

# Environmental Archaeology and Byzantine Southern Italy

Whatever one personally feels as regards the consequences of climatic and environmental change on human population and history, hotly debated in the present-day times of global warming<sup>1</sup>, there can be little doubt that the considerable subject of environmental archaeology, which brings together and interrelates several disciplines, has a lot to offer in our understanding of the development of past cultures and historical ecology. Not only can such archaeology nuance understanding of a whole range of topics from cultivation to alimentation, or from health to housing, but it has the instruments to help reassess views that until relatively recently were firmly text-based<sup>2</sup>. It is thus now all the more encouraging to see historians exploiting the increasing potential of environmental archaeology and the applied sciences to the reconstruction of the Byzantine and medieval past. In the field of Byzantine studies, itself a relative newcomer to historical disciplines, moreover as regards archaeology, studies pertaining to the realm of environmental archaeology have played a substantial part from the attempts in the 1990s by Johannes Koder to examine climate change, to the current projects promoted by scholars such as Michael McCormick on genetic analyses and more, or John Haldon on environmental reconstruction in Cappadocia<sup>3</sup>.

In Italy, the change of direction in historical and archaeological studies so to embrace the potential of environmental archaeology is largely a belated result of the influence of New Archaeology in the late 1970s and '80s<sup>4</sup>. This was the very time in which medieval archaeology emerged as a discrete discipline in the country, largely under the influence of such scholars as Riccardo Francovich at Siena and Tiziano Mannoni in Genova, the latter, incidentally, with a degree in natural science<sup>5</sup>. Although this synchrony permitted post-classical archaeology to develop basically free from the restrictions that bedevil Greek and Roman archaeology, still somewhat restrained by the traditions of art history and Classical studies, Byzantine archaeology finds itself in an ambiguous position, in so far as the discipline is still hardly recognised as being a

valid field of study in Italy, being viewed either as the (negative) decline of the classical past or being subsumed under the archaeology of the Early Middle Ages and migrations, itself substantially dominated by the Lombards<sup>6</sup>. Even if the Lombards from the late 6<sup>th</sup> century had seized substantial amount of the peninsula after the conquest of Ostrogoth Italy under the Byzantine emperor Justinian I (527-565), various parts of the country remained under the rule of Constantinople until the Norman conquest of the south in the later 11<sup>th</sup> century. The cities of Ravenna, Rome and Naples, and their hinterlands were only lost during the course of the 8<sup>th</sup> century, whilst most of Sicily was gradually relinquished to the Arabs during the course of the 9<sup>th</sup>, with the last outpost at Rometta falling in 965. The greater part of Apulia and various parts of Calabria and Basilicata, instead, remained substantially Byzantine until the Norman invasion of the 11<sup>th</sup> century. Thus, for half a millennium, a significant portion of southern Italy remained integral and, at times, even essential to the Byzantine Empire, and its history is surely worthy of detailed analysis and consideration.

The most researched topic in this timeframe of some 500 years is the nature of the transition from Late Antiquity to the Middle Ages. Many towns and rural settlements in this period had been abandoned, the population had shrunk and the ancient Roman economy had collapsed. All this permitted new beginnings. Traditional views, ever since the writings of Ludovico Antonio Muratori in the first half of the 18<sup>th</sup> century, more recently expounded by the influential writings of Vito Fumagalli, have seen the environment of Roman Italy as deteriorating through both cultural and natural causes, from the abandonment of settlements, farmland and hillside terraces and increase in woodland and marshes, to increased rainfall, flooding and cooler conditions, aiding and abetting economic collapse and almost total systemic breakdown<sup>7</sup>. From time to time particular emphasis has been given to one or another aspect, such as Roman overgrazing and desertification, which was particularly favoured by Cedric Yeo during the 1930s epi-

1 See, e.g., McMichael et al., *Climate Change*.

2 Unfortunately, environmental archaeology and the environmental sciences have taken a long time to penetrate Mediterranean historical reconstruction because of both text dominated views and the supremacy of art history. Furthermore, Byzantine archaeology is a relative latecomer to the archaeological disciplines.

3 Koder, *Climatic Change*. – McCormick, *Molecular Middle Ages*. – England et al., *Landscape Change*.

4 But not so prehistoric studies that have always been somewhat pioneering in the field of archaeology.

5 For a history of the development of medieval archaeology in Italy see Gelichi, *Introduzione*.

6 For the position of Byzantine archaeology in Italy see Zanini, *Le Italie*.

7 See the historiographical studies of Traina, Muratori and Squatriti, *Floods*, and the various publications by Vito Fumagalli, such as his collection of essays published in 1994, *Paesaggi della paura* (esp. idem, *Paesaggio delle campagne*).

sode of the Great American Dust Bowl<sup>8</sup>. Such dramatic views have since been questioned on the basis of archaeological discoveries that are finally beginning to illustrate the variety and complexity of outcomes throughout the length and breadth of the peninsula (and the Mediterranean). It is here that various disciplines of environmental archaeology are now contributing by posing alternative or more nuanced interpretations.

