

## **Mediterranean economies compared through archaeology (10<sup>th</sup>-12<sup>th</sup> centuries)**

by Alessandra Molinari

This article offers a comparative reassessment of Mediterranean economies between the 10<sup>th</sup> and 12<sup>th</sup> centuries through an archaeological perspective, with particular attention to Italy and the Islamic regions of the central Mediterranean (Egypt, Sicily, and Tunisia). The analysis of chaînes opératoires, exchange networks, and technological innovations in both craft and agricultural sectors makes it possible to assess more accurately the levels of specialisation and economic complexity of the different areas. Archaeological evidence confirms the strong vitality of Islamic economies, especially in terms of their capacity for innovation and the complexity of their internal distribution networks, while showing a later role for central-northern Italy in processes of growth. Engaging with recent historiographical debates, the article argues that medieval economic development was largely driven by regional dynamics and domestic markets, but suggests rethinking the significance of interregional exchanges primarily as vehicles for the circulation of knowledge, techniques, and cultural models.

Questo contributo propone una rilettura comparativa delle economie mediterranee tra i secoli X e XII attraverso l'archeologia, con particolare attenzione all'Italia e alle regioni islamiche della sponda centrale del Mediterraneo (Egitto, Sicilia, Tunisia). L'analisi delle catene operative, delle reti di scambio e delle innovazioni tecnologiche nei settori artigianali e agricoli consente di valutare in modo più preciso i livelli di specializzazione e la complessità economica delle diverse aree. I dati archeologici confermano la forte vitalità delle economie islamiche, soprattutto in relazione alla capacità di innovazione e alla complessità delle reti interne di distribuzione, mentre mostrano un ruolo più tardivo dell'Italia centro-settentrionale nei processi di crescita. In dialogo con il recente dibattito storiografico, il contributo sostiene che lo sviluppo economico medievale fu determinato in larga misura da dinamiche regionali e da mercati interni, ma pro-

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pone di riconsiderare il peso degli scambi interregionali soprattutto come veicolo di circolazione di conoscenze, tecniche e modelli culturali.

Middle Ages, 11<sup>th</sup>-12<sup>th</sup> centuries, Economic archaeology, Medieval Mediterranean, Technological innovation, Exchange networks.

Medioevo, secoli XI-XII, archeologia economica, Mediterraneo medievale, innovazione tecnologiche, reti di scambio.

In a volume devoted to the discussion of continuity and change in Italy during the 11<sup>th</sup> and 12<sup>th</sup> centuries, archaeology can, unsurprisingly, offer a valuable contribution. I believe this contribution can be particularly significant in debates concerning economic growth and the so-called commercial revolution. Moreover, it is essential to conduct a comparative analysis of the available evidence from the Italian Peninsula and that from other Mediterranean regions – especially those of the Islamic world. When considered systematically, archaeological data make it possible to reconstruct the various *chaînes opératoires* employed by artisans (from raw materials to finished products), as well as the networks through which objects and goods of various kinds circulated. These reconstructions help assemble a body of evidence useful for assessing levels of specialization and the complexity of medieval economies. The increasing use of scientific analyses and archaeometric methods further enhances our ability to identify processes of technological innovation, which occurred in different ways and at different times across the regions under study. Although archaeological inquiry is often dismissed as a kind of fetishism for “potsherds,” we can now assert not only that ceramics are a fully legitimate source for reconstructing economic processes (from production methods to exchange networks), but also that a far broader range of materials and contexts is now available for integrated analysis. In any case, such “potsherds” constitute an exceptional source of information, no less illuminating than well-known documentary series such as the Cairo Geniza. Ceramics are ubiquitous in Mediterranean stratigraphy – precisely because they are not recyclable – and they retain information about both production processes and the raw materials employed, which in turn allows us to infer their potential provenance. Ceramics can be quantified both in terms of the distance from their production centres and in terms of typology – by degree of technical sophistication, origin, or function. This makes it possible to carry out systematic comparisons across different chronological periods and geographical contexts.

We therefore aim to discuss periodization and economic growth through a comparative use of archaeological datasets, focusing on Italy and, above all, on the Islamic regions of the central Mediterranean that once formed part of the Fatimid Empire (10<sup>th</sup>-12<sup>th</sup> centuries): Egypt, Sicily, and Tunisia. These areas not only constituted a political unit for at least part of the period under consideration, but – especially in the case of Sicily – have also been the subject of recent research that has enabled an integrated reading of diverse forms of material evidence. This, in turn, allows us to contribute to the epistemological

debate stimulated by Chris Wickham's recent volume.<sup>1</sup> As is well known, *The Donkey and the Boat* challenges a widely held historiographical interpretation that credits Italian merchants with initiating a commercial revolution in the Mediterranean from the 11<sup>th</sup> century onward. Drawing on both historical and archaeological data, Wickham argues that economic growth was primarily rooted in regional dynamics, grounded in the local exchange of everyday goods rather than in international trade or the circulation of luxury items. His comparative analysis of six Mediterranean regions reveals that Italy's economic development was relatively late, while Egypt maintained the most complex economy in the region at least until the Black Death. Wickham also critiques historical narratives that depict the economic trajectories of Islamic or Byzantine societies as 'failures', suggesting that such interpretations often serve to reinforce a narrative of early Western ascendancy and are seldom supported by robust empirical evidence. He concludes that Italian merchants arrived late and never succeeded in dominating the internal economies of the various Mediterranean political entities.

My recent research leads me to endorse fully many of the arguments presented in *The Donkey and the Boat*, particularly with regard to the periodization of economic growth and the considerable internal complexity of the Islamic economies under examination. In this contribution, however, I broaden the range of archaeological evidence considered, including not only inorganic materials but also organic remains (plants and animals), as well as typically perishable materials such as paper and textiles. Special attention will be devoted to a crucial aspect of any discussion of economic growth: the varying degrees of technological innovation achieved by the societies in question. This expanded perspective allows for further reflection on the relative complexity of the economies under analysis, on the timing and nature of their growth, and – most importantly – on the role of international relations, not so much in terms of the volume of goods exchanged as in the circulation of ideas, knowledge, and tastes. In short, I would suggest that exchanges – between culturally and politically distinct regions may enhance a society's capacity for innovation and therefore should not be viewed as peripheral to processes of growth. In some instances, I will also touch upon developments in the 13<sup>th</sup> century, which often displays marked discontinuities that make it particularly interesting for comparative analysis. For this period, it may be possible to reopen the discussion of the role played by Italian merchants in the economies of regions such as the Crusader states or Sicily, and to reassess the extent to which their economic activities remained truly "external" to the societies in which they operated. In the pages that follow, alongside reflections on technological innovation, I will seek to summarise several key aspects relating to settlement patterns and exchange networks, drawing on new research con-

<sup>1</sup> Wickham, *The Donkey and the Boat*. See also Saggioro and Varanini, "Una discussione" and Goldberg, Wilkin, Tabarrini, and Wickham, "About «The Donkey and the Boat»."

ducted both in Italy and in the Islamic regions of the central Mediterranean. A brief concluding section will offer some thoughts on the value of periodisation and comparison as analytical tools.

### 1. *The different capacities for technological innovation*

The increase in the overall stock of knowledge, which also includes technological progress, is considered one of the main drivers of economic growth, although it is not always easy to understand why some societies are more creative than others.<sup>2</sup> Technological innovation is hardly the sole driver of growth; rather, it goes hand in hand with market expansion, demographic trends, and patterns of investment. Far from being a period of technological stagnation,<sup>3</sup> the Middle Ages are increasingly recognised as highly innovative. Archaeology is greatly enhancing its ability to identify and date the introduction and establishment of new techniques across a range of productive sectors, from agriculture to handicrafts. It is rarely possible to pinpoint archaeologically the exact moment of an invention, but certainly the phases in which innovations became more or less widely adopted within particular social groups are clearly discernible.<sup>4</sup> Innovations do not always follow the same pathways: they may arise simultaneously and independently in several places, or result from the mobility of artisans or peasants. It is also possible – and frequently observed – that innovations occur because new needs arise that lead to the exploitation of empirical knowledge already possessed by a given society<sup>5</sup>. In these latter processes, the role of women is also receiving increasing attention. Finally, it is worth recalling that innovation may involve both the gradual refinement of existing techniques and the invention and application of entirely new processes. As noted above, archaeology is becoming ever better equipped to recognize innovations thanks not only to its traditional focus on reconstructing *chaînes opératoires* and production cycles, but also to the growing availability of archaeometric analyses, which can more accurately identify the composition and origin of raw materials, as well as the dating of artefacts and ecofacts.

Returning to our themes and to the specific period addressed in this chapter, it becomes evident that the Islamic world – particularly the Mediterranean region – was significantly more creative and innovative than peninsular Italy, especially during the 10<sup>th</sup> and 11<sup>th</sup> centuries.<sup>6</sup> This observation appears to reinforce further Wickham's reconstruction, which is based above all on

<sup>2</sup> A good overview of the subject is Mokyr, *The Lever or Riches*.

