

Edomite Copper Industry

The Wadi Feinan, halfway between the Red Sea and the Dead Sea, is a remote and desolate region of southern Jordan. In antiquity, it was one of the few industrial centres of the ancient Near East. For southern Bilad al-Sham it was the only one of major importance. Copper, the most important raw material for the Bronze Age and the Iron Age,¹ was mined and partially processed in the Wadi Feinan region, which contains the major concentration of copper ore in the southern Levant.² This paper will place the copper industry of Wadi Feinan in the Iron Age (13th century to 5th century BC) into an historical perspective; an in-depth study of this subject is in preparation.³

The literary sources and the history books written from these sources do not mention this specific copper industry. However, the ancient copper production of the western Wadi 'Arabah, a major place of interaction between Egypt, Palestine, Jordan and Arabia in the 13th/12th centuries BC,⁴ is known. The so-called Timna area (el-Mene'iyeh)⁵ is the only site in southern Bilad al-Sham which ancient Near Eastern scholars recognise as being relevant for the economic and technological history of Palestine.⁶ This helps to illustrate the perpetuation of a research bias which is framed by the Old Testament, and which places Palestine at the focal point of the ancient Near East, and thus regards the east bank of the Jordan river as secondary in importance. If the primary archaeological and epigraphical data are used, instead of biased and haphazard literary sources, as well as the modern received historical inter-

pretations of those sources, it may become possible to write a more balanced history of the ancient Near East.⁷

History of research

Prior to the recent work of the Deutsches Bergbau-Museum, it was A. Musil who first mapped, photographed, and described Khirbet Feinan (1898). He connected the large slag heaps there with metallurgical activities in the Roman period.⁸ Roman mining and smelting of the 3rd/4th centuries AD is the only industrial activity attested in the literary record for the Feinan region. Unfortunately, the attestations are not for economic reasons, but rather because of Christian hagiographic interest in the martyrs who happened to work, suffer, and die with other dissidents and criminals in the mines and at the furnaces.⁹

Musil was followed by F. Frank (1932/33), who surveyed the whole length of Wadi Arabah on foot. He discovered and sketched the important Iron Age smelting site of Khirbet en-Nahas, situated 10 km north-west of Feinan at Wadi Ghuweibeh.¹⁰ Whereas Frank's sketch-maps and drawings are still valuable, his ability to read surface pottery was non-existent. It was N. Glueck, one year after F. Frank, who surveyed Wadi Arabah on camel back and recorded most of the major archaeological sites. Glueck, as is well-known, was the first to use surface pottery collections as a way of interpreting the occupational history of a site. Glueck added Khirbet el-Jariyeh (FIG. 1) and Khirbet el-Ghuweibeh (FIG. 2) to the list of major Iron Age smelting sites, and was the first to discover evidence for Bronze and Iron Age occupation at Khirbet Feinan.¹¹ He

¹ Cf. Weippert (1977b), 220–221; Stager (1985), 10–11.

² Cf. Weippert (1977a), 42; Hauptmann et al. (1985), 164–166.

³ This will form part of an archaeological and epigraphical study of Edomite history by S. Hart, E. A. Knauf and C. J. Lenzen, to be published in the monograph series of Yarmouk University's Institute of Archaeology and Anthropology.

⁴ Cf. Conrad-Rothenberg (1980); Knauf (forthcoming), §II 1.c.

⁵ The 'biblicizing' renaming of el-Mene'iyeh to 'Timna' obviously tried to link the Mene'iyeh-area to the Edomite tribe of Timna (Genesis 36: 12; 40). There is no attestation of Edomite presence in the Mene'iyeh-area, however. Cf. for the frequent phenomenon of aberrant 'Biblical' place names in modern Palestine, Rainey (1978), 11.

⁶ Cf. Weippert (1977a), 42–44. It is sad to note that a major history of Palestine in the Iron Age recently published does not even mention the copper industry of el-Mene'iyeh: Donner (1984–86).

