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Antiguo Oriente: Cuadernos del Centro de Estudios de  
Historia del Antiguo Oriente Vol. 7, 2009

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Cómo citar el documento:

Bimson, John J., Juan Manuel Tebes. "Timna revisited: egyptian chronology and the copper mines of the southern Arabah". *Antiguo Oriente: Cuadernos del Centro de Estudios de Historia del Antiguo Oriente* 7 (2009).

<http://bibliotecadigital.uca.edu.ar/repositorio/revistas/timna-revisited-egyptian-chronology.pdf>

(Se recomienda indicar al finalizar la cita bibliográfica la fecha de consulta entre corchetes. Ej: [consulta: 19 de agosto, 2010]).

# TIMNA REVISITED: EGYPTIAN CHRONOLOGY AND THE COPPER MINES OF THE SOUTHERN ARABAH\*

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## **Abstract: Timna Revisited: Egyptian Chronology and the Copper Mines of the Southern Arabah**

This article studies the chronology of the New Kingdom Egyptian copper mining in the southern Arabah valley, and particularly Timna, traditionally dated in the 13th–12th centuries BCE. A reassessment is made of the local archaeological evidence and especially of the findings of the Hejazi Qurayya pottery in archaeological assemblages of the southern Levant. It is argued that the chronology of the New Kingdom activities at Timna needs a revision towards lower dates.

**Keywords:** Timna – Egypt – Qurayya pottery – Chronology

## **Resumen: Timna revisitada: La cronología egipcia y las minas de cobre del Arabá meridional**

Este artículo estudia la cronología de las actividades mineras egipcias del Reino Nuevo en el valle del Arabá meridional, particularmente Timna, tradicionalmente datadas en los siglos XIII–XII a.C. Se realiza una revaloración de la evidencia arqueológica local y especialmente de los hallazgos de cerámica Qurayya, del Hejaz, en conjuntos

\* Article received: October 3<sup>rd</sup> 2009; approved: November 30<sup>th</sup> 2009.

arqueológicos del Levante meridional. Se sostiene que la cronología de las actividades del Reino Nuevo en Timna necesita de una revisión hacia fechados más tardíos.

**Palabras clave:** Timna – Egipto – cerámica Qurayya – cronología

#### INTRODUCTION (JOHN J. BIMSON)

Until the 1960s it was widely believed, following the work of Nelson Glueck, that the copper deposits of the southern Arabah had been exploited during Iron Age II by the biblical King Solomon and his successors. This view was overturned by the results of the Arabah Expedition, begun by Beno Rothenberg in 1959. Within ten years a very different picture had emerged from the work of Rothenberg and his colleagues. The copper industry of the area had been active during three main phases: firstly in the Chalcolithic and Early Bronze Age periods; secondly under Egyptian control towards the end of the Late Bronze Age and into Iron Age I; thirdly when Roman engineers entered the Arabah in the second century CE. There had been no copper mining or smelting at all in the southern Arabah during Iron Age II. The dating of the second phase was due in large part to the discovery of inscribed Egyptian items associated with metallurgical operations at Timna, in Wadi Mene‘iyyeh (now the Timna Valley). These finds fixed the date of those operations firmly to the 13th–12th centuries BC.

In 1980 I questioned the new consensus, pointing out that the Egyptian finds are in tension with other evidence that points to a later date.<sup>1</sup> At that time I could only allude tangentially to the possibility that something might be “seriously wrong with Egyptian chronology”.<sup>2</sup> Since then there have been a number of attempts to shorten the conventional chronology of Egypt by varying degrees.<sup>3</sup> Scholars dealing with the history and archaeology of all areas that depend on Egypt for their dates would do well to note the comment of Egyptologist Aidan Dodson: “It is now apparent to a growing number of scholars that the chronological status quo is no longer an option; far less clear

<sup>1</sup> Bimson 1981. Much of that paper is now out of date and the present one should be regarded as superseding it.

<sup>2</sup> Bimson 1981: 144.

<sup>3</sup> See for example: Aston 1989; James 1991; Hagens 1996; Dodson 2000; Thijs 2003, and references there to his earlier articles in *Göttinger Miszellen*.

is any incipient consensus as to what precisely will replace it!"<sup>4</sup> In view of this it is time to revisit the issues.

The present paper begins by briefly sketching the history of the debate between Glueck and Rothenberg. It then focuses on some of the chronological tensions which the new consensus has not resolved, and which point to the need for a shorter chronology for Egypt. Finally it explores how one model for a revised chronology could resolve those tensions.

## 1. A BRIEF HISTORY OF THE DEBATE (JOHN J. BIMSON)

The southern Arabah was identified as a copper-working area by J. Petherick as long ago as 1861. It was partially explored by the German scholar Fritz Frank and the American Nelson Glueck in the 1930s, and it was Glueck who became the region's chief interpreter until the 1960s. Partly on the basis of the pottery he found in the area, which he felt was all Iron Age II, and partly on the basis of historical probability, Glueck became convinced that the mines had been exploited from the time of Solomon, in the 10th century BC, down to the end of the Judean monarchy in the 6th century BC.<sup>5</sup>

Glueck's dating of the Arabah copper-smelting sites was closely linked with his interpretation of the site of Tell el-Kheleifeh, which he excavated for three seasons in 1938–1940. Tell el-Kheleifeh lies half a kilometre from the shore of the Gulf of Aqabah, midway between the modern towns of Aqabah and Elat and only a few metres from the boundary between Israel and Jordan. Following a suggestion of Frank's, Glueck identified it with Ezion-geber, Solomon's Red Sea port mentioned in I Kings 9:26, as well as with biblical Elath.<sup>6</sup>

Glueck never published a technical report of his excavations at Tell el-Kheleifeh but he discussed the site and its pottery in several articles. He divided its occupation history into five levels which he idiosyncratically numbered from the bottom up. Only Level IV, the second level from the surface, produced useful dating criteria. A number of Edomite inscriptions, along with pottery which showed strong Assyrian influence, led Glueck to place Level IV in the 7th–6th centuries BC. He dated the preceding levels (I–III) between the 10th and 8th centuries BC. However, his reason for stretching

<sup>4</sup>Dodson 2000: 16.

<sup>5</sup>Note however that Glueck had originally dated the Wadi Mene'iyeh (Timna Valley) copper workings, on the basis of Edomite pottery, to the 13th–8th centuries BC: Glueck 1935: 138.

<sup>6</sup>Glueck 1940: 92–94.

occupation back to the 10th century was chiefly his conviction that the place had been founded by Solomon. Glueck interpreted one of the structures at Tell el-Kheleifeh as a refinery, and believed that copper from the mines in the southern Arabah (at Timna and in Wadi Amrani) had been smelted there. He also compared some of the pottery he found associated with the Arabah mines with the pottery from Tell el-Kheleifeh.<sup>7</sup>

Glueck's interpretation of the finds at Tell el-Kheleifeh has been radically revised in the light of subsequent studies. In 1982 (42 years after the end of the excavations and 11 years after Glueck's death) the American School of Oriental Research launched a project to reassess all the excavated material from the site. The work was undertaken by Gary Pratico and published in 1993. Pratico's study of the pottery, including some collected during a fresh survey in 1980, showed that none of it was older than the 8th century BC.<sup>8</sup> Hence Tell el-Kheleifeh cannot have been Ezion-geber or any other Solomonic settlement. Pratico distinguished two phases at Tell el-Kheleifeh, the first surrounded by a casemate wall, the second, covering a larger area, surrounded by an offset-inset wall. However, Pratico's revision of the site's phases is unlikely to be the last word on the matter, for when a new excavation was carried out in 1999 by Mary-Louise Mussell, the finds appeared to reverse the order of the two walls.<sup>9</sup> Other revisions to Glueck's interpretation of Tell el-Kheleifeh will be noted below.

The major challenge to Glueck's dating of the southern Arabah copper industry came from the mining sites themselves. In 1959 Rothenberg founded the Arabah Expedition to study systematically the ancient metallurgical operations there. The Expedition soon distinguished three main types of pottery in the region:<sup>10</sup>

- (1) A coarse, handmade pottery which Glueck had called Amalekite ware, assuming it had been produced by the nomadic people named in the Bible as inhabiting the southern desert areas. Rothenberg called it "Negev-type" pottery because it occurs throughout the Negev as well as in Sinai and the Arabah. It is now generally known as Negev or Negevite ware.<sup>11</sup>

<sup>7</sup> Glueck 1967.

<sup>8</sup> Pratico 1993.

<sup>9</sup> Mussell 2000, see pp. 577–578.

<sup>10</sup> Rothenberg 1972: 105–109, 153–162.

<sup>11</sup> For a detailed study of this pottery see Tebes 2006.

(2) A polychrome pottery decorated with geometric designs and sometimes with stylized birds, animals and human figures. This is usually wheel-made, pink-buff ware with a heavy cream-coloured slip, decorated in brown, reddish-brown and black.<sup>12</sup> Glueck had not distinguished it from Edomite pottery, with which it shares several geometric decorative motifs. However, it also differs from Edomite ware, e.g. often including more sophisticated motifs in its decoration and (when a sherd is examined in section) containing numerous visible grits. The origins of this pottery became apparent in 1968 when it was found in abundance at the site of Qurayya in the Hejaz (northwest Arabia), about 70 km NW of Tabuk.<sup>13</sup> The large quantity of sherds, found all over the site, and the ruins of six kilns, showed that this polychrome pottery was manufactured at Qurayya on an industrial scale. Petrographic analysis revealed that the pottery of this type found at Timna had almost certainly come from the Hejaz, probably from Qurayya.<sup>14</sup> Rothenberg originally followed Glueck in calling this pottery “Edomite”, but after its discovery in the Hejaz he renamed it “Midianite”, northwest Arabia being the territory of the biblical Midianites. However, applying ethnic labels to pottery styles runs many dangers, and Peter Parr’s proposal that this pottery should be called “Qurayya painted ware” will be followed in the rest of this paper.<sup>15</sup>

(3) “Normal” wheel-made pottery, some of which was later discovered to be of Egyptian manufacture. The rest seems to have been made locally.<sup>16</sup> During early surveys by the Arabah Expedition, the “Normal” wheel-made ware was the main dating tool. Of the three types this was the most abundant and the only one for which datable comparanda existed in Palestine and neighbouring areas. Shallow, carinated cooking pots with small folded rims and no handles were a particularly useful guide.<sup>17</sup>

<sup>12</sup> While some vessels were handmade (e.g. Fritz 2002: 98), the majority seem to have been thrown on a slow wheel. See Rothenberg 1998: 201; Tebes 2007a: 12.

<sup>13</sup> Parr, Harding and Dayton 1970.

<sup>14</sup> Parr, Harding and Dayton 1970; Dayton 1972; Kalsbeek and London 1978; Rothenberg and Glass 1983: 111–113; Rothenberg 1988: 100–101; Parr 1996; Rothenberg 1998; Tebes 2007a: 12–14. The latter also refers to INAA results.

<sup>15</sup> Parr 1988: 74.

<sup>16</sup> Rothenberg 1988: 101–108.

<sup>17</sup> Rothenberg 1972: 107.

In 1962 Yohanan Aharoni, the Expedition's advisor on ceramic dating and stratigraphy, expressed the view that none of the Arabah pottery should be dated later than the 10th century BC.<sup>18</sup> Subsequently he decided it was all Early Iron Age I in date, from the 12th–11th centuries BC. In 1964, during the excavation of a smelting camp known as Site 2, all three types of Arabah pottery were found together for the first time in a well-stratified context, and Rothenberg reported the discovery as follows:<sup>19</sup>

*“The fact that ordinary Early Iron Age I pottery, including cooking-pots, was found in a stratified excavation together with the ‘Edomite’ [later called ‘Midianite’] and primitive Negev pottery, enables us accurately to date such pottery, found until now only on the surface. The pottery must be dated 12<sup>th</sup>–11<sup>th</sup> centuries BC and nothing later was found in the excavations.”*

Glueck was not convinced and stood by his own dating:<sup>20</sup>

*“The statements by Aharoni and Rothenberg, first that the Iron Age pottery... belonged exclusively to the tenth century BC, and then that this same pottery belonged exclusively to the twelfth and eleventh centuries BC, with absolutely no other Iron Age pottery occurring in Wadi Arabah, are equally in error.”*

At this stage in the debate, Glueck was supported by W. F. Albright, who wrote:<sup>21</sup>

*“Every new discovery of pottery convinces me that Nelson Glueck is right in his chronology and that Aharoni and Rothenberg are wrong.”*

These two defences of Glueck's dates appeared in 1969. But their ink was barely dry before that year's excavations at Timna uncovered the remains of an Egyptian temple dedicated to the goddess Hathor. Here all three types of pottery were found together again, and this time they were stratified with inscribed Egyptian finds bearing the cartouches of pharaohs from the 19<sup>th</sup> and 20<sup>th</sup> Dynasties. This discovery required even earlier dates for the pottery, in

<sup>18</sup> Aharoni 1962.

<sup>19</sup> Rothenberg 1966: 7.

<sup>20</sup> Glueck 1969: 54. Similarly in Glueck 1967: 23.