Certainly, it is now generally agreed that there was a climatic optimum during the first few centuries AD, which even saw the cultivation of grape as far north as Yorkshire in England<sup>9</sup>. This was followed by an overall drop in temperature and increased rainfall, that was to persist until the 9<sup>th</sup> century and the beginning of the Medieval Warm Period. A recent interdisciplinary study of climatic variation over the last 2500 years, based on oak growth-ring analyses and proxy data, showing apparent correlations with major historical events and human susceptibility, has largely substantiated the view of increased precipitation and falling temperatures from the 4<sup>th</sup> to the first half of the 6<sup>th</sup> century, with a major traumatic event, probably a volcanic eruption, occurring around 536 (some date it 533/534 ± 2), succeeded by the Justinianic plague<sup>10</sup>. Wetter and warmer summers appear from the end of the 6<sup>th</sup> century and mark the beginning of a phase of reduced climatic fluctuations that was to last until around the year 1000. The authors of the study note that the environmental conditions from the 8<sup>th</sup> century onwards match »the new and sustained demographic growth in the northwest European countryside«<sup>11</sup>. The climate changes sketched above would have equally affected Byzantine Italy. It is possible, for instance, that increased precipitation was one of the principal factors in the abandonment of low-lying coastal towns such as Paestum (prov. Salerno) and Metaponto (prov. Matera), which archaeology shows to have been in decline well before the 6<sup>th</sup> century traumas. Both lie in areas that, during periods of wet climate, may well have degenerated to marshland, as they were in recent times, prior to the drainage schemes of the mid 20<sup>th</sup> century.

Furthermore, as in many other parts of Italy, archaeological field survey in the low-lying hinterland of Brindisi (prov. Brindisi) illustrates an almost total disappearance of rural settlement during the course of the 6<sup>th</sup> century, despite the land having been heavily exploited, particularly for its grain, in Roman times<sup>12</sup>. It is tempting to see this early medieval degradation of the land as having been amplified by increased

rainfall and higher sea-levels, thus creating wetlands that may have endured with their ups and downs until recent drainage<sup>13</sup>. Apart from fostering mosquito infestation and malaria, such conditions would have helped it play a role as natural barrier between the Lombards and Byzantine possessions to the south during the 7<sup>th</sup> and 8<sup>th</sup> centuries. Byzantine re-conquest of much of southern Italy under emperor Basil I (867-886) during the later 9<sup>th</sup> century, although including this territory, did not entail the shift of the main Byzantine port at Otranto (prov. Lecce), back to Brindisi; a shift which eventually took place under the Normans.

Similar wetland conditions may have helped define part of the frontier territory known as Liburia, which divided the land of Naples from that of the Lombards in Campania<sup>14</sup>. Michael McCormick has observed what appears to be a close correlation between the recorded distribution of the genetic disorder known as thalassemia in mid 20<sup>th</sup> century Italy, which reduces malarial morbidity and mortality, and the extent of Byzantine territory in the peninsula after the late 6<sup>th</sup> century Lombard conquest<sup>15</sup>. Its distribution is particularly suggestive of immigration from the eastern Mediterranean to the Po Valley (Byzantine Ravenna and the Exarchate) as well as to Apulia, southern Calabria and Sicily, as thalassemia is not common among most western European populations, whilst being frequent amongst people from coastal regions of Asia Minor, the Aegean, and Greece, having even been identified in later medieval skeletal remains at Corinth (Peloponnese/GR)<sup>16</sup>. Historical sources do indeed attest the immigration of people from the eastern Mediterranean into Byzantine territories in Italy, and they may have been responsible for its diffusion. For instance, the Slav invasions of Greece and the Balkans during the 6<sup>th</sup> century are likely to have driven many people into southern Italy. Later, in the 8<sup>th</sup> century, immigration is attested with the onset of iconoclasm. The Byzantine authorities also occasionally enforced colonisation, such as when, after 876, citizens of Heraklea Pontica (il. Zonguldak/TR) in Asia Minor were moved to southern Apulia to make up for a decrease in numbers following Saracen attacks on the area<sup>17</sup>.