<sup>3</sup> See, most recently, Franceschi, et al., *Medioevo che crea*.

<sup>4</sup> For the differences between invention and innovation, see Mokyr, *The Lever*, 21-48; Giannichedda, *Uomini e cose*, 73-81.

<sup>5</sup> Graeber, Wengrow, *The Dawn of Everything*, 527-9.

<sup>6</sup> Among recent works, see, for example, Colangeli, Sacco, *Le forme del vetro*.

the analysis of internal exchange networks. A good example is Egypt, now regarded as the engine of Mediterranean economies for much of the Middle Ages. In the 9<sup>th</sup> and especially the 10<sup>th</sup> century, Egypt switched from papyrus to paper; from natron (a mineral component) to vegetable ash in glass production; began producing glazed and decorated ceramics inspired by the fashions from China and Iraq; introduced new cash crops such as cotton (to which we will return) and sugar; and probably developed new methods of spinning and dyeing textiles. Similar innovations occurred in Sicily and Tunisia, in ways that were in some cases certainly independent. Many of these innovations – clearly underway across much of the Islamic world – did not reach the Italian Peninsula until the 12<sup>th</sup> and, especially, the 13<sup>th</sup> century. The innovations did not only concern the craft sector alone. In agriculture, the so-called green revolution was, according to some scholars, facilitated by the creation of the vast Islamic economic and cultural sphere and involved the introduction of new plants and/or new methods of cultivation.<sup>7</sup> In this regard, as we shall see, a considerable number of recent studies detail and refine our understanding of the processes of agricultural transformation, which did indeed take place in several parts of the Islamic world. Resistance to innovation is certainly not attributable solely to economic backwardness: tastes, habits, the size of human groups, and social distinctions are all factors that may have delayed the adoption of new technical processes and objects. The fact remains that much of the Italian Peninsula was, for a long time, much less creative than its neighbours in the Islamic world. In discussing some case studies, I will dwell especially on those for which archaeological research offers interesting new insights, without any claim to be exhaustive.

It is not yet entirely clear which pathways led to the adoption of paper in Egypt. The mediation of Baghdad and its chancellery was probably crucial, and it is estimated that during the first half of the 10<sup>th</sup> century paper almost completely supplanted papyrus.<sup>8</sup> The Fatimid administration made exclusive use of paper for official documents. The preference of the Shia caliphs is thought to have stemmed from the greater difficulty in forging paper documents and from the capillarity of their state organization. Egyptian archaeology – which benefits from unusually favourable conditions for the preservation of perishable artefacts – has shown how the use of paper as a writing medium was socially widespread between the 10<sup>th</sup> and 11<sup>th</sup> centuries, extending well beyond strictly administrative or official contexts. In addition to the fact that the vast majority of the documents of the Cairo Geniza are on paper,<sup>9</sup>

<sup>7</sup> See Watson, *Agricultural Innovation* and, most recently, Davis, “Watson’s Green Revolution,” and Kirchner, et al., “Re-thinking the ‘Green Revolution’” for an extensive critical review on the subject.

<sup>8</sup> It would seem that papermaking techniques did not reach the Islamic world directly from China, but rather via Central Asia: see Bloom, *Paper Before Print*; Rustow, *The Lost Archive*, 128–52.

<sup>9</sup> Cohen, *Composition Analysis of Writing Materials*.

the French excavations of the 1980s/90s at Fustat (Istabl Antar)<sup>10</sup> uncovered a large rubbish deposit containing hundreds of fragments of common-quality cloth and paper stratigraphically datable to the 11<sup>th</sup> century. From the same site, a similar deposit – datable instead to the 9<sup>th</sup> century – yielded not only cloth of varying quality, but also rather poor papyrus, and no paper at all. Even in the 11<sup>th</sup> century levels of the excavation of the port of Quseir al-Qadim on the Red Sea, paper is the main writing medium (found on over a thousand objects). It is followed by cloth, wood, and even oyster shells, but not by papyrus, which had been the principal medium in the Roman levels. Between the 10<sup>th</sup> and 11<sup>th</sup> centuries, therefore, there appears to have been a clear substitution of paper for papyrus, despite the latter having been produced in Egypt for millennia. This was a radical innovation, introduced through a top-down impulse but also associated with a very widespread social use of writing.

Egypt also holds enormous potential for information regarding the archaeology of textiles. In addition to the large number of post-antique and mostly luxury textiles preserved in museums around the world, everyday fabrics recovered from settlement excavations are of great interest: e.g. at Quseir al-Qadim, Deir al-Naqlun, Jasirat Fara'un, and again at Fustat.<sup>11</sup> From these findings, it appears that the production of cotton fabrics – the fibre that revolutionised the cloth market in the Middle Ages – began early (perhaps as early as the 10<sup>th</sup> century) in Egypt for everyday use,<sup>12</sup> alongside the better known linen, wool, and silk fabrics. We will return later to the subject of cotton cultivation and its interpretative challenges, but it is worth noting here that archaeological evidence has also yielded relatively substantial finds of fabrics that can confidently be identified as Indian (cotton textiles printed with stamps), again at Quseir al-Qadim and Fustat.<sup>13</sup> The arrival of know-how required for the production of cotton fabrics in Egypt may have resulted from the intensification of contacts with India, although it should be remembered that cotton fabrics (archaeologically attested) have been recognised on the Arabian Peninsula since pre-Islamic times as well.<sup>14</sup> Since relations between Egypt and India certainly predate the Middle Ages, it is interesting to note that it was nevertheless this period that proved more favourable to large-scale innovation.

<sup>10</sup> See Gayraud, "Fostat: évolution d'une capitale arabe;" Gayraud, Vallauri, *Fustat II, Fouilles d'Istabl Antar*. Roberta Cortopassi (Louvre Museum), who has catalogued all the textiles, believes that among those dated to the 11<sup>th</sup> century there are very common, locally produced fabrics, including some made from cotton (personal communication).

<sup>11</sup> See Desrosiers, "Techniques des textiles," for an overview.

<sup>12</sup> Cotton also appears to have been used for furnishing fabrics or even as padding – e.g. in funerary rituals; see Desrosiers, "Techniques" and Gayraud, "La nécropole fatimide."

<sup>13</sup> See Barnes, *Indian Block-printed Textiles in Egypt* for the Ashmolean Museum's collections of textiles from Fustat – made in India and dated by C<sup>14</sup> to between the 9<sup>th</sup> and 13<sup>th</sup> centuries; and Vogelsang-Eastwood, *Resist Dyed Textiles*, for the finds from Quseir al-Qadim.

<sup>14</sup> Ryan, et al., "Strontium isotope evidence."

Archaeometric analyses of Egyptian glass are also of great interest. Until the 8<sup>th</sup> century, Egypt remained one of the great primary producers of glass, manufactured from silica and natron as a flux. Natron – extracted in the Wadi el-Natron, about 90 km north-east of Cairo – was one of the main components (as flux), together with silica of course, of glass produced in both Egypt and the Levant until at least the 7<sup>th</sup> century.<sup>15</sup> Raw glass or finished objects made from natron circulated throughout Mediterranean and even reached the continental part of the empire in Roman and late Roman times. From the 8<sup>th</sup> century, for reasons that are not entirely clear, this fundamental component disappeared from glass production except in Egyptian glass or in glass made from older recycled material. In the Levant, ash from specific plants (such as *salicornia*, which is a marine plant) began to be used instead of natron. Archaeometric analyses have shown that in Egypt, plant ash began to be employed as a flux from at least the 10<sup>th</sup> century. In this case, the shift represents an expedient that did not introduce entirely new processes, but rather involved the replacement of a fundamental raw material (*natron*) with another – plant ash – characterised, perhaps, by a simpler production cycle and greater availability. It would therefore be a form of innovation likely to lower production costs, even in a country that had previously mined natron in large quantities. It is not unlikely that this technique reached Egypt from the Levant. Here we can recall that locally produced glass made from plant ash is found in Sicily and probably also in Tunisia between the late 9<sup>th</sup> century and the 10<sup>th</sup> century.<sup>16</sup> On the Italian Peninsula, by contrast, even in the Venice area, glass in the 11<sup>th</sup> century still appears to have been produced primarily by recycling ancient and late antique glass (which contained natron) and was in any case extremely rare and luxurious.<sup>17</sup>

A development of great interest to archaeologists – and very evident in the material record – is the introduction of ceramics intended for food consumption that are covered with transparent (glazed) or opaque (enamelled) coatings, very often accompanied by painted (using different colour palettes) or incised decorations. In the late 9<sup>th</sup> and especially the 10<sup>th</sup> century, these ceramics came into common use in virtually all households across the Islamic world. What is particularly interesting is the multiplicity of technical, as well as formal, solutions employed in producing these glass surfaces,<sup>18</sup> all of which, however, require the vessel to be fired at least twice. This was therefore a technical innovation that appears to have increased production costs, owing to the doubling of the fuel requirements and the use of more complex manufacturing processes that, in some cases, also demanded rare raw mate-

<sup>15</sup> For a recent overview of the composition and local production of glass in Egypt in Islamic and pre-Islamic times, see Schibille, *Islamic Glass in the Making*; and Foy, “Entre orient et occident, le verre islamique.”

