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Archaeological Expedition in Amyan. Report of the Study Campaign (2021)

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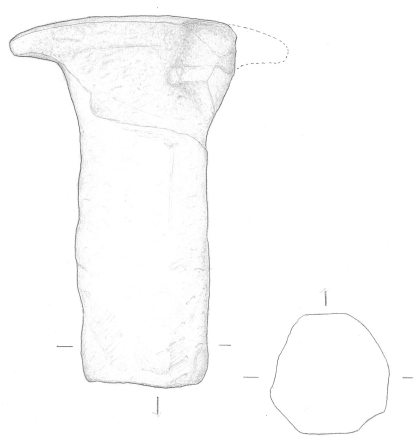
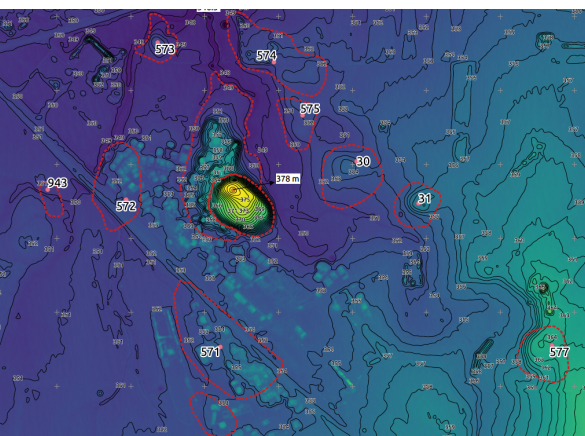
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ARCHAEOLOGICAL EXPEDITION IN AMYAN

REPORT OF THE STUDY CAMPAIGN (2021)

Edited by Barbara COUTURAUD



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General Directorate of Antiquities

Erbil

2022

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GENERAL INTRODUCTION

Barbara COUTURAUD¹

Hiwa SHIMAL²

The archaeological expedition at Amyan (*Mission archéologique d'Amyan*, MAA) was created in 2019, with the overall objective of gaining a better understanding of Northern Mesopotamia, located in present-day Iraqi Kurdistan, during the Bronze Age period (3rd & 2nd millennia BC).³ With this in mind, the project intends to fill many gaps in our knowledge of this area of Mesopotamia, beginning with the exploration of the region around the modern city of Duhok (Fig. 1), more specifically in the Navkur Plain, which shows an extremely dense occupation during antiquity (Fig. 2). Moreover, the research undertaken at Amyan intends to shed light on the Bronze Age period through the excavation of complete stratigraphical sequences in order to build a ceramic reference typology that could be used for the occupation of the whole area which has been extensively occupied, probably due to its fertile agricultural soils. The long-term objectives of the archaeological expedition at Amyan were thus determined in 2019 as follows:

- the establishment of a complete chronological sequence of the occupation of the high mound and the lower town and a ceramic typological reference system;
- the study of the Early Bronze Age period;
- the study of the environment of the site.

The site of Amyan presented all the necessary characteristics to allow such a research program. Surveyed by the LoNAP in 2012 and 2016,⁴ it consists of a main site in the form of a high mound with a continuous occupation from Late Chalcolithic to its abandonment during the Ottoman period. The main mound is surrounded by a lower town on its southern and eastern sides (Fig. 3), partly covered by a modern village, and nine peripheral sites, where occupation goes back to the Hassuna period, and that has been diversely occupied throughout times (Fig. 4). This cluster of sites is crossed by the river Kurabak that flows into the river al-Khazir, a tributary of the Great Zab.

¹ IFPO-Erbil.

² Directorate of Antiquities-Akre.

³ For a detailed presentation of the project, see Couturaud & Shimal 2020.

⁴ The Land of Nineveh Archaeological Program; see Morandi Bonacossi 2020.

The first season of fieldwork on the site was held in 2019 during which a step trench (Area A) was excavated on the eastern flank of the high mound (Fig. 5).⁵ It led to the discovery of prestigious architecture, i.e. a small part of an administrative building and the remains of a fortification system, with an enclosure wall (rampart?) resting on a massive structure (terrace or glacis?) (Fig. 6). That excavation had been preceded by a topographical study that had made an initial assessment of the main mound possible. The overall season was accompanied by a rapid preliminary study of the artefacts and ceramic material recovered, that led us to believe that the remains excavated dated to the 2nd millennium BC.

Unfortunately, after this very promising first excavation season, which confirmed that Amyan was undoubtedly an important urban centre in the Navkur Plain, and probably a local staging post of the great powers in the region from at least the 3rd to the 1st millennium BC, health and security conditions have prevented us from going back on the site. Indeed, even after the global Covid pandemic situation calmed down, the French authorities did not allow us to return to the field, judging the security situation too unstable. Hence, until now, the first season of excavations, in 2019, remains the only one.

However, despite these constraints, we decided to take the opportunity to finish the studies of the material collected in 2019, which are presented in this report, in order to prepare more in-depth analyses. Hence, a short historical study of the area of Amyan provides a framework for contextualizing the data gathered by the survey program.⁶ A ceramic study was carried out in June 2021 in order to finalize the recording of data on the sherds collected and to start the work which will lead to the establishment of the ceramic sequence of Amyan.⁷ The drawing of all artefacts was also done during the same mission,⁸ as we did not have enough time during the excavation season to do so. Finally, we were able to finish and extend the topographical study of the site in September 2021, thanks to a UAV survey of the main mound and the peripheral sites.⁹ These three studies were carried out thanks to funding obtained by the University of Liege, originally planned for the excavation, and supplemented by the IFPO. Needless to say that the studies of the material brings us one step closer to more in-depth studies: a more developed article to be published on the historical context of Amyan,¹⁰ a paper will be presented on the ceramics¹¹ and another with the detailed study of the most intriguing objects found during the 2019 excavation campaign, i.e. the wall nails.¹²

We wish here to thank those who have supported us not only through these study missions, but also through these difficult times when it was not possible to go back into the field. First of all, our colleagues from the Directorate of Antiquities for their amazing patience and support, namely Kayfi ALI, General Director of Antiquities of Kurdistan, Hiwa SHIMAL, Director of Antiquities in Akre, and Bekas HASSAN, Director of Antiquities in Duhok. We also thank them, as well as Omar SHAREF, archaeologist of the Directorate of Antiquities in Akre, for having allowed and

⁵ See Couturaud 2020.

⁶ See Couturaud in this volume.

⁷ See Mouamar in this volume.

⁸ See Othman in this volume.

⁹ See Lisein in this volume.

¹⁰ To be submitted in *Syria* by Barbara Couturaud.

¹¹ To be submitted in *Iraq* by Georges Mouamar and Barbara Couturaud.

¹² To be submitted in *Iraq* by Barbara Couturaud.

facilitated the mission in Erbil, and for having convoyed the Amyan artefacts from Akre to Erbil. Many thanks also to our excellent colleagues who performed the study missions, Jonathan LISEIN, researcher and drone operator at the University of Liege, Georges MOUAMAR, archaeologist and ceramologist associated to the CNRS in Lyon, and Ali OTHMAN, archaeologist and wonderful draftsman. Our deepest recognition also goes to Laurent COLONNA D'ISTRIA, professor and head of Service of Assyriology and Archaeology of Western Asia, Michel MOUTON and Myriam CATUSSE, successive General Directors of the IFPO, and Dominique PIERI, Director of the Department of Archaeology and History of Antiquity at the IFPO, who, beyond their faithful support, have allowed these missions to be held thanks to generous funding.

Bibliography

Couturaud B. & Shimal H., 2020, "Introduction", in Couturaud B. (ed.), *Archaeological Expedition in Amyan I. Report of the First Campaign (2019)*, Erbil, 2-13.

Morandi Bonacossi D., 2020, "The Amyan Archaeological Complex Survey by the Land of Nineveh Archaeological Project", in Couturaud B. (ed.), *Archaeological Expedition in Amyan I. Report of the First Campaign (2019)*, Erbil, 14-26.

Couturaud B. (ed.), *Archaeological Expedition in Amyan I. Report of the First Campaign (2019)*, Erbil.

