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## Connected Hinterlands

Proceedings of Red Sea Project IV

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### A Palestinian Red Sea Port on the Egyptian Road to Arabia: Early Islamic Aqaba and its Many Hinterlands Kristoffer Damgaard

Merriam-Webster's online dictionary offers three definitions of the term hinterland: "1: a region lying inland from a coast; 2a: a region remote from urban areas; and 2b: a region lying beyond major metropolitan or cultural centres".1 This strictly geographical understanding of the term is perhaps the most appropriate in a colloquial context, and it is certainly supported by the term's etymology, as lexical referencing reveals. However, with the increasing acknowledgement of the social, cultural and economic complexity of past societies, academia cannot continue to perceive this term so rigidly. Currently, the majority of archaeological discourse tends to set both the theoretical and methodological concept of archaeological hinterlands within this geographical framework; defining research goals and guiding in-field approaches. Yet while many hinterland studies continue to deal with the regions in immediate vicinity of the locality under scrutiny,<sup>2</sup> a broader scope is increasingly being employed, often producing significant and, at times, unexpected results.3

This article argues that many forms of hinterland exist, and that it is possible to formulate an analytical methodology based on tiered levels. Examples could be 'political', in the sense of administrative affiliation and/or subordinance to centres of political power; economic, in regard to a site's position within relevant economic networks; or ethnoconceptual, that is pertaining to the perceived identities of a locality's occupants. A given site's hinterlands are thus both physical and metaphysical, immediate and distant, and exist as a multiplicity of threads that are intrinsically interconnected. It is important to stress that the author does not underestimate the value or significance of investigating geographical backdrops in order to better understand local and regional demographic profiles and economic infrastructures; I merely suggest that hinterlands can be perceived as more than this. The following article will therefore use a 'pebble in a pond' approach to illuminate the multiplicity and interconnectivity of Agaba's hinterlands

in the Early Islamic period (c. AD 650-1100). The nucleus is the walled city of Ayla, and from here the analysis expands, like rings in water, to include the full geographic scope of hinterland regions related to the site. Ayla's affiliation to these regions may operate on a variety of levels, and in many cases on several levels at once. So as a means of simplifying these complex trends in a model, the hinterland concept has been subdivided spatially to constitute three spheres of geographical influence: the micro-hinterland, dealing with issues immediately outside the defined area of interest; the medio-hinterland, encompassing what is traditionally perceived as a hinterland and dealing with stretches of land directly linked to the area of interest; and the macro-hinterland, in which the archaeologically more arbitrary, yet equally powerful influences operate (Figure 10:1). Naturally, the active mechanisms stimulating a site's dynamic fluctuate over time, and the analysis is therefore not only structured geographically, but to some extent chronologically; presenting, in a preliminary fashion, the way site functionality, communal identities and regional associations change over both time and space.

Figure 10:1. Map showing the geographic scope of Ayla's hinterlands with modern political contexts (© K. Damgaard).



<sup>1.</sup> http://www.merriam-webster.com/dictionary/hinterland.

<sup>2.</sup> Some of the most renowned of which are Robert McCormick Adams' eminent surveys of the floodplains of Mesopotamia (Adams 1965; 1981). However, the trend clearly persists in archaeological fieldwork (*e.g.* Doonan 1998; Rose 1996; and in the case of Aqaba, Whitcomb 2006a).

<sup>3.</sup> A good example of the widening scope of the hinterland concept can be found in the articles published in Mango & Dagron (eds.) 1995. In the case of Early Islamic Aqaba, important aspects of the complexity and multiplicity of regional associations have been demonstrated in Whitcomb 1998.

#### Ghetto or Suburbia? Ayla's Micro-Hinterlands

The walled city of Ayla was first identified in 1986, when a team led by Donald Whitcomb of the Oriental Institute in Chicago began excavating a section of the beachfront in modern Aqaba, Jordan. In the following years, Whitcomb and his team uncovered a substantial portion of the Early Islamic city, including its towered walls, gates, streets and a number of different building units. Based on the evidence retrieved from these excavations. Whitcomb inferred that the enceinte could be dated as far back as AD 650, making it one of, if not the earliest, known Islamic urban foundation in the world.4 Unfortunately, Whitcomb's efforts to secure the walled city - an archaeological site located on a piece of prime real-estate in a rapidly developing city - came at the expense of its suburbs. This has meant that our knowledge, and perhaps more importantly our expectation, of extra muros settlement in the Early Islamic period has been both ambiguous and amorphous. There is nonetheless ample evidence to suggest that urban settlement in the Early Islamic period exceeded the city walls to such an extent that the fortified core of Ayla no more can be said to have constituted the full cityscape of Ayla, than say Manhattan constitutes all New York. In spite of being constructed as an independent unit that was clearly distinguishable by its monumental walls, the Islamic city was constructed in a symbiotic relationship with the pre-existing Byzantine town of Aila, which lay immediately north-northwest of it.

Aila had surrendered by treaty (*sulh*) to the Prophet Muhammad roughly two decades earlier and it is generally assumed that such treaties guaranteed the safety and property of the surrendering city's inhabitants. Naturally, this type of agreement limited the possibility of simply appropriating the urban environment, and the new Muslim settlers had to come up with alternative ways of establishing themselves. Mostly, the problem was solved by purchasing the necessary real-estate, but in other cases, a satellite settlement (*misr*) was constructed in close proximity to the extant settlement. The satellite could then arrogate

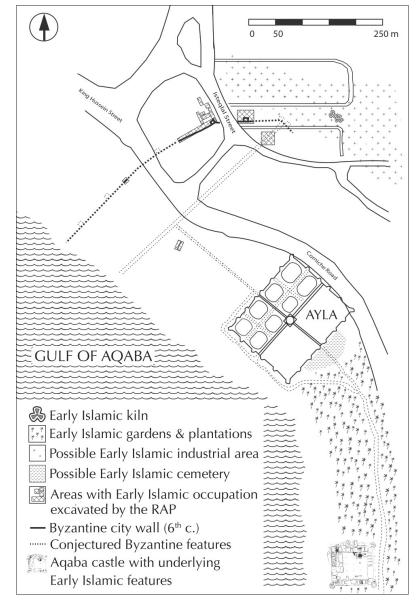


Figure 10:2. Stylised representation of Early Islamic Ayla and its environs, including conjectured Byzantine features and outlines of the modern roads and Aqaba Castle (© K. Damgaard; using Parker 2003: 322 as a template).

<sup>4.</sup> See especially Whitcomb 1989a, 1994, 1995a. 5. Khadduri 1997; It is interesting to note that in the case of Ayla's surrender, these freedoms included the right to "travel by sea" (Crone 1987: 44).

administration without the inconvenience of demographic shifts. The layout and features of the satellite settlement of Ayla have been published elsewhere, and although the author is conducting new archaeological research on the morphology of the site, a major discussion of the city itself will not be taken up here. It is, however, worth noting that new excavations have confirmed both the established phasing of the site, as well as the presence of occupational strata stretching back to the early 7<sup>th</sup> century, and possibly earlier.

The notion of a symbiotic relationship between Ayla and Aila resonates well with the discoveries of the Roman Agaba Project (RAP), which under the directorship of Thomas Parker (University of North Carolina) has excavated substantial parts of the Roman and Byzantine cityscapes. Primary among the features discovered by the RAP is a monumental stone wall with salient square towers dated by Parker to the late 4th to early 5th century AD,8 and reinforced with semicircular towers on the interior in the 6th century. A segment of roughly 120 m of this structure, which was termed the Byzantine city wall by its excavator, has been unearthed northwest of Islamic Ayla (Area J). An additional short section of it was found when probing south of King Hussein Street, near the modern pumping station (Area U) (Figure 10:2). Even though the excavated wall sections do not allow us to ascertain the full extent of the Byzantine city wall, a number of observations may be put forward. Firstly, it is clear from the excavated sections that the shape of the wall is polygonal, and that the long section in Area J at some point breaks south towards the shoreline. Secondly, it is equally manifest that the interior of the wall is on the south and east side. This is indicated both by the large square towers protruding from its north face, but also from the settlement profiles excavated on either side of the walls. We are thus dealing with a structure, which if perceived in the traditional sense of a city wall (i.e. encircling at least the core of urban settlement when it is constructed), must either have made some turns at uncharacteristically sharp angles, or have enclosed a very large area in close proximity to the site of Islamic Ayla. Due to the modern development of Aqaba, it is impossible to ascertain exactly how much territory the Byzantine wall enclosed, but comparison with other Late Roman-Byzantine provincial centres may begin to provide the enough clues for us to substantiate the speculation with focused archaeological probing.