As late antique and early medieval climatic change may well have increased malaria transmission, it may also have both triggered the plague and aided its diffusion<sup>18</sup>. Despite graphic accounts of the pestilence, particularly by the Lombard writer Paul the Deacon<sup>19</sup>, direct evidence for the pandemic is proving particularly difficult to identify. In Italy, proxy

8 e.g., Yeo, *Overgrazing*. The effects of the Dust Bowl were caused not only by overgrazing, but by its combination with particularly dry seasons and storms, as well as by the precarious economic conditions of the Great Depression; Egan, *Worst Hard Time*. – See also: Van Andel/Runnels/Pope, *Land Use*; Vita-Finzi, *Valleys*.  
9 Brown et al., *Vineyards*. A kiln for the manufacture of wine amphorae dating to around the end of the 1<sup>st</sup> c. AD was unearthed at Brockley Hill in Middlesex (England): *Castle, Amphorae*.  
10 Büntgen et al., *2500 Years*. – Delogu, *L'ambiente* 76. – Larsen et al., *Ice Core Evidence*.  
11 Büntgen et al., *2500 Years* 580.

12 Aprozio, *Brindisi*. Decline in some parts of Italy may have been exaggerated because of a lack of understanding of post-classical ceramics, quite apart from population shifts.  
13 On the relationship between climate, geology and land use for erosion and alluviation, see Brown/Ellis, *People*.  
14 Martin, *problèmes*.  
15 McCormick, *Byzantium on the Move*. – See also: Sallares, *Malaria*.  
16 Barnes, *The Dead* 440-441.  
17 Jacob, *Sylitzès*. – von Falkenhausen, *Dominazione bizantina* 26.  
18 Much has been written about the Justinianic plague. See Little, *Plague*. – Stathakopoulos, *Famine*.  
19 Paul. Diacon. *Hist. Langob.* (ed. Waitz) 2, 4: Paulus Diaconus, *Historia Langobardorum*. Hrsg. von Georg Waitz, *MGH SS rerum Langobardicarum* (Hannover 1878) 12-187.

data for plague may come from the Roman building at Carminiello ai Mannesi in Naples (prov. Napoli), which has yielded amongst the first bones of the black rat (*Rattus rattus*) to have been identified from archaeological contexts in Italy. The rubbish accumulating in the road adjacent to the building may have been such that it eventually led to its abandonment and its citation in a 10<sup>th</sup> century source as *vico clusa*. The rat bones came largely from layers that blocked the drain in the road during the later 5<sup>th</sup> or early 6<sup>th</sup> century<sup>20</sup>. Rats have since been found in numerous other contexts throughout the peninsula, and from a mid Imperial to late antique high, would appear to have decreased substantially in number from the 7<sup>th</sup> century<sup>21</sup>. As they were vectors of the plague, the spread of the pandemic has been linked to their diffusion, which was first and foremost based on maritime trade. Thus it is quite possible that a few infants found buried beneath quicklime in a fountain basin at Carminiello ai Mannesi during the 6<sup>th</sup> century were plague victims<sup>22</sup>. More spectacularly, mass burials have been found at Castro dei Volsci, some 100 km south-east of Rome, where hundreds of individuals were buried during the same century<sup>23</sup>.

Regrettably, we are still largely ignorant of anthropological characteristics of the Italian population through Late Antiquity and the Early Middle Ages<sup>24</sup>. Furthermore, hardly any of the studies that have yet been published regard Byzantine individuals in southern Italy or Sicily, where cemeteries have often been excavated with little regard for the remains of the tombs' occupants<sup>25</sup>. It is thus all the more interesting that a recent anthropological study of human remains by Irene Barbiera and Gianpiero Dalla Zuanna<sup>26</sup>, recovered substantially in areas that were not under Byzantine rule, suggests that during the Early Middle Ages various people had a healthier nutrition than in Roman times. Their conclusion is based on the fact that skeletal evidence so far shows the former to have attained a higher stature than the latter, even if life expectancy was shorter. The skeletons from an 8<sup>th</sup> century cemetery excavated at Matera (prov. Matera) in southern Italy, where one individual in the 20-25 year age range even reached over 1.80m in height, support this<sup>27</sup>. If, indeed, one can demonstrate healthier nutrition in early medieval times than previously, this would counter past views that have suggested undernourishment, even if we should be wary of sweeping generalisations. Whilst during Late Antiquity and

the Early Middle Ages there were less people competing for food resources, surviving urban and rural populations being smaller than before, there were also less people farming the land and tending the herds. Thus, the well-being of populations will have to be judged across both time and space. Even given a healthy nutrition, this is not to say that the Italian population was healthier in general when compared to Roman times, as the early medieval period also witnessed higher mortality rates amongst the young, which still require proper understanding<sup>28</sup>. Of course, the individuals sampled by Irene Barbiera and Gianpiero Dalla Zuanna may have been largely immigrants or descendants of immigrant populations, which on average were of higher stature than the Italian population of Roman times, but to be sure we would need information from strontium and oxygen isotopes. Indeed, the increasing employment of stable isotope analysis, particularly of carbon and nitrogen isotopes, will clarify understanding of changing human conditions, which largely depends on a better knowledge of what people ate, both qualitatively and quantitatively.