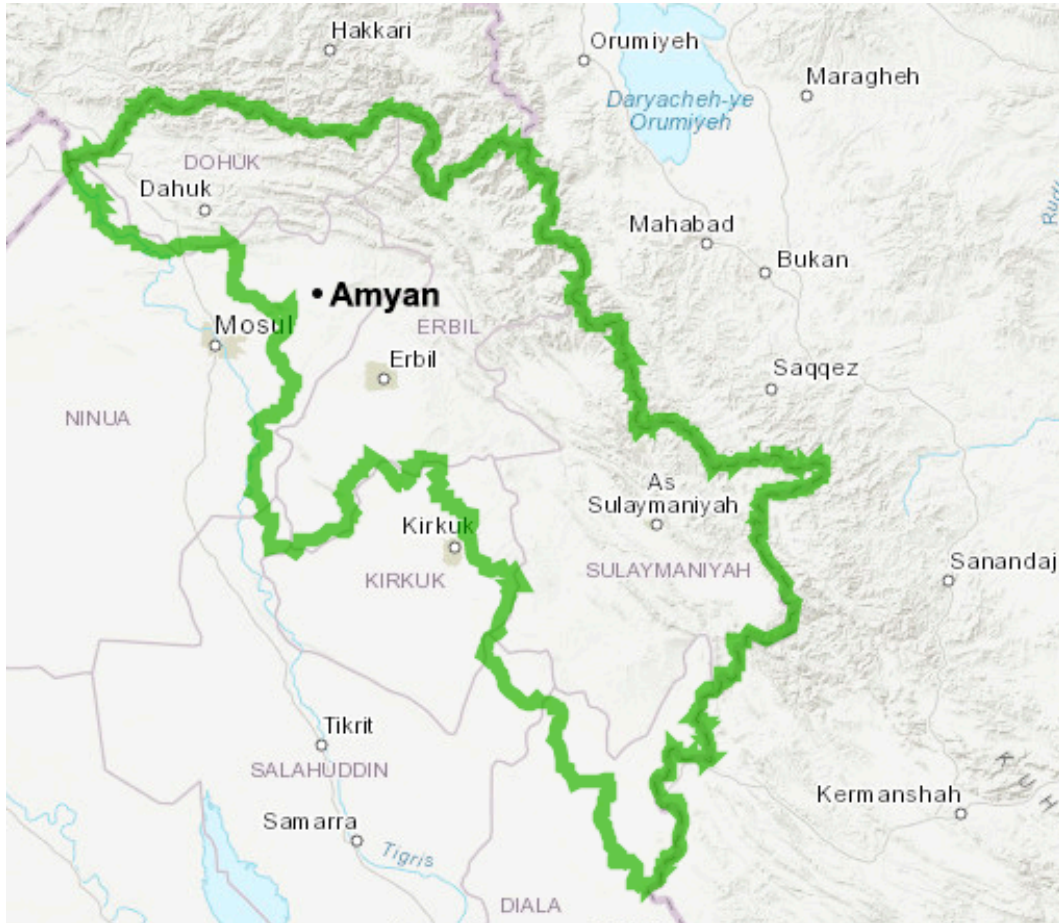


FIG. 1: Location of Amyan in Iraqi Kurdistan (after <http://www.arcgis.com/home/webmap/viewer.html?webmap=d844b2cff7e64b12a42b9d6bc09136db>)

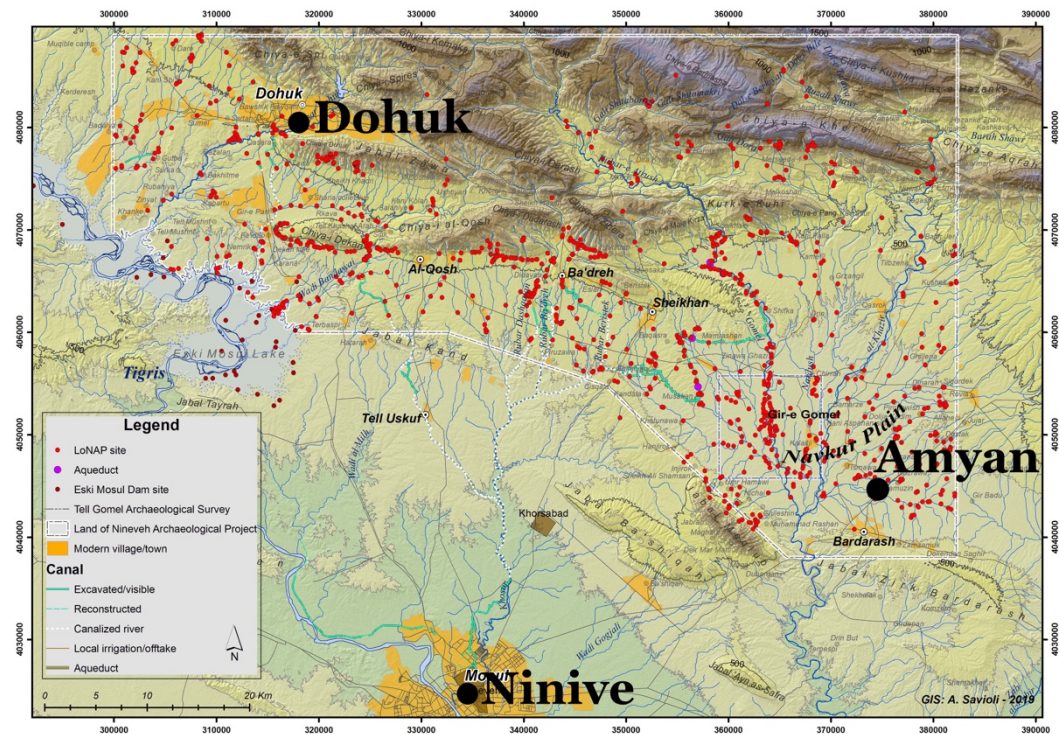


FIG. 2: Location of Amyan in the Navkur Plain (after LoNAP)



FIG. 3: Location of the step trench on the high mound (MAA)

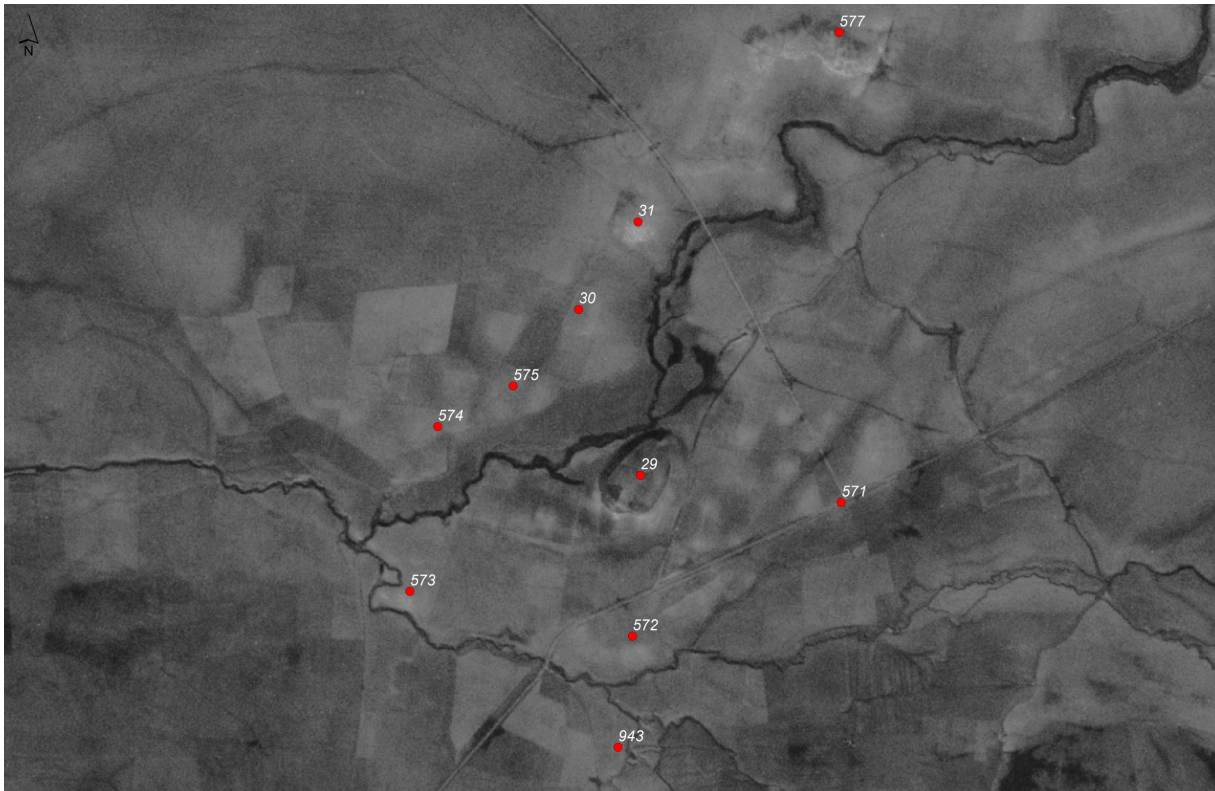


FIG. 4: The Amyan archaeological complex (LoNAP after <https://corona.cast.uark.edu/atlas>)



FIG. 5: The step trench in Area A after excavation (MAA)

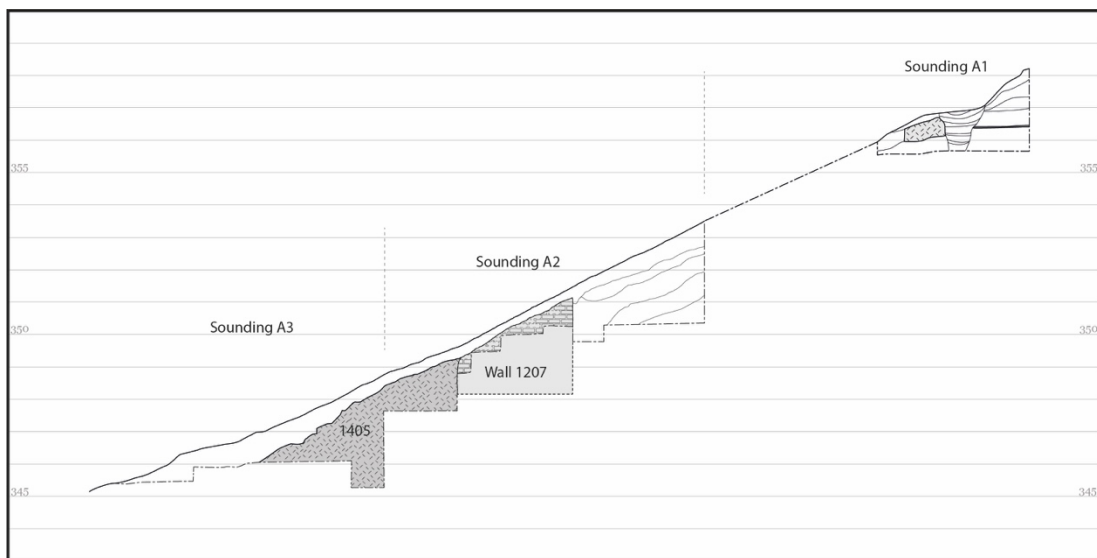


FIG. 6: Main remains in the step trench of Area A (MAA)

AMYAN IN ITS HISTORICAL CONTEXT

Barbara COUTURAUD¹

Introduction

The main site of Amyan and its nine peripheral and smaller occupations are located within the Navkur Plain, one of the several plains that lie on the eastern bank of the Tigris River (Fig. 1). These plains are characterized by extremely fertile sediments consisting of alluvial layers and natural reserves of non-saline water.² Today, they receive an average of 400-600 mm of rainfall per year, allowing dry-farming agriculture;³ a similar situation certainly existed in ancient times. This propitious environment largely explains why this set of northern plains of the Tigris in general, and the Navkur Plain in particular, is one of the most important centres of settlements in Mesopotamia from prehistoric times onward.