The conjectured wall line is in accord with the presence of Early Islamic settlement in the 'Byzantine' town. Parker found extensive Early Islamic strata, but only in areas 'inside' the Byzantine wall. These included what he termed an Early Islamic suburb (Area L) northwest of Ayla, and extensive multiphase occupation and re-use activity in Areas J and K. <sup>10</sup> Particularly noteworthy is a street in Area K, which was laid out in the Roman period, but which continued to be used as such at least until the early 10<sup>th</sup> century. Remarkably, the line of this street crosses at an exactly perpendicular angle to the line created by the central 'decumanus' at Ayla, opening a possibility of integrated orthogonal planning between the two settlements.

Parker's profile of an Early Islamic settlement was further substantiated in the early 2000s when the Mövenpick Hotel extended its resort facilities along the western flank of Ayla. Prior to the development of this land, rescue excavations conducted by the Jordanian Department of Antiquities revealed Early Islamic structures in every single location they penetrated. Unfortunately, this material remains unpublished, and it is currently unclear whether these salvage efforts produced any evidence of the Byzantine city wall. Even so, there is still ample evidence to suggest that Ayla's most proximal hinterland lay immediately outside its walls, and consisted of the continued occupation of the pre-existing settlement.

An additional clue to the extent of urban spread was provided by Whitcomb and his team, who in the course of *extra muros* surveys discovered an industrial area in the Radwan domestic area north of the site. <sup>13</sup> On what must by then have been the outskirts of the city, several kilns dating to the late 7<sup>th</sup> century were unearthed. These were production facilities for the characteristic Aqaba amphorae, <sup>14</sup> which seem to have been produced locally from the 5<sup>th</sup> century onwards. <sup>15</sup> The distribution pattern of these amphorae is extensive, with fragments showing up at sites such Berenike and Axum, <sup>16</sup> but also on a shipwreck off the Eritrean coast, <sup>17</sup> and most recently in a 6<sup>th</sup> century destruc-

<sup>6.</sup> See most recent publications by Whitcomb 2006b, 2007.

<sup>7.</sup> Damgaard forthcoming. Following our initial season in 2008, an uncontaminated charcoal sample, taken from a stratum butting the earliest identified architectural phase within the city, came up with a calibrated (sigma 2) radiocarbon dating between AD 382 and 576. Nevertheless, this dating cannot be seen as decisive evidence for pre-Islamic occupation on the site, as only one sample was tested and this derived from the very limited area (ca. 1 m x 2 m) that was penetrated to sufficient depth. 8. Parker 2003: 324.

<sup>9.</sup> Parker 1998: 387 (Area L), 2000: 383-93, 2002: 418-21, 2003: 324-39 (Areas J & K).

<sup>10.</sup> *Ibid.*; the finds from these areas remain unpublished, but Margaret O'Hea has a comparative analysis of the glass coming out in Vol. 23 of the *ARAM periodical* (expected in 2010).

<sup>11.</sup> I am thankful to Sawsan al-Fakhry of the Aqaba Antiquities Authority for relaying this information. It is hoped that at least some this material can be accessed for the author's doctoral research.

<sup>12.</sup> The archaeological evidence from Ayla suggests that by the late 8<sup>th</sup> century, steps were taken to integrate the two cityscapes by camouflaging the gates with markets (Whitcomb 1995b: 503-07, 2006b; Damgaard forthcoming).

<sup>13.</sup> Melkawi et al. 1994; Whitcomb 2001.

<sup>14.</sup> I.e. Peacock & Williams Type 52 with interior ledge in the neck for sealing with ceramic discs.

<sup>15.</sup> No other kilns have been located so far, but Aqaba amphorae have been discovered in enough sealed archaeological contexts for this dating to be warranted (Parker 2006: 228-29; see also Parker's contribution in this volume).

<sup>16.</sup> For Berenike see Hayes 1996: 159-61; for Axum see Wilding 1989: 314 (No. 469).

<sup>17.</sup> For the Assarca shipwreck, see Pedersen 2000.

tion layer at Zafar in Yemen (Figure 10:3). <sup>18</sup> Historically, there seems to have been a lull in the Red Sea trade regime from the 6<sup>th</sup> century onwards. <sup>19</sup> Large coastal entrepôts such as Berenike and Leuke Kome were replaced with new harbours further north, at Aila and Clysma (Qulzum). <sup>20</sup> On the hitherto unidentified island of Iotabê, the fortified Byzantine taxation centre appears to have suffered continual raids from the Arabian coast, <sup>21</sup> and in the southern end of the Red Sea littoral, local dynasties expanded the spheres of their economic influence and territory. <sup>22</sup> Yet in spite of the paucity of history and the seeming retraction of Roman/Mediterranean influence in the Red Sea trade, it is tantalising that Aqaba's production and distribution of amphorae was maintained.

This composite exposé of Islamic settlement within the city limits has recently been further augmented by excavations at Agaba Castle. These have unequivocally confirmed that the geographic scope of Early Islamic settlement was not limited to the walled town and pre-existing settlement, but was a widely dispersed and presumably growing phenomenon. The Aqaba Castle excavations were initially launched to explore the history and morphology of the Mamluk-Ottoman fortified khan, but a series of probes into the pre-khan strata revealed that the site had a complex settlement history stretching back to the early 8th century. These features, more than a kilometre south of the walled city, consist of a range of installations that include multiple hearths, wells of varying sizes, stone built irrigation canals and orthogonally organised land-plots delineated by sturdy terracing walls (Figure 10:4).<sup>23</sup> Several of these structures were linked to the largest of the stone built wells. From its west side, a slender wall protrudes, runs east and subsequently turns south. A similar wall on the east side of the well continues this axis. At some point these walls were deliberately covered with a fill of coarse sand, and a second phase of walling was constructed on top of them in exactly the same alignment. While the nature of the earliest installation remains elusive, the secondary phase was constructed with a sloping incline towards the well, and may thus have formed a type of miniature aqueduct used for a combination of irrigation and water collection within the land-plots.

These features generally paint a picture of small-scale agriculture and horticulture on the city's southern outskirts. Although Aqaba suffers from a hyper-arid climate, with annual precipitation rarely exceeding 50 mm,<sup>24</sup> limited agricultural exploitation of the city's immediate hinterland

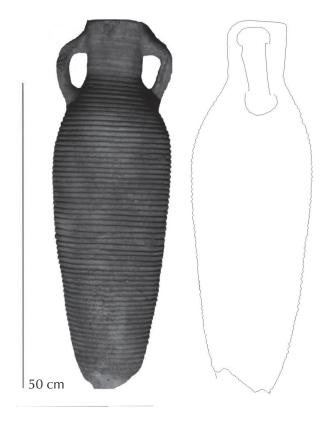


Figure 10:3. The Ayla amphora found in a post collapse fill of a temple at Zafar (reproduced with permission from Paul Yule, director of the Zafar excavations).

Figure 10:4. Early Islamic irrigation system under Aqaba Castle overlain by modern piping ( $^{\circ}$  J. De Meulemeester/IAP).



<sup>18.</sup> I thank Paul Yule for kindly providing me with some details and a picture of this important and unpublished find, and Donald Whitcomb for making me aware of its existence.