<sup>21</sup> W.F. Albright, quoted by Glueck 1969: 54, n. 16.

the 13th–12th centuries BC, and also led to the surprising conclusion that the copper mines had been operated by Egyptian expeditions.<sup>22</sup> Previously there had been no evidence of Egyptian involvement.

Glueck acknowledged the Egyptian finds in the second edition of his book *The Other Side of the Jordan*,<sup>23</sup> but still did not accept that his late dates for the pottery had been refuted. In the same book he once again rejected the dates put forward by Aharoni and Rothenberg, stating that the Arabah pottery should be dated “between the tenth and sixth centuries BC, beginning with the time of Solomon”.<sup>24</sup> This was Glueck’s last published statement on the matter; the revised edition of *The Other Side of the Jordan* appeared in 1970, and Glueck died in February 1971. Albright, however, accepted the implication of the Egyptian finds. Shortly before his own death in September that same year, he retracted his earlier statements, saying that he and Glueck had both been wrong in their dating of the Arabah pottery.<sup>25</sup>

With Glueck’s death and Albright’s retraction, the defence of Solomonic and later activity came to an end. There could be no denying that copper mining and smelting did take place in the Arabah at the time of Egypt’s 19<sup>th</sup> and 20<sup>th</sup> Dynasties, and that all three types of Arabah pottery were associated with this Egyptian activity. On the other hand, the early dates based on the Egyptian finds are in tension with other evidence that points to a later date.

## 2. CHRONOLOGICAL QUESTIONS (JOHN J. BIMSON)

### 2.1 *The economic argument*

According to 1 Kings 9:26–28, Solomon carried out important trading enterprises from Ezion-geber on the Red Sea. Gold, almug wood and precious stones are said to have been imported from Ophir via this port (9:28; 10:11). 1 Kings 10:22 adds that every three years the combined fleets of Solomon and Hiram of Tyre, who had helped Solomon establish his Red Sea trading enterprise (9:27), brought back gold, silver, ivory and exotic animals—presumably also via Ezion-geber.

Before the Arabah Expedition had forced a revision of Glueck’s dates for the pottery, Dame Kathleen Kenyon stated that, even without pottery evidence,

<sup>22</sup> Rothenberg 1972: 180.

<sup>23</sup> Glueck 1970: 93–94.

<sup>24</sup> Glueck 1970: 73.

<sup>25</sup> Albright 1971: 4.



“it would have been not unreasonable to suggest that the most flourishing period for this exploitation was that of the reign of Solomon. The control of mineral resources provides one explanation for his wealth, for its products supplied export goods to be exchanged for the luxuries we know he imported”.<sup>26</sup> Speaking of the time of the monarchy in general, she commented: “The mineral wealth of the district is no doubt one reason for the prolonged struggles between Israel and Edom, for its control was clearly of great economic importance”.<sup>27</sup> G. E. Wright made a similar point when Aharoni questioned Glueck’s Iron II date for the Arabah pottery, stating that “one would think it very strange if material from that date were not found”.<sup>28</sup>

While the economic argument has been dismissed by some scholars,<sup>29</sup> it does have some force (if the biblical traditions are assumed to have historical reference—a contentious assumption in some quarters). The copper mines of the southern Arabah were close to the Red Sea, offering a valuable trading commodity. It would have made little economic sense for the mines to lie unworked when the organization for their effective exploitation existed, and a port with an expanding maritime trade had been established nearby.

## 2.2 Metallurgical activities at Tell el-Kheleifeh

While Glueck’s interpretation of Tell el-Kheleifeh is no longer feasible, the site did produce some evidence of copper working. Glueck initially interpreted a solidly-built, four-room structure as a copper smelter. He thought that holes in its walls had been flues, and that some of the pottery vessels found there were crucibles. He also found signs of fire which he thought pointed to its use for smelting. This interpretation was later overturned by Rothenberg: the pottery vessels were not crucibles but simply crude Negevite cooking pots; the holes in the walls had been left when wooden tie-beams were consumed by fire in the building’s destruction. Rothenberg reinterpreted the building as a granary, a view which Glueck accepted.<sup>30</sup> Pratico has since suggested it was actually a stronghold.<sup>31</sup>

<sup>26</sup> Kenyon 1960: 257.

<sup>27</sup> Kenyon 1960: 256.

<sup>28</sup> Wright 1961: 61.

<sup>29</sup> See the objections of Rothenberg 1962: 42, and Muhly 1984: cols. 275–292.

<sup>30</sup> Glueck 1965.

<sup>31</sup> Pratico 1993: 24–25, following Y. Shiloh.

However, Rothenberg's reappraisal did not dispose of all the evidence for metallurgical activities at Tell el-Kheleifeh. While retracting his interpretation of the building as a copper smelter, Glueck emphasised that copper slag had been found at the site.<sup>32</sup>

Six large pieces of slag, and many smaller ones, have been preserved from Glueck's excavations, as well as four large fragments and several smaller pieces of copper ore. The slag is of the fayalite type, produced by the use of an iron oxide flux. In this respect it is similar to the majority of slags from Site 2 and Site 30 (Layers 3–2) at Timna.<sup>33</sup> However, it is unlikely that the slag found at Tell el-Kheleifeh was transported from Timna; the copper content of the Tell el-Kheleifeh slag is relatively high (10%), indicating poorer metallurgical techniques than those used at Timna.<sup>34</sup> Glueck may therefore have been right in thinking that the slag was produced at Tell el-Kheleifeh itself. But if so, this still leaves the question of where the copper ore may have come from.

Copper mines in the Faynan district (in the north-eastern Arabah) were being exploited during Iron II,<sup>35</sup> but these lie some 150 km from Tell el-Kheleifeh; the mines at Timna lie only 25 km from Tell el-Kheleifeh, and those in Wadi Amrani are less than half that distance away. Analysis of the Tell el-Kheleifeh ore samples showed them to be "similar to those in the Timna region".<sup>36</sup> However, this does not prove conclusively that they originated there. Copper ores from the two sides of the Arabah "are very much the same in the isotopic composition of their lead and in their trace element contents. Therefore, no analysis based on these parameters allows us to distinguish unambiguously between copper produced at Timna and Faynan."<sup>37</sup> The proximity of the southern Arabah mines is suggestive but the question must remain open for the time being.

<sup>32</sup> Glueck 1965: 75; cf. 1970: 115. For Glueck's earlier reports of finding both copper ore and slag at Tell el-Kheleifeh see Glueck 1937: 13; 1938: 5; 1940: 93.

<sup>33</sup> Rothenberg 1999: 155 and 160.

<sup>34</sup> Koucky and Miller 1993: 65. For details of slag from Timna see e.g. Rothenberg 1999: 155. Singer-Avitz (2008: 78–79) seemingly overlooks this evidence when she suggests that a hypothetical early settlement at Tell el-Kheleifeh served as a way-station on the copper trade route from Timna in the 12th century BC and that the slags, ore fragments and copper objects had come from there.

<sup>35</sup> Tebes 2007b: 74–77 and literature cited there.

<sup>36</sup> Koucky and Miller 1993: 65.

<sup>37</sup> Tebes 2007b: 74.

### 2.3 Iron Age II pottery in the Arabah?

In his own surveys of the southern Arabah (at Timna and Wadi Amrani), Glueck reported a number of sherds to which he gave an Iron II date. This was partly on the basis of parallels from Tell el-Kheleifeh Level IV. In the light of recent reassessments of Tell el-Kheleifeh, we should ignore this precise attribution while remembering that none of Tell el-Kheleifeh's pottery is now dated earlier than the 8th century BC (with the exception of a few sherds of Qurayya Painted Ware to be discussed below). Some of Glueck's comparanda from Tell el-Kheleifeh are dated by Assyrian parallels to the 7th–6th centuries BC.<sup>38</sup>

Glueck's dating criteria were overridden by the overwhelming evidence of the Egyptian finds at Timna. Nevertheless, after studying the material from Glueck's Arabah survey for her doctoral dissertation, Aileen Baron reached the conclusion that Iron I and Iron II pottery was represented at the Timna mining and smelting sites.<sup>39</sup> In a subsequent paper she reaffirmed Glueck's view that Tell el-Kheleifeh had "serviced task force sites in the vicinity of copper sources in the Arava", and in a table summarising the archaeology of the Negev, Baron listed Timna as an "Iron I" ("1200–1000 B.C.") and "Iron II" ("1000–586 BC") site.<sup>40</sup> This prompted a reply from Rothenberg, correcting what he saw as a misleading error and insisting that pottery from Timna belonged to the Late Bronze Age. Baron in turn replied to Rothenberg:<sup>41</sup>

*"The conclusions published in my dissertation were based on the material that was available to me from Glueck's survey. I have since re-examined the material from the Timna Valley (Sites 238, 239, 240A, 317, 495 and 495A). None of the pottery presently in the collection from these sites can be identified as dating to the Late Bronze Period."*

In summary, without denying Rothenberg's claim to have found Late Bronze pottery, Baron insisted that all the pottery available to her was of Iron Age date. Moreover she concurred with Glueck's conclusion that the pottery in his collection from the southern Arabah included Iron Age II sherds.

<sup>38</sup> Glueck 1967: 18ff.

<sup>39</sup> Baron 1978.

<sup>40</sup> Baron 1981, see p. 68 and Table 2, p. 62.

<sup>41</sup> See the exchange between Rothenberg and Baron 1983.

In fact Rothenberg himself subsequently admitted that Egyptian metallurgical activities at Timna had been revived for a short time in the 10th century BC. The evidence for this comes from Site 30, a smelting camp where three strata have been distinguished. The earlier two strata, numbered Layer 3 and Layer 2, contained the same mixture of pottery types as the Hathor temple (with the addition in the earliest stratum, Layer 3, of some Egyptian red-burnished pottery). In other words, these strata seem to belong to the period of Egypt's 19<sup>th</sup> and 20<sup>th</sup> Dynasties. Between Layer 2 and Layer 1 was a layer of wind-blown soil, indicating a period of abandonment. Layer 1 differs from those below in its smelting technology and its pottery: it contains no Qurayya Painted Ware, and the Egyptian pottery included some dated stylistically to the 22<sup>nd</sup> Dynasty (c. 945–800 BC). Rothenberg suggests this later smelting activity followed Shoshenq I's campaign into Palestine (c. 925 BC), though there is no inscriptional evidence for this.<sup>42</sup>

The Egyptian pottery from Site 30 therefore significantly modifies Rothenberg's earlier dogmatic statements. It also lends credibility to Baron's identification of Iron I and Iron II pottery among Glueck's collection from the Arabah.

### 3. THE TIME SPAN OF THE QURAYYA PAINTED WARE (JOHN J. BIMSON)

As noted above, the Qurayya Painted Ware (QPW) seems to have originated in the Hejaz. From there it reached the Arabah, Edom, the central Negev and a few sites further into southern Palestine.<sup>43</sup> The QPW from the Timna Valley constitutes the largest corpus of this pottery outside the Hejaz. The majority of sites where it occurs have yielded only a few sherds. The Timna finds are also important for providing the most secure chronological peg for QPW, for in the Hathor temple, where it comprised about 25% of the excavated pottery, it occurred alongside objects bearing the cartouches of 19<sup>th</sup> and 20<sup>th</sup> Dynasty pharaohs. It is therefore important to look more closely at the stratigraphy of the Hathor temple (Site 200).

<sup>42</sup> For details see Rothenberg 1980: 208–212, and more briefly in 1999: 160–162.

<sup>43</sup> For a thorough discussion of the distribution of this pottery see now Tebes 2007a; for earlier discussions: Rothenberg and Glass 1983; Rothenberg 1998.

### 3.1 *The Hathor Temple at Timna*

Rothenberg believes that the first Hathor temple at Timna was built in the reign of Seti I (1294–1279 BC), because a bracelet bearing that king's cartouche was the earliest dated object found in Stratum IV, the lowest stratum of the temple (the remains labelled as Stratum V being Chalcolithic).<sup>44</sup> However, Geraldine Pinch has argued for pushing the foundation of the temple back from the 19<sup>th</sup> to the 18<sup>th</sup> Dynasty. Her detailed stylistic analysis of the numerous votive offerings from the temple leads her to conclude: "On the basis of the objects themselves, I would suggest that offerings were being made at Timna at least as early as the reign of Amonhotpe III".<sup>45</sup> This would mean a temple of some kind was founded before the mid-14th century BC. Rothenberg has resisted this conclusion on stratigraphical grounds.<sup>46</sup> However, the temple's stratigraphy does not seem to pose an insuperable obstacle to Pinch's view. As she points out, the bracelet with Seti I's cartouche from Stratum IV "does not prove that the first phase of the temple dates to that king. All it shows is that the temple was in existence under Seti I".<sup>47</sup> More generally, the stratigraphical context of individual offerings can prove little about when they were brought to the site, for Pinch also points out that evidence from Egyptian shrines elsewhere "suggests that...votive objects might even be preserved and replaced after extensive rebuilding work".<sup>48</sup>

Stratum III marks a major reconstruction of the temple, dated by Rothenberg to the reign of Ramesses II (1279–1213 BC). However, A. R. Schulman, Egyptologist for the Arabah Expedition, prefers to assign this phase to Ramesses III (1184–1153 BC). Pinch accepts Ramesses II as the main builder of Stratum III, but suggests that Ramesses III was responsible for a subphase of this temple.<sup>49</sup> The last datable cartouche from Stratum III belongs

<sup>44</sup> Rothenberg 1988: 275.