Since the 2010s and the resumption of archaeological activities in Iraqi Kurdistan, this vast territory has been the subject mainly of survey programs, which are only partially published: in the northeast, the Eastern Habur Archaeological Survey (EHAS, directed by Peter Pfälzner, University of Tübingen, Germany, 2013-2018);⁴ around the Navkur Plain, the Land of Nineveh Archaeological Project (LoNAP, directed by Daniele Morandi Bonacossi, University of Udine, Italy, 2012-2018);⁵ around the Greater Zab, the Upper Greater Zab Archaeological Reconnaissance (UGZAR, directed by Rafał Koliński, University of Poznan, Poland, 2012-2017);⁶ and on the Erbil Plain, the Erbil Plain Archaeological Survey (EPAS, directed by Jason Ur, Harvard University, 2012-present).⁷ These have allowed an initial picture of the occupations throughout time in this area of Northern Mesopotamia and a chronological framework for Amyan (Fig. 3).⁸

¹ IFPO-Erbil.

² Buringh 1960.

³ Wirth 1962.

⁴ Pfälzner & Sconzo 2015; Pfälzner & Sconzo 2016.

⁵ Morandi Bonacossi & Iamoni 2015.

⁶ Koliński 2017; Koliński 2018a; Koliński 2019.

⁷ Ur *et al.* 2013.

⁸ See also Morandi Bonacossi 2020 for the survey around the cluster of Amyan.

Prehistoric Times (6500-3000 BC)

The region of Amyan has been occupied since the Pre-Pottery Neolithic period, but it is more particularly – and evidently – the settlements in which ceramics were used that have been attested by survey programs, which have tried to distinguish between the Hassuna culture (7000-6000 BC), the Halaf culture (6000-5300 BC) and the Ubaid culture (5300-4500 BC) as well as possible. Unfortunately, few remains allow us to fully understand the processes of Neolithization in this region. The survey programs seem to testify to permanent and semi-nomadic settlements, especially in the Navkur Plain, with an occupation that might have moved throughout time. Indeed, the sites rarely show a continuity of occupation – especially during the transition between the Halaf and Ubaid periods – but instead they seem to indicate a move to different sites before more permanent settlement in the following periods⁹. This could be the case, notably, for the sites of the Amyan cluster (Fig. 2).¹⁰

The Late Chalcolithic period (4500-3000 BC) in this area of Northern Mesopotamia follows the process of urbanization started during the Ubaid period, only more intensively: in the Navkur Plain, for instance, where Amyan is located, the number of settlements increases threefold.¹¹ This increase of occupation must have been accompanied by forms of long-distance exchanges, as well as a better control of the territory – possibly already with the use of irrigation – allowing agriculture on a larger scale. Excavations on other sites in the area indicate many achievements, such as specialized craftsmanship, copper metallurgy, exchange of rare and prestige goods and the development of social hierarchies. Excavations carried out at the site of Tepe Gawra,¹² a few kilometres north-east of Mosul, as well as recent discoveries in the plain of Erbil, for example on the sites of Helawa¹³ and Surezha,¹⁴ to name but a few, have highlighted indigenous processes of development of complex societies in Northern Mesopotamia, that were certainly in contact with the south, but not under its influence.¹⁵ Moreover, and contrary to the discoveries made in the Erbil plain, one of the most widespread markers of the so-called Uruk culture of Southern Mesopotamia, namely the bevelled rim bowls, represents a very small percentage of the ceramic assemblages,¹⁶ to such an extent that some have not hesitated to consider the Great Zab as forming a sort of frontier in the diffusion of this type,¹⁷ which would be restricted to areas close to the Tigris.¹⁸ Finally, regarding the occupation of the territory, recent data from survey programs show that it is dotted with numerous settlements, none of them reaching a significant size,¹⁹ unlike what is known in the Khabur triangle area

⁹ Conati Barbaro *et al.* 2019, 217-221.

¹⁰ Morandi Bonacossi 2020.

¹¹ Morandi Bonacossi & Iamoni 2015, 21.

¹² Speiser 1935; Tobler 1950; Rothman 2002; Butterlin 2009.

¹³ Peyronel & Vacca 2015.

¹⁴ Stein & Fisher 2019.

¹⁵ Rothman 2001; Butterlin 2003; Stein 2022.

¹⁶ Gavagnin, Iamoni & Palermo 2016, 130-132; Koliński 2017, 583; Conati Barbaro *et al.* 2019, 221.

¹⁷ Koliński 2014, 14; Koliński 2018a, 17.

¹⁸ Sconzo 2019, 155. This being the case, it is necessary to remember that these hypotheses are based on the results of survey programs and not on archaeological excavations, and that southern ceramic types are nevertheless present in the ceramic assemblages of sites within the northern area, albeit in smaller quantities; Sconzo 2019, 150-151.

¹⁹ Morandi Bonacossi & Iamoni 2015, 21.

with sites such as Hamukar,²⁰ or even on the other side of the Tigris with a site like Tell al-Hawa.²¹

Bronze Age Period (3000-1300 BC)

The Early Bronze Age (3000-2000 BC) begins with the Ninevite 5 period (3000-2500 BC), corresponding to the local development of a culture distinguished above all by its ceramic material.²² The beginning of this period seems to be characterized by a slight decrease and a possible reorganization of the settlements.²³ Around 2500 BC, the territory is more densely occupied, up to four times more in certain areas,²⁴ which leads to the birth of large urban centres: Bassetki²⁵ in the Duhok Plain (50 ha); Gomel²⁶ (35 ha), Xrab-i Kilaşin²⁷ (30 ha) and Amyan (14 ha) in the Navkur Plain; Nineveh²⁸ on the banks of the Tigris (40 ha at least); and Baqrta²⁹ in the Erbil plain (80 ha). It should be noted that all these sites had existed before, and would continue to develop over the subsequent periods. However, except for Baqrta, they do not reach the large size attested in other regions (i.e. more than 50 ha); on the contrary, it seems that the territory is mainly occupied by medium-sized sites (10-50 ha) and small sites (less than 5 ha), certainly attesting to an amplification of the rural phenomenon.³⁰ At that time, the area was most probably included in the Subartu – Sumerian Subir – mentioned for the first time in a text from King Eannatum of Lagash (25th century BC) and texts from Ebla.³¹ However, it is not known to what extent Subartu included the whole northern region of Mesopotamia, conceived as a strip along the Zagros and the Taurus, or whether it consisted of the more restricted territory that would become the ‘Assyrian triangle’ around the cities of Nineveh, Ashur, Nimrud and Erbil.

The Early Bronze Age period ends, as in Southern Mesopotamia, with the domination of the great ‘empires’ of Akkad³² and Ur III.³³ At the time of Sargon (ca. 2330-2280 BC), it seems that Akkadian control did not go beyond the city of Ashur to the north. It may have been in the reign of Naram-Sin (ca. 2250-2220 BC) that the region of the plains to the east of the Tigris came under the control of Akkad, as is perhaps attested by the relief of Pir Hussein and the famous statue of Bassetki, as much as by mentions by Naram-Sin himself, who claimed the destruction of Bassetki, ancient Mardaman.³⁴ But for the time being, no archaeological excavation has been able to demonstrate the tangible domination of this region by Akkadian power. What is certain is that the texts remain silent on the people living in this region, whereas they are more loquacious on people living in the south-east of present-day Iraqi Kurdistan, where the countries of

²⁰ Ur 2010.

²¹ Ball, Tucker & Wilkinson 1989.

²² For an overview of this period, see Rova & Weiss 2003; for the Upper Tigris area more particularly, see Rova 2019.

²³ Pfälzner & Sconzo 2015, 112; Conati Barbaro *et al.* 2019, 222.

²⁴ Morandi Bonacossi & Iamoni 2015, 23.

²⁵ Pfälzner & Qassim 2017.

²⁶ Morandi Bonacossi *et al.* 2018.

²⁷ Koliński 2018a, 17-18; Koliński 2018b, 216-239.

²⁸ Iamoni 2017.

²⁹ Ur *et al.* 2013, 97.

³⁰ Morandi Bonacossi & Iamoni 2015, 23-24.

³¹ Michalowski 1999; for other mentions of Subartu, see Maiocchi 2015.

³² For an overview of this period, see Liverani 1993 and Foster 2016.