<sup>16</sup> See, most recently, Colangeli, Sacco, *Le forme del vetro*.

<sup>17</sup> On glass from the Venice area, see e.g. Ferri, “Shine bright.”

<sup>18</sup> See, most recently, Salinas, et al. “Técnicas decorativas de la cerámica vidriada.”



rials (as in the case of the tin oxide needed for majolica). We can say that these ceramics – generally, at this chronological stage, the product of urban workshops – soon reached a very wide market that certainly included rural contexts. The variety of technical and formal solutions suggests highly complex dynamics behind these technical innovations: the mobility of craftsmen, the imitation of imported products, the revival of local techniques that had been marginal or dormant, or even the invention of entirely new procedures. For Egypt, it is now quite clear that the formal and decorative models – especially those of Fatimid glazed wares – owe much (though by no means everything) to the imitation of Chinese ceramics (porcelain and celadons from southern China) or Iraqi ceramics (metal lustres), which were regularly imported into Egypt from the 9<sup>th</sup> century through to well beyond the 15<sup>th</sup> century.<sup>19</sup> We will return later to the quantitative significance of these imports in relation to local production. Here it is worth emphasising, on the one hand, that the technical processes used in Egyptian imitations of Chinese ceramics were entirely distinct from the originals, and, on the other, that these exotic wares must, nevertheless, have been sufficiently well known for people to want to imitate them. We may recall once more that in peninsular Italy the new techniques for glazing tableware became established in the 12<sup>th</sup> century in the south, and only in the early 13<sup>th</sup> century in north-central Italy.<sup>20</sup>

This is not the place to revisit the debate surrounding the so-called Islamic Green Revolution; however, even if the term ‘revolution’ may be considered inappropriate, it remains undeniable that numerous agricultural innovations can be identified – and, in some cases, chronologically situated – following the Islamic conquest of various regions of the Mediterranean. In this area of archaeological study (archaeobotany), the context in which seeds and wood are found remains crucial, since not all soils or types of contexts allow the remains of new plants to be preserved; absences, therefore, may not always correspond to historical reality.<sup>21</sup> Turning to the positive evidence, we can regard the finds from the excavation of the Egyptian port of Myos Ormos/Quseir al-Qadim on the Red Sea as particularly significant, since they reveal substantial differences between the Roman and Fatimid (11<sup>th</sup> century) phases. In the latter, newly cultivated plants – such as sugarcane, cotton, aubergines, certain citrus fruits, bananas, colocasia, and watermelon – appear in such quantities that M. Van der Veen, who has studied this exceptionally well-preserved context, argues that whereas Roman Egypt looked to the Mediterra-

<sup>19</sup> There is an extensive bibliography on this topic: see e.g. Gayraud, “Arabisation, islamisation et orientalisation” on imitation; François, *Céramiques médiévales à Alexandrie*, 143–54, on Egypt; Priestman, *Ceramic Exchange and the Indian Ocean*; Zhang, *An Exploratory Quantitative Archaeological*; Qin, Ho, “Chinese Ceramic Exports to Africa,” on the circulation of Chinese ceramics within the Indian Ocean, the Persian Gulf, and Red Sea.

<sup>20</sup> For an overview, see Berti, et al., “Trasformazioni tecnologiche.”

<sup>21</sup> As is well known, a number of environmental and structural conditions favour or limit the preservation of charred, calcified, and dehydrated plant remains, including arid or very humid areas, latrines, and fire layers.



nean for its culinary preferences, Fatimid Egypt drew more heavily on the cultures of the Indian Ocean area.<sup>22</sup>

For Sicily we possess highly systematic data for Mazara, an important city on the south-western coast of the island, and for the area of Castronovo, located in the interior between Palermo and Agrigento, collected within the framework of the ERC *SicTransit* project.<sup>23</sup> Fortunately, Palermo can also be added to these areas thanks to information from written sources and to the study of ceramic vessels – for example, those used in sugar production or for lifting water from wells (the so-called *noria* or *senia* vessels).<sup>24</sup>

In the 10<sup>th</sup>-11<sup>th</sup> century latrines of Mazara, a number of new plants associated with the so-called green revolution have been found: aubergines, as well as spinach, citrus fruits, and again cotton. Sugar production is currently attested in Palermo, where – as mentioned above – the finds of vessels suitable for refining are concentrated. The data from the inland area of Castronovo, however, present a rather different picture: plant remains indicate a clear orientation towards cereal production (predominantly wheat rather than barley until the 12<sup>th</sup> century). Indeed, at one of the main sites in this area, Casale San Pietro, numerous amphorae arrived from Palermo between the 10<sup>th</sup> and 11<sup>th</sup> centuries, containing wine, oil, and probably also salted fish.<sup>25</sup> No new plants are reported in this inland territory until much later. It is quite clear, therefore, that agricultural novelties and specialised crops in Sicily were concentrated around at least two coastal cities with cosmopolitan elites, while the island's interior continued to fulfil its traditional role as a wheat producer.<sup>26</sup> It is also evident that the Sicilian agricultural economy was highly integrated, as shown by the distribution cross much of the island of amphorae for wine, oil, and fish manufactured in Palermo.<sup>27</sup> It is worth noting briefly that in Mazara during the Swabian and Angevin periods, in the 13<sup>th</sup> century, there was a marked increase in the cultivation of cash crops – cotton in particular – and this was accompanied by the presence of a larger number of aged sheep, raised for wool and dairy products.<sup>28</sup>

More complex is the identification and especially the dating, of structures and tools associated with new agricultural techniques, including irrigation. A recently conducted survey by Gideon Avni, of the *qanats* – a type of underground aqueduct that captured groundwater and channelled, sometimes over

<sup>22</sup> Van der Veen, *Consumption, Trade and Innovation*, 227-32.

<sup>23</sup> See the contributions by Gerolamo Fiorentino and Milena Primavera in Molinari, e Meo, *Mazara/Mazar: nel ventre della città medievale* and Carver, et al., *Castronovo di Sicilia*. See also the website <https://sicily-in-transition.org/>.

<sup>24</sup> Sacco, *Dalla ceramica alla storia economica*, 148-52.

<sup>25</sup> Carver, et al., *Castronovo di Sicilia*.

<sup>26</sup> However at a period that is not precisely ascertained, but in any case during the Middle Ages, the farming community of Castronovo built a system of irrigated terraces intended for polyculture, considered typical of Islamic world: Carver, et al., *Castronovo*, 173-201.

<sup>27</sup> Sacco, *Dalla ceramica alla storia economica*, 248-63.

<sup>28</sup> See Veronica Aniceti's contribution in Molinari, e Meo, *Mazara/Mazar*, 533-91.

several kilometres, to irrigated areas – has shown that in various areas of Eurasia these installations were often constructed in the phases immediately following the Islamic conquest, between the 7<sup>th</sup> and 8<sup>th</sup> centuries, enabling the cultivation of semi-desert areas and a substantial expansion of crops.<sup>29</sup> *Noria* and sugar vessels can also be dated with precision on the basis of the archaeological contexts in which they have been found. In Sicily, *noria/senia* vessels are known in Palermo from the late 9<sup>th</sup> century and in Mazara from the 10<sup>th</sup>.<sup>30</sup> Much more challenging, by contrast, is the dating of irrigated terrace systems, owing to their continuous remodelling and their extraordinary durability over time.<sup>31</sup>

To conclude this part, we may briefly mention one last topic: the building sector. Studies in this field are, however, far more advanced for Italy than for the various Islamic regions under consideration here. As is well known, the advent of Romanesque architecture on the Peninsula, between the late 11<sup>th</sup> and 12<sup>th</sup> centuries, entailed significant innovations in building techniques (from the reopening of quarries to obtain isodomic blocks to the organisation of construction sites), the origins of which remain debated.<sup>32</sup> Some hypotheses link these architectural innovations to the experience of the Crusades and to direct contact with the more advanced techniques in the Greater Syria area.<sup>33</sup> It is, however, very difficult to make a proper assessment of this issue. For example, in al-Andalus the main building innovation – already from the emiral period (9<sup>th</sup> century) and increasing exponentially in the following centuries – was the adoption of the *tapial*, a North African construction technique (using earth compressed in moulds). Its quality and durability, though, varied considerably.<sup>34</sup> In general, it appears that in the Latin-Christian Mediterranean world (particularly in the cities of central and northern Italy), investment in private construction employing complex building processes and durable materials was, from the 12<sup>th</sup> century onwards, more substantial – or at least more enduring – than in Islamic regions.<sup>35</sup>

<sup>29</sup> Avni, “Early Islamic Irrigated Farmsteads.”