<sup>45</sup> Pinch 1993: 67. In light of this it is worth recalling an earlier debate concerning an inscribed building stone from the Hathor temple site. This bears a partially effaced cartouche which K.A. Kitchen, on the basis of a photograph, read as that of a Thutmose (Kitchen 1976). This would have required a foundation date in the 18<sup>th</sup> Dynasty. However, A. R. Schulman, the Egyptologist for the Arabah Expedition, insists that the cartouche is that of a Ramesside pharaoh (Schulman 1988: 115–116).

<sup>46</sup> Rothenberg, pers. comm., 27 March 2001.

<sup>47</sup> Pinch 1993: 63.

<sup>48</sup> Pinch 1993: 67.

<sup>49</sup> See Rothenberg 1988: 277; Schulman 1988: 145; Pinch 1993: 65.

to Ramesses V (1147–1143 BC).<sup>50</sup> The Stratum III temple was destroyed by an earthquake and and/or rockfall from the adjacent cliffs.

With little or no break, worship at the temple site was renewed in Stratum II. However, the temple was not restored; instead the site was turned into a “Semitic tented desert shrine”.<sup>51</sup> There are no signs of Egyptian presence and Hathor was no longer venerated there. Worshippers at the shrine continued to use QPW: “a particularly large quantity” of Qurayya sherds came from Stratum II.<sup>52</sup> The shrine was brought to an end by a further devastating rockfall, after which the site was abandoned until the Roman period (Stratum I). It is not clear how long the tent-shrine had been in use, but Rothenberg considers it to have been “only a shortlived, makeshift establishment”.<sup>53</sup> It had almost certainly been abandoned before Egyptians returned to the smelting camp at Site 30 in the 22<sup>nd</sup> Dynasty, because QPW is totally absent from Layer 1 there.<sup>54</sup>

The finds from the Hathor temple are helpful but not decisive in dating the time when QPW was first produced. While Rothenberg is confident that the temple provides “stratigraphic evidence for the presence of ‘Midianite’ pottery from the late 14<sup>th</sup> century to the middle of the 12<sup>th</sup> century BC”,<sup>55</sup> Singer-Avitz points to the disturbed nature of the temple’s strata and expresses doubts about this dating. In her view, QPW did not appear until the 12th century BC and may have been in use for only a short period.<sup>56</sup>

The date when the ware went out of use has proved even more contentious. Parr originally judged the 11th century BC to be “the latest date which can be safely assigned to the Qurayya pottery”,<sup>57</sup> but he subsequently entertained the possibility that “it may have survived for a greater or lesser span of time into the first millennium”.<sup>58</sup> It seems hazardous to conclude with Rothenberg<sup>59</sup>

<sup>50</sup> Schulman 1988: 144–145.

<sup>51</sup> Rothenberg 1988: 277.

<sup>52</sup> Rothenberg 1988: 271–272.

<sup>53</sup> Rothenberg 1988: 278.

<sup>54</sup> Rothenberg 1988: 201.

<sup>55</sup> Rothenberg 1988: 201 and cf. p. 276. Note that Rothenberg has always employed a high chronology for the 19<sup>th</sup> Dynasty, dating Seti I 1318–1304 BC.

<sup>56</sup> Singer-Avitz 2004.

<sup>57</sup> Parr 1992: 43.

<sup>58</sup> Parr 1996: 214. Cf. his earlier comment in Parr 1988: 86, that the Midianite settlement at Qurayya, where the pottery was produced, may have come to an end around 1000 BC.

<sup>59</sup> Rothenberg 1988: 201.

that the absence of Qurayya sherds from the 22<sup>nd</sup> Dynasty workings at Site 30 means the pottery was no longer in use by that time (10th century BC?). Its users may simply have left the Timna Valley. As we will see, there is increasing evidence that QPW continued in use into the Iron Age II period.

### 3.2 *Tell el-Kheleifeh again*

As noted earlier, Glueck discerned five phases of occupation at Tell el-Kheleifeh, and dated the first to the 10th century BC. But he was only able to produce good dating criteria for what he called Level IV. These included Edomite inscriptions and many items of pottery which showed a strong Assyrian influence: “Both the shape and hard metallic ware of many of them are in clear imitation of contemporary seventh-sixth century BC. Assyrian metal and pottery vessels...”<sup>60</sup>

Among the pottery assigned by Glueck to Level IV were painted sherds which he described as “Edomite”.<sup>61</sup> In fact these sherds included some half-dozen which are now acknowledged to be QPW.<sup>62</sup>

In Parr’s view these sherds from Tell el-Kheleifeh throw no light on the time when QPW was in use, because Pratico’s study revealed “how utterly unreliable Glueck’s methods and conclusions were...”<sup>63</sup> The criticism of Glueck’s methodology is apt and it is entirely possible that the Qurayyah sherds did not come from Level IV—if indeed such a clear stratum ever existed (there was little real stratigraphy at the site). However, an important point to emerge from Pratico’s study is that QPW is the earliest pottery from Tell el-Kheleifeh by several centuries. All other pottery from the site belongs to the 8th–6th centuries BC and later.<sup>64</sup> This leaves the Qurayyah sherds without an occupational context if they belong to a much earlier period.

Even before Pratico’s study heightened the problem, there was much discussion of the Qurayya sherds from Tell el-Kheleifeh. Rothenberg has

<sup>60</sup> Glueck 1969: 53. Glueck had previously referred to Level IV as beginning in the 8th century BC (1938: 13; 1965: 86), but by 1967 he had come to the view that it could date “at the earliest” to the late 8th century and “belonged primarily...to the seventh-sixth centuries BC” (1967: 24).

<sup>61</sup> Glueck 1967: 10–15; 1969: 54.

<sup>62</sup> Rothenberg and Glass 1983: 75–76; Pratico 1993: 49–50.

<sup>63</sup> Parr 1988, especially p. 75.

<sup>64</sup> On possible continuation to the end of the Persian period see Bienkowski 2001a, especially pp. 210–211.

repeatedly referred to them as surface finds.<sup>65</sup> In his view they indicate “a pre-Edomite phase of this site”, and “clearly signify a road station on the way from the Egyptian/Midianite mines in the Arabah to the mining regions of NW Arabia”.<sup>66</sup> However, while Glueck’s attribution of these sherds to Level IV may be questionable, there is no evidence that they were surface finds.<sup>67</sup>

Parr has suggested that the Qurayya sherds from Tell el-Kheleifeh “may well have originated in the earliest attested structural phase there, that of the casemate fortress, the date of which is disputed but which may be of the 11<sup>th</sup> century—a date compatible with that of the [Qurayya] pottery on other grounds.”<sup>68</sup> However, this suggestion, like other attempts to give the casemate phase an early date,<sup>69</sup> would seem to be ruled out by Mussell’s recent excavation.<sup>70</sup>

As will be noted below, similar arguments have been applied at other sites where QPW has been found in unexpectedly late contexts. The chief reason for resorting to such arguments is that criteria derived from Egyptian chronology (especially, but not exclusively, the finds at Timna) have pushed the manufacture of QPW back to the 13<sup>th</sup>–12<sup>th</sup> centuries BC, and it is generally considered unlikely that it continued in use for several centuries.

However, Piotr Bienkowski does think it possible that QPW enjoyed a very long period of use. At Tawilan, in addition to two sherds of QPW found during surface surveys,<sup>71</sup> a stratified sherd was excavated by C.-M. Bennett. This was associated with late Iron II pottery.<sup>72</sup> In fact Tawilan has produced

<sup>65</sup> Rothenberg 1967: 284, n. 88 (in Hebrew), where the view that the sherds were found “outside the excavations” is attributed to Aharoni; also Rothenberg and Glass 1983: 76.

<sup>66</sup> Rothenberg 1998: 207. See also Singer-Avitz 2008: 78–79.

<sup>67</sup> In 1979 I wrote to Miss Eleanor Vogel, who for years had catalogued and preserved Glueck’s Tell el-Kheleifeh material in Cincinnati, asking whether the records in her care could clarify the context of the few “Midianite” sherds from the site. She informed me (pers. comm. 12 June 1979) that the extant records did not preserve the find-spots of the sherds; thus while they did not confirm Glueck’s statements that they came from Level IV, neither did they lend any support to the claim that they were surface finds. It seems likely that both Glueck and Rothenberg/Aharoni were basing their claims on their presuppositions about the date of this pottery.

<sup>68</sup> Parr 1988: 75.

<sup>69</sup> E.g. Mazar 1993: 397; Levy, Najjar and Higham 2007: 20.

<sup>70</sup> Mussell 2000.

<sup>71</sup> Rothenberg and Glass 1983: 84.

<sup>72</sup> Bienkowski 2001b, especially pp. 261–262.



no evidence of settlement before the late 8th century BC at the earliest, and so its few Qurayya sherds provide a parallel to the situation at Tell el-Kheleifeh.

In discussing the Qurayya pottery from Tell el-Kheleifeh which Glueck dated to the 7th–6th century BC, Rothenberg and Glass comment: “It is hard to accept such a longevity of such a homogeneous pottery, from the thirteenth to the sixth cent. BC, that is, some seven hundred years.”<sup>73</sup> This is one reason Rothenberg has preferred to view the Tell el-Kheleifeh sherds as surface finds. In response, and in light of the stratified Qurayya sherd from Tawilan, Bienkowski calls this “a dangerous argument”, pointing out that Negevite pottery “had precisely this long time span”.<sup>74</sup> However, the comparison is questionable. Negevite pottery is a crude, hand-made ware which occurs not only throughout the Iron Age<sup>75</sup> but also in Early Bronze II and Middle Bronze I and reappears in the Early Islamic Period.<sup>76</sup> Its forms were dictated by purely utilitarian considerations. By contrast, the Qurayya painted pottery combines simple shapes with sophisticated decorations that show a high level of aesthetic appreciation.<sup>77</sup> It does not seem likely that this pottery could remain “exceedingly homogeneous”<sup>78</sup> over several centuries.

But if it is unlikely that QPW was in use for several centuries, it is also methodologically dubious to posit phantom Iron I strata to which sherds can be attributed.

### 3.3 *QPW in late contexts (Juan Manuel Tebes)*

Our knowledge of the time-span of use of the QPW in the southern Levant is not extensive. To this day, the only clear archaeological context where QPW has been found is provided by the Late Bronze/Iron I Ramesside activities at Timna. For this reason, QPW has very often been used as diagnostic pottery for demonstrating Late Bronze/Iron I occupation in other areas. This line of reasoning has led in many cases to assumptions that are not properly supported by the evidence. Specifically, the existence of Iron I occupation has been suggested at several sites because of the occurrence of QPW, despite the fact

<sup>73</sup> Rothenberg and Glass 1983: 76.

<sup>74</sup> Bienkowski 2001b: 261.

<sup>75</sup> Pratico 1993: 35–38.

<sup>76</sup> Tebes 2006: 97.

<sup>77</sup> Rothenberg 1998: 201, 204.

<sup>78</sup> Rothenberg 1998: 201; cf. Rothenberg and Glass 1983: 102; Singer-Avitz 2004: 1284.

that the overall archaeological contexts suggest a later dating. This is the case of 'Ain el-Qudeirat and the central Negev Highlands,<sup>79</sup> Tell el-Kheleifeh,<sup>80</sup> Barqa el-Hetiye,<sup>81</sup> Khirbet en-Nahas<sup>82</sup>—these two sites in the lowland area of Faynan in Edom—, and Edom in general.<sup>83</sup> Other scholars, on the other hand, have attempted to backdate QPW occurring in late contexts, arguing that the stratum of the discovery was misidentified by the excavators, e.g., the QPW found in Tel Masos.<sup>84</sup>

Overall, the picture of the chronology of the QPW is one of complete dependence on the dates of Iron I Timna. Yet such a model seems to be at odds with the growing findings of QPW in late contexts in the Negev and Edom.<sup>85</sup> A perusal of the current literature demonstrates the increasing amount of QPW being discovered in 10th–8th centuries BC contexts:

- (1) QPW has been found in Iron Age IIA Negev sites (traditionally, the 10th century BC), e.g. the central Negev Highlands,<sup>86</sup> Tel Masos,<sup>87</sup> and 'Ain el-Qudeirat;<sup>88</sup>
- (2) Recent excavations in “pre-Edomite” sites of the Faynan area of southern Jordan have unearthed QPW, e.g. at Khirbet en-Nahas (10th–early 9th centuries BC),<sup>89</sup> Barqa el-Hetiye (9th century BC)<sup>90</sup> and Rujm Hamra Ifdan (10th–early 9th centuries BC);<sup>91</sup>

<sup>79</sup> Fantalkin and Finkelstein 2006: 20; Singer-Avitz 2008.

<sup>80</sup> Rothenberg and Glass 1983: 76; Rothenberg 1998: 203; Singer-Avitz 2008: 79.

<sup>81</sup> Rothenberg 1998: 203; Fritz 1994: 114–115.

<sup>82</sup> Levy *et al.* 2004; Singer-Avitz 2008: 79.

<sup>83</sup> Rothenberg and Glass 1983; Finkelstein 1992; 1995: 127–137.