³³ For an overview of the domination of the Ur III kings on Northern Mesopotamia, see Frayne 2008 and Michalowski 2018.

³⁴ Sallaberger & Schrakamp 2015, 45. See also Pfälzner & Qassim 2017 and Pfälzner & Qassim 2018.

Simurru and Lullubum were located, around the modern city of Sulaymaniyah.³⁵ After the fall of the Akkadian power around 2150 BC, the region perhaps regained a form of autonomy. The Gutti power, in the Zagros mountains, evoked again in texts the countries of Simurru and Lullubum, to which it added that of Urbilum, corresponding to the current city of Erbil.³⁶ At the time of the Ur III period, the three countries were still mentioned in texts of King Shulgi (2094-2047 BC), recounting his conquests and incursions in the northern mountains of Mesopotamia, along with mentions of Shashrum, located in the vicinity of the present-day plain of Rania, and Shimanum, in the region of the Upper Tigris, most probably around the present-day cities of Diyarbakır and Mardin, in Turkey. The city of Nineveh is also mentioned for the first time through its king Tish-atal, a vassal of Shu-Sin of Ur (2037-2029 BC).³⁷ As the area of the Navkur Plain is not attested in the texts, one should nonetheless mention the city of Talmush which occurs repeatedly in the administrative texts of the Ur III period, and may have been located around modern Duhok.

Between the fall of the Kingdom of Ur III and the advent of the Kingdom of Mitanni, the first four centuries of the 2nd millennium are documented episodically by texts. The region of the plains east of the Tigris was most certainly inhabited by Amorites and Hurrian, who arrived by the end of the 3rd millennium BC.³⁸ The territory was probably divided between several kingdoms, among which the Amorite Kingdom of Qabra,³⁹ which ruled the territory of the plain of Erbil,⁴⁰ or Utum, whose capital Shushara was located in Shemshara, in the vicinity of the modern city of Rania.⁴¹ Regarding the area of Amyan, it is very likely that, as well as the city of Nineveh, it was dependent at that time of the powerful Kingdom of Nurrugum,⁴² and recently, it has been suggested that its eponymous capital was on the current site of Gomel.⁴³ Nurrugum fell under the rule of King Samsi-Addu (1815-1775 BC) and was integrated into the short-lived Kingdom of Upper Mesopotamia, whose territory extended from the foothills of the Zagros in the north and east, to the bend of the Euphrates in the west and to the limits of the rival and neighbouring Kingdom of Eshnunna in the south.⁴⁴ At the death of Samsi-Addu in 1775 BC, his kingdom broke up and the region of Nineveh could have been temporarily integrated into the Babylonian Kingdom of Hammurabi (1792-1750 BC), as suggested by the mention of Nineveh as one of the cities taken by Hammurabi on the famous stele of his code.⁴⁵ It seems that the region then quickly came under the domination of a Hurrian kingdom before being integrated into the Kingdom of Mitanni. In any case, surveys have shown that, in the first half of the 2nd millennium, there was a significant occupation of the territory.⁴⁶

This occupation reduced somewhat when the region came under the rule of the Kingdom of Mitanni (1600-1300 BC). Several uncertainties remain about this kingdom

³⁵ Kepinski *et al.* 2015, 53-58.

³⁶ Macginnis 2014.

³⁷ Macginnis 2017.

³⁸ Wilhelm 1989; Kozad 2012, 168-228.

³⁹ Charpin 2004; Charpin 2015.

⁴⁰ Probable modern Kurd Qaburstan; Schwartz *et al.* 2017.

⁴¹ Shawaly 2015.

⁴² Yuhong 1994; Ziegler 2004; Kozad 2012, 344; Macginnis 2017.

⁴³ Morandi Bonacossi *et al.* 2018, 74, 151.

⁴⁴ Charpin & Ziegler 2003, 93, 99; Ziegler 2004.

⁴⁵ Kozad 2012, 479-480.

⁴⁶ Morandi Bonacossi & Iamoni 2015, 24.

and this period more generally,⁴⁷ but it is almost certain that the territory of the plains east of the Tigris passed under its domination.

The Rise and Fall of the Assyrian Empire (1300-612 BC)

Around 1300 BC, the decline of the power of the Kingdom of Mitanni was advanced enough to allow the emergence of the power of the Assyrian kings over the area. Assur-Uballit I (1353-1318 BC) and the three rulers of the 13th century, Adad-Nirari I (1295-1264 BC), Salmanazar I (1263-1234 BC) and Tukulti-Ninurta I (1233-1197 BC), are known to have laid the foundations of the territorial Assyrian Empire.⁴⁸ It is certainly under the reign of Ashur-Uballit I that the plains east of the Tigris came under the domination of the Assyrian power, as is the case for the city of Nineveh. The territory at that time was probably divided into small provinces, for example, Bassetki is now known to have been the seat of the province of Mardama.⁴⁹ In other provinces, it is known that the Assyrians left local kings in place, as long as they showed allegiance, as in Satu Qala, for instance.⁵⁰ The territory at that time was undoubtedly well controlled, as attested, for example, by the discovery at Qasr Shemamok, ancient Kilizu, of a palace built by Adad-Nirari I.⁵¹ In any case, the area was dotted with numerous settlements at this time and, in the Neo-Assyrian period, the highest density of occupation recorded by the survey programs was reached.⁵²

The Neo-Assyrian period (1000-612 BC) is characterized by an extremely strong control of the territory through the mastering of water and irrigation, as shown by numerous recent publications,⁵³ with the creation and development of irrigation canals and the circulation of goods in the ‘Assyrian triangle’,⁵⁴ associated to the construction of waterworks, such as aqueducts⁵⁵ and quays.⁵⁶ These land development endeavours were associated with numerous reliefs engraved in strategic places linked to water, whether they were springs or branches of artificial canals. These reliefs highlighted the power of Assyrian kings, such as the relief of Tiglath-Phalazar III (745-727 BC) at Mila Mergi,⁵⁷ the reliefs of Sennacherib (705-681 BC) at Khinnis, or those of Maltai, recently attributed to Sargon II (722-705 BC), as well as those recently uncovered at Faidah.⁵⁸ Such reliefs are also found on the periphery of the empire, on the border with the northern enemy of Urartu.⁵⁹ Recent survey programs, particularly those around Duhok, have shown that the sites, although numerous, remain small in size.⁶⁰ In the Navkur Plain, the site of Gomel probably remained an important centre, perhaps corresponding to the city of Gammagara/Gamgamara mentioned by Sennacherib on

⁴⁷ Freu 2003; Cancik-Kirschbaum *et al.* 2014.

⁴⁸ For an overall view of the period, see Tenu 2009.

⁴⁹ Faist in Pfälzner & Qassim 2018, 65.

⁵⁰ Pappi 2016.

⁵¹ Rouault & Masetti Rouault 2016, 214-215.

⁵² Morandi Bonacossi & Iamoni 2015, 24-25.

⁵³ For an overview of the period, see Altaweel 2008; for irrigation works more particularly, see Bagg 2000, Morandi Bonacossi 2018 and Ur 2018.

⁵⁴ Ur 2018.

⁵⁵ Morandi Bonacossi 2016.

⁵⁶ Morandi Bonacossi 2014; Reade & Ur 2015; Morandi Bonacossi 2018.

⁵⁷ Edmonds in Pfälzner & Sconzo 2016, 45-46.

⁵⁸ Morandi Bonacossi 2018.

⁵⁹ Radner 2011.

⁶⁰ Pfälzner & Sconzo 2015, 114.

his inscriptions of the Jerwan aqueduct.⁶¹ Other names of cities or territories that are located in the Navkur Plain are also known at that time, such as Hannusa, Halahhu, or Kurbail.⁶²

From the Post Assyrian Period to Modern Times

After the fall of the Assyrian Empire follows a drastic decrease in occupations in the period commonly called post Assyrian (612-330 BC),⁶³ which certainly saw the domination of the Medes and then the Persians over the territory of the plains east of the Tigris,⁶⁴ although these occupations are not clearly visible and remain few.⁶⁵ In Amyan, the occupation seems to be restricted to the main mound. The Persian power over the region was then defeated in 331 BC, during the famous battle of Gaugameles, which likely took place in the Navkur Plain, near Gomel.⁶⁶

The Hellenistic period (330-125 BC) corresponds to the Seleucid domination over the region⁶⁷ and saw the occasional reoccupation of the Assyrian centres.⁶⁸ With the Parthian period (125 BC-250 AD) a new peak of occupation was reached, and the territory was integrated into the Kingdom of Adiabene.⁶⁹ The Parthian power left its mark in the region with a number of sculpted reliefs, such as the one of Gali Zerdak, on the Jebel Maqlub, about fifteen kilometres from Amyan.⁷⁰ After a brief period under Roman rule as part of the Roman province of Assyria,⁷¹ the region fell under the power of the Sassanid Empire (250-650 AD);⁷² no occupation of that period was recorded at Amyan. This area of Northern Mesopotamia was then integrated into the successive Arab-Muslim Empires (600-1900 AD), with a marked reduction in the number of occupations and the size of settlements.⁷³ Occupation in Amyan may have ceased between the Middle and Late Islamic period.

The modern village of Amyan was created around 1970, after a few centuries of abandonment. Previously, the Harki Tribe seems to have built a small village north of the main mound of Amyan, around the site no 577 of the Amyan cluster, before being chased by the Goran Tribe in the early 1990s.⁷⁴ The first settlement was abandoned, and the present-day village, around the main mound, was erected. At that time, there was some illegal excavation activity on the site: a small hole close to Area A, and another one on the top of the main mound, where a pit nearly 13 m deep was dug, which is still visible on satellite images.⁷⁵

⁶¹ Reade 1978, 169; Reade & Anderson 2013, 74-75; Morandi Bonacossi *et al.* 2018, 75.