<sup>19.</sup> Tomber 2005, 2008: 57-82; For a good critique of our current understanding of these developments see Ward 2007.

<sup>20.</sup> Presumably due to a combination of silting of harbours and decreasing Roman influence in the region (Ward 2007).

<sup>21.</sup> Mayerson 1992; 1995.

<sup>22.</sup> Tomber 2008: 88-109.

<sup>23.</sup> De Meulemeester & Pringle 2004, 2005; De Meulemeester & al-Shqour 2006.

<sup>24.</sup> Dahamsheh & Aksoy 2007: 203.

is possible due to the shallow water table.<sup>25</sup> Whether these plots were a form of local resource management, instigated and maintained by the city's inhabitants, cannot be said with certainty, but it seems plausible and is indeed an activity that to this day continues in the same area. The gardens formed a transitional green-zone between cityscape and its southern hinterland, and were probably divided into family or clan-based plots as was customary in the Early Islamic period.<sup>26</sup> Based on the associated ceramic assemblages, the use of these features can be dated between the Umayyad period and the early Ayyubid period, but artefact density suggests that the area was particularly active from the late 8th to early 11th century.27 Although settlement in Agaba generally seems to have shifted southwards following the violent earthquake of 1068, there is no apparent morphological relationship between the land plots and the initial phase of the fortified khan, as the axes applied in their respective layouts are quite incongruent (Figure 10:5).

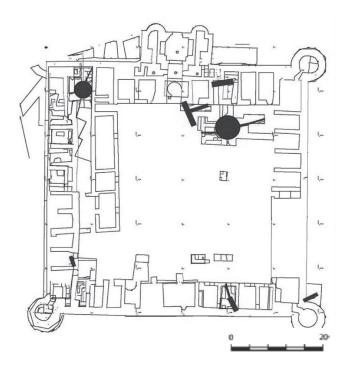


Figure 10:5. Plan of the Early Islamic features excavated under Aqaba Castle (© J. De Meulemeester/IAP).

#### Rural High-Tech Industries: Ayla's Medio-Hinterland

Moving away from the cityscape, into what has traditionally been perceived as Aqaba's hinterland, surveys and excavations conducted in the wadis to the north and west of Aqaba (especially in the Wadi Araba, but also in Wadi Tawahin, Wadi Taba, Wadi Tweiba and Wadi Merah) have shown that this entire region was heavily exploited for a range of purposes in the Early Islamic period. Immediately northwest of Ayla, in Eilat and Nahal Roded, limestone quarries have been identified and partially excavated.<sup>28</sup> Finds associated with these sites correspond to the assemblages from Early Islamic strata at Ayla, and based on the work of scholars such as Zeev Meshel, Uzi Avner and Jodi Magness, Whitcomb has concluded that these were the sources for the massive limestone blocks used to construct Ayla's city walls and large urban institutions.<sup>29</sup>

The same regions were exploited for gold and especially copper mining. Extraction activities had taken place here for millennia,30 but the distribution and degree of organisation that the Early Islamic initiatives must have required are unparalleled in previous periods.31 During Ayla's earliest occupation phase, the raw materials were probably taken into the city and processed here, as indicated by the presence of copper slag retrieved from the layers under the congregational mosque. By the latter half of the 8th century, processing facilities had been established in direct relation to the mines.32 The extensive copper mining was complimented by the more illustrious search for gold. In the Wadi Tawahin, no more than 10 km from Agaba, a series of sites dedicated to the extraction and refinement of gold dust have been identified.<sup>33</sup> The ceramic horizons of these communities of metallurgists suggest they were founded in the early 8th century, associating Ayla with a Late Antique network of gold mining initiatives throughout the Hijaz, Egypt and the Sudan.34

The southern Negev and Wadi Araba had much more to offer than the extraction of ore. Both regions were extensively exploited for a variety of other purposes, a very

<sup>25.</sup> Musil (1926: 88) noted that when the sea ebbs, sweet water gushed from ubiquitous springs in the rocky seabed.

<sup>26.</sup> Akbar 1989. It should be noted that a pre-Islamic origin of these gardens cannot be dismissed. Following the ASOR expeditions to 'eastern Palestine' in the 1930s, Nelson Glueck mentions an area of extensive Byzantine surface sherding in the gardens along the shore, and notes that the discovery of two Byzantine capitals suggest the presence of an undiscovered Byzantine church in this location (Glueck 1937: 9-12, 1939: 1-4), although it should be acknowledged that much of what appeared to be Byzantine pottery during this time has since been shown to continue into the Early Islamic period.

<sup>27.</sup> One of the excavated wells contained a high density of Mahesh ware, which Whitcomb has dated to the transition from Umayyad to Abbasid rule in the mid-8<sup>th</sup> century (Whitcomb 1989b).

<sup>28.</sup> Excavated by Zeev Meshel and superficially published in Hebrew (Meshel 1974). A good recap is offered in Avner & Magness 1998: 45. 29. Whitcomb 2006a: 240.

<sup>30.</sup> The foothills behind Aqaba have revealed several Chalcolithic sites seemingly dedicated to the extraction and working of copper ore. See for example Khalil 1995; Müller-Neuhof *et al.* 2003.

<sup>31.</sup> See especially Avner 2001-2002; Avner & Magness 1998; Haiman 1995a; Magness 2003. These large-scale initiatives appear to be directly associated with the political success of Islam, as they stand in stark contrast to the continuity of more localised traditions in peripheral regions such as the Negev highlands (Saidel 2005).

<sup>32.</sup> As the preliminary ceramic chronology indicates (Avner & Magness 1998: 50-51)

<sup>33.</sup> Avner & Magness 1998: 44-45.

<sup>34.</sup> Heck 1999; Meyer 1995, 1998; see also the important contribution by Tim Power in this volume (Chapter 12).

important one of which was large-scale agriculture. In addition to smaller farmsteads (50-70 ha.), three vast estates have been identified: to the north, just southeast of the Dead Sea's south basin is Khirbat ash-Shaykh 'Īsā; 35 in the middle, a second estate surrounds the oasis of Yotvata; and in the south, similar assets were formed at Evrona. Around these large estates, an array of satellite villages and agricultural cooperatives were identified,<sup>36</sup> it is likely that these, combined with more substantial settlements like Gharandal and Ruwath,<sup>37</sup> were home to some of the many people employed at the mega-farms. Based on their artefactual yield many of these sites were purpose-built and highly specialized communities, working either with the mining and processing of copper (e.g. as smelting camps) or the cultivation, treatment and packaging of agricultural produce (indicated for example by the ample presence of large millstones and the predominance of bones from large domesticated stocks).

The larger estates were huge enterprises that would have demanded the mobilisation of a substantial workforce to execute and maintain.<sup>38</sup> They applied complex technology to store and use the water and fertile silt coming from the surrounding wadis; technology which would have required the expertise of skilled engineers to conceive and construct. Most impressive are the extensive *qanat* that irrigated the fields of both estates. Presumed Persian in origin, qanat technology is customarily perceived as being spread into neighbouring regions with the successful expansion of Islam.<sup>39</sup> Whereas a substantial part of the irrigation system at Evrona has been destroyed, enough of the *qanat* of Yotvata have been preserved to appreciate the scale of the enterprise. The main canal stretches for almost 5 km with regular mounded access points every 10-20 mm, and had a series of smaller tributary conduits connected to it from the west. A secondary canal, which

may have just been as long, runs parallel to it, indicating that additional fields may either have been planned or in use to the east as well. South of this system, at Nahal Argaman, a second yet independent system was discovered; in total approximately 10 km of subterranean tunnels and canals irrigating in excess of 300 ha at this farm alone.<sup>40</sup>