<sup>84</sup> Yannai 1996: 144–145; Herzog and Singer-Avitz 2004: 222–223.

<sup>85</sup> For a more detailed study, see Tebes 2007a.

<sup>86</sup> Cohen and Cohen-Amin 2004: 8\*, 141.

<sup>87</sup> Fritz 1983: 87.

<sup>88</sup> Bernick-Greenberg 2007: 140–141.

<sup>89</sup> Rothenberg and Glass 1983: 85; Levy *et al.* 2004: 875–876.

<sup>90</sup> Fritz 1994: 114–115.

<sup>91</sup> Levy *et al.* 2008: 16465.

(3) QPW overlapped geographically and chronologically with true Edomite ceramics, e.g. at Tell el-Kheleifeh,<sup>92</sup> Ghrareh,<sup>93</sup> Tawilan<sup>94</sup> and 'En Hazeva/Givat Hazeva.<sup>95</sup>

Furthermore, recent radiocarbon dates have confirmed these findings of QPW in periods later than the Iron I:

*Khirbet en-Nahas*: Calibrated <sup>14</sup>C dates indicate occupation during the 11th–early 9th centuries BC. Findings of QPW led the excavator, T. Levy, to suggest earlier dates for occupation in the site, as early as the 12th century BC,<sup>96</sup> although the exact find spots of these ceramics were not provided. Findings of QPW in late contexts at other sites would make Levy's amendments unnecessary.<sup>97</sup>

*Barqa el-Hetiye*: The excavator, V. Fritz, suggested an 11th century BC date for the local QPW,<sup>98</sup> however, soon after this site was radiocarbon dated to the 9th century BC.<sup>99</sup>

*Ain el-Qudeirat*: Here, the opposite case. QPW was found in the "Lower Fortress" (Stratum IV) (traditionally, the late 10th century BC), although some sherds were also discovered in the succeeding "Middle Fortress" (Stratum III) (8th–7th centuries BC).<sup>100</sup> Because of these finds, H. Bernick-Greenberg, who published the site's ceramic assemblage, suggested that the QPW was still in use in the 10th century.<sup>101</sup> Several radiocarbon dates have been taken from Stratum IV, and while two of them fall within the 10th century,<sup>102</sup> another one has provided a surprisingly early date: the calibrated date falls in the early

<sup>92</sup> Pratico 1993: 43, 47, 49.

<sup>93</sup> Hart 1989: 18.

<sup>94</sup> Rothenberg and Glass 1983: 84; Hart 1995: 60.

<sup>95</sup> Tebes 2007a: 16–17; Bowman 2009.

<sup>96</sup> Levy *et al.* 2004: 875–876; Smith and Levy 2008: 81–84, 86.

<sup>97</sup> As already indicated by van der Steen and Bienkowski 2006.

<sup>98</sup> Fritz 1994: 144–145.

<sup>99</sup> Hauptmann 2000: 66 Table 7.

<sup>100</sup> Bernick-Greenberg 2007: 140–141.

<sup>101</sup> Bernick-Greenberg 2007: 143.

<sup>102</sup> Gilboa *et al.* 2009: 89.

11th century, although earlier datings in the 12th or 13th centuries are also possible.<sup>103</sup> Singer-Avitz has offered an interpretation that would solve this dilemma. She argues that the QPW actually comes from Stratum IVc, a substratum with little evidence that antedates the Stratum IV fortress. Moreover, she suggests that this early occupation—and the QPW that originated in it—dates to the 12th century BC.<sup>104</sup> This, in Singer-Avitz's view, would explain the surprisingly early radiocarbon date, which now should be attributed to this early phase of settlement.

The sherd material is sparse but enough has been found in late contexts to support a continuity of the QPW into the Late Iron II.

Although the evidence for ascribing QPW to Iron II contexts is reasonably strong, some caution must be expressed for a number of reasons. First of all, given the similarities between the QPW painted decorations and those in other Late Bronze wares, it has become customary to identify QPW based on their decorative patterns *and* their origin (Qurayya). Although it cannot be ruled out that someday QPW will be found to have been manufactured in Edom or the Negev, examples of QPW found in late contexts have been identified as such because of their decorations but so far neither Neutron Activation Analysis (NAA) nor petrographic studies have been carried out on them. Second, the amount of QPW (in fact, sherds) that has been unearthed in very late contexts is so far very limited. A third problem is the resemblance between some of the QPW decorative patterns with those of the Edomite painted pottery, which could have led the inexperienced eye to confuse both pottery traditions. Fourth, material from surveys supplements the repertoire of QPW in southern Jordanian sites. Because all of these wares were found in surveys out of any stratigraphic context, and given the uncertainties regarding the Iron I period in Edom, it is uncertain whether they belong to the Iron I or Iron II periods. Lastly, some of these QPW sherds might be stray finds, sherds that somehow found their way into later strata.

The above discussion demonstrates that more research is needed on the QPW found in late contexts, particularly NAA and petrographic studies. These investigations may shed new light onto the relationship between the QPW and Edomite ceramics.

<sup>103</sup> Bruins 1986: 112–116; Bruins and van der Plicht 2005: 352, 357; 2007: 488.

<sup>104</sup> Singer-Avitz 2008.

### 3.4 QPW and the Edomite pottery (*Juan Manuel Tebes*)

A crucial problem is the alleged relationship between the QPW and Edomite ceramics. The Edomite pottery is a distinctive ceramic group found in the territory of Biblical Edom (southern Transjordan) and in Negev sites of the Late Iron Age. It consists of several ware types, of which the most representative ones are the plain wares, usually kraters and bowls with a denticulated fringe applied around the vessel; bowls with red and black-painted geometric decorations; cooking-pots with a stepped-rim; and vessels, mainly carinated bowls, influenced by “Assyrian ware” pottery.<sup>105</sup> The Edomite pottery is traditionally dated in the late 8th–early 6th centuries BC based on local epigraphic evidence and destruction levels in the Negev, although early antecedents going back to the 10th–9th centuries BC have been recently proposed.<sup>106</sup>

The fact that the decorative patterns of the Edomite painted pottery resemble some of the QPW has led some scholars to speculate about some kind of relationship between both traditions.<sup>107</sup> Stylistically, the Late Bronze/Early Iron date of the QPW is supported by their elaborate decorative patterns. These decorations, scholars agree, have parallels in the Eastern Mediterranean wares of the Late Bronze Age, especially Bichrome, Minoan, Mycenaean and Cypriot wares, as well as in Iron I Egyptian ceramics.<sup>108</sup> The question is particularly complicated given that the time span separating the Edomite pottery and the Late Bronze/Iron I context at Timna is so long that it seems to rule out any possible contact. However, the apparent lack of a “pre-Edomite” pottery tradition in the Edomite highlands with which the sudden development of the Edomite painted wares can be associated makes a connection with the QPW attractive. As Oakeshott put it, “The decoration in particular causes more problems than it solves as the range of proliferation of painted motifs on the Edomite pottery recalls the Late Bronze Age rather than the later Iron II.”<sup>109</sup>

One point that has rarely been addressed is the possibility that some of the decorative patterns of the Edomite pottery were the result of the influence

<sup>105</sup> Oakeshott 1983; Mazar 1985.

<sup>106</sup> Smith and Levy 2008.

<sup>107</sup> Oakeshott 1983: 62; Dornemann 1983: 86 n. 12; Zeitler 1992: 172; James *et al.* 1991: 201–202. Lipiński also considers the possibility that the Iron II Moabite pottery is a later derivative of the QPW (Lipiński 2006: 321–322).

<sup>108</sup> Tebes 2007a: 12.

<sup>109</sup> Oakeshott 1983: 92.

of the contemporary painted Phoenician pottery,<sup>110</sup> which is but another derivation of the Late Bronze ceramic traditions of the Mediterranean.<sup>111</sup> The 10th–9th centuries BC represented the peak of the trade contacts between Phoenicia and Palestine,<sup>112</sup> and it is possible that the distribution of Phoenician wares in Palestine inspired the Edomite potters to imitate their decorative patterns.

An important point is that, typologically, it is very difficult to find similarities in form between the QPW and Edomite ceramics. It should be noted that there is a restricted spectrum of QPW types, which appear predominantly in the form of small table wares and containers. Edomite wares, by contrast, exhibit a wider range of types and variations. Typologically, QPW bowls bear more resemblance to the coarser, hand-made Negevite pottery that was characteristic of the whole Iron Age, than to the finer Edomite bowl types. However, in dealing with parallels for the QPW one should bear in mind that not only has it been found in relatively large quantities only at Timna, but also that in this place it was especially concentrated in the Temple of Hathor, a fact that accounts for the unusually high ratio of small table wares (bowls) and containers (jugs, juglets, goblets) found at the site.<sup>113</sup> Thus, differences between both painted pottery traditions can be attributed not only to a chronological separation but also to the different locations and socioeconomic frameworks in which the “Edomite” and “Qurayya” potters lived.

The main pointers to a putative relationship between the QPW and Edomite pottery are the patterns of decoration. Geometrical designs occur on both wares.<sup>114</sup> Typical QPW decorative motives that are paralleled in the Edomite ceramics include (Fig. 2):

1. Band/s in the rim or immediately below, outside and inside;
2. Radial strokes around the rims of bowls;
3. Small dots between two bands;
4. Vertical lines between horizontal lines;
5. Net pattern;

<sup>110</sup> Oakeshott 1978: 185–185; Mazar 1985: 261.

<sup>111</sup> Schreiber 2003.

<sup>112</sup> Gal 1995.

<sup>113</sup> Rothenberg and Glass 1983.

<sup>114</sup> Oakeshott 1978: 186; Rothenberg and Glass 1983: 67–68; Dornemann 1983: 86 n. 12; Eitam 1988: 325–326.

6. Crosses between two horizontal lines—however those in the QPW are smaller;
7. Triangles between two bands.

However, a number of characteristic QPW decorative traits are consistently absent in the Edomite pottery, such as chevrons,<sup>115</sup> lozenges,<sup>116</sup> arches,<sup>117</sup> semicircles,<sup>118</sup> wavy lines,<sup>119</sup> scrolls,<sup>120</sup> depictions of birds—apparently ostriches—, schematic representations of human beings<sup>121</sup> and camels.<sup>122</sup> And, conversely, QPW does not show the characteristic plastic decorations of the Edomite pottery, particularly the denticulated fringe in the rim or carination.

It is also interesting to assess the fabric and origin of both pottery traditions. A cursory review of the available evidence shows that QPW and Edomite ceramics diverge in fabric and origin. Particularly, it should be noted that the QPW was of coarser manufacture, made on slow wheels and sometimes hand-made.<sup>123</sup>

All in all, I would argue that although QPW and Edomite wares may share some decorative patterns, they are different pottery traditions and should be treated as such. Their place of origin (the Hejaz in the case of the QPW,<sup>124</sup> Edom/Negev in the case of the Edomite wares<sup>125</sup>) and method of manufacture are rather different and express the work of different workshops. That these ceramics show close resemblance to each other should not be surprising in the light of their spatial overlapping as well as their temporal contiguity.

Certainly, other contemporary traditions of painted decoration existed in the Negev and southern Transjordan. I have suggested elsewhere that the

<sup>115</sup> Rothenberg and Glass 1983: Fig. 10.D.

<sup>116</sup> Rothenberg and Glass 1983: Fig. 10.F.

<sup>117</sup> Rothenberg and Glass 1983: Fig. 10.H.

<sup>118</sup> Rothenberg and Glass 1983: Fig. 10.I.

<sup>119</sup> Rothenberg and Glass 1983: Fig. 10.J.

<sup>120</sup> Rothenberg and Glass 1983: Fig. 11.L.

<sup>121</sup> Rothenberg and Glass 1983: Fig. 11.M: II–III.

<sup>122</sup> Ingraham *et al.* 1981: Pl. 79:14.

<sup>123</sup> Kalsbeek and London 1978.

<sup>124</sup> Rothenberg and Glass 1983.

<sup>125</sup> Gunneweg *et al.* 1991.

Edomite painted decorations developed out of the painted vessels that were produced in southern Cisjordan during the Iron Age IIA.<sup>126</sup> For example, a family of small bowls with short black strokes in the rim does occur in Iron Age II Cisjordanian sites, such as Ashdod IX–VIII,<sup>127</sup> Tel Beersheba VI<sup>128</sup> and ‘Ain el-Qudeirat, where they appeared already in Stratum IV and lasted until Stratum II, thus being contemporary with “true” Edomite ceramics.<sup>129</sup> They are also common in the fortress of Khirbet en-Nahas.<sup>130</sup>

### 3.5 QPW and its relations in Arabia (John J. Bimson)

Parallels have been noted between QPW and another northwest Arabian painted pottery found in large quantities at the site of Khuraybah (ancient Dedan, near modern al-‘Ula). The Khuraybah (or al-‘Ula) pottery belongs chiefly to the 6th–5th centuries BC, though its manufacture may have begun earlier. Peter Parr has speculated on a possible relationship between the Edomite and Khuraybah styles,<sup>131</sup> but even more intriguing is the possibility that the QPW was ancestral to the Khuraybah pottery. There are admittedly some significant differences between the two types: Qurayya designs are more elaborate and include animal and bird motifs which are absent from the Khuraybah pottery. Nevertheless, Parr notes “undoubted similarities between the simpler decorative elements, especially the ladder and trellis patterns”. He goes on:<sup>132</sup>

*“...If the chronological gap between the “Midianite” [Qurayya] and Khuraybah pottery could be closed, it would be a not unreasonable temptation to see the Khuraybah style as a late manifestation of a tradition in painted pottery first introduced into N.W. Arabia in the Late Bronze Age.”*

<sup>126</sup> Tebes 2009.