⁶² Reade & Anderson 2013, 74.

⁶³ Morandi Bonacossi & Iamoni 2015, 29-30; Koliński 2018b, 101.

⁶⁴ For an overview of the period, see Briant 1996.

⁶⁵ Koliński 2018b.

⁶⁶ Reade & Anderson 2013, 75-76.

⁶⁷ Capdetrey 2007.

⁶⁸ Palermo 2016, 280-286.

⁶⁹ Morandi Bonacossi & Iamoni 2015, 29; Palermo 2016, 286-289.

⁷⁰ Reade & Anderson 2013, 117-118.

⁷¹ Maricq 1958.

⁷² Mousavi & Daryaee 2012; Palermo 2016, 289-291.

⁷³ Morandi Bonacossi & Iamoni 2015, 29-32.

⁷⁴ This modern history of Amyan relies on multiple discussions with its inhabitants during the 2019 archaeological season.

⁷⁵ Mainly jars would have been recovered, some of them containing jewellery.

In 2003, there were heavy firefights in Amyan that have left traces in the site, between the Iraqi army based in the town of Bardarash, and the Peshmerga, based on the top of the main mound of Amyan.⁷⁶

Until the beginning of the 2000s, the village houses were made of mudbrick. The inhabitants took earth from the main mound, at the foot of the step trench, where the school now stands and a depression in the contour of the archaeological mound is clearly visible.⁷⁷ Over the last twenty years concrete houses have mostly replaced the old houses, encouraged and financed by state subsidies, though some mudbrick walls can still be seen in the village. The village, located at the eastern and southern side of the main mound, is still occupied today, spreading across the ancient lower town. However, the proximity of the village guarantees the protection of the site; we thank all the inhabitants of Amyan for their safeguarding of this wonderful and beautiful area.

Bibliography

Altaweel M., 2008, *The Imperial Landscape of Ashur: Settlement and Land Use in the Assyrian Heartland*, Heidelberg.

Bagg A., 2000, "Irrigation in Northern Mesopotamia: Water for the Assyrian Capitals (12th-7th Centuries BC)", *Irrigation and Drainage Systems* 14, 301-324.

Ball W., Tucker D. & Wilkinson T., 1989, "The Tell al-Hawa Project: Archaeological Investigations in the North Jazira 1986-87", *Iraq* 51, 1-66.

Briant P., 1996, *Histoire de l'Empire perse de Cyrus à Alexandre*, Paris.

Buringh P., 1960, *Soils and Soil Conditions in Iraq*, Baghdad.

Butterlin P., 2003, *Les temps proto-urbains de Mésopotamie : contacts et acculturation à l'époque d'Uruk au Moyen-Orient*, Paris.

Butterlin P. (ed.), 2009, *À propos de Tepe Gawra, le monde proto-urbain de Mésopotamie*, Turnhout.

Cancik-Kirschbaum E., Brisch N. & Eidem J., 2014, *Constituent, Confederate, and Conquered Space. The Emergence of the Mittani State*, Berlin.

Capdetrey L., 2007, *Le pouvoir séleucide. Territoire, administration, finances d'un royaume hellénistique (312-129 av. J.-C.)*, Rennes.

Charpin D., 2004, "Histoire politique du Proche-Orient amorrite (2002-1595)", in Charpin D., Edzard D. & Stol M., *Mésopotamien. Die altbabylonische Zeit*, Freiburg & Göttingen, 25-480.

Charpin D., 2015, "Le mariage d'une princesse de Qabra avec un prince de Qatna", in Marti L., Nicolle C. & Shawaly K. (eds), *Recherches en Haute Mésopotamie II. Mission archéologique de Bash Tapa (campagnes 2012-2013) et les enjeux de la recherche dans la région d'Erbil*, Paris, 5-12.

Charpin D. & Zigel N., 2003, *Mari et le Proche-Orient à l'époque amorrite : essai d'histoire politique*, Paris.

⁷⁶ Couturaud & Bechetoille 2020, 27-28.

⁷⁷ Couturaud & Bechetoille 2020, 27-28.

- Conati Barbaro C., Iamoni M., Morandi Bonacossi D., Moscone D. & Qassim H., 2019, “The Prehistory and Protohistory of the Northwestern Region of Iraqi Kurdistan: Preliminary Results from the First Survey Campaigns”, *Paléorient* 45, 207-229.
- Couturaud B. & Bechetoille S., 2020, “First Reconnaissance and Topographical Survey of the High Mound”, in Couturaud B. (ed.), *Archaeological Expedition in Amyan. Report of the First Campaign (2019)*, Erbil, 27-35.
- Foster B., 2016, *The Age of Agade: Inventing Empire in Ancient Mesopotamia*, London.
- Frayne D., 2008, “The Zagros Campaigns of the Ur III Kings”, *Journal of the Canadian Society for Mesopotamian Studies* 3, 33-56.
- Freu J., 2003, *Histoire du Mitanni*, Paris.
- Gavagnin K., Iamoni M. & Palermo R., 2016, “The Land of Nineveh Archaeological Project: The Ceramic Repertoire from the Early Pottery Neolithic to the Sassanian Period”, *Bulletin of the American School of Oriental Research* 375, 119-169.
- Iamoni M., 2017, “The Prehistoric Roots of Nineveh”, in Petit L. & Morandi Bonacossi D. (eds), *Nineveh, the Great City. Symbol of Beauty and Power*, Leyden, 109-112.
- Kepinski C., Tenu A., Benech C., Clancier P., Hollemaert B., Ouraghi N. & Verdellet C., 2015, “Kunara, petite ville des piedmonts du Zagros à l’âge du Bronze. Rapport préliminaire sur la première campagne, 2012 (Kurdistan irakien)”, *Akkadica* 136, 51-88.
- Koliński R., 2014, *Report on the Field Activities of the Upper Greater Zab Archaeological Reconnaissance Project for the 2014 Season*, 18 p.
- Koliński R., 2017, “Settlement History of Iraqi Kurdistan: An Assessment Halfway into the Project”, *Polish Archaeology in the Mediterranean* 26, 579-590.
- Koliński R., 2018a, “An Archaeological Reconnaissance in the Greater Zab Area of the Iraqi Kurdistan (UGZAR) 2012-2015”, in Salisbury R. (ed.), *Proceedings of the 10th International Congress on the Archaeology of the Ancient Near East, Volume 2, Prehistoric and Historical Landscapes et Settlement Patterns*, Wiesbaden, 13-26.
- Koliński R., 2018b, “The Post-Assyrian Period in the Eastern Assyria”, in Koliński R., Prostko-Prostynski J. & Tyborowski W. (eds), *Awilum Sa La Mase - Man Who Cannot Be Forgotten. Studies in Honor of Prof. Stefan Zawadzki Presented on the Occasion of His 70th Birthday*, Münster, 93-113.
- Kozad A., 2012, *The Beginnings of Ancient Kurdistan (c. 2500-1500 BC): A Historical and Cultural Synthesis*, PhD Thesis, Leyden University.
- Liverani M. (ed.), 1993, *Akkad, the First World Empire: Structure, Ideology, Traditions*, Padova.
- Macginnis J., 2014, *A City From the Dawn of History. Erbil in the Cuneiform Sources*, Oxford.
- Macginnis J., 2017, “Nineveh in the Cuneiform Sources”, in Petit L. & Morandi Bonacossi D. (eds), *Nineveh, the Great City. Symbol of Beauty and Power*, Leyden, 29-31.
- Maiocchi M., 2015, “History and Philology”, in Rova E. (ed.), *Tigridian Region*, Turnhout, 355-371.