⁷ This approach is indebted to W. F. Albright, who although criticized more frequently in recent years also knew his own limitations. The amount of primary data (in the form of archaeological and epigraphic data) available to us since the time of Albright has multiplied considerably, which means that meaningful history writing can no longer be carried out by a single scholar commanding all the necessary fields of specialisation. Furthermore, the amount of primary data that has newly come to light has disproven more often rather than 'proven' the received historical tradition; cf., e.g., the cases of Buseirah and Tell Hesban.

⁸ Cf. Musil (1907), 293–298, FIGS 150–165.

⁹ Cf. Musil (1907), 310 fn. 27; Glueck (1935), 28 fn. 61a.

¹⁰ Cf. Frank (1934), 221–224.

¹¹ Cf. Glueck (1935), 20–34.

1. Khirbet el-Jariyeh from the south.



2. Khirbet el-Ghuweibeh from the north-east.



was also the first to survey and document Islamic smelting sites in the region.¹² His interpretation of certain structures as ‘furnaces’, however, is not accurate. Although he was the first to identify the typical Edomite pottery of southern Jordan in the Iron Age, his dating of this pottery to the Early Iron Age (13th through 8th centuries BC) has been proven wrong by recent archaeological work on the Edomite plateau.¹³ Present archaeological research has to determine, therefore, which kind of ‘Iron Age’ pottery is to be found at sites where Glueck listed ‘Early Iron I-II’ pottery. It is by no means possible to register all these sites as ‘Iron I’ sites.¹⁴

The rich copper ore deposits of the Wadi Feinan region have also attracted recent attention. Scientists from the German Geological Mission in Jordan and geologists from several private business companies working for the Jordanian Natural Resources Authority in the 1960s tried to evaluate the potential of the Feinan region for modern copper mining; in the process, they also identified the remnants of ancient mining. One geologist from the German Mission, H. D. Kind, published his observations in 1966 in an article which seems to be largely ignored.¹⁵ Kind taught himself pottery by comparing his sherds with those from sites discovered by Glueck, which means that he perpetuated Glueck’s error in dating southern Jordan’s Iron Age. His article, however, contains a wealth of observations by somebody thoroughly acquainted with the region, and present projects will have to spend several seasons until they can hope to have checked all the mining and smelting sites he mentions. Kind is the only one who thinks he has discovered evidence for some iron smelting in the Feinan region. Presently, there is no archaeological or mineralogical evidence that corroborates this idea.

Further work carried out by Jordanian geologists in the 1970s helped to clarify the archaeological evidence for ancient mining. Prospection galleries (horizontal tunnels), excavated by the National Resources Authority, dissected mines from the Early Bronze Age, which followed the layers of copper ore more or less horizontally and which departed from the slopes where the ore layers had been visible on the surface. These had been backfilled in antiquity. In several cases, all that was necessary in 1984 was to draw the profiles of the ancient mines.¹⁶ It was an engineer from the National Resources Authority, K. Omari, who excavated an Edomite shaft mine, and in 1984, the Deutsches Bergbau-Museum measured this using photogrammetry.¹⁷ Because the Bronze Age miners had exhausted the visible ore deposits by using horizontal tunnels, the Edomites had to excavate shafts from ground level in order to mine the same ore layers.

¹² Cf. Glueck (1935), 30–32; Hauptmann et al. (1985), 190–192.

¹³ Cf. Bennett (1983); Bennett (1984); Hart (1986), 54.

¹⁴ Cf. Weippert (1979), 28–30; Weippert (1982a), 153–154; 157. On the other hand, Kellermann et al. (1985) still list Buseirah as a site settled in the 11th/10th centuries BC, contrary to the present state of archaeological knowledge about the site.

¹⁵ Kind (1966), used by Weippert (1971a) and Weippert (1977a), but not by Weippert (1982b) and not by Donner (1984–86).

¹⁶ Cf. Hauptmann et al. (1985), 173 FIG. 10.

¹⁷ Cf. Hauptmann et al. (1985), 172–175.