<sup>127</sup> Dothan and Freedman 1967: Figs. 36:13, 17; 42:3,5, 6.

<sup>128</sup> Brandfon 1984: Fig. 26:4.

<sup>129</sup> Bernick-Greenberg 2007: 133; Cohen and Bernick-Greenberg 2007: Pls. 11.1:9; 11.24:10; 11.26:4–5; 11.27:16–18; 11.30:16–20; 11.41:11; 11.42:5; 11.50:18; 11.54:15–16; 11.59:10; 11.63:5; 11.92:12; 11.129:5.

<sup>130</sup> Smith and Levy 2008: Figs. 12:2; 13:1–4; 14:1–2; 15:5; 16:1–2; 17:1.

<sup>131</sup> Parr 1982, especially pp. 131–133.

<sup>132</sup> Parr 1982: 132.



However, he sees no way in which “the chronological gap” can be closed. Even if the manufacture of the Khuraybah (or al-‘Ula) pottery were to be pushed back as early as the 7th or even 8th century BC, on the basis of its similarities with Edomite vessels, there would still be “too long a gap between this date and that of the Late Bronze Age Qurayya ware to substantiate the view that there was a direct connection between these two pottery styles, despite the obvious formal parallels”.<sup>133</sup>

One archaeologist who has tried to bridge this “chronological gap” is Garth Bawden. On the basis of excavations at Tayma (about 150 km NE of al-‘Ula), where Qurayya painted ware and Khuraybah/al-‘Ula pottery both occur, he argues for a continuous painted pottery tradition in northwest Arabia, spanning both types.<sup>134</sup> However, Bawden’s evidence for this continuity has been criticised in detail by Parr, who finds on the contrary “no indication that the al-‘Ula style follows the Qurayya style without a break”.<sup>135</sup> In fact Parr goes so far as to say: “There is, I believe, a ‘ceramic hiatus’ in northern Arabia between about the 11<sup>th</sup> century (which is the latest date which can be safely assigned to the Qurayya pottery), and the 6<sup>th</sup> century BC, when the second type of pottery may have been in production.”<sup>136</sup> Parr’s arguments are compelling, but his conclusion is surprising, for, as he admits, the Qurayya ware and the Khuraybah/al-‘Ula pottery—both occurring in the same area—stand out as the only examples of painted pottery from Arabia between the 3rd millennium BC and the Islamic period.<sup>137</sup> Once again let us note that the “chronological gap” results from the early date required for Qurayya painted ware by the conventional Egyptian chronology.

#### 4. APPLYING A REVISED CHRONOLOGY (JOHN J. BIMSON)

We could summarise much of the foregoing discussion by saying that Egyptian dating criteria applied to the mining and smelting activities at Timna are in tension with other dating criteria which are independent of Egyptian chronology.<sup>138</sup> I suggest the reason for this tension is that currently accepted

<sup>133</sup> Parr 1988: 77.

<sup>134</sup> Bawden 1983: 37–52.

<sup>135</sup> Parr 1988: 81. See also Parr 1993: 48–58, and in the following note.

<sup>136</sup> Parr 1992: 43.

<sup>137</sup> See Parr 1982: 132.

<sup>138</sup> See also Tebes 2004: 91–104.

dates for the Egyptian New Kingdom are too early. This chronological tension is not confined to the Arabah, but is replicated in numerous cultures around the Mediterranean.<sup>139</sup> Because links with Egypt are used to date the end of the Late Bronze Age and the start of the Iron Age, the currently accepted Egyptian dates have pulled this transition back in time and have stretched the Iron Age as a whole. It is worth emphasising that a range of proposals that would lower the dates of the New Kingdom (Dynasties 18–20) by varying degrees have now been tabled,<sup>140</sup> and that in Dodson's words, "It is now apparent to a growing number of scholars that the chronological status quo is no longer an option".<sup>141</sup>

In the final part of this paper I will apply a revised Egyptian chronology to the finds at Timna to see how far it resolves the tensions noted above. In what follows I will tentatively experiment with the lower dates for Egypt's New Kingdom proposed by James *et al.* in *Centuries of Darkness*.<sup>142</sup> This is one of the more radical revisions, lowering dates for the New Kingdom by about 250 years by compressing the Third Intermediate Period which follows it. Because they are dependent on Egyptian chronology, dates for the Late Bronze Age and early Iron Age are also reduced by this revision.<sup>143</sup>

#### 4.1 Revised dates for Egyptian activity at Timna

Applying the *Centuries of Darkness* revision to the stratigraphy of the Hathor temple produces the following results. If Pinch is correct in arguing that offerings to Hathor were already being made at Timna by the reign of Amenhotep III, we can suggest there was an Egyptian presence there shortly before 1100 BC. Seti I would have reigned *c.* 1050–1035 BC, so the first phase of the Hathor temple would have lasted until then. The next phase (Stratum III) would have begun in the late 11th century BC. Pinch suggests that Ramesses III may have added the pronaos to the Stratum III temple. In the revision, Ramesses III reigns *c.* 937–906 BC and becomes the pharaoh called Shishak in

<sup>139</sup> James *et al.* 1991.

<sup>140</sup> See n. 3.

<sup>141</sup> Dodson 2000: 16.

<sup>142</sup> James *et al.* 1991. For subsequent bibliography on this chronology, see references in Morkot and James in this volume of *Antiguo Oriente*.

<sup>143</sup> An even more radical revision is that of Rohl (1995), which lowers New Kingdom dates by 350 years. This, however, rests on questionable correlations between biblical and Egyptian history and raises more problems than it solves.

the Bible (1 Kings 14:25–26; 2 Chronicles 12:1–4).<sup>144</sup> It is therefore no surprise that he is well attested at Timna. As we have seen, the latest cartouche from the Hathor temple belongs to Ramesses V. The revision would probably place his short reign in the 890s BC. Lack of later Egyptian finds from the temple, and the period of abandonment attested at Site 30, suggest that the Egyptians left Timna during or soon after the reign of Ramesses V.

Rothenberg has to assume a gap of two centuries or more between this Egyptian withdrawal from Timna and the revival of activity under Shoshenq I. However, the fact that the workers of Layer 1 at Site 30 reused some of the structures of Layer 2, and that the Egyptian pottery of Layer 1 was “very similar” to that of Layers 3–2 (but with the addition of vessels dated to the 22<sup>nd</sup> Dynasty)<sup>145</sup> argues for a shorter hiatus than this. In the *Centuries of Darkness* model, the 21<sup>st</sup> Dynasty overlaps with both the 20<sup>th</sup> and the 22<sup>nd</sup>, leaving only a short gap between the end of the 20<sup>th</sup> Dynasty and the start of the 22<sup>nd</sup>. Shoshenq I, the first king of the 22<sup>nd</sup> Dynasty, reigns c. 835–815 BC.<sup>146</sup> Thus the period between Ramesses V (c. 890s BC) and Shoshenq I is cut to less than a century, and the time for which Site 30 was abandoned may have been much less than this. The people who adapted the ruined Hathor temple as a “tent shrine” after the time of Ramesses V (Rothenberg’s “Midianites”) continued to work the mines and smelting camps for an indefinite period.<sup>147</sup> The gap between Layer 2 and Layer 1 at Site 30 might therefore have been around 45 years (c. 860–815 BC?).

If the 22<sup>nd</sup> Dynasty pottery at Site 30 belongs to the years immediately following Shoshenq I’s Palestinian campaign (which took place toward the end of his reign), then the renewed Egyptian presence at Timna would have begun in the late 9th century BC. It therefore becomes likely that some mining was still going on at Timna and/or the Wadi Amram when Tell el-Kheleifeh was founded. This would explain the copper ores and slag found at the latter site.

#### 4.2 Lower dates for *Qurayya Painted Ware*

If Rothenberg is correct in his interpretation of the Hathor temple’s difficult stratigraphy, the earliest QPW at Timna dates no later than the reign of Seti I, c. 1050–1035 BC in the *Centuries of Darkness* model. However, if

<sup>144</sup> James *et. al.* 1991: 257.

<sup>145</sup> Rothenberg 1999: 161–162.

<sup>146</sup> James, pers. comm.

<sup>147</sup> Rothenberg 1988: 278; 1999: 172.

Singer-Avitz is correct in suggesting that the users of QPW did not arrive at Timna until the reign of Ramesses III,<sup>148</sup> its first appearance there should be dated to the last quarter of the 10th century BC.

As noted above, QPW continued in use after the reign of Ramesses V, whose cartouche is the latest known from Stratum III of the Hathor temple; indeed, “a particularly large quantity” of Qurayya sherds came from the following Stratum II.<sup>149</sup> The fact that no Qurayya sherds were found associated with the 22<sup>nd</sup> Dynasty workings at Site 30 does not necessarily mean that it was no longer being manufactured at that date (probably late 9th –early 8th century BC in the revised model). It may be that the people who used it had simply left the copper mining and smelting sites by that time.

As yet there is no clear evidence for the time when Qurayya painted ware went out of use. In terms of the 250-year revision it certainly becomes feasible that its use extended into the 8th century BC, where it can readily be seen as an antecedent of Edomite pottery. The earliest Khuraybah/al-‘Ula pottery, on the other hand, is unlikely to be as early as the 8th century BC, but we can suggest that this in turn was influenced by the decorated Edomite pottery—a possibility already discussed by Parr.<sup>150</sup> The lower Egyptian chronology would therefore close the current “chronological gap” between the Qurayya pottery and these later decorated wares. An 8th-century BC date for the demise of Qurayya pottery also means that Tell el-Kheleifeh could have been founded shortly before it went out of use, explaining the few sherds found there by Glueck.

### *4.3 Beyond the southern Arabah*

Lower dates for QPW can be applied fruitfully to some related issues further afield. Each of the following deserves a much longer discussion, but the aim here is simply to point out a few implications.

If Tell el-Kheleifeh was not founded until the 8th century BC at the earliest, we must look elsewhere for Solomon’s port of Ezion-geber. A likely candidate is the island of Jeziret al-Farun, a few kilometres away down the west coast of the Gulf of Aqabah.<sup>151</sup> The straits between the island and the

<sup>148</sup> Singer-Avitz 2004: 1284.

<sup>149</sup> Rothenberg 1988: 271–272.

<sup>150</sup> Parr 1982: 131–132.

<sup>151</sup> Rothenberg 1967; 1972: 202–207; Flinder 1989: 30–43; Bartlett 1989/1990: 66. Bartlett suggests Tell el-Kheleifeh could still be identified with biblical Elath, a suggestion in keeping

coast provide a sheltered anchorage and the island itself has a natural harbour. Significantly, surveys of Jeziret al-Farun have produced QPW, leading Rothenberg to suggest it served as a harbour for the mining expeditions of the 13th–12th centuries BC.<sup>152</sup> In the *Centuries of Darkness* chronology this pottery would be compatible with occupation in the Solomonic era.

Much lower dates for QPW would naturally affect the dating of occupation at Qurayya itself. They would shrink (if not quite close) what Parr has called the “rather strange gap in the archaeological record of N.W. Arabia that seems at present to exist between the period of the flourishing of Qurayya and that of Dedan...”<sup>153</sup> The revision would also bring the irrigation system at Qurayya closer to its 1st-millennium BC parallels.<sup>154</sup>

As noted above, the Faynan sites of Barqa el-Hetiye and Khirbet en-Nahas are among the sites where QPW has been used to suggest Iron I occupation when otherwise the archaeological context seems to be Iron II. In this way the dating of QPW has played a small part in the heated debate over the age of the Kingdom of Edom. Whether state formation in Edom should be dated to the 10th–9th centuries BC<sup>155</sup> or in the 8th century BC<sup>156</sup> is a debate with many facets, several of which relate to the tensions outlined above and which can ultimately be traced back *via* the dating of the LB/Iron Age transition to the chronology of Egypt. Lower dates for the end of the New Kingdom would not resolve all the issues, some of which involve the interpretation of C14 dates, but they would reduce the conflict over ceramics.

Part of the debate over state-formation in Edom concerns the date of the fortresses at Tell el-Kheleifeh and En Hazeva (the latter lying further north in the western Arabah). Levy *et al.* believe these fortresses and their pottery should be dated to the 10th–9th centuries BC on the basis of their architectural similarities to the fortress of Khirbet en-Nahas in the Faynan.<sup>157</sup> Opponents of this early date take the contrary view, insisting (in line with the conventional view of the pottery) that Tell el-Kheleifeh and En Hazeva were 8th century

with its 8th-century foundation by Azariah (2 Kings 14:22).

<sup>152</sup> Rothenberg 1972: 203–204. Cf. Rothenberg and Glass 1983: 76–77. Some possible Iron II pottery was also found.

<sup>153</sup> Parr 1982: 133.

<sup>154</sup> Cf. Parr 1988: 83.

<sup>155</sup> E.g. Levy *et al.* 2004; Levy, Najjar and Higham 2007.