- Maricq A., 1958, “Classica et Orientalia”, *Syria* 35, 295-360.
- Michalowski P., 1999, “Sumer Dreams of Subartu: Politics and the Geographical Imagination”, in Van Lerberghe K. & Voet G. (eds), *Languages and Cultures in Contact. At the Crossroads of Civilizations in the Syro-Mesopotamian Realm*, Leuven, 305-315.
- Michalowski P., 2018, “Urbilum/Erbil and the Northern Frontier of the Ur III State”, in Déroche V., Masetti Rouault M. G. & Nicolle C. (eds), *Études mésopotamiennes. Mesopotamian Studies* 1, Oxford, 178-187.
- Morandi Bonacossi D., 2014, “River Navigation and Transport in Northern Assyria. The Stone Quay-Walls of the Rivers Gomel and Al-Khazir in the Navkur Plain, Iraqi Kurdistan”, in Gaspa S., Greco A., Morandi Bonacossi D., Ponchia S. & Rollinger R. (eds), *From Source to History. Studies on Ancient Near Eastern Worlds and Beyond Dedicated to Giovanni Battista Lanfranchi on the Occasion of His 65th Birthday on June 23, 2014*, Münster, 441-453.
- Morandi Bonacossi D., 2016, “The Land of Nineveh Archaeological Project. Assyrian Settlement in the Nineveh Hinterland: A View from the Centre”, in Macginnis J., Wircke D. & Greenfield T. (eds), *The Provincial Archaeology of the Assyrian Empire*, Cambridge, 141-150.
- Morandi Bonacossi D., 2018, “Water for Nineveh. The Nineveh Irrigation System in the Regional Context of the ‘Assyrian Triangle’: A First Geoarchaeological Assessment”, in Kühne H. (ed.), *Water for Assyria*, Wiesbaden, 77-115.
- Morandi Bonacossi D., 2020, “The Amyan Archaeological Complex Survey by the Land of Nineveh Archaeological Project”, in Couturaud B. (ed.), *Archaeological Expedition in Amyan I. Report of the First Campaign (2019)*, Erbil, 14-26.
- Morandi Bonacossi D., Qasim H., Coppini C., Gavagnin K., Girotto E., Iamoni M. & Thonghini C., 2018, “The Italian-Kurdish Excavations at Gir-e Gomel in the Kurdistan Region of Iraq. Preliminary Report on the 2017 and 2018 Field Seasons”, *Mesopotamia* 53, 67-162.
- Morandi Bonacossi D. & Iamoni M., 2015, “Landscape and Settlement in The Eastern Upper Iraqi Tigris and Navkur Plains: the Land of Nineveh Archaeological Project, Seasons 2012–2013”, *Iraq* 77, 9-39.
- Mousavi A. & Daryae T., 2012, “The Sassanian Empire: An Archaeological Survey, c. 220-AD 640”, in Potts D. (ed.), *A Companion to the Archaeology of the Ancient Near East*, Hoboken, 1076-1094.
- Palermo R., 2016, “Filling the Gap: The Upper Tigris Region from the Fall of Nineveh to the Sassanians. Archaeological and Historical Overview Through the Data of the Land of Nineveh Archaeological Project”, in Kopanias K. & Macginnis J. (ed.), *The Archaeology of the Kurdistan Region of Iraq and Adjacent Regions*, Oxford, 277-296.
- Pappi C., 2016, “Satu Qala: An Assessment of the Stratigraphy of the Site”, in Kopanias K. & Macginnis J. (eds), *The Archaeology of the Kurdistan Region of Iraq and Adjacent Regions*, Oxford, 297-307.
- Peyronel L. & Vacca A., 2015, “Northern Ubaid and Late Chalcolithic 1-3 Periods in the Erbil Plain. New Insights From Recent Researches at Helawa, Iraqi Kurdistan”, *Origini* 37, 89-127.

- Pfälzner P. & Qassim H., 2017, “The First and Second Seasons of the German-Kurdish Excavations at Bassetki in 2015 and 2016”, *Zeitschrift für Orient-Archäologie* 10, 10-43.
- Pfälzner P. & Qassim H., 2018, “Urban Developments in Northeastern Mesopotamia from the Ninevite V to the Neo-Assyrian Periods. Excavations at Bassetki in 2017”, *Zeitschrift für Orient-Archäologie* 11, 42-87.
- Pfälzner P. & Sconzo P., 2015, “First results of the Eastern Habur Archaeological Survey in the Dohuk Region of Iraqi Kurdistan. The Season of 2013”, *Zeitschrift für Orient-Archäologie* 8, 1-32.
- Pfälzner P. & Sconzo P., 2016, “The Eastern Habur Archaeological Survey in Iraqi Kurdistan. A Preliminary Report on the 2014 Season”, *Zeitschrift für Orient-Archäologie* 9, 10-69.
- Radner K., 2011, “Assyrians and Urartians”, in Steadman S. & McMahon G. (eds), *The Oxford Handbook of Ancient Anatolia (10,000-323 BCE)*, New York, 734-751.
- Reade J., 1978, “Studies in Assyrian Geography”, *Revue d'assyriologie et d'archéologie orientale* 72, 47-72, 157-180.
- Reade J. & Anderson J., 2013, “Gunduk, Khanes, Gaugamela, Gali Zardak: Notes on Navkur and Nearby Rock-Cut Sculptures in Kurdistan”, *Zeitschrift für Assyriologie* 113, 68-122.
- Reade J. & Ur J., 2015, “The Hydraulic Landscape of Nimrud”, *Mesopotamia* 50, 25-51.
- Rothman M. (ed.), 2001, *Uruk Mesopotamia and Its Neighbours: Cross-Cultural Interactions in the Era of State Formation*, Santa Fe.
- Rothman M., 2002, *Gawra: The Evolution of a Small Prehistoric Center in Northern Iraq*, Philadelphia.
- Rouault O. & Masetti Rouault M.-G., 2016, “Les briques inscrites de Qasr Shemamok : migrations, réutilisations et valeur documentaire”, in Perello B. & Tenu A. (eds), *Parcours d'Orient : mélanges offerts à Christine Kepinski*, Oxford, 214-215.
- Rova E. (ed.), 2019, *Tigridian Region*, Turnhout.
- Rova E. & Weiss H. (eds), 2003, *The Origins of North Mesopotamian Civilization: Ninevite 5 Chronology, Economy, Society*, Turnhout.
- Sallaberger W. & Schrakamp I., 2015, *History and Philology*, Turnhout.
- Schwartz G., Brinker C., Creekmore A., Feldman M., Smith A. & Weber J., 2017, “Excavations at Kurd Qaburstan, a Second Millennium BC Urban Site on the Erbil Plain”, *Iraq* 79, 1-43.
- Sconzo P., 2019, “Pots and Places in the Late Chalcolithic Period. A View From the Eastern Habur Region (Kurdistan Region, Iraq)”, *Paléorient* 45, 137-162.
- Shawaly K., 2015, “Quelques remarques sur les turukkéens au deuxième millénaire av. J.-C.”, in Marti L., Nicolle C. & Shawaly K. (eds), *Recherches en Haute Mésopotamie II. Mission archéologique de Bash Tapa (campagnes 2012-2013) et les enjeux de la recherche dans la région d'Erbil*, Paris, 13-21.
- Speiser E., 1935, *Excavations at Tepe Gawra* 1, Philadelphia.

- Stein G., 2012, "The Development of Indigenous Social Complexity in Late Chalcolithic Upper Mesopotamia in the 5th-4th Millennium BC. An Initial Assessment", *Origini* 34, 125-151.
- Stein G. & Fisher M., 2019, "Surezha Excavations 2018. Erbil Plain, Kurdistan Region, Iraq", *The Oriental Institute 2018-19 Annual Report*, 125-138.
- Tenu A., 2009, *L'expansion médio-assyrienne : approche archéologique*, Oxford.
- Tobler A., 1950, *Excavations at Tepe Gawra 2*, Philadelphia.
- Ur J., 2010, *Urbanism and Cultural Landscapes in Northeastern Syria. The Tell Hamoukar Survey 1999-2001*, Chicago.
- Ur J., 2018, "Water for Arbail and Nimrud", in Kühne H. (ed.), *Water for Assyria*, Wiesbaden, 57-75.
- Ur J., De Jong L., Giraud J., Osborne J. & Macginnis J., 2013, "Ancient Cities and Landscapes in the Kurdistan Region of Iraq: The Erbil Plain Archaeological Survey 2012 Season", *Iraq* 75, 89-118.
- Wilhelm G., 1989, *The Hurrians*, Warminster.
- Wirth E., 1962, *Agrargeographie des Irak*, Hambourg.
- Yuhong W., 1994, "The Localization of Nurrugum and Ninet = Ninuwa", *Nouvelles assyriologiques brèves et utilitaires*, 35-37.
- Ziegler N., 2004, "The Conquest of the Holy City of Nineveh and the Kingdom of Nurrugum by Samsî-Addu", *Iraq* 66, 19-26.



FIG. 1: Location of Amyan and the main Bronze Age archaeological sites of Northern Mesopotamia (background map M. Sauvage)

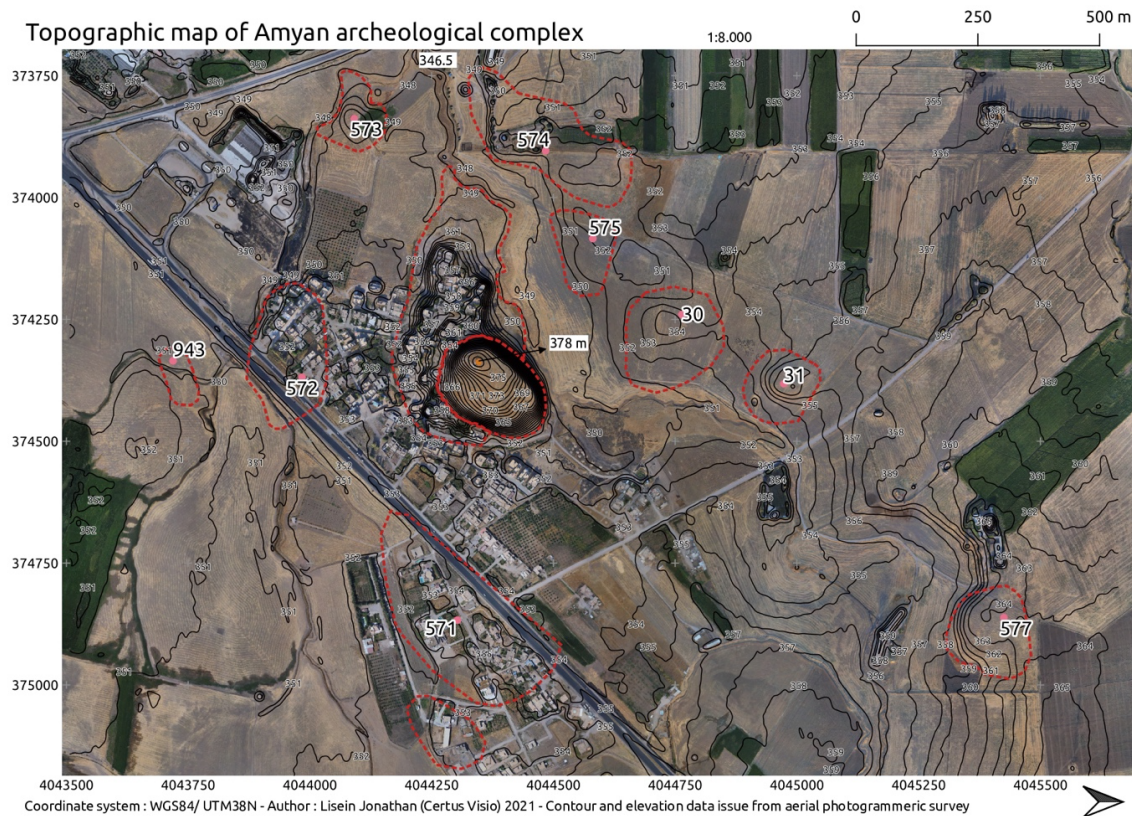


FIG. 2: The cluster of nine sites around the main mound of Amyan (MAA)