<sup>30</sup> Sacco, *Dalla ceramica alla storia economica*, 148–9.

<sup>31</sup> There are several international projects devoted to dating terraces (including non-irrigated ones) using new methods – especially OSL – although the results are still preliminary. See, e.g., Turner, et al. “Agricultural terraces,” the ERC projects TERRACE (<https://www.terrace.no/>); and the GreenMedRev project (<http://medgreenrev.com/en>), which is still in its early stages. See also, Avni, et al., “Byzantine-Early Islamic Agricultural Systems.”

<sup>32</sup> See, e.g., Salvarani, et al., *Alle origini del romanico*; Brogiolo, Gentilini, *Tecniche murarie e cantieri*, and the paper by Cantini in this volume.

<sup>33</sup> See, e.g., Cagnana, “Oriente e Occidente.”

<sup>34</sup> Martín Civantos, Rouco Collazo, “De la piedra a la tierra.”

<sup>35</sup> Some reflections in Molinari, Giovannini, *Il paesaggio pietrificato*. However, this is a subject that still needs to be explored in great depth in relation to Islamic regions.

## 2. Settlement and exchange networks

The reconstruction of settlement types and networks is, of course, crucial for understanding the forms of organisation, the levels of domination or autonomy within peasant communities, and thus the different ways in which surplus was extracted from rural production. Unfortunately, in this regard, post-antique archaeology in both Egypt and Tunisia does not allow for very detailed overviews.<sup>36</sup> We are, however, far better informed about Sicily and peninsular Italy. Here I will recall only a few themes to our comparative analysis.

Research on settlement dynamics – conducted especially in central and northern Italy over the last two decades, through both surface survey and intensive excavations – has made it possible to refine and nuance themes such as *incastellamento*, settlement concentration, and the petrification of the built environment between the 10<sup>th</sup> and 13<sup>th</sup> centuries.<sup>37</sup> Castles often took at least two centuries to become the predominant form of settlement (and in any case this was not the case everywhere on the Peninsula), and the petrification of built-up areas occurred in stages, often beginning with the upper enclosures, followed by the towers and mansions. The petrification of peasant houses often took place much later, in the 13<sup>th</sup> century, in different ways and with different meanings; in at least some cases, however, it must have entailed greater pressure on the mobility of rural families.<sup>38</sup> For the issues that concern us here, we may say that – contrary to what was once argued by Pierre Toubert,<sup>39</sup> and to some extent by Riccardo Francovich as well<sup>40</sup> – the 10<sup>th</sup>–11<sup>th</sup> centuries do not appear to represent the full affirmation of castles/villages with stone buildings, nor the disappearance of dispersed settlement. Moreover, *incastellamento* would not seem to have occurred in a context of economic expansion, but rather during a phase of broader transformation marked by the crisis of public powers and the progressive rise of lordship and urban centres.<sup>41</sup>

Research on rural settlements in Sicily continues to advance, providing an increasingly chronologically and spatially articulated picture of settlement dynamics. Within the centuries under consideration, one may note that between the 10<sup>th</sup> and 11<sup>th</sup> centuries, especially in western and central Sicily, there was a marked expansion in the number and/or size of rural centres, most of which were located in unprotected and unfortified sites. By way of example, we may mention the large village that arose on the ruins of the late Roman

<sup>36</sup> See, e.g., Gascoigne, “Egypt” and Fenwick, *Early Islamic North Africa*.

<sup>37</sup> A truly vast literature could be cited; for the sake of brevity, see Molinari, *Mondi rurali*; Galetti, Augenti, *L’incastellamento*; Bianchi, *Archeologia dei beni pubblici*; Carocci, “Nobiltà e petrificazione della ricchezza.” Maria Elena Cortese, Alessio Fiore and Sandro Carocci also address these topics in their contributions to this volume.

<sup>38</sup> See, e.g., the various essays on the subject in Molinari, Giovannini, *Il paesaggio pietrificato* and Carocci, “Nobiltà.”

<sup>39</sup> Toubert, *Les structures du Latium Médiéval*.

<sup>40</sup> See, e.g., Francovich, Hodges, *Villa to village*.

<sup>41</sup> For brevity, see Wickham, *The Donkey*, 465–620; Fiore, Poloni, *L’economia medievale*, 97–138.

villa near Piazza Armerina and the site of Casale San Pietro in central Sicily, both of which reached their maximum expansion precisely in these centuries (with estimates suggesting an area of up to 40 hectares).<sup>42</sup> In the survey at Contessa Entellina and in the Jato Valley, in the Belice area, the number of settlements clearly increases; this is not the case in the east of the island – for example, in the area of ancient Megara – where the 10<sup>th</sup>-11<sup>th</sup> centuries are less clearly identifiable.<sup>43</sup> It would appear that during the height of the Islamic period an important role was played by large lowland settlements, almost always with earlier phases, located along important communication axes. These sites, certainly centres of peasant habitation, often also hosted specialised production activities and in all likelihood also fulfilled public functions as well, serving as post stations and places for tax collection. It is not always clear, however, when these types of open settlements went into decline. In the case of Casale San Pietro, it has been possible to document with precision a clear contraction beginning in the second half of the 11<sup>th</sup> century. By contrast, the village of Villa del Casale near Piazza Armerina was abandoned in the mid-12<sup>th</sup> century. The establishment of centralised highland villages in Sicily is a process that is not yet entirely clear. Unlike Byzantine authority, Islamic rule does not appear to have undertaken explicit initiatives to promote or construct public fortifications; nor, on the other hand, did Islamic Sicily experience phenomena comparable to territorial lordship.<sup>44</sup> The creation of highland villages may, at least in the west, be understood as the spontaneous initiative of peasant communities during phases of weakened state structures – for example, in the 9<sup>th</sup> century (during the long period of Islamic conquest) or in the 11<sup>th</sup> century with the fragmentation of political authority under the Kalbite emirate and the subsequent Norman conquest.<sup>45</sup> The Normans then superimposed summit fortifications onto highland villages that were almost always already in existence.<sup>46</sup> The Swabian period appears to have been one of the most radical phases of upheaval, especially in the west, where, in the first half of the 13<sup>th</sup> century, large spontaneous highland centres – inhabited main-

<sup>42</sup> Pensabene, Barresi, *Piazza Armerina* and Carver, et al., *Castronovo di Sicilia*. In addition, the various essays in Castrorao, Mandalà, *Suburbia*, and Nef, Ardizzone, *Les dynamiques de l'islamisation*, include several relevant contributions.

<sup>43</sup> In general, it should be noted that the number of settlements alone is not sufficient to demonstrate settlement contraction. A clear case in point is again Casale San Pietro (Castronovo), which concentrated a substantial portion of the territory's population during the 10<sup>th</sup>-11<sup>th</sup> centuries.

<sup>44</sup> On Byzantine fortification strategies in Sicily, see, e.g., Arcifa, et al., "Sicily in a Mediterranean context" on *incastellamento* in Sicily, see, e.g., Molinari, "Paesaggi rurali e formazioni sociali" and, most recently, Carver, et al., *Castronovo*.

<sup>45</sup> This would seem to be the case, for example, in the present village of Castronovo in central Sicily (Carver, et al.), or *Calathamet* (Lesnes, Poisson, *Calathamet*) in western Sicily.

<sup>46</sup> See, e.g. *Calathamet*, Castronovo, but also perhaps all those sites that still preserve a fortified area together with a district known as the *rabato*, which appears to represent the oldest part of the highland settlements. Future research would ideally involve excavating the *rabati* in order to gain a clearer understanding of the 11<sup>th</sup> and 12<sup>th</sup> centuries.

ly by Muslims – such as Segesta, Entella and Monte Jato<sup>47</sup> developed, while most of the unprotected sites were abandoned. As is well known, all the large Muslim highland sites just mentioned had been abandoned by the mid-13<sup>th</sup> century. We must imagine that the rural population was compelled (at time forcibly) to relocate to other centres, to emigrate, to suffer significant demographic decline, or to undergo processes of urbanisation. Transformations in the central and eastern part of the island appear to have been more gradual.