<sup>156</sup> E.g. Van der Steen and Bienkowski 2006; Finkelstein and Singer-Avitz 2008.

<sup>157</sup> Levy, Najjar and Higham 2007: 20–21.

BC foundations, and that they provide the dating criterion for the Khirbet en-Nahas fortress.<sup>158</sup>

There is an echo here of Pratico's comment on the casemate fortress phase at Tell el-Kheleifeh, the ground plan of which has good parallels at a number of sites in the central Negev. On the basis of their wheel-made pottery the Negev fortresses have been assigned a date in the 10th or 11th century BC,<sup>159</sup> prompting Pratico to comment: "It is clear that dating of Tell el-Kheleifeh's pottery to the late Iron Age is not consistent with the current dating of the central Negev fortresses to the tenth century BC or earlier."<sup>160</sup> Pratico mentions the possibility that Glueck failed to collect earlier pottery associated with this phase, but Mussell's more recent excavation also failed to find such pottery. More pertinent is Pratico's question: "Have the central Negev fortresses been dated correctly?"<sup>161</sup> The answer is probably "No". If the Iron Age has been over-extended by a falsely high chronology for the LBA, the ceramics which provide the date of the Negev fortresses will have been dated too early. The difference in dates between the Negev fortresses and Tell el-Kheleifeh would be reduced, and perhaps eliminated, by the revision proposed above.

#### *4.4 Radiocarbon dates from Timna*

Since the 1970s a number of radiocarbon dates have been obtained for samples from the Timna mines and smelting camps and the site of the Hathor temple. In my 1981 article I tried to show that several of the results then available were evidence of mining and smelting activities during the time of the Israelite monarchy.<sup>162</sup> Subsequently James Muhly criticised my use of a MAS-CA 1973 calibration curve and argued that the results confirmed Ramesside activity in the 13th–12th centuries BC.<sup>163</sup> Since then more results and new calibrations have been published.

<sup>158</sup> Finkelstein and Singer-Avitz 2008: 17.

<sup>159</sup> See Cohen (1980: 77) for the full range of dates. As well as wheel-made pottery the central Negev fortresses produced examples of the hand-made Negev ware, which Rothenberg also found at Timna. The association of Negev ware with Egyptian finds at Timna led Rothenberg (1972: 180–182) to date the central Negev fortresses as early as the 13th (or even late 14th) century BC.

<sup>160</sup> Pratico 1993: 72; see also his discussion, pp. 29–31.

<sup>161</sup> Pratico 1993: 72.

<sup>162</sup> Bimson 1981: 142–144.

<sup>163</sup> Muhly 1984: 282–283.

Gerd Weisgerber has recently compiled a table containing twenty-two radiocarbon dates from Timna, along with five from Beer Ora, one from Wadi Amram and one from Gebel Shehoret.<sup>164</sup> Leaving aside very early dates which seem to relate to activity in the Chalcolithic and Early Bronze periods, and very late dates relating to Roman and Early Islamic activity, Weisgerber's table contains fifteen dates from Timna which are relevant to the foregoing discussion. These are reproduced below (with location details simplified).

<i>Lab No.</i>	<i>Location</i>	<i>2-sigma calibration</i>
HAM-207	Mine S 27	1313–914 BC
HAM-208	Mine S 27	1293–968 BC
HAM-210	Mine shaft S 18 (212/1e)	1454–1112 BC
HAM-211	Mine shaft S 19 (212/1g)	928–747 BC
HAM-212	Mine S 28/1 (212/2)	1134–796 BC
HAM-216	Site 30, level 1 of slag dump	1769–1493 BC
BM-1115	Site 2	1132–892 BC
BM-1117	Site 200	1056–810 BC
BM-1162	Site 30, Level 1	769–486 BC
BM-1598	Site 30, Level 1	1054–816 BC
BM-1368	F2	1411–1152 BC
BM-2382	Site 2, Layer 2	1613–1411 BC
GrN-4493	Site 2, Area F	1397–1111 BC
HD?	Site 2	920 +/- 50 BC
Pts 4121	Site 2	1496–1208 BC

While some results are readily compatible with the conventional dates for Late Bronze/Early Iron I metallurgical activity at Timna, some seem too early (HAM-216, BM-2382) and others too late. The late dates are, however, compatible with the lower chronology we have experimented with above, in which Egyptian activity at Timna (probably from the late 18<sup>th</sup> Dynasty to the early 22<sup>nd</sup> Dynasty) spans the 12<sup>th</sup>–8<sup>th</sup> centuries BC. Because of their range, some dates could be compatible with either the conventional or the lower chronology.

A few of the low dates deserve highlighting. BM-1117 provides a low date for material immediately overlying the Hathor temple (Site 200), in good

<sup>164</sup>Weisgerber 2006: 27, Table 1.

agreement with the lower chronology.<sup>165</sup> The sample for which Weisgerber gives the lab number as simply “HD?” suggests a 10th-century BC date for Site 2, a Ramesside smelting camp contemporary with the Hathor temple. BM-1115 also suggests low dates for Site 2. Seven charcoal samples were taken from mining tunnels at Site 212 (excavated in 1974–1976), where some shafts and galleries contained Early Bronze Age pottery and others contained pottery contemporary with that from the Hathor temple. Two samples (not included in our table) gave dates in the Early Bronze Age. Of the other five (HAM-207, HAM-208, HAM-210, HAM-211 and HAM-212) three have a range that allows compatibility with either the conventional dates for Ramesside activity or with the *Centuries of Darkness* revision, but HAM-211 and HAM-212 match the lower chronology better.

The two samples BM-1598 and BM-1162 are both from Layer 1 at Site 30, the stratum now associated with 22<sup>nd</sup>-Dynasty activity which Rothenberg suggests began with the campaign of Shoshenq I. Their calibrated dates were previously published by Rothenberg as 1000 BC and 780 BC respectively.<sup>166</sup> The former is a good fit with the conventional date for Shoshenq I, while the latter would fit better with the *Centuries of Darkness* dates for that pharaoh.

Given the vagaries of radiometric dating, and bearing in mind that some of these samples were tested three decades ago when techniques were relatively crude, it would be unwise to attach much weight to the small number of radiocarbon dates currently available from Timna. Unexpectedly early dates (which exist for *both* chronologies) could result from the “old wood” factor—i.e. charcoal may derive from wood that stopped growing long before it was burnt. On the other hand, unexpectedly late dates can be explained in terms of incorrect association and Iron Age re-use of the sites.<sup>167</sup> It is perhaps more relevant to note the low dates recently published by the wide-ranging Early Iron Age dating project, which place the start of Iron IA as late as c.1050 BC.<sup>168</sup> The authors note, however, that this result should be treated with caution.

<sup>165</sup> But cf. Muhly 1983: 284, suggesting (*contra* Rothenberg) a long period of “Midianite” activity at the temple site.

<sup>166</sup> Rothenberg 1980: 201.

<sup>167</sup> Cf. Weisgerber 2006: 24.

<sup>168</sup> Gilboa, Sharon and Boaretto 2009: 173–183.



## CONCLUSION (JOHN J. BIMSON)

The dates currently given to mining and smelting operations in the southern Arabah produce a number of chronological anomalies and tensions. Taken together these suggest the need for lower dates for New Kingdom Egypt, which would in turn allow a lower date for the Late Bronze/Iron Age transition. An experiment with the revised chronology of James *et al.* showed that the conflicting data are brought into a remarkable degree of harmony by that revision. This does not, of course, prove the correctness of that model, and it is not the only revision to have been proposed in recent years; on the other hand, less radical revisions would not resolve the chronological tensions to the same degree.<sup>169</sup> We recommend a greater awareness of the influence of Egyptian chronology on various dating disputes concerning the cultures of the southern Arabah, Edom and the Negev, and that lower chronologies be seriously considered in future discussions.

## ACKNOWLEDGEMENTS

John J. Bimson would like to thank Peter James, Peter Parr, Peter van der Veen and Uwe Zerbst for helpful comments on previous drafts of his sections of this paper, parts of which were delivered at a meeting in Tübingen, 12–14 October 2001. Juan Manuel Tebes previously presented his research at the BICANE (“Bronze to Iron Age Chronology in the Near East”) seminar on Levantine chronology held in Cambridge, UK (July 25–27 2008) and in the *American Schools of Oriental Research 2008 Annual Meeting*, Boston, USA (November 19–22 2008). He would like to express his gratitude to the following awards, without which this research would not have been possible: Fulbright Commission – Universidad Católica Argentina Fellowship (2007–2009), Isabel F. Knight Graduate Enrichment Fund in History Award (April 2008) and Conference Travel Awards (May and November 2008), Department of History and Religious Studies Program, College of The Liberal Arts, Pennsylvania State University.

<sup>169</sup> It should be noted that several of the lesser reductions that have been proposed can theoretically be combined to yield an overall reduction of over 150 years for New Kingdom dates (Bimson 2005: 85–86; cf. Porter 2005: 47–48).

**CITED REFERENCES**

- AHARONI, Y. 1962. "Iron Age Pottery of the Timna' and 'Amram Area." In: *Palestine Exploration Quarterly* 94, pp. 66–67.
- ALBRIGHT, W.F. 1971. "Nelson Glueck in Memoriam." In: *Bulletin of the American Schools of Oriental Research* 202, pp. 2–6.
- ASTON, D. 1989. "Takeloth II—A King of the 'Theban Twenty-third Dynasty'?" In: *Journal of Egyptian Archaeology* 75, pp. 139–153.
- BARON, A.G. 1978. *The Glueck Survey: Issues and Problems in the Archaeology of the Negev*. Unpublished PhD Dissertation, University of California.
- BARON, A.G. 1981. "Adaptative Strategies in the Archaeology of the Negev." In: *Bulletin of the American Schools of Oriental Research* 242, pp. 51–81.
- BARTLETT, J.R. 1989/90. "Ezion-geber/Elath: a Study in Stratigraphy and Topography." In: *Bulletin of the Anglo-Israel Archaeological Society* 9, p. 66.
- BAWDEN, G. 1983. "Painted Pottery of Tayma and Problems of Cultural Chronology in Northwest Arabia." In: J.F.A. SAWYER and D.J.A. CLINES (eds.), *Midian, Moab and Edom: The History and Archaeology of Late Bronze and Iron Age Jordan and North-West Arabia*. Journal for the Study of the Old Testament Suppl. 24. Sheffield, Journal for the Study of the Old Testament Press, pp. 37–52.
- BERNICK-GREENBERG, H. 2007. "The Ceramic Assemblages and the Wheel-made Pottery Typology." In: R. COHEN and H. BERNICK-GREENBERG (eds.), *Excavations at Kadash Barnea (Tell el-Qudeirat) 1976–1982. Part 1: Text*. Israel Antiquities Authority Reports N<sup>o</sup> 34/1. Jerusalem, Israel Antiquities Authority, pp. 131–210.
- BIENKOWSKI, P. 2001a. "New Evidence on Edom in the Neo-Babylonian and Persian Periods." In: J.A. DEARMAN and M.P. GRAHAM (eds.), *The Land That I Will Show You: Essays in Honour of J. Maxwell Miller*. Journal for the Study of the Old Testament Suppl. Series 343. Sheffield, Sheffield Academic Press, pp. 198–213.
- BIENKOWSKI, P. 2001b. "Iron Age Settlement in Edom: A Revised Framework." In: P.M.M. DAVIAU, J.W. WEVERS and M. WEIGL (eds.), *The World of the Aramaeans II: Studies in History and Archaeology in Honour of Paul-*

- Eugène Dion*. *Journal for the Study of the Old Testament Suppl. Series* 325. Sheffield: Sheffield Academic Press, pp. 257–269.
- BIENKOWSKI, P., M.F. OAKESHOTT, and A.M. BERLIN. 2002. “The Pottery.” In: P. BIENKOWSKI, *Busayra: Excavations by Crystal-M. Bennett 1971–1980*. British Academy Monographs in Archaeology 13. Oxford, Oxford University Press, pp. 233–351.
- BIMSON, J.J. 1981. “King Solomon’s Mines? A Re-assessment of Finds in the Arabah.” Tyndale Biblical Archaeology Lecture, 1980. In: *Tyndale Bulletin* 32, pp. 123–149.
- BIMSON, J.J. 2005. “Wann eroberte Josua Kanaan, am Ende der Mittleren Bronzezeit IIC oder am Ende der Späten Bronzezeit I?” In: U. ZERBST and P. VAN DER VEEN (eds.), *Keine Posaunen vor Jericho? Beiträge zur Archäologie der Landnahme*. Holzgerlingen, Hänssler-Verlag, pp. 79–93.
- BOWMAN, C.D. 2009. “Biblical Tamar (aka Ein Hazeva): Renewed Excavations 2005–2009.” In: *Bible and Interpretation*. <http://www.bibleinterp.com>
- BRANDFON, F.R. 1984. “The Pottery.” In: Z. HERZOG, *Beersheba II: The Early Iron Age Settlements*. Publications of the Institute of Archaeology 7. Tel Aviv, Institute of Archaeology, Tel Aviv University, pp. 37–69.
- BRUINS, H.J. 1986. *Desert Environment and Agriculture in the Central Negev and Kadesh-Barnea During Historical Times*. Nijkerk, The Netherlands, Midbar Foundation.
- BRUINS, H.J. and J. VAN DER PLICHT. 2005. “Desert Settlement through the Iron Age: Radiocarbon Dates from Sinai and the Negev Highlands.” In: T.E. LEVY and T. HIGHAM (eds.), *The Bible and Radiocarbon Dating: Archaeology, Text and Science*. London, Equinox, pp. 349–366.
- BRUINS, H.J. and J. VAN DER PLICHT. 2007. “Radiocarbon Dating the ‘Wilderness of Zin’.” In: *Radiocarbon* 49/2, pp. 481–497.
- COHEN, R. 1980. “The Iron Age Fortresses in the Central Negev.” In: *Bulletin of the American Schools of Oriental Research* 236, pp. 61–79.
- COHEN, R. and H. BERNICK-GREENBERG. 2007. *Excavations at Kadesh Barnea (Tell el-Qudeirat) 1976–1982. Part 2: Plates, Plans and Sections*. Israel Antiquities Authority Reports No. 34/2. Jerusalem, Israel Antiquities Authority.