	Main Mound 4 ha	Lower Town 14 ha	30 3.5 ha	31 1.8 ha	571 10 ha	572 3.7 ha	573 1.2 ha	574 4.7 ha	575 1.7 ha	577 2.4 ha	943 0.7 ha
Hassuna 7000-6000 BC			X	X							
Halaf 6000-5300 BC				X							
Ubaid 5300-4500 BC				X							
L. C. 1-2 4500-3900 BC	X			X							
L. C. 3-5 3900-3000 BC	X	X		X							
Ninevite 5 3000-2500 BC	X					X					
Late 3rd mill. 2500-2000 BC	X	X	X		X	X		X	X		X
MBA 2000-1600 BC	X	X	X	X	X		X	X		X	X
Mitanni 1600-1300 BC	X	X				X		X	X		
Middle-Ass. 1300-1000 BC.	X	X			X			X			
Neo-Ass. 1000-612 BC	X	X	X	X		X	X				
Post-Ass. 612-330 BC	X										
Hellenistic 330-125 BC	X	X		X			X			X	
Parthian 125 BC-250 AD	X	X		X			X			X	
Sassanian 250-650 AD											
Early Isl. 650-1000 AD		X					X			X	
Middle Isl. 1000-1300 AD		X		X						X	
Late Isl. 1300-1900 AD											

FIG. 3: Periods attested on the site of Amyan and peripheral sites

AERIAL MAPPING OF AMYAN

Jonathan LISEIN¹

Introduction

In September 2021, the second part of the topographic study initiated in 2019 was carried out.² The previous study had been carried out on the site in order to provide the first reconnaissance, and this second mission was carried out using a drone. Using the overhead images of the site of Amyan and the peripheral sites previously recorded by the LoNAP team,³ together with the results of the work done in 2019, the objective was to produce a topographic map of the entire area. The drone work was carried out on site by Jonathan LISEIN, photogrammetric expert at the University of Liege, with the kind help of Omar SHAREF, archaeologist from the Directorate of Antiquities in Akre, and Muhammad Aziz KARIM, mokhtar of Amyan.

The mapping operations were performed with a small Unmanned Aerial System (drone) over the Amyan archaeological complex (Iraqi Kurdistan). The Amyan site group is a cluster of ten sites spread over a distance varying between 400 m and 1200 m from the main Amyan mound. The use of the UAS (here a Parrot Anafi drone) has many advantages over terrestrial mapping. UAS has been used for some years now in archaeology, as this technology can adequately replace traditional topographic measurements that are extremely time-consuming. Due to constraints related to security reasons, the survey had to be completed in a short time; hence, the use of a UAS was particularly convenient. The survey's goal is to deliver a topographic map of the site complex, with a focus on the terrain levelling by photogrammetry. During this survey, 13 flights were made and about 1200 aerial images were recorded. Oblique views and videos were also taken to illustrate the environment of the archaeological sites.

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² For the report of the first topographical survey, see Couturaud & Bechetoille 2020.

³ See Morandi Bonacossi 2020.

Methodology of the Photogrammetric Survey

The Parrot Anafi drone is a very lightweight multirotor drone (320 gr) which has a flight duration exceeding 20 minutes (Fig. 1). The sensor is a wide-angle camera with a focal length of 35 mm, equivalent of 23 mm. It delivers images of 21 Mpixels. The ground control station consists of the remote controller and an android-powered CROSSCALL smartphone. This unmanned aerial vehicle is designed by a French company and is one of the smallest civil drones that are appropriate for this kind of survey. The image exposure is set automatically by the drone firmware.

Flights were performed either manually in First Person View mode (i.e. piloting based on video retransmission), which requires manual triggering of the images, or with a flight plan application (pix4D capture) that enables the automatic covering of an area with constant flight altitude and image overlap. An image overlap of at least 75% was maintained as often as possible. Flight altitude was chosen as a trade-off between the individual image footprint, the size of the area to cover and the required Ground Sample Distance (i.e. image resolution).

Due to the size of the mapped area, which is a rectangle 2300 m long and 1700 m wide, flights were done at an altitude of 250 m above ground level, which is quite a high altitude for this UAS model. A high altitude was chosen in order to cover a large area over a short period. Secondly, flights at a lower altitude were also performed, but only above the mound of Amyan.

Georeferencing and camera calibration is a crucial step of the photogrammetric workflow. Here the methodology used for the survey is summarized. Every single image is geotagged by the drone GPS. Although this information is not very accurate, the redundancy (1200 images means 1200 GPS positions) ensures quite a good performance in planimetry (X and Y axis). Considering that GPSs are not very accurate in altimetry and that a poor camera geometric calibration may result in inaccurate altimetric measurements, the only way to provide accurate photogrammetric measurements of the elevation is to use additional ground levelling information (Fig. 2). Thus, eight ground control points that were measured with a total station were used. Four of them consisted of targets (black and white wooden board) that were placed on the mound prior to the flight. The rest consisted of objects that are easily recognized in the aerial images, mostly corners of the roofs of the village buildings. The photogrammetric levelling technique is thus an approach which combines three different technologies: information from the image bloc, measurements from the drone GPS and topographic measurement on the ground.

Photogrammetric processing was done with Agisoft Metashape 1.7.2. Alignment quality was set to medium mode, with a maximum number of images featuring 10,000 tie points with a threshold of 1000 tie points. Dense matching was performed on images resampled with a factor 8 (low quality mode) on 512 images. The photogrammetric dense matching delivers a digital surface model, which is a map of the altitude for every position. This DSM was used for the contour generation (level curve with 1 m interval). Computation of the orthophotomosaic aims at generating images with a resolution of 20 cm per pixel.

In addition to the mapping of the archaeological complex, flights at a lower altitude of 140 m over the mound of Amyan were also made. Relief can thus be represented by contour curves which are more precise. An orthophotomosaic of a resolution of 10 cm has been computed.

Results and Perspectives

After a few days of flight and aerial surveying, a first topographic map of the archaeological complex of Amyan was delivered, with colour gradients to illustrate the elevation of the ground surface (Fig. 3). Above the mound of Amyan, some flights at lower altitude provided more accurate orthophoto and contour level curves than flights over the whole Amyan cluster (Fig. 4).

The resulting digital elevation model and orthophotomosaic will be very useful for the localization of all visible features of any interest. For example, roads, trees, rivers and house may be digitized in order to create maps. More importantly, the absolute location (X, Y, Z) of any points can be determined from this model.

Bibliography

Morandi Bonacossi D., 2020, “The Amyan Archaeological Complex Survey by the Land of Nineveh Archaeological Project”, in Couturaud B. (ed.), *Archaeological Expedition in Amyan. Report of the First Campaign (2019)*, Erbil, 14-26.

Couturaud B. & Bechetoille S., 2020, “First Reconnaissance and Topographical Survey of the High Mound”, in Couturaud B. (ed.), *Archaeological Expedition in Amyan. Report of the First Campaign (2019)*, Erbil, 27-35.



