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### **Supplier of Rome or Mediterranean marketplace? The Changing Economic Role of Ostia after the Construction of Portus in the light of new Archaeological Evidence**

The aim of this short paper is to stimulate discussion about the economic role of Ostia during the 2<sup>nd</sup> century AD and its relation to Portus and Rome. Contrary to the traditional understanding, my main thesis is that Ostia served during this period only partially as a supplier of Rome - a task which was successfully taken over by Portus - but that it generated much of its income as an important centre of intermediate trade within the Mediterranean world<sup>1</sup>. My point of departure is the urbanistic development of Ostia as we can reconstruct it on the basis of recent research at Ostia and Portus and the results of our own project in the unexcavated parts of the city, using geophysical survey methods, aerial photography and stratigraphic excavations<sup>2</sup>. In the first part of my paper I will summarize some of the most important stages in the development of Ostia; in the second part I will suggest some more general ideas about the economic role of city.

Ostia developed at first only hesitantly after its foundation in the late 4<sup>th</sup> century as a fortress controlling the river mouth with a small number of settler families. Even if Ostia gradually outgrew the wall of the *castrum* and spilled over unsystematically along the main roads leading out of town, it preserved the look of a small town, almost a village, until the end of the republic as far as size and infrastructure are concerned. The reason for this astonishingly slow development was probably the lack of a suitable harbour. Most of the goods coming from the eastern Mediterranean directed toward Rome went through the port of Puteoli on the Bay of Naples.

However, I am no longer convinced that seagoing ships could not enter the mouth of the Tiber, which is the traditional view. Recent geo-archaeological work shows that the ancient river had a depth of approximately 5 to 6 meters and that even in the dry summer period, when most of the sea traffic would arrive, the water level of the Tiber probably did not drop below 3 to 4 meters<sup>3</sup>. This means that most of the Roman ships, which usually had a cargo between 200 – 400 tons, could easily enter the Tiber mouth throughout the year. However, the river harbour had a major logistical problem. Because of the flow of the river, ships had to be docked parallel to the embankment. This means, considering the length of the settlement, that not more than about 20 ships could have been unloaded in the same time. It has been estimated that the unloading of a normal-sized ship with about 250 tons required 6 to 8 days. Thus, the risk of arriving at Ostia during the high season and not finding a free docking space must have been significant. Therefore, I think we have to accept

<sup>1</sup> In general: MEIGGS 1973; RICKMAN 1980; PAVOLINI 1986b; GARNSEY 1988; SIRKS 1991; VIRLOUVET 2000.

<sup>2</sup> HEINZELMANN and MARTIN 2000, 277-283; HEINZELMANN 2001, 313-28. HEINZELMANN 2002b, 225-242; HEINZELMANN and MARTIN 2002, 5-19; MARTIN and HEINZELMANN 2002, 259-304.

<sup>3</sup> ARNOLDUS-HUYZENDVELD and PAROLI 1995, 383-392; ARNOLDUS-HUYZENDVELD and PELLEGRINO 2000, 219-226; LE GALL 2005, 13-23.

that Ostia was a normal river harbour like hundreds of other in the Mediterranean but that its capacities were simply not sufficient to deal with the enormous quantities of Rome's daily demand.

It is well known that the emperors from Augustus on had a special interest in improving this situation either by administrative measures or investments in infrastructure. Indeed, the urbanistic development of Ostia became significantly more dynamic in the Julio-Claudian period, when the built-up area expanded, especially in the west toward the seacoast. At the same time important urbanistic measures can be seen inside the city that are at least in part attributable to the direct involvement of the imperial house or its immediate surroundings: for example, the construction of the theatre by Agrippa and of the Piazzale delle Corporazioni, as well as the enlargement of the forum and the construction of the temple of Roma and Augustus.

However, it is only with Claudius that we can observe the first improvements of the harbour infrastructure itself. The most important is the creation of a large harbour basin just inside the Tiber mouth in the west of Regio III, which was about 100 m long, and 80 m deep<sup>4</sup>. On its east side a monumental *navalia* - temple complex was installed, which gives Ostia a representative façade towards the sea for the first time.