The work of the Deutsches Bergbau-Museum in the Feinan region started in 1983 with preliminary investigations. The team was convinced that the Feinan region, and no other region in southern Bilad al-Sham, was the main copper producing area of the southern Levant.¹⁸ This work also provided the first clear archaeological evidence for Edomite copper mining and smelting in the 8th to 5th centuries BC.¹⁹ The first survey campaign took place in autumn 1984. Approximately 20 per cent of the area which, based on geological analysis, had a potential for ancient mining, was surveyed intensely.²⁰ Mining and smelting started at the end of the 4th millennium BC, and extended at least into the 13th century AD.²¹

Early Iron Age Copper production

Based upon the 1984 and 1986 seasons, and on the pottery from G. R. D. King’s survey in Wadi Arabah,²² the Feinan region has been settled since the Late Neolithic period with a possible gap in the ‘Abbāsid period.’²³ Human presence was more intense in some periods than it was in others, but there is no period in which human beings did not leave material culture remains in the Feinan region. This, of course, holds true for Jordan in general.²⁴

Since there are no pre-8th century BC stratified deposits from southern Jordan, there is no unquestionable evidence for Early Iron Age occupation. It is likely, however, that some of the pottery classified as ‘non-Edomite Iron Age’ by Hart and Knauf²⁵ belongs to the 13th through 8th centuries BC. All the major smelting sites that have provided ‘non-Edomite’ pottery have provided Edomite pottery as well (Khirbet en-Nahas, Khirbet el-Jariyeh, Khirbet el-Ghuweibeh). Only one site with architecture and slag had ‘non-Edomite Iron Age’ pottery only, as far as the Iron Age is concerned. This site, Khirbet Hamr Ifdan (FIG. 3), was occupied as early as the Early Bronze I period (3200–3000 BC) and as late as the Ottoman period (16th through 19th centuries AD). It is highly likely that the Feinan region produced copper as early as the 13th century BC, but nothing definite can be said about pre-Edomite Iron Age copper production for the time being.

Northwestern Arabia, Madyan, is another region with concentrations of copper ore. These deposits could have been processed by the technological means available in the Iron Age.²⁶

¹⁸ Cf. Bachmann-Hauptmann (1984), 114.

¹⁹ Cf. Knauf (1984c), 120–121.

²⁰ Cf. for the ores that could be processed in the Bronze and Iron Ages, Bachmann (1983), 122.

²¹ Cf. Hauptmann et al. (1985). The second campaign was underway at the time of writing (spring 1986); cf. preliminarily Hart-Knauf (1986).

²² Cf. King (1985), 44–45. The pottery from this survey is shortly to be published by Lenzen.

²³ Cf. for the early periods, Raikes (1980) and Raikes (1985), whose overall picture of the history of settlement (1985, 101) can easily be supplemented from the literature quoted in this article.

²⁴ Cf. for northern Jordan, Lenzen (forthcoming); Lenzen-Knauf (forthcoming a); Lenzen-Knauf (forthcoming b); Lenzen-McQuitty-Knauf (forthcoming); for a balanced view of southern Jordan Bartlett (1979); Hart (1986), 54.

²⁵ Hart-Knauf (1986), 10.

²⁶ Cf. Bachmann (1983), 122; Knauf (forthcoming), §1.1.e.

3. Khirbet Hamr Ifdan from the south-west.



As concerns Iron Age copper mines in this area, it is only known that some existed.²⁷ Since it is not known how much copper ore was mined in Northwestern Arabia in the 13th to 11th centuries BC, it is equally unknown how much of the copper needed in southern Bilad al-Sham was imported from Madyan, and how much was imported from the Feinan region. At this time, the people of the southern Levant may have had to look for their copper supplies in these relatively remote and inaccessible regions, because the troubles in the Aegean world around 1200 BC probably disrupted the maritime trade routes, and therefore cut off Palestine from Cyprus, their main copper supplier in the Late Bronze Age.²⁸ There is evidence for copper smelting or copper processing in southern Bilad al-Sham from the 13th to the 11th centuries, from Khirbet el-Mshash in the south to Tell el-Qadi in the north.²⁹ This would indicate that in this period the ore was not processed at or near the mining site.