- COHEN, R. and R. COHEN-AMIN. 2004. *Ancient Settlements of the Negev Highlands*. Vol. 2: *The Iron Age and the Persian Periods*. Israel Antiquities Authority Reports No. 20. Jerusalem, Israel Antiquities Authority.
- DAYTON, J.E. 1972. "Midianite and Edomite Pottery." In: *Proceedings of the Seminar for Arabian Studies* 1, pp. 25–37.
- DODSON, A. 2000. "Towards a Minimum Chronology of the New Kingdom and Third Intermediate Period." In: *The Bulletin of the Egyptological Seminar* 14, pp. 7–18.
- DORNEMANN, R.H. 1983. *The Archaeology of the Transjordan in the Bronze and Iron Ages*. Milwaukee, Milwaukee Public Museum.
- DOTHAN, M. and D.N. FREEDMAN. 1967. *Ashdod I: The First Season of Excavations, 1962*. 'Atiqot 7. Jerusalem, Israel Antiquities Authority.
- EITAM, D. 1988. "The Settlement of Nomadic Tribes in the Negev Highlands During the 11<sup>th</sup> Century B.C." In: M. HELTZER and E. LIPÍŃSKI (eds.), *Society and Economy in the Eastern Mediterranean (c. 1500-1000 B.C.)*. Leiden, Peeters, pp. 313–340.
- FANTALKIN, A. and I. FINKELSTEIN. 2006. "The Sheshonq I Campaign and the 8th-Century-BCE Earthquake—More on the Archaeology and History of the South in the Iron I-IIA." In: *Tel Aviv* 33, pp. 18–42.
- FINKELSTEIN, I. 1992. "Edom in the Iron I." In: *Levant* 24, pp. 159–166.
- FINKELSTEIN, I. 1995. *Living on the Fringe. The Archaeology and History of the Negev, Sinai and Neighbouring Regions in the Bronze and Iron Ages*. Monographs in Mediterranean Archaeology 6. Sheffield, Sheffield Academic Press.
- FINKELSTEIN, I. and L. SINGER-AVITZ. 2008. "The Pottery of Edom: A Correction." In: *Antiguo Oriente* 6, pp. 13–24.
- FLINDER, A., 1989. "Is This Solomon's Seaport?" In: *Biblical Archaeology Review* 15, pp. 32–43.
- FREUD, L. and I. BEIT-ARIEH. 1995. "Pottery." In: I. BEIT-ARIEH (ed.), *Horvat Qitmit: An Edomite Shrine in the Biblical Negev*. Monograph Series of the Institute of Archaeology No. 11. Tel Aviv, Institute of Archaeology, Tel Aviv University, pp. 209–257.

- FRITZ, V. 1983. "Areal H." In: V. FRITZ and A. KEMPINSKI (eds.), *Ergebnisse der Ausgrabungen auf der Hîrbet el-Mšāš (Têl Māšōš) 1972–1975*. Vol. 1, *Textband*. Wiesbaden, Harrasowitz, pp. 81–88.
- FRITZ, V. 1994. "Vorbericht über die Grabungen in *Barqā el-Heḥīye* im Gebit von *Fēnān, Wādī el-ʿAraba* (Jordanien) 1990." In: *Zeitschrift des Deutschen Palästina-Vereins* 110, pp. 125–150.
- FRITZ, V. 2002. "Copper Mining and Smelting in the Area of Feinān at the End of Iron Age I." In: S. AHITUV and E.D. OREN (eds.), *Aharon Kempinski Memorial Volume: Studies in Archaeology and Related Disciplines*. Beer-sheva: Studies by the Department of Bible and Ancient Near East Vol. 15. Beersheba, Ben-Gurion University of the Negev Press, pp. 93–102.
- GAL, Z. 1995. "The Diffusion of Phoenician Cultural Influence in Light of the Excavations at Hurvat Rosh Zayit." In: *Tel Aviv* 22, pp. 89–93.
- GILBOA, A., T.A.J. JULL, I. SHARON and E. BOARETTO. 2009. "Notes on Iron IIA <sup>14</sup>C Dates from Tell el-Qudeirat (Kadesh Barnea)." In: *Tel Aviv* 36, pp. 82–94.
- GILBOA, A., I. SHARON and E. BOARETTO. 2009. "Tel Dor and the Chronology of Phoenician 'Pre-Colonisation' Stages." In: C. SAGONA (ed.), *Beyond the Homeland: Markers in Phoenician Chronology*. Ancient Near Eastern Studies Supplement Series Vol. 28. Leuven, Peeters, pp. 113–204.
- GLUECK, N. 1935. *Explorations in Eastern Palestine II. American School of Oriental Research* 15. New Haven, American Schools of Oriental Research.
- GLUECK, N. 1937. "Explorations in Eastern Palestine, III." In: *Bulletin of the American Schools of Oriental Research* 65, pp. 8-29.
- GLUECK, N. 1938. "The First Campaign at Tell el-Kheleifeh (Ezion-Geber)." In: *Bulletin of the American Schools of Oriental Research* 71, pp. 3-17.
- GLUECK, N. 1940. *The Other Side of the Jordan*. 1st ed. New Haven, American Schools of Oriental Research.
- GLUECK, N. 1965. "Ezion-geber." In: *Biblical Archaeologist* 28, pp. 70–87.
- GLUECK, N. 1967. "Some Edomite Pottery from Tell el-Kheleifeh, Parts I and II." In: *Bulletin of the American Schools of Oriental Research* 188, pp. 8–38.

- GLUECK, N. 1969. "Some Ezion-Geber: Elath Iron II Pottery." In: *Eretz-Israel* 9, pp. 51–59.
- GLUECK, N. 1970. *The Other Side of the Jordan*. 2nd ed. New Haven, American School of Oriental Research.
- GUNNEWEG, J., T. BEIER, U. DIEHL, D. LAMBRECHT and H. MOMMSEN. 1991. "Edomite', 'Negevite' and 'Midianite' Pottery from the Negev Desert and Jordan: Instrumental Neutron Activation Analysis Results." In: *Archaeometry* 33, pp. 239–253.
- HAGENS, G. 1996. "A Critical Review of Dead-reckoning from the 21<sup>st</sup> Dynasty". In: *Journal of the American Research Center in Egypt* 33, pp. 153–163.
- HART, S. 1989. *The Archaeology of the Land of Edom*. Unpublished PhD Dissertation, Macquarie University.
- HART, S. 1995. "The Pottery". In: C.-M BENNETT and P. BIENKOWSKI, *Excavations at Tawilan in Southern Jordan*. Oxford, Oxford University Press, pp. 53–66.
- HAUPTMANN, A. 2000. *Zur frühen Metallurgie des Kupfers in Fenan/Jordanien*. Der Anschnitt, Beiheft 11. Bochum, Deutsches Bergbau-Museum.
- HERZOG, Z. and L. SINGER-AVITZ. 2004. "Redefining the Centre: The Emergence of State in Judah." In: *Tel Aviv* 31, pp. 209–244.
- INGRAHAM, M.L., T.D. JOHNSON, B. RIHANI and I. SHATLA. 1981. "Saudi Arabian Comprehensive Survey Program: c. Preliminary Report on a Reconnaissance Survey of the Northwestern Province (with a note on a brief Survey of the Northern Province)." In: *Atlat* 5, pp. 59–84.
- JAMES, P.J., I.J. THORPE, N. KOKKINOS, R. MORKOT and J. FRANKISH. 1991. *Centuries of Darkness*. London, Jonathan Cape.
- KALSBECK, J. and G. LONDON. 1978. "A Late Second Millennium B.C. Potting Puzzle." *Bulletin of the American Schools of Oriental Research* 232, pp. 47–56.
- KENYON, K.M. 1960. *Archaeology in the Holy Land*. Benn, London.
- KITCHEN, K.A. 1976. "A Pre-Ramesside Cartouche at Timna." In: *Orientalia* 45, pp. 262–264.
- KOUCKY, F.L. and N.R. MILLER. 1993. "The Metal Objects from Tell el-Kheleifeh." In: G.D. PRATICO, *Nelson Glueck's 1938-1940 Excavations at*

- Tell el-Kheleifeh: A Reappraisal*. American Schools of Oriental Research Archaeological Reports No. 3. Atlanta, Scholars Press, pp. 65–70.
- LEVY, T.E., R.A. ADAMS, M. NAJJAR, A. HAUPTMANN, J.D. ANDERSON, B. BRANDL, M.A. ROBINSON, and T. HIGHAM. 2004. “Reassessing the Chronology of Biblical Edom: New Excavations and <sup>14</sup>C Dates from Khirbat en-Nahas (Jordan).” In: *Antiquity* 78, pp. 863–876.
- LEVY, T.E., T. HIGHAM, C. BRONK RAMSEY, N.G. SMITH, E. BEN-YOSEF, M. ROBINSON, S. MÜNGER, K. KNABB, J.P. SCHULZE, M. NAJJAR and L. TAUXE. 2008. “High-Precision Radiocarbon Dating and Historical Biblical Archaeology in Southern Jordan.” In: *Proceedings of the National Academy of Sciences* 105, pp. 16460–16465.
- LEVY, T.E., M. NAJJAR and T. HIGHAM. 2007. “Iron Age Complex Societies, Radiocarbon Dates and Edom: Working with the Data and Debates.” In: *Antiguo Oriente* 5, pp. 13–34.
- LEVY, T.E., M. NAJJAR, J. VAN DER PLICHT, N.G. SMITH, H.J. BRUINS and T. HIGHAM. 2005. “Lowland Edom and the High and Low Chronologies: Edomite State Formation, the Bible and Recent Archaeological Research in Southern Jordan.” In: T.E. LEVY and T. HIGHAM (eds.), *The Bible and Radiocarbon Dating: Archaeology, Text and Science*. London, Equinox, pp. 129–163.
- LIPÍŃSKI, E. 2006. *On the Skirts of Canaan in the Iron Age: Historical and Topographical Researches*. Orientalia Lovaniensia Analecta 153. Leuven, Peeters.
- MAZAR, A. 1993. *Archaeology of the Land of the Bible*. 2nd ed. Lutterworth, Cambridge.
- MAZAR, E. 1985. “Edomite Pottery at the End of the Iron Age.” In: *Israel Exploration Journal* 35, pp. 253–269.
- MUHLY, J.D. 1984. “Timna and King Solomon.” In: *Bibliotheca Orientalis* 41, cols. 275–292.
- MUSSELL, M.-L. 2000. “Tell el-Kheleifeh.” In: V. EGAN, P.M. BIKAI and K. ZAMORA, “Archaeology in Jordan”, *American Journal of Archaeology* 104, pp. 577–578.
- OAKESHOTT, M.F. 1978. *A Study of the Iron II Pottery of East Jordan with Special Reference to Unpublished Material from Edom*. Unpublished PhD Dissertation, University of London.