At the same time, the storage facilities were improved: either by imperial investments, like the so-called Grandi Horrea, or private ones, like the Horrea of Hortensius. With this expansion of the river harbour and the contemporary initial construction of Portus under Claudius, the urbanistic development of Ostia received more of an impulse in the second half of the 1<sup>st</sup> century.

In the east the built-up area reached the line of the city wall in Regio V, while it passed beyond it in the west along the seacoast in a broad band that apparently went up to the beach. The first buildings appear on the north side of the Tiber, and Ostia was connected by a road with Portus.

As far as the way the new built-up area was used is concerned, it is possible to identify two sectors with particularly dynamic development. On the one hand, there is an increase in *horrea* from the Flavian period, especially in the vicinity of the harbour basin in the west of Regio III. However, the first indication of a row of large, luxurious dwellings and of at least one large *villa suburbana* in the southeastern outskirts of the city is particularly important<sup>5</sup>. Three of the buildings we investigated go back to the Flavian period and thus undoubtedly before the great urbanistic boom of the 2<sup>nd</sup> century. Apparently, a small group of especially wealthy citizens grew up in this period, possibly because of the city's increase in trade, which gave up a presence in the centre of the city and migrated to the outskirts.

In the course of the 2<sup>nd</sup> century a fundamental urbanistic upsurge took place at Ostia, which Russell Meiggs correctly described as an "architectural revolution" and which has characterized our picture of the city until now<sup>6</sup>. While almost all the previous structures in the centre of the city were gradually demolished and replaced by new and larger buildings, the city expanded rapidly on the outskirts, doubling the built-up area within a few decades.

The character of the new neighbourhoods was deeply influenced by aspects of commercial utility. The largest building group consists of newly created *horrea* of the most varied sizes and types, which are to be found sometimes even in the most out-of-the-way parts of the city<sup>7</sup>. About 20 to 25 new *horrea* have to be added to the 15 known buildings of this type, doubling the available storage space of the second century.<sup>8</sup> *Insulae* of various sizes make up a further group, representing a particularly lucrative source of income for investors as multifunctional rental objects. Most of the ground floors of these *insulae* were used for commercial purposes like the more than 800 *tabernae* that have been counted in the excavated city-centre; again it can be estimated that we have to double this figure in the unexcavated areas<sup>9</sup>.

The multitude and typological multiplicity of these buildings, as well as the evidently largely uncoordinated development of the single neighbourhoods, suggest that the dynamic of the economic upswing of the city was characterized principally by purely private economic interests, completely unlike the systematic

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<sup>4</sup> HEINZELMANN and MARTIN 2002, 5-19.

<sup>5</sup> HEINZELMANN, 2002b, 225-242.

<sup>6</sup> MEIGGS 1973, 133-145.

<sup>7</sup> RICKMAN 1971, 15-86.

<sup>8</sup> See also paper by KEAY in this session.

<sup>9</sup> GIRRI 1956, 7-44; HEINZELMANN 2005, 113-128 with fig. 2.

expansion of Portus carried out by emperors<sup>10</sup>. Indeed, as Janet Delaine has recently shown by analyzing brick stamp assemblages, even large-scale building projects such as the *Casa a Giardino* originated in private investments<sup>11</sup>. In fact, we can suppose that a wide-ranging concentration of the ownership of real estate in the hands of wealthy investors took place at Ostia as a consequence of the extremely dynamic economic upswing, while the vast majority of the population lived in rented premises.

All together, Ostia shows an extreme and one-sided economic boom, which is unique in the Mediterranean. Ostia in the second century was a completely commercialized city and society, but contrary to Portus this boom was primarily sustained by private investors. At the same time, the Ostian economy generated enough surplus to give a massively increasing population work and bread. Hundreds of private entrepreneurs, organized in guilds, thousands of smaller salesmen, shopkeepers, craftsmen and workers kept the business going. The result was the formation of an astonishingly broad middle class.