Alimentation can partly be reconstructed through texts and discoveries of food remains, isotopic analyses of human bones, as well as through the study of food-processing apparatus such as pottery<sup>29</sup>. Actual remains of food, that include residues in ceramics, are more usually composed of archaeozoological and archaeobotanical material (figs 1-2). As regards faunal remains, few are yet available for Byzantine Italy, but include a large sample of animal, fish and bird bones, as well as shellfish, from urban Naples, the material from the 7<sup>th</sup> century Byzantine fort at S. Antonino di Perti (prov. Savona) in Liguria, and some samples in Apulia<sup>30</sup>. Published archaeobotanical remains are equally rare. In northern Italy, the recent discovery of storerooms at 8<sup>th</sup> century Classe, the port of Ravenna (prov. Ravenna), for instance, have yielded various contexts with carbonised seed remains<sup>31</sup>. Barley was by far the commonest grain, followed by small quantities of wheat. The legumes consisted mainly of lentils, with a minor presence of chickpeas. Both were grown in Italy but were also, perhaps surprisingly, imported in Roman times from Alexandria. It is interesting that some amphorae from the Yassi Ada shipwreck (İl. Istanbul/TR) that sank off the south-western coast of Turkey around 626 contained lentils<sup>32</sup>. Broad beans (*Vicia faba*) have recently been found in 12<sup>th</sup> century

20 King, Mammiferi.

21 Salvadori, Zooarchaeologia 228. – Ruffino/Vidal, Early Colonization.

22 Arthur, Napoli.

23 Rubini, La terribile peste. – An early medieval ossuary containing around 30 individuals, mainly adults, was also found at Otranto, but was only roughly dated between the mid 6<sup>th</sup> and the 10<sup>th</sup> century, Becker, Human Bones 163-164.

24 Lo Cascio/Malanima, Cycles.

25 Neil Christie also laments the general lack of information on Byzantine burial in Italy: »The furnished Lombard burials enable us to follow persistences of Germanic design and decoration and to observe new influences, changes in dress style, or preferences for artefact decoration, and so allow us to question rates as well as types of acculturation. But without comparable burial data for the 'Byzantines' in Italy – city dwellers, administrators, churchmen, farmers, merchants – we struggle to see how far Lombard or Germanic material culture and ideas influenced these; indeed, we learn more about 'Byzantine' art and

dress and design from the Lombard graves«, Christie, Interactions 120. An overview of the situation in Basilicata and Calabria is published by Paparella, Basilicata. For rare reports in Apulia see Anderson, resti antropologici; Emanuel, Paleobiologia.

26 Barbiera/Dalla Zuanna, Population Dynamics.

27 Anderson, Santa Lucia. – Bruno, Matera. – A new project is now being launched to study the anthropological remains in detail.

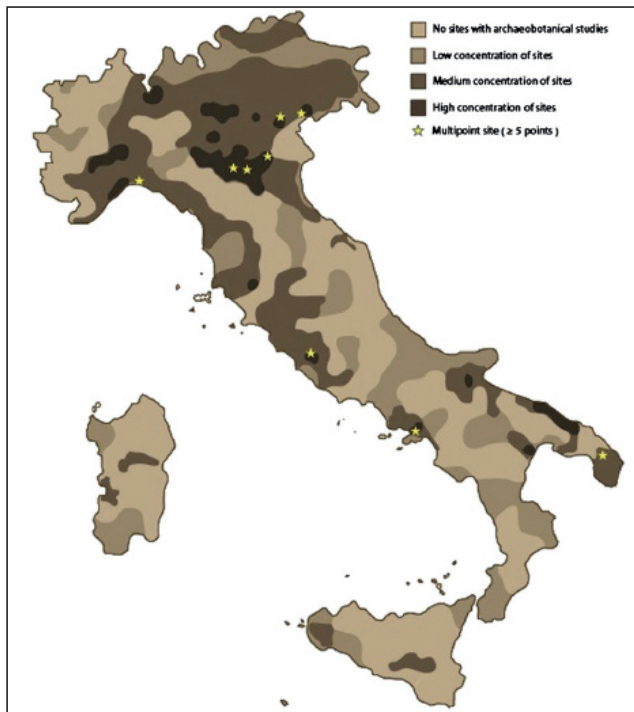
28 Barbiera, Memorie 234-236.

29 e.g., Arthur, Pots.

