pivot holes or flat doorposts are too general to assume a direct relation.

#### 5.4 Conclusion

Apart from some exceptions there is no relation between measures, proportions and dates of the travertine doorframes in the necropolis *Isola Sacra*. Furthermore the type of tomb does not seem to have influenced the measures and proportions. Preferred measures, however, have been used which are identical for each of the three elements: 0.75 x 1.5 x 5.0 (-5.25) *pedes*, though deviations from the standard measures occur. By varying in the placing of prefabricated elements doorframes of each tomb got an individual proportion. The doorframes in the necropolis of *Porta Laurentina* belong to the same architectural tradition as those of *Isola Sacra* in spite of evident differences. In contrast the doorframes in Ostia city itself, which are multiform, do not resemble the doorframes in the two cemeteries mentioned.

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