However, this incredible economic success did not last very long. Carlo Pavolini could demonstrate in a systematic survey of the third century building activities that from the late Severan period onwards Ostia suffered a dramatic crisis and a deep going economic restructuring<sup>12</sup>. None of the *horrea* in the excavated areas shows signs of continued use after the middle of the 3<sup>rd</sup> century. Indeed, we can say that five of the *horrea* we investigated in our excavations were given up completely in this period. At least one hundred *tabernae* in the city centre were abandoned. Many of the multi-storied *insulae* were not in use any more or reduced in height and converted into smaller housing units, indicating a dramatic decrease in the population of Ostia. It is especially significant, however, that at least one large *domus* in Regio III, as well as the large *villa suburbana* in Regio IV, was completely abandoned toward the end of the 3<sup>rd</sup> century<sup>13</sup>. It seems, therefore, that the crisis of the 3<sup>rd</sup> century affected even the beneficiaries of the previous economic boom.

While the earlier development of Ostia up to the Flavian period seems to be quite comprehensible in its function as the supply harbour of Rome, the extraordinary economic success of the 2<sup>nd</sup> century remains somehow mysterious. It has long been said that it has to be connected somehow with the building of the Trajanic harbour and the subsequent transfer of the Alexandrian grain fleet to Portus<sup>14</sup>. However, so far no really convincing arguments on how Ostia actually should have profited from this process have been brought forward, since all goods that were unloaded in Portus went directly to Rome and did not touch Ostia. So how does it come about that Ostia, although its harbour system was much less efficient than Portus, developed into a booming trade centre on its own?

One important reason can be proposed: we probably have to distinguish between different kinds of goods that were transhipped at Portus and Ostia. Portus was obviously designed to optimize the supply of the daily demands of Rome within the *annona*, which means especially grain and later oil. The preferred type of storage buildings are elongated *horrea* of the corridor type, which are most suitable for the short-term storage of mass products like grain. On the contrary, at Ostia the most common *horrea* are of the courtyard type, some of them with rich decoration, designed obviously with the intention of attracting potential customers<sup>15</sup>. In fact, these *horrea* were more trading houses than simple storage facilities. It is clear that these privately owned *horrea* dealt probably with other goods, like luxurious products from the East, special wines etc. However, why should the Romans make the long trip to Ostia to buy these goods there, since we can observe the same mixture of different *horrea* types in Rome itself? And secondly, the more critical question: why was it only at the beginning of the 2<sup>nd</sup> century that Ostia attracted such a massive private investment in this sector? I think we can exclude that the decisive stimulus came from Rome. The consumption of luxurious wares by the imperial court and the aristocratic houses reached its peak already under Nero and the Flavians. From Trajan's reign they remained at a constantly high but increasing level during the second century. Also the demands of the broader Roman population remained probably at the

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<sup>10</sup> HEINZELMANN 2002a, 103-122; DELAINE 2005, 29-47; KEAY *ET AL.* 2005, 281-290, 305-314.

<sup>11</sup> DELAINE 2002, 41-102.

<sup>12</sup> PAVOLINI 1986a, 239-283; PAVOLINI 2002, 325-352.

<sup>13</sup> HEINZELMANN 2002b, 225-242.

<sup>14</sup> MEIGGS 1973, 278-285.

<sup>15</sup> HEINZELMANN 2002a, 103-222; DELAINE 2005, 29-47.

same level, as the number of circa one million inhabitants did not change significantly between Augustus and the end of the 3<sup>rd</sup> century, nor did the living conditions for the greater part of the urban population. So where was the market for the enormous amount of goods stored and traded at Ostia? There is indeed one big market with an increasing demand: the cities in the provinces, which experienced an enormous upsurge during the second century AD in nearly all regions of the Empire. So if we look in this direction, how would it be possible to connect Ostia with this market?

We all know very well that goods of all kinds were constantly transported on the Mediterranean in all directions. For example, the characteristic Iberian oil amphora Dressel 20 was distributed in the first two centuries AD far to the East, or in the opposite direction, the wine amphora Kapitän II, which was produced in the Eastern Mediterranean and reached Spain, Germany and even Britain from the late 2<sup>nd</sup> cent. AD<sup>16</sup>. But how did this trade actually work? Is it possible that Ostia functioned as a place for intermediate trade for these products? Unfortunately, it is very difficult to find good archaeological evidence for this thesis. However there are at least some small indications.