Edomite Copper Production

Edomite pottery is associated with mining debris in the Wadi Khaled, 5 km north of Khirbet Feinan, and with slag-heaps around Khirbet Feinan. The slag can be classified, typologically, as post-Bronze Age and pre-Roman.³⁰ It is, therefore, probable that an extensive Edomite copper industry existed at Feinan. This industry left approximately 100,000 tons of

slag and would have produced several thousand tons of copper. This fits in well with recent insights into Edomite history.

As early as the 13th century BC, Edom is attested in Egyptian textual sources as an area inhabited by pastoralists and/or semi-sedentary agriculturalists.³¹ Egyptian topographical lists from the same period mention population groups who, according to their clan names or tribal names, worshipped the deity Qaus, which was to become the national deity of the later Edomites.³² Linguistically it can be demonstrated that Qaus could not have become the main deity of the Edomites much before the end of the 8th century BC,³³ and it is not until the end of the 8th century BC that there is a significant concentration of settlements in southern Jordan.³⁴ Before the end of the 8th century, there are no material culture remains that can be identified as 'Edomite'. It seems plausible, therefore, that the Edomites took over the copper mining area of Feinan in order to exploit it industrially at the same time that they founded towns and villages in the region. Both economic activities, copper production and agriculture, might have been stimulated by the Assyrians, who were interested in a well-organised Edom because major trade routes were in this area and because they were interested in its economic resources.³⁵

The end of the Iron Age

It seems reasonable to assume that the end of Iron Age copper production in the Feinan region occurred about 400 BC. In a recent article on a major Edomite site, Tell el-Kheleifeh, excavated by Glueck 1938–40, G. Pratico states that the his-

²⁷ Cf. Knauf (forthcoming), §11.e; the Northwest-Arabian mining survey: Kisnawi et al. (1983), obviously did not recognise pre-Roman type mines.

²⁸ Cf. for the Aegean world, Weippert (1971a); Bittel (1977); Helck (1977); Lehmann (1977); Otten (1977); Sandars (1978); Lehmann (1979); Stiebing (1980); Merrillies (1986), 45; 48; 50; for Late Bronze Age copper trade from Cyprus, Buchholz (1955); Maddin-Muhly (1974); Wheeler et al. (1975); Heltzer (1977); Muhly (1977); Wüst (1977); and, cf. Stager (1985), 10.

²⁹ Cf. Weippert (1977b), 220; Fritz-Kempinski (1983), 39–43; 198–208; Biran (1985), 187.

³⁰ Cf. Hauptmann et al. (1985), 179–182.

³¹ Cf. Weippert (1974); Weippert (1979), 32–34; Görg (1982); Weippert (1982a), 155–156.

³² Cf. Knauf (1984b).

³³ Cf. Knauf (1984a).

³⁴ Cf. Weippert (1982a), 154; 157–158; Hart (1986), 54–58.

³⁵ Cf. Weippert (1982b), 295; Hart (1986), 54–57.

tory of the site remains unclear after 586 BC, although epigraphic finds from the site indicate human presence in the 5th through 3rd centuries BC.³⁶ The author had learned that 'Edomite' pottery belonged to the 'Iron IIC' period, and he also learned that the 'Iron IIC' period ended in 586 BC. His statement concerning the end of Edomite pottery production, derived from these two premises, is confusing, to say the least. First, this assumption is inappropriate for Palestine, since material culture changes do not occur immediately after a political event. Second, it is difficult to see what relevance the fall of Jerusalem in 586 BC (or at any other date) or the destruction of any other city of Jordan's West Bank necessarily has for the cultural history of Jordan's East Bank. The excavations of Tawilan have shown that Edomite pottery extends well into the 5th century BC.³⁷

Literary texts attest copper production in the Feinan region after 586 BC and after 553 BC, when the Neo-Babylonian king Nabonidus conquered Edom.³⁸ These texts are contained in the Old Testament, which is an element of the cultural heritage of Bilad al-Sham, but is rarely studied from the point of view of the country of its origin. Having become 'sacred scripture' for a number of religious communities, Old Testament studies are often guided by other than purely historical interests. This fact may grieve historians of the ancient Near East who deal with this corpus of texts. To neglect the Old Testament completely would, however, deprive history writing of a source.