The economic relationship between the inhabitants of coastal Agaba and its northern hinterland appears to have been fundamental. So much so that it was maintained until modern amenities made it obsolete. Thus, when the Czech orientalist Alois Musil travelled through the region in the early 20th century, he noted how the inhabitants of Agaba would cultivate the great date plantations in the western Araba and just south of the city. Although these belonged to the region's Bedouin tribes, tending them provided the inhabitants of Aqaba with a third of the annual yield as income. In addition to dates, these plantations would grow pomegranates, figs and sweet lemons, as well as a variety of vegetables. When added to the staples yielded by rented agricultural plots in the Wadi al-Okfi, not to mention light fishing and trading with Egyptian sailors and Turkish soldiers, this not only provided the inhabitants of Aqaba with the means to sustain them, but reflects that ageless quality of good geographical placement.<sup>41</sup>

In their lucid analysis, Avner and Magness have argued that the estates, mining operations and farmsteads of the Wadi Araba and southern Negev functioned within a complex economic system that not only provided cities such as Nessana, Gharandal, Beersheeba, Ma'an and Ayla with the staples necessary for survival. Within this system Ayla functioned as the 'mother city'; an economic dynamo that could absorb and redistribute the massive yield that these facilities generated. 42 It is unclear what role elite holdings such as Humayma played in running these large estates. Were they the instigators or products of these activities? Certainly a multi-tiered economic system such as this must have demanded the conviction, planning and funding of someone capable of mobilizing and maintaining a large and professional workforce. In this respect, the association of the rural initiatives with the new Islamic entrepôt of Ayla becomes all the more compelling, for the city retains all the characteristics of a 'gateway community', where the surplus of regional production sites was stored and the onward transport to destination sites facilitated.<sup>43</sup>

The ceramic assemblages associated with the exploitation of Ayla's northern hinterland are predominantly 8<sup>th</sup> and 9<sup>th</sup> century in date, and include types found contemporaneously both in Ayla and under the castle (e.g. cream wares,

<sup>35.</sup> Although many of the associated occupation surfaces were tentatively dated as Middle Islamic (Photos-Jones et al. 2002: 591-93, 607-12), excavations revealed substantial Abbasid strata on Umayyad foundations (Politis et al. 2005: 318-19; Politis et al. 2007: 205-208). Khirbat ash-Shaykh 'Īsā is likely to have formed part of the agricultural mediohinterland of Early Islamic Zughar, and Whitcomb appropriately assigns it to the southern Ghors agricultural complex (Whitcomb 1992: 115-17). Zughar was capital of the al-Sharat region and had trade relations with Jericho, Ramla, Jerusalem and Amman. It was, in some ways, a counterpart to Ayla on the Dead Sea. The northern Araba sites remain relevant to the discussion of Ayla's hinterlands, since part of the yield (especially cash crops such as indigo) were exported to the Hijaz through Ayla. 36. Mordechai Haiman claims to have identified ca. 300 Umavvad farms in the Negev Highlands alone (1995b: 9-10), and regards the phenomenon as "a state-sponsored enterprise to sedenterize a seminomadic population" (1995b: 11; see also Haiman 1995a on this issue). 37. See Walmsley et al. 1999: 468-75 (Gharandal); Walmsley & Barnes

<sup>2002: 486-87 (</sup>Ruwath).
38. Indicated by the discovery of an administrative document found at Evrona specifying wage expenses in *dirham* (Porath 1987: 112).

<sup>39.</sup> Lambton 1989. More recently, Lightfoot (1996: 323-37) has suggested the possibility of earlier local traditions for *qanat* systems. Hydraulic and irrigation technology was certainly a specialty of the Nabateans, but *falaj* systems are also found as early as the Iron Age in southeast Arabia.

<sup>40.</sup> Avner & Magness 1998: 47.

<sup>41.</sup> Musil 1926: 81-87 (especially 85).

<sup>42.</sup> Avner & Magness 1998: 39.

<sup>43.</sup> As first outlined by Yuval Portugali and Bernard Knapp (1985), and subsequently taken up as a recurrent theme in much of Knapp's work.

Coptic glazed bowls and an abundance of Mahesh ware).44 There seems to be little ceramic evidence dating the activities to the 7th century, and no examples of the types associated with the Ayla kilns have been identified. Nevertheless, the authors point out that the chronologies are "not refined enough" to limit activity to these two centuries, and radiocarbon dating does indeed suggest that their occupation and use should be pushed back a century. 45 There may indeed be many circumstances limiting the presence of transport amphorae from Ayla. As Parker correctly notes in this volume, the distribution pattern of the Aqaba amphorae is distinctly south,46 but this is perhaps to be expected when dealing with heavy, bulky vessels suited specifically for maritime transport. The yields from Wadi Araba and the Negev are much more likely to have been transported in lighter, more perishable containers such as basketry, hides and sacks. Remains of such have been discovered throughout the Negev, especially at Nahal Omer,<sup>47</sup> but also in slightly later contexts on the island of Jazirat Fara'un, located in the Bay of Aqaba.<sup>48</sup>

If the notion of Ayla as a gateway community is acceptable, then the question that remains is what was the destination of all this merchandise? The answer seems to be western Arabia. The Gulf of Aqaba had been a nexus on the important trade and transport routes that connected the Mediterranean world to Arabia since antiquity. Yet this natural connectivity acquired particular impetus and esteem following the success of Islam and the sanctification of Mecca and Medina. With Islam's political hegemony, the Hijaz attained an economic standing that it had never had before, and its patrons became not just unsurpassed political figures, but a large and economically enfranchised ruling class that was both able and willing to live (and display) the success of their new ideology.<sup>49</sup> The combined archaeological evidence of Ayla's early settlement and ceramic profiles, its amphorae producing kilns (which are likely to represent, rather than constitute Ayla's production of ceramics) and the activities in its northern hinterland, all suggests that Ayla's initial success as an urban centre was, essentially, due to its role in supplying the emerging economic powerhouses of the Hijaz. 50 This role was elaborated and moulded over time, yet it came to define the city and its inhabitants in ways that would last for centuries.

#### Hinter the Hinterlands: the Macro-Perspective

The archaeological evidence from Ayla's micro- and mediohinterlands does indeed suggest a close commercial affiliation with the Hijaz in the 7th and 8th centuries: linking the political capitals of Syria with the holy cities of Mecca and Medina, and functioning as a gateway for the merchandise moving from one to the other. The affiliation of Ayla to the Hijaz is further enhanced by historical evidence that shows how, some time after the surrender of Aila to Muhammad, its inhabitants became clients (mawali) of Uthman b. Affan (r. AD 644-656) - one of Mecca's most famous sons, the third orthodox caliph and a companion (sahaba) of the Prophet.<sup>51</sup> Such alliances were not only a practical means of stimulating loyalty and maintaining control, but situated the relationship within an established power-structure, thus orienting the communal identity of Ayla through the agency of individuals and their feelings of affinity. The intimacy that this patronage created is seen in the rise of Aylīs to prominent positions in Medina or in the hereditary obligation and privilege to function as the private guard of the caliph and his family.<sup>52</sup> Interestingly, Ayla's population continued to reinforce this identity for centuries after the fall of the Umayyads and the subsequent cessation of the relationship's socio-political connotations. 53 The continuity in the client relationship's symbolic value and social status not only demonstrates the resilience of such identity hierarchies, but reveals a need among Ayla's 'original' inhabitants to distinguish themselves from a perceived group of 'newcomers'. Could this perceived 'other' consist of an influx of well-to-do Muslim immigrants responding to the economic opportunities of the Red Sea littoral and settling in Ayla in the late 8th/early 9th centuries?

There is reason to suggest strong ties to the Hijaz, but is the evidence sufficient to support the interpretation of political and economic ties as directing the construction of local identities? The integration of Muslim settlers with the extant population was a gradual process. In addition to subordination to an important Hijazi, Ayla's pre-Islamic inhabitants consisted of a considerable amount of Judeo-Christian Arabs from the Yemeni Judhām tribe. <sup>54</sup> The affiliations with Arabia did not just stimulate communal affinities, but facilitated the success of an economic regime based primarily on the supply and demand of Hijazi markets.