We do not know much, on an archaeological basis, about social stratification within villages during the Islamic period, but no very clear forms of hierarchisation appear to be evident. At the most extensively excavated site – Villa del Casale – we can nevertheless see that between the 10<sup>th</sup> and 11<sup>th</sup> centuries, there were specialised production activities (such as kilns for glazed tableware) and also a dwelling that may have belonged to a ‘doctor’, or in any case to someone living at a relatively higher standard than the rest.<sup>48</sup> At Casale San Pietro we have excavated what were in all probability public structures (a postal station, a tax collector’s office). Monetary circulation also appears to have been considerable at both excavated sites.<sup>49</sup> Our archaeological knowledge of social stratification in the Norman period is likewise limited. At Castronovo (the present-day town in the centre of Sicily that succeeded Casale San Pietro), for example, the creation of a fortified upper area and a palace/‘donjon’ is particularly telling. As can also be inferred from the written sources, these were buildings commissioned by the monarchy rather than by the aristocracy.<sup>50</sup>

Turning now to the exchange networks within the areas under consideration, we may recall, as already mentioned, that these have become a fundamental key to assessing the complexity of regional economies. The study of ceramics has likewise become an essential tool for understanding the distribution networks of non-luxury goods in the centuries examined here, just as it has long been for Late Antiquity and the early Middle Ages. It should be made clear from the outset that coherent observations can be drawn not only from transport ceramics, i.e. amphorae,<sup>51</sup> but also from the full range of pottery, from decorated and glazed tableware to strictly utilitarian wares such as cooking vessels. Moreover, as mentioned above, by analysing the *chaîne*

<sup>47</sup> For an overview, see Molinari, “Paesaggi rurali e formazioni sociali.”

<sup>48</sup> On an 11<sup>th</sup>-century kiln, see Pensabene, Barresi, *Piazza Armerina*, 581-90; on the “doctor’s house” (house A), also dating from the Islamic period, see Bonanno, *Piazza Armerina*, 41-5.

<sup>49</sup> See Palma, “I rinvenimenti numismatici” for the Villa del Casale, and Mammato, “Monete e circolazione monetaria a Castronovo” for Casale San Pietro.

<sup>50</sup> Carver, et al., *Castronovo*, 163-72. On public powers and southern lordships more generally, see Carocci, *Signorie di Mezzogiorno*.

<sup>51</sup> Amphorae, which persisted in several areas of the Islamic world and in the Byzantine world even in the 10<sup>th</sup>-13<sup>th</sup> centuries, are instead absent or insignificant in other areas, where they may have been replaced by perishable containers. For example, Tunisian oil was transported in containers made of animal skins. The absence of amphorae does not therefore necessarily imply the absence of commodity exchange; only positive evidence can be used for this type of container. See, in general, Gelichi, Molinari, *I contenitori da trasporto*.

*operoire* and the places of production of all types of ceramics, it is possible to make meaningful observations about production specialisation, as well as about the varying levels of product sophistication and quality in urban and rural markets.

Let us begin with Sicily. The recent systematisation of chronologies and morphologies of the productions of Palermo and Mazara del Vallo, together with the systematic study of rural contexts such as Casale San Pietro (in the territory of Castronovo), Pizzo Monaco, Paternò, and Villa del Casale, as well as the publication of surface surveys in areas such as Entella and Jato,<sup>52</sup> now allows for rather precise observations, especially for the centuries of interest here. In the course of the 10<sup>th</sup> century, amphorae, fine tableware (decorated and glazed), and kitchenware produced in Palermo reached virtually the entire island. In many inland areas – particularly the central regions – they could represent almost the entirety of the pottery used in rural settlements. This is, for example, at Casale San Pietro, where the excavation of an uninterrupted stratigraphic sequence between the 5<sup>th</sup> and 13<sup>th</sup> centuries, combined with surface survey across the area occupied by the settlement, makes it possible to trace variations in the supply of ceramics to this rural centre located some 80 kilometres from Palermo.<sup>53</sup> Here in the 10<sup>th</sup> and early 11<sup>th</sup> centuries, fine glazed tableware, cooking pottery, and amphorae were imported from the emiral capital. Analyses indicate that the amphorae carried wine and apparently also oil and fish. To this evidence we may add that plant remains show a clear predominance of cereal cultivation for the same period, with wheat prevailing over other species. Equally significant is the discovery, among the archaeozoological finds, of tuna vertebrae. A series of iron slags – although not securely dated, as they were found out of context – may nonetheless suggest that ironworking was among the possible activities carried out at Casale San Pietro during this period. To summarise, the archaeological evidence indicates that fine and cooking pottery, as well as agricultural products such as wine, oil, and salted fish transported in amphorae, arrived from the capital on a massive scale. In the 10<sup>th</sup> century, this impressive network of internal trade appears to have been decisively dominated by the emiral capital, Palermo, which was itself undergoing remarkable growth at the time.<sup>54</sup> This would go hand in hand with the importance of the centres located along the main arterial roads (with fiscal and settlement functions), such as the oft-mentioned Casale San Pietro. The distribution of amphorae and fine pottery even in the areas of peasant settlement thus makes it possible to observe how the fiscal network also promoted rural consumption.

<sup>52</sup> For the sake of brevity, see the frequently cited Sacco, *Dalla ceramica*; Molinari, e Meo, *Mazara/Mazar*; Carver, et al., *Castronovo*; Wickham, *The Donkey*, 218–30, with further bibliography.

<sup>53</sup> See the chapters on ceramics in Carver, et al., 353–461, as well as those on archaeobotanical and faunal remains, 531–67.

<sup>54</sup> See, most recently, Vassallo, “The Topographical Context of Palermo.”



The 11<sup>th</sup> century in Sicily presents a highly complex picture, with different phenomena occurring in the different parts of the island. Palermo lost its absolute political and artisan pre-eminence due to competition from other production centres, sometimes located in cities promoted as capitals by the so-called *gaitti*<sup>55</sup> (as has been established in the case of Mazara). Local production of fine glazed ceramics also began in medium- to large-sized rural centres such as Paternò or the village that arose above the Villa del Casale in Piazza Armerina.<sup>56</sup> Centres such as Casale San Pietro, however, seem to have maintained a strong link with Palermo. While the consumption patterns of rural settlements became less dependent on Palermo, they nevertheless show a strong demand at the peasant level for fine pottery, so much so that large rural centres such as Paternò or Villa del Casale developed their own production of good-quality glazed ceramics. In the 12<sup>th</sup> century, the trends already underway in the 11<sup>th</sup> century appear to have intensified, and even a centre such as Casale San Pietro imported pottery both from Palermo and from other areas of Sicily. During this century another important phenomenon began – one that would become fully established in the 13<sup>th</sup> century – namely the circulation throughout the island of cooking pots produced in Messina.<sup>57</sup> These vessels, purely utilitarian but of good quality and presumably excellent for cooking and boiling food reached virtually every part of the island in considerable quantities. Messina was certainly promoted by the Norman rulers, to the point that it could be regarded as a second capital alongside to Palermo. Curiously, Messina's fine tableware pottery – truly unattractive, to be honest – did not circulate with anything like the same intensity as its beautiful and functional cooking pots. These observations suggest that the circulation of Messina's pots was driven entirely by commercial factors. In the 12<sup>th</sup> century, there also appears to have been a possible increase in monetary circulation in rural areas.<sup>58</sup>

If, in the context of ceramic circulation in Sicily, we turn our attention to extra-regional imports, we can immediately see that between the 10<sup>th</sup> and 12<sup>th</sup> centuries they were quantitatively very limited. In Palermo, for example, in the 10<sup>th</sup>–11<sup>th</sup> centuries we can identify imports of glazed ceramics and amphorae from Tunisia, while tableware fragments from Egypt, Spain, or China (the latter probably arriving via Egypt) are extremely rare.<sup>59</sup> In Mazara, in the 11<sup>th</sup> century, non-Sicilian imports of fine pottery were almost exclusively Tunisian and accounted for around 10% of all glazed wares.<sup>60</sup> In the 12<sup>th</sup> century, in an

<sup>55</sup> Such as Mazara, Syracuse, Enna, and Agrigento: see, e.g., Chiarelli, *A History of Muslim Sicily*, 126–32.

<sup>56</sup> Messina, “La Collina di Paternò” and Pensabene, Barresi, *Piazza Armerina*, 599–628.

<sup>57</sup> For an overview of this type of pottery, see Paola Orecchioni's text in Molinari, e Meo, *Mazara/Mazar*, 352–6.

<sup>58</sup> See the bibliography cited in n. 49.

<sup>59</sup> Sacco, 204–10.

<sup>60</sup> See the overview paper by Antonino Meo and Paola Orecchioni in Molinari, e Meo, *Mazara/Mazar*, 595–608.

inland highland centre in the west such as Calathamet, imported ceramics (Egyptian and Iberian Peninsula fine wares) arrived in very small quantities compared to Sicilian pottery.<sup>61</sup> By contrast, when we look at exports from Sicily – both of glazed ceramics and, above all, of amphorae (mainly containing wine) – those produced Palermo between the 10<sup>th</sup> and 11<sup>th</sup> centuries reached a vast area extending from Tunisia to southern France.<sup>62</sup> It remains to be determined to what extent the production centres that emerged in the 11<sup>th</sup> century exported outside Sicily; with the possible exception of Agrigento, however, their distribution appears to have been mainly local or sub-local. In short, until the 12<sup>th</sup> century, Sicily consumed predominantly pottery produced on the island itself and imported only a very small number of, I would say, occasional items. Exports of both amphorae and glazed ceramics from Palermo peaked between the 10<sup>th</sup> and 11<sup>th</sup> centuries and seem to have decreased sharply, if not ceased altogether, by the 12<sup>th</sup> century.<sup>63</sup> As becomes clear, the 12<sup>th</sup> century does not display solely expansionary trends.