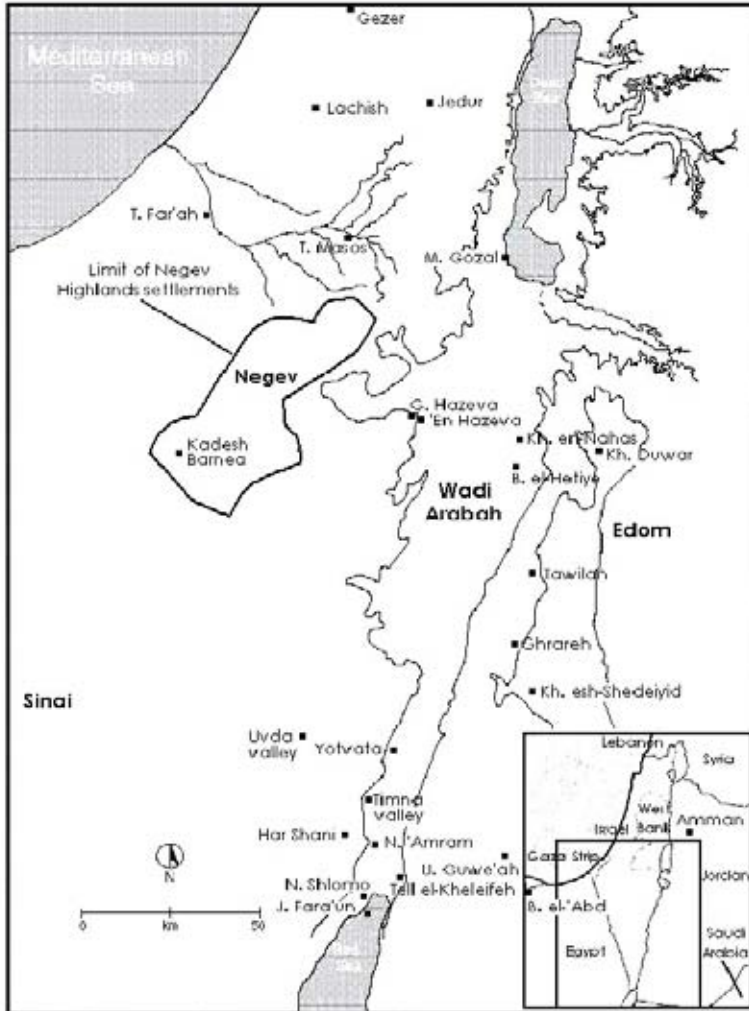
- OAKESHOTT, M.F. 1983. "The Edomite Pottery." In: J.F.A. SAWYER and D.J.A. CLINES (eds.), *Midian, Moab and Edom: The History and Archaeology of Late Bronze and Iron Age Jordan and North-West Arabia*. Journal for the Study of the Old Testament Suppl. 24. Sheffield, Journal for the Study of the Old Testament Press, pp. 53–63.
- PARR, P.J. 1982. "Contacts between North West Arabia and Jordan in the Late Bronze and Iron Ages." In: A. HADIDI (ed.), *Studies in the History and Archaeology of Jordan* 1, Amman, Dept. of Antiquities, pp. 127–133.
- PARR, P.J. 1988. "Pottery of the Late Second Millennium B.C. from North West Arabia and its Historical Implications". In: D.T. POTTS (ed.), *Araby the Blest. Studies in Arabian Archaeology*. The Carsten Niebhur Institute of Ancient Near Eastern Studies Pub. 7, Copenhagen, Museum Tusulanum Press, pp. 73–89.
- PARR, P.J. 1992. "Edom and the Hejaz." In: P. BIENKOWSKI (ed.), *Early Edom and Moab: The Beginning of the Iron Age in Southern Jordan*. Sheffield Archaeological Monographs 7. Oxford, Collis, pp. 41–46.
- PARR, P.J. 1993. "The Early History of the Hejaz: A Response to Garth Bawden." In: *Arabian Archaeology and Epigraphy* 4, pp. 48–58.
- PARR, P.J. 1996. "Further Reflections on Late Second Millennium Settlement in North West Arabia". In: J.D. SEGER (ed.), *Retrieving the Past: Essays on Archaeological Research and Methodology in Honor of Gus W. Van Beek*. Mississippi, Cobb Institute of Archaeology, Mississippi State University, pp. 213–218.
- PARR, P.J., G.L. HARDING and J.E. DAYTON. 1970. "Preliminary Survey in N.W. Arabia, 1968." In: *Bulletin of the Institute of Archaeology, University College London* 1, pp. 193–242.
- PINCH, G. 1993. *Votive Offerings to Hathor*. Griffith Institute, Ashmolean Museum, Oxford.
- PORTER, R. 2005. "Orthodox Egyptologists Shorten Egyptian History by over a Century." In: *Journal of the Ancient Chronology Forum* 10, pp. 47–48.
- PRATICO, G.D. 1993. *Nelson Glueck's 1938-1940 Excavations at Tell el-Kheleifeh: A Reappraisal*. American School of Oriental Research Archaeological Reports No. 3. Atlanta, Scholars Press.
- ROHL, D. 1995. *A Test of Time*. London, Century.



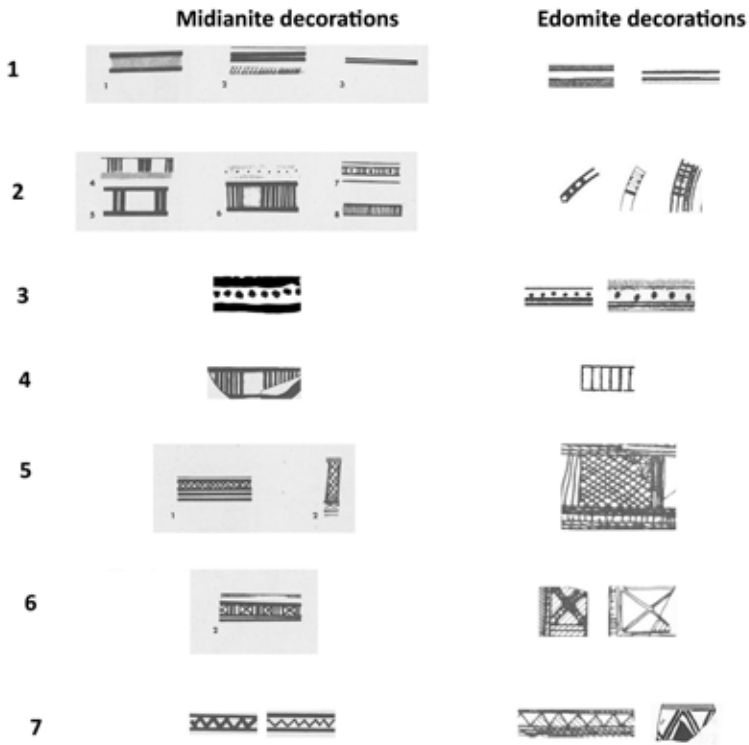
- ROTHENBERG, B. 1962. "Ancient Copper Industries in the Western Arabah." In: *Palestine Exploration Quarterly* 94, pp. 5–65.
- ROTHENBERG, B. "Notes and News." In: *Palestine Exploration Quarterly* 98, 1966, pp. 3–7.
- ROTHENBERG, B. 1967. *Negev: Archaeology in the Negev and the Arabah*. Givataim-Ramat Gan, Masada (in Hebrew).
- ROTHENBERG, B. 1972. *Timna: Valley of the Biblical Copper Mines*. London, Thames and Hudson.
- ROTHENBERG, B. 1980. "Die Archäologie des Verhüttungslager Site 30." In: H.G. CONRAD and B. ROTHENBERG (eds.), *Antikes Kupfer im Timna-Tal. 4000 Jahre Bergbau und Verhüttung in der Arabah (Israel)*. Der Anschnitt, Beiheft 1. Bochum, Deutsches Bergbau-Museum Bochum, pp. 187–213.
- ROTHENBERG, B. and A.G. BARON. 1983. "Short Notes." In: *Bulletin of the American Schools of Oriental Research* 252, pp. 69–71.
- ROTHENBERG, B. (ed.) 1988. *The Egyptian Mining Temple at Timna*. Researches in the Arabah 1959–1984 vol. 1. London, Institute for Archaeo-Metallurgical Studies, Institute of Archaeology, University College London.
- ROTHENBERG, B. 1998. "Who Were the 'Midianite' Copper Miners of the Arabah? About the 'Midianite Enigma'." In: T. REHREN, A. HAUPTMANN and J.D. MUHLY (eds.), *Metallurgica Antiqua. In Honour of Hans-Gert Bachmann and Robert Maddin*. Der Anschnitt, Beiheft 8. Bochum, Deutsches Bergbau-Museum, pp. 197–212.
- ROTHENBERG, B. 1999. "Archaeo-Metallurgical Researches in the Southern Arabah 1959-1990. Part 2: Egyptian New Kingdom (Ramesside) to Early Islam." In: *Palestine Exploration Quarterly* 131, pp. 149–175.
- ROTHENBERG, B. and J. GLASS. 1983. "The Midianite Pottery." In: J.F.A. SAWYER and D.J.A. CLINES (eds.), *Midian, Moab and Edom: The History and Archaeology of Late Bronze and Iron Age Jordan and North-West Arabia*. Journal for the Study of the Old Testament Suppl. 24. Sheffield, Journal for the Study of the Old Testament Press, pp. 65–124.
- SCHREIBER, N. 2003. *The Cypro-Phoenician Pottery of the Iron Age*. Culture and History of the Ancient Near East 13. Boston/Leiden, Brill.

- SCHULMAN, A. 1988. "Catalogue of Egyptian Finds." In: B. ROTHENBERG (ed.) *The Egyptian Mining Temple at Timna*. Researches in the Arabah 1959–1984 vol. 1. London, Institute for Archaeo-Metallurgical Studies, Institute of Archaeology, University College London, pp. 114–146.
- SINGER-AVITZ, L. 2004. "Section F: The Qurayyah Painted Ware." In: D. USSISHKIN, *The Renewed Archaeological Excavations at Lachish (1973-1994)*. 5 vols. Tel Aviv University, Sonia and Marco Nadler Institute of Archaeology, Monograph Series No. 22. Tel Aviv, Emery and Claire Tass Publications in Archaeology, vol. 3, pp. 1280-1287.
- SINGER-AVITZ, L. 2008. "The Earliest Settlement at Kadesh-Barnea." In: *Tel Aviv* 35, pp. 73–81.
- SMITH, N.G. and T.E. LEVY. 2008. "The Iron Age Pottery from Khirbat en-Nahas, Jordan: A Preliminary Study." In: *Bulletin of the American Schools of Oriental Research* 352, pp. 41–91.
- TEBES, J.M. 2004. "The Influence of Egyptian Chronology in the Archaeology of the Iron Age Negev: A Reassessment." In: *Göttinger Miszellen* 198, pp. 91–104.
- TEBES, J.M. 2006. "Iron Age 'Negevite' Pottery: A Reassessment." In: *Antiguo Oriente* 4, pp. 95–117.
- TEBES, J.M. 2007a. "Pottery Makers and Premodern Exchange in the Fringes of Egypt: An Approximation to the Distribution of Iron Age Midianite Pottery." In: *Buried History* 43, pp. 11–26.
- TEBES, J.M. 2007b. "'A Land whose Stones are Iron, and out of whose Hills You can Dig Copper': The Exploitation and Circulation of Copper in the Iron Age Negev and Edom." In: *DavarLogos* 6, pp. 69–91.
- TEBES, J.M. 2009. "The Pottery from Khirbet en-Nahas: Another View." In: *Wadi Arabah Project*. <http://www.wadiarabahproject.man.ac.uk>
- THIJS, A. 2003. "The Troubled Careers of Amenhotep and Panhesy: The High Priest of Amun and the Viceroy of Kush under the Last Ramessides." In: *Studien zur altägyptischen Kultur* 31, pp. 289–306.
- VAN DER STEEN, E. and P. BIENKOWSKI. 2006. "How Old is the Kingdom of Edom? A Review of New Evidence and Recent Discussion." In: *Antiguo Oriente* 4, pp. 11–20.

- WEISGERBER, G. 2006. "The Mineral Wealth of Ancient Arabia and its Use I: Copper Mining and Smelting at Feinan and Timna—Comparison and Evaluation of Techniques, Production and Strategies." In: *Arabian Archaeology and Epigraphy* 17, pp. 1–30.
- WRIGHT, G.E. 1961. "More on King Solomon's Mines." In: *Biblical Archaeologist* 24, pp. 59–62.
- YANNAL, E. 1996. *Aspects of the Material Culture of Canaan during the Egyptian 20th Dynasty (1200–1130 BCE)*. Unpublished PhD Dissertation, Tel Aviv University (Hebrew).
- ZEITLER, J.P. 1992. "'Edomite' Pottery from the Petra Region." In: P. BIENKOWSKI (ed.), *Early Edom and Moab: The Beginning of the Iron Age in Southern Jordan*. Sheffield Archaeological Monographs 7. Oxford, Collis, pp. 167–176.



**Figure 1.**  
Distribution of Qurayya pottery in the southern Levant  
(from Tebes 2007a: Fig. 3).



**Figure 2.**

Similar painted decorative patterns in Qurayya and Edomite wares.

1. Timna: Rothenberg and Glass 1983: Fig. 9.A:1–3; Buseirah: Bienkowski, Oakeshott and Berlin 2002: Fig. 9.12.
2. Timna: Rothenberg and Glass 1983: Fig. 9.A:4–8; Buseirah: Bienkowski, Oakeshott and Berlin 2002: Fig. 9.16.
3. Khirbet en-Nahas: Levy *et al.* 2004: Fig. 6:6; Buseirah: Bienkowski, Oakeshott and Berlin 2002: Figs. 9.25:5, 13.
4. Timna: Rothenberg and Glass 1983: Fig. 6:5; Buseirah: Bienkowski, Oakeshott and Berlin 2002: Fig. 9.30:9.
5. Timna: Rothenberg and Glass 1983: Fig. 9.C:1–2; ‘Ain el-Qudeirat: Mazar 1985: Fig. 8.
6. Timna: Rothenberg and Glass 1983: Fig. 9.B:2; Tell el-Kheleifeh: Mazar 1985: Fig. 7:1; ‘Ain el-Qudeirat: Mazar 1985: Fig. 8.
7. Timna: Rothenberg and Glass 1983: Fig. 4:4, 6; ‘Ain el-Qudeirat: Mazar 1985: Fig. 8; Ḥorvat Qitmit: Freud and Beit-Arieh 1995: Fig. 4.2:17.