From what we know of its early population, communal identities at Ayla were not merely directed south though.

<sup>44.</sup> Whitcomb 1989a: 1990-91

<sup>45.</sup> Avner & Magness 1998: 50-51.

<sup>46.</sup> See Chapter 9, this volume. Sherds of Aqaba amphorae, however, have been found at Humayma (Amr & Schick 2001: 110, fig. 3).

<sup>47.</sup> Baginski & Shamir 1995: especially 31-33.

<sup>48.</sup> Shamir & Baginski 2002: 142-47.

<sup>49.</sup> All be it in different commodities, a parallel development can be noted in the foundation of African Red Sea ports like Badi and Aidhab (Power 2008).

<sup>50.</sup> It is unclear what impact Zubayrid control of the Hijaz had on Ayla's commercial success. In the scope of things, it was a situation quickly rectified and unlikely to have created significant alterations in the economic regime of the town. It is nevertheless tempting to imagine that the second *fitnah* exemplified, to both inhabitants and patrons alike, the fragility of relying too heavily on a single category of consumer.

<sup>51.</sup> Crone 1980: 197-200; Whitcomb 1989a: 174-75; on the nature of the *mawali* see Crone 1991.

<sup>52.</sup> Cobb 1995: 423-26; Al-Isfahani's *Kitab al-Aghani* mentions that Marwan, while governor of Mecca, recruited a police force of 200 men from Ayla (pers. comm. D. Whitcomb).

<sup>53.</sup> As evidenced by the descriptions of medieval and post-medieval chroniclers (Whitcomb 1989a: 174-75).

<sup>54.</sup> Bosworth 1965; It should also be noted that the Yemenis are mentioned specifically in the charter between Ayla and the Muslims (Crone 1987: 44), indicating that although significant in number, they were still perceived as foreign.

The evidence is composite: a tapestry of entangled identities from which singular threads must be pulled out and examined in order to understand their stratification and relevance. One of these, the commercial aspect, has been introduced. Another important characteristic that can be ascribed to Ayla is that of way-station. The city's ideal geographic placement had already in pre-Islamic times ensured it as an important node on the caravan routes between Syria-Palestine and Arabia. This status was augmented in the Early Islamic period when, with the expansive success of Islam, Ayla was developed into a 'gateway' between Bilad al-Sham and the Hijaz, and a major stopping point on the Darb al-Hajj from Egypt and North Africa. 55 Thus, more than ever before, Ayla became a hub of transient travellers from all over the Dar al-Islam and was, as a result, subjected to a continuous and diverse flow of influences.<sup>56</sup>

It is not unreasonable to imagine that the demographic profile of Early Islamic Ayla was both diverse and in constant flux. By the dawn of the 8th century, the city is likely to have had a multicultural, almost cosmopolitan feel to it. Can these localised notions of belonging to a specified 'other' then still be identified? Historically, we are provided with some clues: the historian Baladhuri (d. 892) tells us that Ayla administratively came under the governorate of Egypt (Misr) from the formation of the ajnād in the 7<sup>th</sup> century. This was certainly so by AD 868, when the Tulunid dynasty established independent control of Egypt and parts of Syria. By the 10<sup>th</sup> century, Muqaddasi (ca. AD 945-1000) seems unsure as to its affiliation but connects it to Syria and refers to it as "the port of Palestine on the China sea" and "the storehouse of the Hijaz". 57 But being a geographer from Jerusalem, this may well reflect personal preferences rather than actual reality. The ties to Egypt were more than political or administrative. Important details about Ayla's inhabitants were revealed in 1995 when Paul Cobb convincingly demonstrated that, from the early 8th century Ayla was home to a vivacious scholastic com-

55. Tamari 1982: 435, 470-71, 517. Unless one wished to exploit the consistent northerly winds and sail to al-Jar or Jiddah, the land-bound *hajj* route from Syria seems to have gone more inland, moving from Damascus through the Hauran to Amman, capital of the Balqa province (Walmsley 1987: 297). In the Early Islamic period many of Syria's pilgrims would gather here and then move in caravan via Qatrana and Ma'an to Tabuk (Walmsley 1987: 223-30, Map 8). Alternatively, one could take a secondary route to Zughar, and from there continue via Gharandal and Ayla to the Hijaz (Walmsley 1987: 237-38). Whereas the importance of Amman as a *hajj* station is reflected in luxurious ceremonial spaces (e.g. Mshatta and Amman Citadel), the importance of Ma'ān as *hajj* station is reflected in the ample storage facilities (Genequand 2003), which are likely to have stored some of the local produce for sale to pilgrims.

56. The notion of Ayla as a major way-station has recently been substantiated archaeologically by the presence of numerous postholes of varying sizes and distribution patterns associated with the Mamluk *khan*. Similar transitory encampments may have sheltered pilgrims and others passing through in Early Islamic times, however, the extensive construction and occupation of subsequent periods has limited the possibility of investigating these strata in a more extensive manner than deep probes. 57. Collins 2001: 149-50.

munity; many of whom were trained as *hadīth* specialists in either Egypt or the Hijaz. Academic professions of this sort appear to have been restricted to a few select families, and each family maintained their individual social position by passing knowledge and skill on from one generation to another. The scholastic community as whole sustained their integrity through inter-family marriages. Their presence was not just an intellectual asset; it was a stimulant (and a dependant) of the city's economic dynamic.

On inspection, it seems Ayla was an ideal place for a scholastic community to grow. The steady flow of people, ensured by its geographic position at the nexus of three important regions, provided the economic basis for a professional scholastic community's livelihood. Queries expressed by travellers heading to and from the holy cities, and thus perhaps inclined to be in a spiritually inquisitive mindset, are sure to have constituted a substantial share of their income. In spite of this, it was other financial lures that drew the first notables to Ayla. Among these were members of the Umayyad family, who seem to have settled at Ayla from an early stage.<sup>59</sup> The most influential for local identities was probably Abu Bakr al-Zuhri (AD 671-742), a prominent imam and transmitter of traditions from Medina, and in many ways the founder of the Aylī School. Interestingly, al-Zuhri was not drawn to Ayla by inquisitive pilgrims or theological debate, but by his private investment in a large estate (diy'a) at Ayla.<sup>60</sup>

We can only speculate at the location of this estate, just as the role of men like al-Zuhri in the creation of the large estates of Wadi Araba and the Negev remains elusive. The construction of enormous qanat systems would tend to suggest a patronage of considerable power and wealth, perhaps slightly overshadowing the capacities of an average landowner. But al-Zuhri should perhaps rather be seen as representing the emergence of a new Muslim elite sometime in the 8th century; a group that often consisted of prominent public figures, but doubled as private entrepreneurs. These industrious people retained massive landholdings, exploited natural (and human) resources and dominated trans-regional trade through mercantile alliances with agents positioned at strategic localities.<sup>61</sup> Doing so, they paved the road for the intensification of production and exchange in the Fatimid period. But the 9th century belonged to them.

In his contribution to this volume, Tim Power persuasively suggests how this tendency manifested itself in Egypt and

<sup>58.</sup> Cobb 1995: 422-23.

<sup>59.</sup> Rotter 1982: 115.

<sup>60.</sup> Cobb 1995: 427.