30 Syntheses of the available data are in Salvadori, animali; Kroll, Animals; De Grossi Mazzorin, Resti archeozoologici.

31 Augenti et al., Classe. – For an overview see the contribution by Anna Elena Reuter in this volume p. 149-170.

32 Van Doorninck, Shipwrecks.



**Fig. 1** Distribution map density of archaeological sites with archaeobotanical analyses; dark colour refers to the highest number of sites. – (After Mercuri et al., *Pollen* 253 fig. 1).

contexts at the castle of Lecce. Eighth and 9<sup>th</sup> century contexts from Naples have yielded a large quantity of archaeobotanical samples, showing both the rich variety of food plants available, as well as enough weeds as to suggest the presence of abandoned or rundown urban areas<sup>33</sup>. The presence of dark earth layers, as in various Italian towns, also suggests cultivation within the walls of Naples during early medieval times. Neither cultivation within the walls nor importation are surprising for large urban centres, though we need to know more about the contribution of food plants to the diets of individuals. What, instead, may be somewhat surprising is the discovery of the variety of plant foods available to a small rural community near Supersano (prov. Lecce) in southern Apulia.

The site excavated near Supersano is that of a later 7<sup>th</sup> to 8<sup>th</sup> century Byzantine village, abandoned no later than the early to mid 9<sup>th</sup> century (fig. 3). Abundant charcoal suggests that simple buildings made use of oak beams, presumably cut from the neighbouring forest, the now extinct Bosco di Belvedere, and apparently had roofs thatched with heather. However, the most spectacular remains came from an 8<sup>th</sup> century well, which revealed waterlogged wooden objects and thousands of plant remnants (fig. 4)<sup>34</sup>. The latter included quince (*Cydonia oblonga*), fig (*Ficus carica*), sloe (*Prunus cf. spinosa*), European cornel (*Cornus mas*), olive (*Olea europaea*) and lentils (*Lens sp.*), although only elderberry seeds (*Sambucus nigra*) appeared in any significant numbers. Rare

33 Arthur, *City-State* 113-115.

34 Grasso, Supersano.



**Fig. 2** Distribution map of medieval faunal remains analysed up to 2009. The map displays numbers of analysed animal bone fragments per region. – (After Salvadori, *Animali* 303 fig. 1).

cereal fragments comprised oats (*Avena sativa*), barley (*Hordeum vulgare*), and wheat (*Triticum sp.*). Spontaneous vegetation, some of which was useful to man, included remains of heather, burr medic, corn buttercup, pistachio, goosefoot, and other plants. Nonetheless, the majority of remains comprised almost 3000 grape (*Vitis vinifera*) pedicels, skins and seeds, undoubtedly the remnants of local cultivation and on-site pressing for wine production. It may be remarked that genetic analyses of grape seeds from the well conducted project at the University of Copenhagen has revealed the presence of fragments of DNA that, together with the morphological analyses, suggest an Aegean origin of the variety of grape unearthed at Supersano<sup>35</sup>. Interestingly, gas-chromatography showed that one of the amphorae found in the well had remains of calcium tartrate, a derivative of wine. Another contained traces of pine resin, either to help seal the vessel or to create a resinated wine, which was certainly known in ancient times, or both. Foodstuffs from the excavations at Supersano also embraced archaeozoological remains, including cattle, pig, sheep and goat, a minor quantity of red deer and, interestingly, some oysters, despite the distance from the sea<sup>36</sup>.

At Apigliano (prov. Lecce), another Byzantine village, a slightly later context, datable between the 10<sup>th</sup> and 11<sup>th</sup> century, yielded cultivated food remains that included broad beans (*Vicia faba minor*), lentils (*Lens sp.*), and probably peas (cf. *Pisum sp.*), as well as wheat kernels (*Triticum aes-*

35 Cappellini et al., *Grape Seeds*. – For DNA-analyses on amphorae, see also Hanson/Foley, *Ancient DNA*.

36 De Grossi Mazzorin, *L'economia*.





**Fig. 3** Reconstruction of the Byzantine site at Supersano (Lecce) based on archaeological, archaeobotanical and faunal data. – (Drawing: InKlink, Florence).

*tivum/durum/compactum*), and some barley (*Hordeum vulgare*)<sup>37</sup>. Unlike Supersano, the remains were carbonised and presumably much less representative of what was actually grown and available. Much information is missing. For instance, it would be interesting to have more information regarding the relative cultivation of various cereals across time, space, and social contexts.

Nonetheless, the exceptional data from the Byzantine village of Supersano suggests the possibility of a relatively varied diet that was based on local resources, without recourse to importation, although it will be hard to gauge nutritional effects on the population in the absence of accompanying anthropological evidence. It may also be questioned how much the open market of the Roman Empire conditioned eating habits and nutrition, particularly in the larger urban centres, and if a possibly healthier diet was a feature of market collapse and a greater reliance on local resources after the 6<sup>th</sup> century. Pig, for instance, undoubtedly provided a major contribution to the meat diet of some Roman towns, including Rome itself<sup>38</sup>, though particularly in Naples may be seen to have been surpassed by sheep and goat in late antique and early medieval times. One may be reminded of the

modern-day conflict between the Mediterranean diet and the all-pervasive fast-food industry or even just the greater use of animal fats in food<sup>39</sup>. Furthermore, a decrease in the variety of food resources and a simplification of food dishes and eating rituals may have brought about a simplification of culinary habits, which seems reflected in the lesser variety in ceramic types produced in early medieval times. Fabio Giovannini argues for ascendancy of a rural model in Italy from around the 7<sup>th</sup> or 8<sup>th</sup> century that brought about an ever-greater reliance of boiled foods<sup>40</sup>.