Two Biblical texts from the 6th or the 5th century BC attribute a special 'wisdom' to Edom (Jeremiah 49: 7; Obadiah 8). Until recently, Biblical scholars have speculated about some lost or partially preserved Edomite wisdom books similar to the so-called 'wisdom literature' of the ancient Near East.³⁹ It is much more likely that the Hebrew term *ḥokhmah* refers to technical skill in this context, rather than to some kind of literature.⁴⁰ In all probability, these sayings reflect the envy of Edom's northern neighbours which was aroused by its prosperous industry.

The book of Job, written not before 550 BC and not after 400 BC,⁴¹ contains a description of mining work that matches the Iron Age mines of the Feinan region perfectly (Job 28: 1–12).⁴² This means that Edomite copper production flourished under Babylonian and Persian rule as it flourished under Assyrian rule. Statistical information about Edom under Persian rule may be found in Genesis 36, another text frequently misinterpreted by scholars who trust the phrases of the text which place these statistics, in all probability intentionally misleading, in the 'early' periods, that is, the 12th to 11th century BC; and who disregard the unintentional linguistic evidence

provided by this text, that is, the linguistic structure and affiliation of the tribal names and the personal names contained in them.⁴³ Genesis 36: 41 lists Phinon as one of the twelve tribes or districts of Edom. The only other Biblical reference to Feinan, Numbers 33: 42f, most probably belongs to the Persian period as well.⁴⁴

About 400 BC, the Persian empire lost control over Egypt and North Arabia, where Persian government officials are attested epigraphically for the 5th century BC.⁴⁵ Most probably, the Persian empire lost control over southern Jordan at the same time. This paved the way for the rise of the Nabataeans, who established themselves in the resulting vacuum. The turmoil of the next three hundred years was not favourable for continuing industrial production in an area where logistics must always have been a problem. These speculations about the end of Edomite copper production may now find support in scientific data for furnace pottery from Khirbet el-Jariyeh, one of the Iron Age smelting sites, which points to 400 BC as one of the periods of copper production.⁴⁶

In summary, the study of the Wadi Feinan copper industry may lead to a methodological point. Following the discovery of an Edomite copper industry in the field, it became possible to discover allusions to this industry in the well-known literary sources. They will continue to be used for the reconstruction of history. They can be used for the reconstruction of history, however, only in those cases where the basic outlines of history as it happened are already known from material culture remains, or from non-literary texts: from sources that do not have intentions, or that provide information unintentionally. The final aim of this approach is a coherent, balanced, and unbiased view of history. As far as the history of Jordan is concerned, this history will finally be written by archaeologists, anthropologists, and epigraphers in close cooperation with each other.

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⁴³ Cf. Knauf (1985a), 10 fn. 45; 61–63; Knauf (1985b), 249.

⁴⁴ Cf. Hauptmann et al. (1985), 164.

⁴⁵ Cf. Högemann (1985), 23; Knauf (1985a), 76–77; Knauf (1985b), 251.

⁴⁶ A. Hauptmann, oral communication 1986.

³⁶ Cf. Pratico (1985), 22–27.

³⁷ Cf. Bennett (1984); Hart (1986), 57.

³⁸ Cf. Lindsay (1976); Bartlett (1979), 57–58.

³⁹ Cf. Pfeiffer (1926); Kaiser (1984), 371.

⁴⁰ Cf. Müller (1977), 936–937.

⁴¹ Cf. Knauf (1983), 26–27; Knauf (1985a), 76 fn. 394.

⁴² Cf. Hauptmann et al. (1985), 176–177.

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