I will briefly mention here the main changes occurring in the 13<sup>th</sup> century. In western Sicily, in addition to the massive arrival of pots from Messina, both urban and rural centres exhibit conspicuous quantities of fine tableware, mainly imported (thus in complete contrast to the previous period) from regions such as Campania, Tunisia, and southern Italy. In some centres, such as Segesta/Calatabarbaro and Mazara, imported fine pottery equalled or even surpassed local ceramics in quantity, the latter being on average of poorer quality.<sup>64</sup> In eastern Sicily, by contrast, local production continued to predominate, but was of better quality than that of the western part of the island and differed in both technique and form. Work on the amphorae of this period still remains to be carried out, but in any case they appear to have circulated only within the island and over relatively limited areas.

Summarising, then, the trends in the production and circulation of ceramics of all types in Sicily, we may first emphasise the absolute pre-eminence of Palermo in the second half of the 10<sup>th</sup>/early 11<sup>th</sup> century – a city that quite literally dominated the island market, especially in the central and western areas. This suggests that the inland road system was also in good condition and that there was a truly remarkable movement of goods from the capital to inland rural centres and other coastal towns. The case of Castronovo, together with what we know of the new crops cultivated in Palermo, offers a glimpse of a notable economic specialisation: on the one hand, the coastal area gravitating around the capital, where specialised crops (certainly vines and sugar-

<sup>61</sup> Lesnes, Poisson, *Calathamet*, 206–9.

<sup>62</sup> Sacco, 253–73 notes that a new analysis of extra-island finds shows that the bulk of Sicilian amphorae (of various forms) were exported almost exclusively in the Islamic period, rather than in the Norman era as previously believed.

<sup>63</sup> Sacco, 264–7.

<sup>64</sup> See also the contributions of Paola Orecchioni in Molinari, e Meo, *Mazara/Mazar*, 337–41 and 595–608, with bibliography for all of Sicily.

cane) appear to have been concentrated; on the other, the inland area devoted mainly to cereal cultivation. It would appear that, especially in the second half of the 10<sup>th</sup> century, inland networks were strongly reinvigorated by the economic as well as the political role of the new capital. At the same time, the countryside – where a monetised economy was in place – displayed a consistent demand even for non-essential goods (such as richly decorated tableware and glassware). Indeed, it is interesting to note that even cooking pots, which could certainly have been produced locally, were imported in large quantities from the capital. In the 11<sup>th</sup> century, the decline in the dominance of Palermo products should not be seen as a recession in the distribution system, but rather as a result of competition from production centres that were now part of an even more complex network. This development can be explained either by the expansion of demand – which encouraged the spread of specialised artisans to centres other than Palermo – and/or by the rise of other cities alongside the emiral capital, coinciding with the fragmentation of political authority (as we have clearly seen in the case of Mazara). This overall dynamic closely resembles what has been reconstructed, *mutatis mutandis*, for al-Andalus during the period of the *Reinos de taifas*, where political fragmentation does not appear to have had a negative impact on the internal economy.<sup>65</sup> During the 12<sup>th</sup> century, the most noticeable novelty was the widespread distribution of Messina cooking pots, which reached all parts of the island in conspicuous quantities. It must be said, however, that Messina's role as a production and export centre for cooking wares in the 12<sup>th</sup> and 13<sup>th</sup> centuries is in no way comparable to that of Palermo in the 10<sup>th</sup> century, whether in terms of quantity, quality, or variety of exported products. It should also be emphasised that from the 12<sup>th</sup> century onwards, the circulation of amphorae – containers used to transport large quantities of wine, oil, and other goods – seems not only to ceased to be controlled by Palermo, but not to have been taken over by other Sicilian cities either. One possibility is that these goods were no longer transported in amphorae but in perishable containers.

In agreement with Chris Wickham's argument, we may therefore say that for the period between the 10<sup>th</sup> and 12<sup>th</sup> centuries it was internal economic dynamics, rather than interregional trade, that determined Sicily's growth and complexity.<sup>66</sup> At the same time, while the balance between the demands of urban elites and those of the peasantry appears to have been a fundamental ingredient, the political and fiscal role of the Islamic capital (closely linked to Egypt and Tunisia) in the 10<sup>th</sup> century, and of the other cities that served as seats of the *gaiti* in the 11<sup>th</sup> century, as well as the role of Messina as a second

<sup>65</sup> Wickham, *The Donkey*, 365-464.

<sup>66</sup> Reference is also made, for the following considerations, to Wickham, 198-268, where the main bibliography on Sicily is discussed and summarised, including the historiographical debate between, on the one hand, Abulafia, *The two Italies* and Bresc, *Un monde méditerranéen*, and, on the other, Epstein, *An Island for Itself*. This body of historiography on Sicily was also effectively reviewed a few years ago in Petralia, "La nuova Sicilia tardomedievale."

capital during the Norman period, were no less crucial. In short, the flows and directions of goods seem to have been dictated not only – or not primarily – by ecological differences between inland and coastal areas, but also by the shifting contours of internal political geography. Finally, more data are needed to gain a clearer understanding of the 12<sup>th</sup> century as a whole on the island.

The 13<sup>th</sup> century requires additional reflection, especially for western Sicily, and I would like to offer just a few observations that seem particularly significant for the question of periodisation. In the past, I interpreted the exponential increase in imports of high-quality tableware (into western Sicily) within the framework of the ‘colonial’ view of the island’s economy advanced by Henri Bresc and sketched out by David Abulafia. In essence, it seemed to me that the ceramic source supported – at least for western Sicily – the idea that, whereas until the 12<sup>th</sup> century Sicily primarily consumed locally produced specialised handicrafts, in the 13<sup>th</sup> century it imported such goods on a large scale, coinciding with the decline in fine local production. The idea, therefore, that Sicily imported quality manufactured goods while mainly exporting raw materials and grain therefore appeared broadly convincing. Chris Wickham, by contrast, rules out the possibility that medieval economies could have developed to such a degree of productive specialisation as to negatively impact local economies: if the Sicilians were importing large quantities of manufactured goods from outside the island, they must obviously have had an equivalent volume of goods to sell. Since my earlier reflections, new archaeological data – drawn from sectors other than ceramics – have emerged. Particularly significant, to my mind, are the archaeobotanical and archaeozoological data from Mazara, which we have already discussed.<sup>67</sup> In particular, the 13<sup>th</sup> century appears to show an exponential increase in the presence of cotton – which we know was particularly in demand among the Genoese – and a decrease in crop varieties compared to the Islamic period. Equally significant is the sharp increase in the slaughter age of sheep and goats, which evidently shifted from being reared for a wide range of uses during the Islamic period to being kept more extensively for the production of wool and cheese. These indicators, which merit future research, seem to suggest the potential impact on the Sicilian economy of increasing commercialisation and productive specialisation in the agricultural sector, developments that were also encouraged by the activities of Ligurian and Tuscan merchants. This question of the extent to which Italian merchants influenced productive choices in the inland areas of Sicily is a controversial one. Giuseppe Petralia addressed it a few years ago in his commentary on the essays on Sicily by Henri Bresc and Stephan R. Epstein, noting the significant presence as early as the 13<sup>th</sup> century of individuals of Tuscan origin even in the island’s interior.<sup>68</sup> Further evidence may come

<sup>67</sup> See, respectively, the contributions of Gerolamo Fiorentino, et al. and Veronica Aniceti in Molinari, e Meo, *Mazara/Mazar*, 533-93.