Carlo Pavolini pointed out that Roman sailing ships could not sail without a certain amount of ballast, and he therefore proposed that instead of loading sand, the outgoing ships of Ostia actually transported goods<sup>17</sup>. Indeed, there are some wares of definite Roman origin, like tiles and *dolia*, which have been found in many places of the western Empire. Even if this is just a ridiculously small group of products, they prove that at least some outbound trade was going on at Ostia. A promising but much more complicated approach for the future could be the comparison of pottery assemblages of different sites around the Mediterranean. For example, the sudden and nearly contemporaneous occurrence of certain products in completely different regions, like the early African Red Slip Ware at the beginning of the second century, as well as their sudden disappearance, could be a hint that their distribution depended on a major trade centre with which these regions had close contacts<sup>18</sup>.

Finally, if we don't have enough hard archaeological facts, we can always escape into theoretical approaches. Indeed, modern network theories, especially the influential 'Small World' model published by Watts and Strogatz<sup>19</sup>, are able to offer some good explanations for our phenomenon at Ostia. Simplified, this model could show that the most efficient networks consist of a huge number of single nodes that are each connected with their neighbour nodes – in our case these could be the single harbour cities with their hinterlands and neighbouring harbours. The connectivity of such networks rises dramatically if some of the nodes – but not all of them - establish long distance connections, because the path length for these nodes and their neighbours is shortened. From a certain level of connectivity such major nodes, or hubs, attract further links with smaller nodes automatically and grow constantly. The 'Small World' network has meanwhile also been tested by economists, who showed that it is indeed the most efficient way of organizing bilateral trade<sup>20</sup> systems. Here the main axiom is that trade requires search, negotiation and exchange, which are all activities that absorb resources. If all trade agents trade directly with any individual in the market a tremendous amount of search and negotiation is necessary. The application of the 'Small World' model showed that the ideal organization of a trade system requires that most of the agents trade only on a local level, while just a few agents, concentrated in the major hubs deal with the long-distance trade and the sub-distribution to the local markets.

Coming back to Ostia, I think that this approach of a 'Small world' network could offer a very good explanation of what was going on in the second century AD. Before the building of the Trajanic Portus, Ostia had already close links with the West, importing huge quantities of Iberian oil and fish sauces, as well as Gallic wine. However, since the eastern and southern imports were unloaded at Puteoli, these two different trade connections could not be linked with each other. This was only the case when the eastern ships were

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<sup>16</sup> PANELLA 1985, 180-189; REYNOLDS 1995, 106-110.

<sup>17</sup> PAVOLINI 1985, 200-208.

<sup>18</sup> REYNOLDS 1995, 6-14 with figs. 152-154.

<sup>19</sup> WATTS and STROGATZ 1998, 440-442.

<sup>20</sup> WILHITE 2001, 49-64.

attracted by the Trajanic harbour.<sup>21</sup> From this point onwards Ostia could function as an ideal place of intermediate trade between East and West. Incoming ships could unload their goods first at Portus as far as they concerned the *annona*, than continue their trip to Ostia, where they could unload private owned goods, deal with the local agents on the Piazzale delle Corporazioni and finally take new cargo on board for their destinations on the way back.

But why would this successful network system fail in such a dramatic way during the first half of the third century? I can imagine several reasons. First of all the demand for luxurious goods in Rome decreased in this period; secondly the availability of these wares could have suffered from the wars in the East, although we tend to overestimate the influence of political events on trade routes. More important could have been that with the Severans the oil import from Spain, which was formerly organized exclusively by private entrepreneurs, was more and more controlled by the state. This must have had negative effects on the economic activities of the private investors and enterprisers of Ostia<sup>22</sup>. Indeed, the oil imports from Iberia came to a complete end by the mid 3<sup>rd</sup> cent. AD, being replaced by then by imports from North Africa. With the collapse of this major western trade connection the once established equilibrium between the links was broken and this may have marked the end of Ostia as a Mediterranean market place.

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<sup>21</sup> The diversion of the Alexandrian grain fleet from Puteoli to Portus is an issue also discussed by Keay in this session.

<sup>22</sup> REYNOLDS 1995, 106-108.

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