Despite recent work, it is still not possible to relate specific foodstuffs and their nutritional contributions to the individuals that archaeologists excavate in the numerous Byzantine cemeteries that come to light. To this end, preliminary work on carbon and nitrogen isotopes of human remains from the later medieval cemeteries of Apigliano and Quattro Macine (prov. Lecce) by a team led by Michelle Alexander (*née* Munde), show that both populations had a limited access to high protein foodstuffs with a reliance on cereals and only minor contributions of animal proteins<sup>41</sup>. The dietary pattern appears similar to the wider Eastern Mediterranean region, including what is known about Byzantine diet, summarised by

37 Grasso/Fiorentino, *L'ambiente vegetale*.  
 38 De Grossi Mazzorin, *Habitation Models*.  
 39 Sabatelli/Palumbo/Martucci, *Food habits*.

40 Giovannini, *Natalità* 69.  
 41 Rolandsen, *Isotopic Investigation*; Rolandsen et al., *Two Villages*.





**Fig. 4** The Byzantine well at Supersano (Lecce). A reconstruction of the well and some of the recovered remains, among them grape pips (right), fruits of burr medic *Medicago polymorpha* (bottom right) and a leaf fragment. – (Figure: Laboratory for Medieval Archaeology, University of Salento).

Peter Charanis, consisting principally of hard bread, cheese, legumes, greens, and roots, supplemented with olives, fish (where available), and eggs, to which we should add honey, fruits and, of course, wine<sup>42</sup>. A form of porridge seems also to have been consumed in various places. Of course, diet will also have been greatly conditioned by the environmental resources of the area, so we should expect a fair amount of regional variation. However, in the long run, the differences were perhaps not so much what was eaten, but both their relative and absolute quantities and how they were prepared or amalgamated with other ingredients.

Red meat does not seem to have been a mainstay for most members of the population, whilst contributing substantially to the diet of wealthier individuals, but likely featured significantly on feast days, or when work animals reaching the end of their tether could be sacrificed to the table. Faunal analyses suggest a preference for pork throughout many parts of Italy during Roman times and the Early Middle Ages

largely in urban areas, only to drop substantially around the 12<sup>th</sup> century. The 7<sup>th</sup> century Byzantine *kastron* of S. Antonino di Perti, in Liguria, for instance, was represented by some 53% of pig, based on number of identifiable fragments<sup>43</sup>. On available data, Naples stands out as quite an exception, with the predominance of pork through Roman times giving way to sheep/goat during the 6<sup>th</sup> century, but returning to a pork-dominated consumption by the 8<sup>th</sup>. This may be a sign of ruralisation of the urban community in Naples. At the deserted medieval village of Apigliano there was a prevalence of sheep/goat amongst Byzantine (8<sup>th</sup> to 10<sup>th</sup> century) faunal remains, whilst there was a drop in later contexts, although ovicaprids remained prevalent. Sheep/goat vied with pig at the town of Otranto, although as the authors of the report make clear, cattle may actually have provided the greatest quantity of meat during Byzantine times. At Apigliano, where cattle increased in proportion from the 10<sup>th</sup> century, they were older beasts, suggesting that they were princi-

42 Charanis, Political Life.

43 Giovino, Risorse alimentari animali.

pally employed for farming, and that they were eaten when no longer useful for traction. Indeed, a greater reliance on mixed farming after the 10<sup>th</sup> century was equally suggested by the anthracological data, which previously showed an overwhelming preponderance of the olive<sup>44</sup>, and may be indicative of risk-reduction strategies, which is also suggested by site location<sup>45</sup>.

Agrarian practises, eating habits and other cultural traits will also have been affected by immigration, for which we possess some documentary evidence concerning Byzantine Italy (see above), and for which future genetic studies and analyses of oxygen and strontium isotopes of human remains should elucidate. Immigration may also have helped encourage the opening-up of new lands, previously uncultivated or abandoned. Field survey is apparently revealing substantial rural occupation of parts of the Salento peninsula of southern Apulia that were uninhabited or sparsely occupied in classical times, marking a trend that seems in contrast to other areas of Italy, where abandonment seems to have followed intense late Roman occupation. This is the case to the north-west of Otranto, around the Alimini lakes (prov. Lecce), where a soil core has yielded pollen that illustrates a phase of Byzantine deforestation, followed by a sharp increment in the presence of olive (*Olea europaea*) from around the 8<sup>th</sup> century<sup>46</sup>, on the basis of radiocarbon dating. Similar trends to that evidenced in the Alimini lake area may, perhaps, be recognised in parts of Greece, coinciding with what has been called a »little climatic optimum«<sup>47</sup>. Chronologically, this seems to tie in with the appearance of a pottery kiln site at Otranto, which