<sup>68</sup> In addition to the bibliography cited in n. 67, see, e.g., Petralia, “Sui Toscani in Sicilia.”

from further archaeological research, as suggested perhaps by the new data on the medieval cemeteries of Segesta/Calatabarbaro in western Sicily. We do not know the names or origins of those who built the castle and church and demolished the mosque on this large hilltop site in the late 12<sup>th</sup>/early 13<sup>th</sup> century. However, analyses of ancient DNA from the burials – radiocarbon-dated to the 13<sup>th</sup> century – located in front of the church at Segesta indicate a possible provenance from the northern Mediterranean. Moreover, there is no sign of any intermingling with individuals buried according to Koranic rites in the nearby Muslim cemetery, situated only a few metres from the Christian one.<sup>69</sup> The burials from the Islamic area date between the 10<sup>th</sup> and 13<sup>th</sup> centuries. Although, in the case of Segesta, there may have been a short-lived local Christian lord, together with his own retinue of immigrants, who had no connection with Pisan and Genoese merchants, the strong presence of imported tableware nevertheless suggests that new social actors were able to foster trade between inland areas and the coast. Moreover, the involvement of the so-called Latin merchants in the inland economies of the Crusader states has been hypothesised for several regions of the Levant that have been intensively investigated archaeologically; in these areas, such merchants are thought to have encouraged increased production specialisation and the circulation of both tableware and cooking wares.<sup>70</sup>

Overall, then, the data for the 13<sup>th</sup> century point to growth on several fronts. It does not seem unreasonable to consider that the increase in the inter-regional trade – in which Italian merchants played an important role – also had an impact on domestic economies. Moreover, if we regard ceramics as a reliable proxy for reconstructing the modes and intensity of the circulation of cloth (a sector economically far more significant than ceramics), why should we not also view the patterns observed in ceramic consumption in western Sicily in the first half of the 13<sup>th</sup> century – when imports equalled or even surpassed local production of fine pottery – as a valid indicator of broader economic developments?

Let us now turn to Egypt, where the dynamics of internal exchange in the Fatimid period (10<sup>th</sup>-12<sup>th</sup> century) have recently been delineated with great clarity.<sup>71</sup> Here we can offer some additional thoughts, especially with regard to imported ceramics and excavated textiles. Egypt is potentially one of the few areas of the Mediterranean where it is possible – on an archaeological basis – to compare the circulation patterns of perishable artefacts such as textiles with those of ubiquitous ceramics, thanks to the climate and soil conditions that often allow for the remarkable preservation of materials that would otherwise be extremely perishable. The internal distribution network of Egyptian-produced fine tableware ceramics is highly complex. The two

<sup>69</sup> Molinari, *Segesta*; Monnerau, et al., “Multi-Proxy Bioarchaeological Analysis.”

<sup>70</sup> Stern, et al., “The impact of the Crusades.”

<sup>71</sup> Again Wickham, *The Donkey*, 82-93, with bibliography.

main centres – Aswan and Fustat (the capital) – located several hundred kilometres apart, essentially supplied the whole of Egypt with a very wide range of high- and medium-quality products, which were also exported in small quantities outside the country. Also of interest, however, is the quantitative relationship between local production and imports, which unfortunately can only be sketched, as the number of fully published excavations is less than meagre. An extensive study on the production of ceramics from China between 800 and 1500<sup>72</sup> and their circulation across the Indian Ocean to Egypt has shown that, between the 11<sup>th</sup> and 13<sup>th</sup> centuries, Egypt yielded the highest number of finds in the entire region under consideration – surpassing even the centres of the Persian Gulf, which had dominated in earlier centuries. Most finds come from Fustat (where most excavation has also taken place), but significant quantities have also been reported from Alexandria, Quseir al-Qadim, Qûs, and Aydhâb. A range of Chinese ceramics (mostly from southern kilns) are witnessed, and these are not considered luxury productions. This has led Zhang to hypothesise the centrality of Fatimid, Ayyubid, and Mamluk Egypt within the global trade system of the Indian Ocean.<sup>73</sup> Whenever it is possible to examine the composition of ceramic assemblages more closely, however, the amount of exotic imports is generally very low compared to local production.<sup>74</sup> Nevertheless, it was quite normal in Fustat households to possess tableware originating from faraway China. It is not known what was sent to China in exchange for these ceramics, but it is likely that their arrival was mediated through the wider Indian Ocean trade system rather than through any direct relationship between Egypt and China. Chinese ceramics did, however, reach Egypt with regularity over many centuries. It can also be added that, with the exception of a few isolated instances, such ceramics did not reach other Mediterranean regions in the period between the 10<sup>th</sup> and 13<sup>th</sup> centuries. Taken together, the evidence for both local Egyptian production and imported wares certainly seems to support Wickham's view that each individual region needed to possess a sufficiently developed domestic economy in order to participate systematically in interregional trade. However, we must also recall, as we have done above, that the ceramics – especially those from Fustat – that most marked a productive turning point, becoming successful enough to enter the realm of mass consumption, explicitly imitated the various Chinese ceramics or Iraqi lustres that had been imported.<sup>75</sup> If we add to this other products such as paper, glass made with vegetable ash, sugar and cotton, we may well say that Fatimid Egypt's trade and cultural contacts fos-

<sup>72</sup> Zhang, *An Exploratory Quantitative Archaeological Analysis*. See also Qin, Ho, "Chinese ceramic exports."

<sup>73</sup> The literature on the subject is quite extensive: see e.g. Zhang, *An Exploratory*; Priestman, *Ceramic exchange*, who independently holds similar opinions to Wickham, *The Donkey*, on domestic economies and international exchange.

<sup>74</sup> See for example the stratigraphies of the walls of Cairo: Monchamp, *Céramiques des Murailles du Caire*, or the data on Alexandria: François, *Céramiques médiévales à Alexandrie*.

<sup>75</sup> See, e.g., Gayraud, "Arabisation, islamisation et orientaliation."



tered its capacity for innovation. In turn, this capacity was both a product of and a contribution to the dynamism of its domestic markets. In short, international trade may not have been entirely unrelated to domestic development. Something similar occurred, as we will mention shortly, on the Italian Peninsula, especially in the 13<sup>th</sup> century.

Remaining with Egypt, I would like to briefly mention the textiles recovered in archaeological excavations, which provide some of the best evidence for the everyday uses of textiles. Although the published data are limited and it is not possible to determine provenance with the same precision as in the case of ceramics, a few observations can nonetheless be made. In the 1980s excavations at Quseir al-Qadim, a port on the Red Sea, most of the textiles recovered were locally produced, though there was also a significant presence of cotton fabrics identifiable – on the basis of style and technique – as being of Indian origin.<sup>76</sup> The fabrics from the relatively recent excavations at Istabl Antar, an area of Fustat, are still under study, but they too appear to consist largely of very common local products, with only a few fine imported.<sup>77</sup> In addition, many of the Indian cotton textiles now held in the Ashmolean Museum in Oxford – radiocarbon-dated to between the 9<sup>th</sup> and 13<sup>th</sup> centuries – are known to have come from Fustat.<sup>78</sup> While it is clear that the Egyptian domestic market was again far more important than the international one, in this case – unlike with ceramics – imported products were not imitated. Nevertheless, the use of cotton as a weaving fibre appears to have been encouraged by international trade during the Fatimid era.<sup>79</sup>

At Quseir al-Qadim, the best-studied medieval Egyptian context for archaeobotanical remains, it is possible to identify other types of imports, including of spices and Indian wood, although local species tended to be preferred in the Islamic phases.<sup>80</sup> In Fustat, Roland-Pierre Gayraud notes that the 11<sup>th</sup>-century stratigraphic levels of Istabl Antar contain as many as twelve types of plants ‘from India’, though these, like all the wood finds from the site, unfortunately remain unpublished.<sup>81</sup> It would also be interesting to know precisely where these Fustat plant remains originated, and whether material from other Mediterranean regions is attested. As is well known, the shortage of timber in Egypt and the need to import wood have been regarded by some authors as structural weaknesses of the Egyptian economy,<sup>82</sup> and, in any case,

<sup>76</sup> See Vogelsang-Eastwood, *Resist dyed textiles* on excavations in the 1980s and Peacock, Blue, *Myos Hormos-Quseir al-Qadim*, 321-3, on more recent ones.

<sup>77</sup> Personal communication with Roberta Cortopassi of the Louvre Museum. On the context, see also Gayraud, *Fostat* and Gayraud, Vallauri, *Fustat II*.

<sup>78</sup> Barnes, *Indian Block-printed Textiles in Egypt*.

<sup>79</sup> The transfer of the technique of cotton cultivation and weaving are two distinct issues. For example, although it is not yet possible to specify the species, cotton was cultivated in the southern oases of Egypt in the 3<sup>rd</sup> century, but it does not appear to have been used for textiles. See, e.g., Kelley, “By Land or by Sea;” Bouchaud, et al., *Cottoning on to Cotton*.

<sup>80</sup> Van der Veen, *Consumption*, 40-73 and 205-26.

<sup>81</sup> Gayraud, “Arabisation,” 161.

<sup>82</sup> See, e.g. Lombard, *L'Islam dans sa première grandeur*.

as factors that made timber one of the principal products exported from the Christian West to Egypt.<sup>83</sup> It is likely, however, that Egypt was able to diversify its sources of wood considerably, thereby mitigating what might otherwise have been a significant dependence on inter-regional trade.