<sup>61.</sup> Exemplified by Ibn Khurradadhbih's Rādhānites (Pellat 1995) and the Kārimis mentioned both in the Cairo Geniza and by Maqrīzī's (Goitein 1958). Although these both seem to be Jewish groupings, they are likely to represent a general trend for establishing privatised mercantile networks over great distances.

the Sudan. 62 Compared to Egypt's traditional wheat export, the commodities of the 8th (slaves) and 9th centuries (gold, ivory and textiles, including the associated cultivation of flax) were of enormous commercial value. 63 Power notes that many of these entrepreneurs were of non-local origin, but rather ambitious Iraqis moving from one end of the empire to another to fill a commercial vacuum that, if not created, then at least was reinforced by the monolinear Red Sea trade regime of the 8th century. This trend of trans-regional mobility and interconnectivity is echoed in the archaeology of Ayla. From the 9th century, the material culture increasingly shows close affiliations to Egypt. The ceramics take on markedly Egyptian traits, both in the form of imports and emulations, while progressively mirroring the ceramic horizon of Fustat.<sup>64</sup> A similar claim can be made for the respective glass assemblages (Figure 10:6). More important are the major changes that the urban fabric undergoes in this period: walls and towers are breached and used for production, commerce and dumping; the northeast gate is blocked off and a cemetery seemingly created outside; extra muros markets are constructed against the southern and western city wall; and all around the city large courtyard based houses (buyut) spring up. The most monumental undertaking was the clearing and levelling of a large area inside the city, and the subsequent construction of a congregational mosque. In addition to dominating the cityscape, this building threw the axiality of the original plan by forcing the northern half of the 'cardo' to be rerouted around the mosque. Although the town generally seems to be changing in this period, we can only surmise, that such a significant alteration in the urban layout reflects a scarcity and inflated price of downtown real estate. The question is, whether this was a result of wealthy merchants buying up urban plots.

This notion is corroborated by the discovery of rich households covering large parts of the inner city, many of which have indoor plumbing and their own private well in the courtyard (Figure 10:7).<sup>65</sup> Due to a combination of water table and massive overburden, the Umayyad city has only been explored by sporadic probes, and as a result we do not have enough evidence to describe the layout and composition of the city in its earliest phase. Yet the archaeological evidence does clearly show that in the transitional phase between Umayyad and Abbasid rule (i.e. latter half of 8th century), substantial areas of the city are cleared and levelled, and in many places refilled with large courtyard based domiciles. These often include rich and varied artefact assemblages; including large green-glazed storage jars and imported wares such as Iraqi and Egyptian

Figure 10:6. Glass types of the 9th-10th centuries from Ayla and Fustat. 6b has a light green tinge, whereas the piece from Ayla is light blue-green. 36h is transparent with a slight yellow tinge; the bottom of the Ayla parallel is yellowish with slight black patina. 38i is of transparent green glass, the Ayla piece is transparent with light iridescence (Scanlon & Pinder-Wilson 2001: 27-28 [6b], 74-77 [36h], 79-82 [38i]; unpublished drawings of Carol Meyer).

lustre ware, Chinese celadon (Yue) and Arabian steatite. The 2008 season of the Islamic Aqaba Project (IAP) excavated part of such a house, which contained evidence for the processing (numerous large grinding tool of basalt) and packaging (high density of fragments from a small type of amphora, holding no more than 2 decilitre) of agricultural or horticultural produce, as well as tools for commercial exchange (a carved bone coin scale<sup>66</sup>) and personal luxury items (a polished agate pendant). Could such wealthy manors have belonged to an emergent economic elite coming, at least in part, from an increasingly unstable Iraq, to set up operations throughout the Red Sea littoral as Power suggests?<sup>67</sup> Clearly the issue requires further research, but it would appear that certain chronological correlations can be made between the developments at Ayla and the increasingly global scope of Muslim business ventures.

Fustat 36 h (below) & 38i (above)

Ayla (9<sup>th</sup> c.)

Fustat 6b (9<sup>th</sup>-10<sup>th</sup> c.)

<sup>62.</sup> See Chapter 12, this volume.

<sup>63.</sup> Power 2008; aptly demonstrated in Mango 2001.

<sup>64.</sup> Whitcomb 1990-1991: 48-56.

<sup>65.</sup> For a late example of this see Whitcomb 1988. A similar scenario from the early Abbasid period was discovered in 2008 (Damgaard forthcoming).

<sup>66.</sup> Parallels have been discovered in Hama (Ploug  $\it et al.$  1969: 128-29) and Gaza (Petrie 1932: 10 & pl.24, nos. 8-11).

<sup>67.</sup> See Chapter 12, this volume.

#### Conclusion

Many of the ideas presented here are simply that: ideas. However, a synthesis of the available data offers some illumination on the trans-regional dynamics that shaped local aspects of an Islamic Red Sea port. But rather than perceiving this chequered profile of Ayla's macro-hinterland as a dichotomy of identities in the 'elsewhere', Ayla's inhabitants should be seen as flexible and pluralist respondents to a multiplicity of cultural, economic and political influences; their self-conceptualisations based on the interplay of local needs, regional circumstances and quasi-mythological identities. Daily life in Ayla may have been dominated by affiliations with Egypt, but these conflicted neither with the multi-generational identity of subordinance to a famous Hijazi, nor with the high-profile newcomers from the East.

There are many other aspects related to the hinterlands of Ayla that could provide important and new insights. A good example would have been to analyse the Red Sea itself as part of Ayla's hinterland. This article, however, is not an attempt at an encompassing answer, but rather a re-evaluation of research questions. There is little doubt that in a region as dynamic and diverse as the Red Sea littoral, the research of hinterlands and their interconnectivity is a valid and worthwhile intellectual pursuit. However, in order to move beyond traditional perceptions of what that hinterland constitutes, we must continuously remind ourselves of the discrepancies between the concepts we study and the concepts we use and understand. Hinterland studies are not merely the land behind Baghdad, but a means of understanding how past societies, and in particular their individual inhabitants, perceived themselves as situated in an ever-expanding world.

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Figure 10:7. Image of the Abbasid courtyard with a private well as excavated by the IAP in 2008 (© K. Damgaard/IAP).

#### References

Adams, R. M. 1965. *Land Behind Baghdad: A History of Settlement on the Diyala Plains*. Chicago & London: University of Chicago Press.

Adams, R. M. 1981. Heartland of Cities. Surveys of Ancient Settlement and Land Use on the Central Floodplain of the Euphrates. Chicago, London: University of Chicago Press.

Akbar, J. 1989. Khatta and the Territorial Structure of Early Muslim Towns. *Mugarnas* 6: 22-32.

Amr, K. & Schick, R. 2001. The Pottery of Humeima: The Closed Corpus from the Lower Church. In La Céramique Byzantine et Proto-Islamique en Syrie-Jordanie (IVe-VIIIe Siècles Apr. J.-C.). Actes du colloque tenu à Amman les 3, 4 et 5 décembre 1994, E. Villeneuve & P. M. Watson (eds.), pp. 305-313. Beirut: Institut Francais d'Archaeologie du Proche-Orient.

Avner, U. 2002. Ancient Water Management in the Southern Negev. *ARAM* 14: 403-421.

Avner, U. & Magness, J. 1998. Early Islamic Settlement in the Southern Negev. *Bulletin of the American Schools* of Oriental Research 310: 39-57.

Baginski, A. & Shamir, O. 1995. Early Islamic Textiles, Basketry, and Cordage from Nahal 'Omer. '*Atiqot* 26: 21-42.