manufactured globular amphorae for maritime shipment. This is all rather suggestive of involvement of Byzantine administration in boosting local productivity, which is indicated also by the appearance of many villages by the 8<sup>th</sup> century, as well as by Saracen raids, which indicate a substantial and perhaps growing rural population. Of course, we now have to see how much settlement expansion in southern Apulia and elsewhere may have been due to an expanding population and economy, or if it was occasioned by factors such as climatic amelioration and, perhaps, new techniques of water management which, at least in Sicily and Spain, appear to have been imported by the Arabs.

Indeed, there is still an enormous amount of work to be done. Great and exciting breakthroughs are coming from the sciences, and many of these are summarised in a fascinating paper by Michael McCormick »Molecular Middle Ages: Early Medieval Economic History in the Twenty-First Century«, which is why I have concentrated on what archaeology has so far provided for the study of Byzantine Italy. Miserably little, I'm afraid! Indeed, as far as I can see, apart from the usual lack of funding, the biggest problem rests largely with the size and publication of samples, whether they be anthropological, archaeozoological or archaeobotanical. This can only be overcome by creating a greater awareness in archaeologists of the true potential of what they excavate and their responsibility towards rapid publication. If we can achieve this, I believe that the future will offer us many fascinating discoveries and a better understanding of the complexities and the diversities of the Byzantine World.

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## Zusammenfassung / Summary

### Umweltarchäologie und das byzantinische Süditalien

Der Beitrag fasst bislang zur Anwendung gekommene Zugänge zur byzantinischen Umweltgeschichte Süditaliens zusammen und zeigt auf, inwiefern geschichtliche Entwicklungen mit dem Klima und Interaktionen zwischen Mensch und Umwelt verflochten waren. Die Trendwende in den Geschichtswissenschaften und der Archäologie, sich das Potential der Umweltarchäologie zunutze zu machen, ist in Italien vor allem auf den Einfluss der New Archaeology in den späten 1970er und 1980er Jahren zurückzuführen. In dieser Zeit formierte sich auch die Mittelalterarchäologie als eigenständige Forschungsdisziplin im Land.

Innerhalb des ca. 500 Jahre umfassenden Zeitfensters byzantinischer Einflussnahme in Italien stand besonders der Übergang von der Spätantike in das frühe Mittelalter im Fokus der Forschung. Viele Städte und ländliche Siedlungen wurden verlassen, die Bevölkerung ging zurück und das römische Wirtschaftssystem kollabierte. Es kann davon ausgegangen werden, dass sich die Veränderungen des europäischen Klimas in dieser Zeit – ein Klimaoptimum in den ersten nachchristlichen Jahrhunderten gefolgt von einem generellen Absinken der Temperaturen und verstärktem Niederschlag, was bis zum 9. Jahrhundert anhielt – auch auf das byzantinische Italien auswirkten. Diese Klimabedingungen können eventuell mit sich verändernden Siedlungsmustern und der Ausbreitung von Krankheiten, vor allem der Malaria und der Pest, in Verbindung gebracht werden.

Bislang wurden so gut wie keine anthropologischen Studien an byzantinischen Skeletten durchgeführt. Menschliche Überreste aus Gebieten außerhalb des byzantinischen Herrschaftsgebietes im frühmittelalterlichen Italien lassen aber vermuten, dass die Bevölkerung eine größere Statur erreichte als zu römischer Zeit, vermutlich entweder ein Anzeichen für eine bessere Ernährung oder aber für eine Einwanderung. Beide Theorien könnten durch Analysen stabiler Isotopen näher geklärt werden. Auch wenn der archäozoologische und archäobotanische Forschungsstand nur auf wenigen Materialien basiert, lassen sich schon einige Rückschlüsse auf die Wirtschaftsweise und damit die Ernährung ziehen. Dunkle Erden innerhalb von Städten und die Tierknochenspektren geben Hinweise auf eine urbane Landwirtschaft und einen gewissen Ruralisierungsgrad. Gleichzeitig zeigt eine ländliche Siedlung bei Supersano ein Pflanzenfund- und Tierknochenspektrum, das auf eine gesunde und abwechslungsreiche Ernährung aus lokalen Ressourcen hinweist. Es steht zur Diskussion, ob diese Aspekte möglicherweise ein Kennzeichen des Kollapses des römischen Wirtschaftssystems sind. Eine geringere Variabilität der im frühmittelalterlichen Italien produzierten Keramiktypen weist auf eine Vereinfachung der Speisegewohnheiten hin, in denen gekochtes Essen eine größere Bedeutung hatte, möglicherweise ebenfalls bedingt durch eine Ruralisierung seit dem 7. und 8. Jahrhundert.