To sum up: the complexity of internal exchange networks in Egypt and Sicily, their degrees of economic integration with other regions, and their capacity for technical innovation across various fields of production (as attested by archaeological sources) are phenomena that are either not visible – or at least not nearly as pronounced – on the Italian Peninsula, especially in central-northern Italy, before the late 12<sup>th</sup> and especially the 13<sup>th</sup> century. Although the data concerning modes of production and the circulation of pottery and other artefacts for the period in question are not always equally detailed, certain areas of the Peninsula have been analysed more closely and provide particularly significant insights. Between the 10<sup>th</sup> and 12<sup>th</sup> centuries, there appears to have been a gradual shift from redistributive systems based primarily on *curtis* production and dependent artisans to urban production carried out by specialised craftsmen.<sup>84</sup> As mentioned above, this process reached maturity in the 13<sup>th</sup> century. Let us also recall that money circulation was almost non-existent in rural areas until at least the end of the 12<sup>th</sup> century.<sup>85</sup>

In the case of Pisa<sup>86</sup> it has been established that urban ceramic production took hold only gradually over the course of the 11<sup>th</sup>-12<sup>th</sup> centuries, with some urban products circulating in the surrounding countryside. From the early 13<sup>th</sup> century onward, the production of archaic maiolica in the city marked a significant qualitative leap, and during that century Pisan pottery gained a large regional and even interregional market. We may say that archaic maiolica was the first ceramic production in Pisa to become a real commodity. Between the 10<sup>th</sup> and 12<sup>th</sup> centuries, Pisa was one of the Italian cities that received the greatest quantity of imported ceramics – both fine tableware and amphorae. Initially these arrived from Latium and Campania, but later from a wide swath of the Islamic world, from al-Andalus to Egypt, including Tunisia and Sicily, and to a much lesser extent from the Byzantine territories. The percentage of imported ceramics in relation to local production remained generally low until the 12<sup>th</sup> century. Pisa redistributed small quantities of these imports into part of its countryside. By the 13<sup>th</sup> century, however, it is noteworthy that Pisa exported fine ware (its archaic maiolica) along the Tyrrhenian coast, from Sicily to Provence. The bulk of Pisan exports, however, was directed above all towards its vast countryside. A comparable qualita-

<sup>83</sup> Wickham, *The Donkey*, 137.

<sup>84</sup> For an overview, see Bianchi, *Archeologia dei beni pubblici*; Fiore, Poloni, *L'economia medievale*, 97-137.

<sup>85</sup> Rovelli, "Nuove zecche" and her contribution to this volume.

<sup>86</sup> For an overview of the economic aspects of ceramic production and consumption in Pisa, see Cantini, "Ritmi e forme" and Cantini, Grassi, "Produzione, circolazione e consumo."

tive leap can be observed in the production of metal objects, especially in the 13<sup>th</sup> century. Excavations in the Chinzica district, for example, have revealed specialised workshops producing clothing accessories (especially buckles) in series by means of moulds, enabling truly remarkable production volumes.<sup>87</sup>

The ceramic production of Rome between the early and late Middle Ages has also been thoroughly investigated.<sup>88</sup> The well-known Forum ware – whose technical tradition was rooted at least in Late Antiquity and required only a single firing – is poorly standardised in the early stages of production (late 8<sup>th</sup>/9<sup>th</sup> cent.) and, outside the city, is often found in connection with ecclesiastical institutions. It appears to have been produced by craftsmen with low output, perhaps non-independent and/or itinerant. In the 10<sup>th</sup> and 11<sup>th</sup> centuries, Forum ware became progressively more standardised, and written references to specialised craftsmen – especially potters based in Trastevere – multiplied. However, analyses of the clay used in Forum ware sherds found outside the city suggest that the market for Roman ware was primarily, though not exclusively, urban. Between the 10<sup>th</sup> and 12<sup>th</sup> centuries, Rome was probably the most populous and economically complex city on the Italian Peninsula.<sup>89</sup> Nevertheless, as I have argued elsewhere, its level of complexity was modest compared to that of Palermo during the same period.<sup>90</sup>

### 3. *Concluding: periodising and comparing*

Jessica Goldberg<sup>91</sup> has recently observed the difficulty of establishing a clear periodisation while at the same time comparing the Islamic regions of the Mediterranean with areas such as central and northern Italy, noting that regions like Egypt and the Levant may have entered their development phase even before the 10<sup>th</sup> century. We can nonetheless agree with Chris Wickham that the greatest economic complexity within the Islamic Mediterranean is most evident in the 10<sup>th</sup>-12<sup>th</sup> centuries. During the same period, textual and archaeological evidence consistently indicates that central and northern Italy were undergoing a phase of transformation, marked by a gradual transition from systems based on redistribution to the growth of cities and independent, specialised crafts.

For the Islamic areas of the Mediterranean, the modes and locations of ceramic production (including not only amphorae, but also glazed pottery and cooking pots) and its various distribution networks clearly indicate the full

<sup>87</sup> For archaeological evidence of manufacturing activities in Pisa, see Cantini, Rizzitelli, *Una città operosa*. On the former Gentili workshops in Chinzica, see Carrera, *Gli scavi degli "Ex Laboratori Gentili"*.

<sup>88</sup> An overview of the topics mentioned below can be found in Rascaglia, Russo, "La ceramica medievale di Roma" and Molinari, et al., "Stili di vita, produzioni e scambi."

<sup>89</sup> This is discussed in Wickham, *Medieval Rome*.

<sup>90</sup> Molinari, "Riflessioni sulle economie."

<sup>91</sup> Goldberg, "About «The Donkey and the Boat»."

development of specialised, independent craftsmen in urban areas, as well as the substantial consumption of urban products in rural ones. The volumes involved, and the distances between production and consumption sites, would not be matched in Italy until much later. The role of the fiscal authorities in facilitating the circulation of goods is especially evident in Egypt and Sicily during the Fatimid period, and in al-Andalus during the early Caliphal era. Yet this does not appear to have been the only factor encouraging the circulation of goods between city and country. The existence of relatively prosperous peasant communities not dependent on 'lords' seems to have been another important component. What we know about the monetarisation of the rural economies of Egypt and Sicily likewise points in the same direction as the ceramic data.

Important information also comes from archaeology's ability to identify the varying degrees of complexity in the *chaîne opératoire* and the more or less pronounced propensity for technological innovation among past societies. Here again, comparison shows the Islamic regions to have been markedly more prone to innovation. The mechanisms underlying the technical changes identified by archaeologists – whether in craft or agricultural production – are as complex as ever. International trade networks appear to have played an important role in stimulating such innovations, although it is clear that the receptiveness of each society to external novelties depended on a combination of social, economic, and cultural factors internal to each social formation. Somewhat like international trade, which can only be said to be possible when domestic economies are sufficiently developed, the capacity for change requires sufficiently open societies with a balance of urban elites and peasants demand. As we have seen, in the Islamic world the drivers of change included not only the caliphate and the urban aristocracies, but also peasant communities in the agricultural sphere. The mechanisms of innovation could involve imitation, the creation of entirely new techniques, the mobility of artisans and peasants, and the promotion of marginal or dormant techniques to produce new types of objects. Another aspect to consider is the category of innovations that might allow for the economists' celebrated 'free meal'. Here, however, the situation appears to be more complicated. While, for example, the introduction of plant ash as a flux in place of Egyptian natron can indeed be seen as an innovation that reduced the cost of glass production, the spread of richly decorated and glazed ceramics – products that were technically more complex and required double or triple the fuel, as well as more expensive raw materials – seems, by contrast, to represent a 'more expensive meal'. The huge success of glazed pottery on the market must have offset this increase demand for labour, energy, and raw materials. If we evaluate positively only those innovations that make production processes more efficient (such as mills in their traditional forms, the mouldboard plough, or horizontal looms), we risk overlooking the explanatory value of other kinds of innovative processes.

Finally, it seems important to emphasise the profound changes visible in the 13<sup>th</sup> century in peninsular Italy – though not there alone. It would be particularly interesting to reconsider the extent to which the so-called Latin mer-

chants, but especially the Italian ones, influenced local economies between the 12<sup>th</sup> and 13<sup>th</sup> centuries, above all in former Islamic regions with which they intensified their commercial relations. In the Crusader States, for example, both ordinary and fine ceramic production saw increases in scale and organisational changes. In Sicily, in Mazara, we have observed a marked expansion of cotton cultivation in the 13<sup>th</sup> century, at the expense of the polyculture characteristic of the Islamic period, along with a sharper orientation of sheep husbandry towards wool and cheese production. The growth of interregional relations in the 13<sup>th</sup> century, in which Italian merchants played an important role, may well have encouraged the specialisation of production in certain Mediterranean areas. Future research, including archaeological work, should reconsider just how 'external' Italian merchants truly were to the local economies of some Mediterranean regions with which they came into more intensive contact,<sup>92</sup> and to what extent this intensification may have constrained, rather than simply responded to, the autonomous choices of local farmers.

<sup>92</sup> Reflections of this kind have previously been raised by Petralia, "La nuova Sicilia tardomedievale," specifically regarding the presence of Tuscan merchants even in minor Sicilian centres.

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