- Bosworth, C. E. 1965. Djudhām. In *Encyclopedia of Islam Vol. 2*, B. Lewis, Ch. Pellat & J. Schacht (eds.), pp. 573. Leiden: Brill.
- Cobb, P. M. 1995. Scholars and Society at Early Islamic Ayla. Journal of the Economic and Social History of the Orient 38(4): 417-28.
- Collins, B. (tr.) 2001. The Best Divisions for Knowledge of the Regions. Ahsan al-Taqāsīm fī Ma'rifat al-Aqālim by Al-Muqaddasī. Reading: The Center for Muslim Contribution to Civilization & Garnet Publishing,
- Crone, P. 1987. *Meccan Trade and the Rise of Islam*. Princeton: Princeton University Press.
- Crone, P. 1980. *Slaves on Horses. The Evolution of the Islamic Polity*. Cambridge: Cambridge University Press.
- Crone, P. 1991. Mawlā. In *Encyclopedia of Islam Vol. 6*, C.E. Bosworth, E. van Donzel & Ch. Pellat (eds.), pp. 875-882. Leiden: Brill.
- Dahamsheh, A. & Aksoy, H. 2007. Structural characteristics of annual precipitation data in Jordan. *Theoretical and Applied Climatology* 88: 201-212.
- Damgaard, K. (forthcoming). Between Castrum and Medina: A preliminary note on spatial organisation and urban development in Medieval Aqaba. In *Egypt and Syria in the Fatimid, Ayyubid and Mamluk Eras VII*, U. Vermeulen & K. D'hulster (eds.). Leuven: Peeters.
- De Meulemeester, J. & Pringle, D. 2004. The 'Aqaba Castle Project 2003. *Newsletter of the Council of British Research in the Levant*: 26-27.
- De Meulemeester, J. & Pringle, D. 2005. The 'Aqaba Castle Project 2004-5. *Newsletter of the Council of British Research in the Levant*: 42.
- De Meulemeester, J. & al-Shqour, R. 2006. The 'Aqaba Castle Project 2006. *Bulletin of the Council for British Research in the Levant* 1: 27-28.
- Doonan, O. 1998. Survey of the Hinterland of Sinop, Turkey. *Near Eastern Archaeology* 61(3): 178-79.
- Genequand, D. 2003. Ma'ān, an Early Islamic Settlement in Southern Jordan: Preliminary Report on a Survey in 2002. *Annual of the Department of Antiquities of Jordan* 47: 25-35.
- Glueck, N. 1937. Explorations in Eastern Palestine III (Continued). *Bulletin of the American Schools of Oriental Research* 65: 8-29.
- Glueck, N. 1939. Explorations in Eastern Palestine III.
  Annual of the American Schools of Oriental Research
  18/19. New Haven: American School of Oriental
  Research.
- Goitein, S. D. 1958. New Light on the Beginnings of the Kārim Merchants. *Journal of the Economic and Social History of the Orient* 1(2): 175-184.
- Haiman, M. 1995a. Agriculture and Nomad-State Relations in the Negev in the Byzantine and Early Islamic Periods. *Bulletin of the American Schools of Oriental Research* 297: 29-53.
- Haiman, M. 1995b. An Early Islamic Period Farm at Nahal Mitnan in the Negev Highlands. '*Atiqot* 26: 1-13.

- Hayes, J. W. 1996. The Pottery. In Berenike '95: Preliminary Report of the Excavations at Berenike (Egyptian Red Sea Coast) and Survey of Eastern Desert, S.E. Sidebotham, W. Wendrich & F. Aldsworth (eds.), pp. 148-178. Leiden: CNWS School of Asian, African and Amerindian Studies.
- Heck, G. W. 1999. Gold mining in Arabia and the rise of the Islamic state. *Journal of the Economic and Social History of the Orient* 42(3): 364-395.
- Khadduri, M. 1997. Sulh. In *Encyclopaedia of Islam, Vol. 9*, C.E. Bosworth, E. van Donzel, W.P. Heinrichs & G. Lecomte (eds.), pp. 845-846. Leiden: Brill.
- Khalil, L. 1995. Some Technological Features from a Chalcolithic Site at Maqass Aqaba. In *Studies in the History and Archaeology of Jordan VI*, G. Bisheh (ed.), pp. 143-148. Amman: Department of Antiquities.
- Lambton, A. K. S. 1989. The Origin, Diffusion and Functioning of the Qanat. In *Qanat, Kariz and Khattara: Traditional Water Systems in the Middle East and North Africa*, P. Beaumont, M. Bonine & K. McLachlan (eds.), pp. 5-12. London: Middle East Centre, School of Oriental and African Studies.
- Lightfoot, D. R. 1996. Syrian qanat Romani: history, ecology, abandonment. *Journal of Arid Environments* 33(3): 321-336.
- Magness, J. 2003. *The Archaeology of the Early Islamic Settlement in Palestine*. Winona Lake: Eisenbrauns.
- Mango, M. M. 2001. Beyond the Amphora: Non-Ceramic Evidence for Late Antique Industry and Trade. In *Economy and Exchange in the East Mediterranean during Late Antiquity*, S. Kingsley & M. Decker (eds.), pp. 87-106. Oxford: Oxbow Books.
- Mango, C. & Dagron, G. (eds.). 1995. Constantinople and its Hinterland. Papers from the Twenty-Seventh Spring Symposium of Byzantine Studies, Oxford, April 1993. Aldershot: Variorum.
- Mayerson, P. 1992. The Island of Iotabê in the Byzantine Sources: A Reprise. *Bulletin of the American Schools of Oriental Research* 287: 1-4.
- Mayerson, P. 1995. A Note on Iotabê and Several Other Islands in the Red Sea. *Bulletin of the American Schools of Oriental Research* 298: 33-35.
- Melkawi, A., K. 'Amr & Whitcomb, D. S. 1994. The Excavation of Two Seventh Century Pottery Kilns at Aqaba. *Annual of the Department of Antiquities in Jordan* 38: 447-468.
- Meshel, Z. 1974. Horvat Bodedah. *Hadashot Arkheologi-yot* 51-52: 39. (In Hebrew)
- Meyer, C. 1995. A Byzantine Gold-mining Town in the Eastern Desert of Egypt. *Journal of Roman Archaeology* 8: 192-224.
- Meyer, C. 1998. Gold-miners and mining at Bir Umm Fawakhir. In *Social Approaches to an Industrial Past The archaeology and anthropology of min-ing*, A. B. Knapp, V. C. Pigott & E. W. Herbert (eds.), pp. 259-275. London, New York: Routledge.

- Musil, A. 1926. *The Northern Heğâz. A Topographical Itinerary* (Oriental Explorations and Studies 1). New York: American Geographical Society of New York & Czech Academy of Sciences and Arts.
- Müller-Neuhof, B., Schmidt, K., Khalil, L. & Eichmann, R. 2003. Ausgrabungen in Tall Hujayrat al-Ghuzlan (Jordanien). *Alter Orient Aktuell* 4: 22-25.
- Parker, S. T. 1998. The Roman 'Aqaba Project: The 1996 Campaign. *Annual of the Department of Antiquities of Jordan* 42: 375-394.
- Parker, S. T. 2000. The Roman 'Aqaba Project: The 1997 and 1998 Campaigns. *Annual of the Department of Antiquities of Jordan* 44: 373-394.
- Parker, S. T. 2002. The Roman 'Aqaba Project: The 2000 Campaign. *Annual of the Department of Antiquities of Jordan* 46: 409-29.
- Parker, S. T. 2003. The Roman 'Aqaba Project: The 2002 Campaign. *Annual of the Department of Antiquities of Jordan* 47: 321-333.
- Parker, S. T. 2006. Roman Aila and the Wadi Arabah: An Economic Relationship. In *Crossing the Rift. Resources, routes, settlement patterns and interaction in the Wadi Arabah*, P. Bienkowski & K. Galor (eds.), pp. 223-30. Oxford: Oxbow; Council for British Research in the Levant.
- Pedersen, R. K. 2000. Under the Erythraean Sea: an ancient shipwreck in Eritrea. *Institute of Nautical Archaeology Quarterly* 27(2/3): 3-13.
- Pellat, Ch. 1995. al-Rādhāniyya. In *Encycloaedia of Islam, Second Edition. Vol. 8*, C. E. Bosworth, E. van Donzel,
  W. P. Heinrichs & G. Lecomte (eds.), pp. 363-367.
  Leiden: Brill.
- Petrie, W. M. F. 1932. *Ancient Gaza II: Tell el-Ajjūl*. London: British School of Archaeology in Egypt.
- Photos-Jones, E., Politis, K. D., James, H. F., Hall, A. J., Jones, R. E. & Hamer, J. 2002. The Sugar Industry in the Southern Jordan Valley: An Interim Report on the Pilot Season of Excavations, Geophysical and Geological Surveys at Tawāhīn as-Sukkar and Khirbat ash-Shaykh 'Īsā, in Ghawr as-Safi. *Annual of the Department of Antiquities of Jordan* 46: 591-614
- Ploug, G., Oldenburg, E., Hammershaimb, E., Thomsen, R., & Løkkegaard, F. 1969. *Hama. Fouilles et Recherches de la Fondation Carlsberg 1931-1938. Les Petits Objets Médiéveux sauf les Verreries et Poteries*. København: Nationalmuseet.
- Politis, K. D., Kelly, A., Hull, D. & Foote, R. 2005. Survey and Excavations in the Ghawr as-Sāfī 2004. *Annual of the Department of Antiquities of Jordan* 49: 313-337
- Politis, K. D., O'Hea, M. & Papaioannou, G. A. 2007. Ghawr as-Sāfī Survey and Excavations 2006-2007. *Annual of the Department of Antiquities of Jordan* 51: 199-210.
- Porath, Y. 1987. Qanats in the 'Aravah. *Qadmoniot* 20: 106-14. (In Hebrew)