Es bleibt zu klären, inwiefern Einwanderungen, für die es im byzantinischen Italien einige Hinweise gibt, landwirtschaftliche Strategien, Speisegewohnheiten und andere kulturelle Phänomene, die mit Mensch-Umwelt-Interaktionen zusammenhängen, beeinflussten. Einwanderung kann die Erschließung ehemals unkultivierten oder aufgelassenen Landes gefördert haben. Im Gegensatz zu anderen Bereichen Italiens zeigen Feldbegehungen in Teilen der Halbinsel Salento in Südapulien eine beträchtliche ländliche Besiedlung in Gegenden an, die in der Antike nicht oder schwach besiedelt waren. Ein Bohrkern von den Alimini-Seen nordwestlich von Otranto enthielt Pollenspektren, die eine byzantinische Entwaldung, gefolgt von einem scharfen Anstieg der Olivenkultur ab dem 8. Jahrhundert, anzeigen. Zusammen mit anderen Aspekten, z. B. zahlreichen Siedlungen aus dieser Zeit, deutet dies auf Maßnahmen der byzantinischen Verwaltung hin, die lokale Produktion anzukurbeln.

Um eine größere Datenbasis für umweltgeschichtliche Studien zu gewinnen, muss das Bewusstsein der Archäologen für das wahre Potential der von ihnen ausgegrabenen Quellen geschärft werden. Wenn wir dies erreichen, können wir zu einem wesentlich besseren Verständnis der Komplexitäten und der Vielfältigkeit der byzantinischen Welt gelangen.

### Environmental Archaeology and Byzantine Southern Italy

The paper provides an overview of approaches to the environmental history of Byzantine South Italy and points out ways in which historical developments were interwoven with climatic circumstances and human-environment interaction. In Italy, the change of direction in historical and archaeological studies so to embrace the potential of environmental archaeology is largely a result of the influence of New Archaeology in the late 1970s and '80s. This was the very time in which medieval archaeology emerged as a discrete discipline in the country.

The most researched topic in the Byzantine timeframe of some 500 years is the transition from Late Antiquity to the Middle Ages. Many towns and rural settlements were abandoned, the population shrank and the ancient Roman economy collapsed. It can be assumed that the changes of the European climate in the respective periods – a climatic optimum during the first few centuries AD followed by an overall drop in temperature and increased rainfall which was to persist until the 9<sup>th</sup> century – would have equally affected Byzantine Italy. The climatic conditions can be tentatively linked to changing settlement patterns and the spread of diseases, notably malaria and the plague.

As regards anthropology, hardly any studies have been carried out so far that focus on Byzantine individuals. Human remains from non-Byzantine areas of Early Medieval Italy suggest that the population attained a higher stature than in Roman times, either a sign for better nutrition or for immigration. Both theories could be clarified by stable isotope

analyses. Even though the state of research for zooarchaeology and archaeobotany is based on materials from only a few sites, some conclusions on economic strategies and alimentation can be drawn. Dark earth layers in cities, as well as the animal bone spectra point to urban agriculture and some degree of ruralisation. At the same time, a rural village near Supersano seems to have lived on a relatively varied diet based on local resources. It may be hypothesised that a possibly healthier diet was a feature of market collapse and a greater reliance on local resources after the 6<sup>th</sup> century. A lesser variety in ceramic types produced in Early Medieval times points to a simplification of culinary habits, perhaps again due to a ruralisation from around the 7<sup>th</sup> or 8<sup>th</sup> century that brought about an ever-greater reliance of boiled foods.

It needs to be clarified in which way immigration, for which we possess some documentary evidence concerning Byzantine Italy, affected agrarian practises, eating habits and other cultural traits that had an impact on human-environ-

ment interactions. Immigration might have helped encourage the opening-up of previously uncultivated or abandoned land. In contrast to other areas of Italy, field surveys in parts of the Salento peninsula of southern Apulia reveal substantial rural occupation in areas that were sparsely occupied in classical times. A soil core from the Alimini lakes north-west of Otranto yielded pollen that illustrate Byzantine deforestation followed by a sharp increment in the presence of olive from around the 8<sup>th</sup> century. This and other aspects are rather suggestive of involvement of Byzantine administration in boosting local productivity, also indicated by the appearance of several villages at the time.

In order to achieve a more significant database for environmental studies, a greater awareness in archaeologists for the true potential of the archaeological record is needed. If we can achieve this, we can gain a far better understanding of the complexities and the diversities of the Byzantine World.