- Portugali, Y. & Knapp, A. B. 1985. Cyprus and the Aegean. A Spatial Analysis of Interaction in the Seventeenth to Fourteenth Centuries B.C. In *Prehistoric Production and Exchange. The Aegean and Eastern Mediterranean*, A. B. Knapp & T. Stech (eds.), pp. 44-78. Los Angeles: Institute of Archaeology, University of California.
- Power, T. Forthcoming. The Origin and Development of the Sudanese Ports ('Aidhab, Bâdi', Souakin) in the early Islamic Period. *Chroniques yéménites*.
- Rose, P. 1996. *Qasr Ibrim: The Hinterland Survey*. London: Egypt Exploration Society.
- Rotter, G. 1982. *Die Umayyaden und der zweite Bürger-krieg, 680-692*. Wiesbaden: Steiner Verlag.
- Saidel, B. A. 2005. On the Periphery of an Agricultural Hinterland in the Negev Highlands: Rekhes Nafha 396 in the Sixth to Eighth Centuries CE. *Journal of Near Eastern Studies* 64(4): 241-255.
- Scanlon, G. T. & Pinder-Wilson, R. 2001. Fustat glass of the Early Islamic Period. Finds excavated by The American Research Center in Egypt, 1964-1980. London: Altajir World of Islam Trust.
- Shamir, O. & Baginski, A. 2002. Medieval Mediterranean Textiles, Basketry and Cordage Newly Excavated in Israel. In *Towns and Material Culture in the Medieval Middle East*, Y. Lev (ed.), pp. 135-57. Leiden: Brill.
- Tamari, S. 1982. Darb al-Hajj in Sinai: an historicalarchaeological study (Memorie Scienze Morali, Serie 8, Vol. 25.4). Roma: Accademia Nazionale dei Lincei.
- Tomber, R. 2008. *Indo-Roman Trade. From pots to pepper*. London: Duckworth.
- Walmsley, A. 1987. The Administrative Structure and Urban Geography of the Jund of Filastîn and the Jund of al-Urdunn. PhD thesis, University of Sydney.
- Walmsley, A. & Barnes, H. 2002. A Brief Ground Survey of Ruwāth (Robatha), South Jordan, 28 October - 16 November 2000. Annual of the Department of Antiquities of Jordan 46: 485-491.
- Walmsley, A., Karsgaard, P. & Grey, A. 1999. Town and Village: Site Transformations in South Jordan (The Gharandal Archaeological Project, Second Season Report). *Annual of the Department of Antiquities in Jordan* 43: 459-478.
- Ward, W. 2007. Aila and Clysma: The Rise of Northern Ports in the Red Sea in Late Antiquity. In *Natural Resources and Cultural Connections of the Red Sea*, J. Starkey, P. Starkey & T. Wilkinson (eds.), pp. 161-171. Oxford: BAR International Series 1661.
- Whitcomb, D. 1988. A Fatimid Residence at Aqaba, Jordan. *Annual of the Department of Antiquities in Jordan* 32: 207-224.
- Whitcomb, D. 1989a. Evidence of the Umayyad Period from the Aqaba Excavations. In *The Fourth International Conference On The History Of Bilâd al-Shâm During The Umayyad Period*, M. A. Bakhit & R. Schick (eds.), pp. 164-184. Amman.

- Whitcomb, D. 1989b. Mahesh Ware: Evidence of Early Abbasid Occupation from Southern Jordan. *Annual of the Department of Antiquities of Jordan* 33: 269-285.
- Whitcomb, D. 1990-91. Glazed ceramics of the Abbasid period from the Aqaba excavations. *Transactions of the Oriental Ceramic Society* 55: 43-65.
- Whitcomb, D. 1992. The Islamic Period As Seen From Selected Sites. In *The Southern Ghors and Northeast* 'Arabah Archaeological Survey, B. MacDonald (ed.), pp. 113-118 & 232-242 (plates). Sheffield: Sheffield Archaeological Monographs 5.
- Whitcomb, D. 1994. The Misr of Ayla: Settlement at al-Aqaba in the Early Islamic Period. In *The Byzantine and Early Islamic Near East. II, Land use and settlement patterns*, G. R. D. King & A. Cameron (eds.), pp. 155-170. Princeton: Darwin Press.
- Whitcomb, D. 1995a. The Misr of Ayla: New Evidence for the Early Islamic City. In *Studies in the History and Archaeology of Jordan 5*, A. Hadidi (ed.), pp. 277-288. Amman: Department of Antiquities.
- Whitcomb, D. 1995b. A Street and the Beach at Ayla: The Fall Season of Excavations at 'Aqaba, 1992. *Annual of the Department of Antiquities of Jordan* 39: 499-507.
- Whitcomb, D. 1998. Out of Arabia: Early Islamic Aqaba in its regional context. In *Colloque International d'Archéologie Islamique*, R. P. Gayraud (ed.), pp. 403-418. Textes Arabes et Études Islamiques 36. Cairo: Institut Français d'Archéologie Orientale.

- Whitcomb, D. 2001. Ceramic Production at Aqaba in the Early Islamic Period. In *La Céramique Byzantine et Proto-Islamique en Syrie-Jordanie (IV<sup>e</sup>-VIII<sup>e</sup> siècles ap. J.-C.). Actes du colloque à Amman, 3-5 décembre 1994*, E. Villeneuve & P. M. Watson (eds.), pp. 296-303. Beirut: Institut Français d'Archaeologie du Proche-Orient.
- Whitcomb, D. 2006a. Land behind Aqaba: the Wadi Arabah During the Early Islamic Period. In *Crossing the Rift. Resources, routes, settlement patterns and interaction in the Wadi Arabah*, P. Bienkowski & K. Galor (eds.), pp. 239-42. Oxford: Oxbow & Council for British Research in the Levant.
- Whitcomb, D. 2006b. The Walls of Early Islamic Ayla: Defence or Symbol? In *Muslim Military Architecture in Greater Syria. From the Coming of Islam to the Ottoman Period*, H. Kennedy (ed.), pp. 61-74. Leiden: Brill.
- Whitcomb, D. 2007. An urban structure for the early Islamic city: an archaeological hypothesis. In *Cities in the Pre-Modern Islamic World. The urban impact of religion, state and society*, A. K. Bennison & A. L. Gascoigne (eds.), pp. 15-26. Abingdon: New York: SOAS/Routledge Studies on the Middle East.
- Wilding, R. F. 1989. The Pottery. In *Excavations at Aksum. An account of research at the ancient Ethiopian capital directed in 1972-4 by the late Dr. Neville Chittick*, S. C. Munro-Hay (ed.), pp. 235-316. London: The British Institute in Eastern Africa.