FIG. 1: The Parrot Anafi drone (Dottensm)



FIG. 2: Illustration of topographic ground measurements, one of the ground targets (left) and Omar Sharef operating the total station prism at a roof corner of a modern building (MAA)

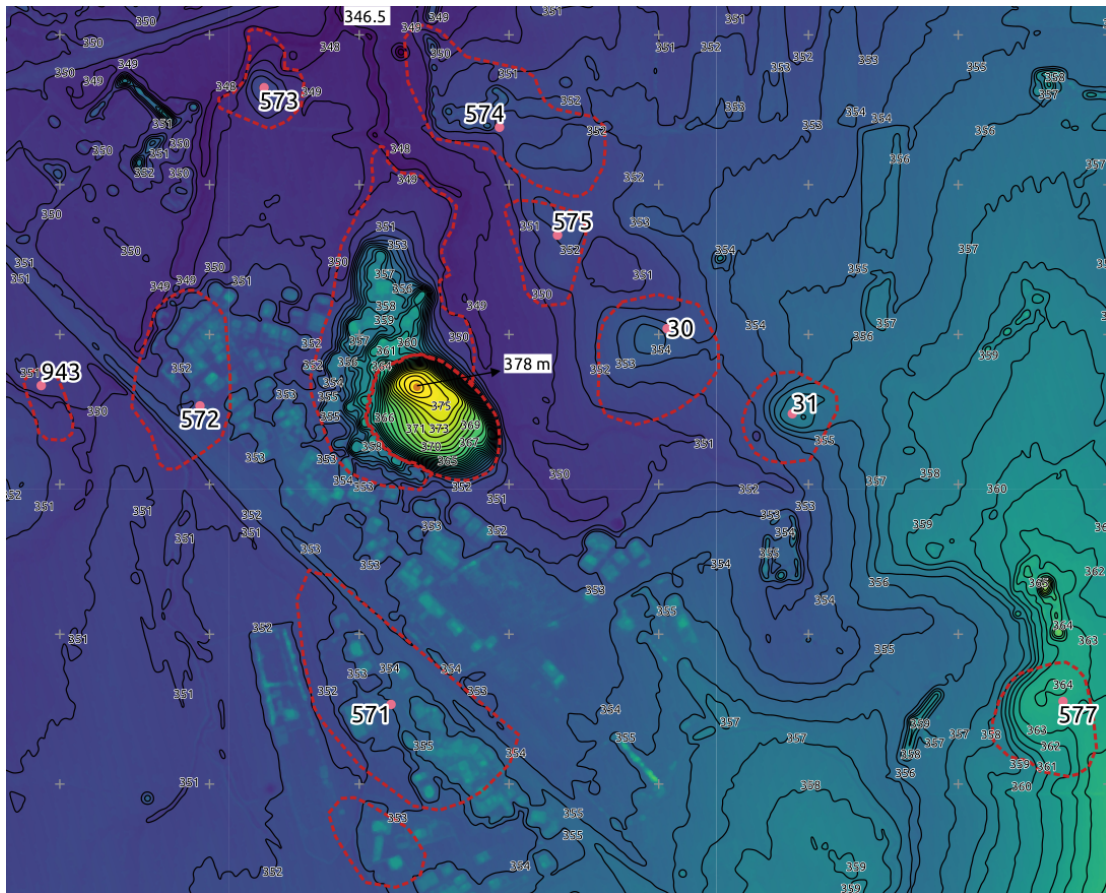


FIG. 3: Topographic map of the archaeological complex of Amyan, north being to the right (MAA)

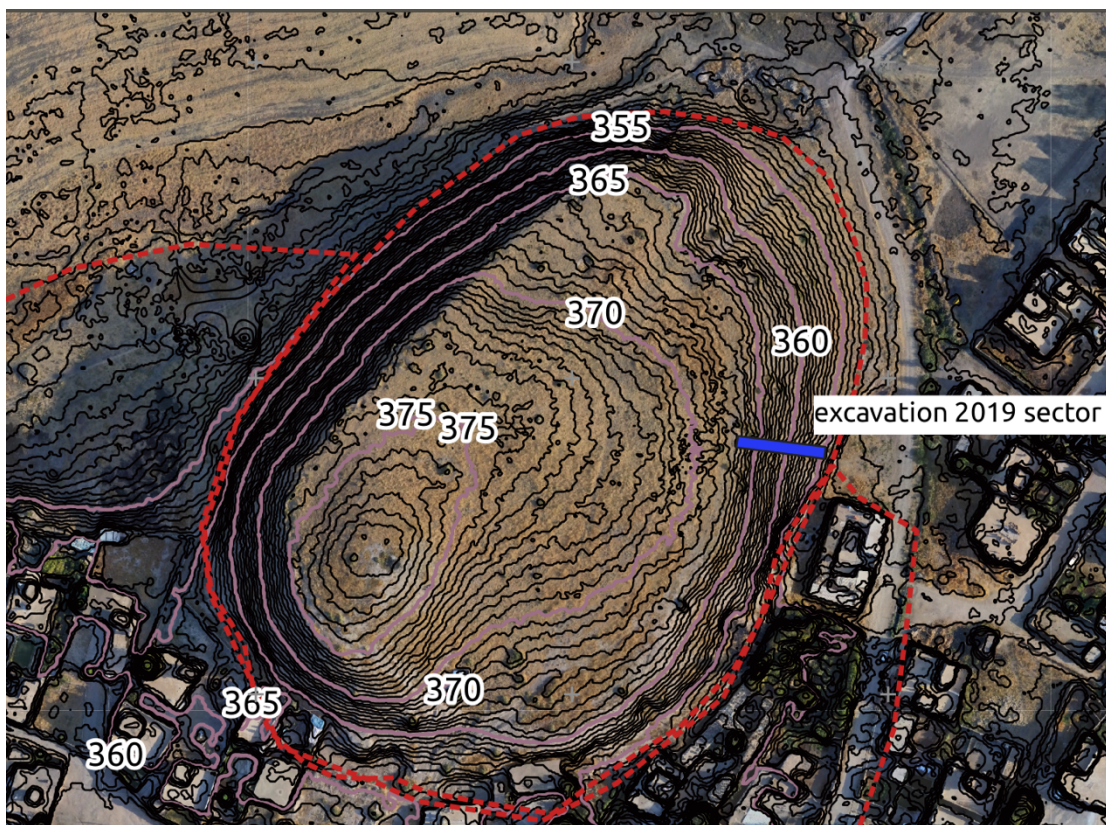


FIG. 4: Detailed view of the contour level curves on the main site of Amyan (MAA)

THE CERAMIC

Georges MOUAMAR¹

André DESMARAIS²

Introduction

The ceramic material recovered in 2019 was only partially studied, not be fully recorded, during the field season due to time constraints.³ The study was completed in June 2021 by George MOUAMAR, associate researcher at CNRS, Archéorient-UMR 5133. The study took place over 10 days in the Ifpo building in Erbil. All the sherds were brought there from Akre, with the kind support of the Directorate of Antiquities. The study focused mainly on observations on production techniques: study of wares, firing techniques, a morphological study, surface treatments and decoration. The refinement of the dating and the establishment of a preliminary ceramic typology is ongoing and will be completed in the future. Using photographs, an analysis of papillary traces (fingerprints) was also carried out. The results of this overall study provide an initial understanding of the ceramics used and/or produced at Amyan.

Methodology

The Amyan ceramic sherds had previously been counted by category and shape and an estimation of the Minimum Number of Individuals (NMI) provided a better understanding of pottery usage. Representative pieces were numbered from 1 to infinity within each US (e.g.: AM19.A2.1212.001). This number was used in the photographs and drawings of the sherds as well as in this report.

A second sorting for reassembly and quantification was carried out, based on the quality of the ceramic fabric and the presence of surface treatments or decorations. After the selection of the US to be analysed, the material was studied according to the stratigraphic indications. After the sorting, reassembly within the US was done.

During this study season, the numbering of the diagnostic sherds of each US was continued. Only the sherds that could, in one way or another, be linked to the typology

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³ The pottery from Amyan was the subject of a first study season carried out in 2019 by Taos Babour, see Babour 2020.

were recorded for study, either because they allowed us to reconstruct the shape of a vessel, or because they bore a decoration.

A total of 714 sherds have been registered in the 'Amyanpots' database, associated with descriptive sheets, photographs of the sherd, and a microscopic view of the section. It should be noted that all the material studied comes mainly from secondary contexts; the interpretations and dating of the ceramics have been restricted to a chronological framework dating from the second and first millennia BC. Conclusions concerning the assemblages will be drawn during subsequent studies. Initial observations on production techniques were recorded as such and remain to be deepened and systematized.

The study of the ceramic material was carried out in three stages, which more or less reflected the production process. The study protocol thus aimed to better understand the manufacturing techniques and to follow their evolution through the different chronological phases of Amyan. The first step was to study, through a technological approach, the categories of paste and firing methods, emphasizing the links between them. The second step was the morphological study, which allowed the forms of each chronological phase to be classified and the characteristics of each morphological type to be determined. The third step was the study of surface treatments and decoration, focusing on the evolution of the ornamentation in order to specify the decorative characteristics of each chronological phase.

The study of Amyan paste categories was essentially based on macroscopic observation with a binocular magnifier, which was carried out on 384 sherds. Macroscopic observation shows that the majority of Amyan material consists of medium-fine fabrics, with vegetal temper in the form of chopped straw and with traces of desiccation. The plant impressions (straw) can reach 2 to 3 mm (Fig. 1). In spite of the abundance of vegetal inclusions, a few white and brown mineral inclusions, smaller than 250 μm , were observed. Their presence does not seem to result from a deliberate addition, but from their natural presence in the clay. The colour of the paste is heterogeneous with a dark core and beige or orange margins. This phenomenon indicates a reducing firing and an oxidizing post-firing (mode A).

Other paste groups were distinguished, such as fine ceramics (Fig. 2). These are characterized primarily by the fineness and hardness of the pastes. No inclusions are visible to the naked eye.

Macroscopic observation has revealed a fine and compact texture (calcareous fabrics). The temper is mainly mineral. It contains coloured inclusions, their shapes are rather blunt and the dimensions are between 100 and 200 μm . The paste is of a light beige colour testifying to the use of an oxidizing post-firing atmosphere.

Cooking Ware pots are very rare. Some of these sherds bear traces of burnishing or polishing. They are characterized by the presence of coarse mineral inclusions, even if a few vegetal imprints are visible, their presence appearing here more accidental than deliberate. The mineral temper is quite abundant. It is essentially composed of large white (translucent or opaque) and black grains. The shapes are rather angular and the average dimensions are between 500 μm and 1 mm. Their distribution is heterogeneous, and their angular shape suggests that their presence results from deliberate addition (Fig. 3). The paste is grey in colour and shows evidence of a type B firing and reducing post-firing.

Regarding morphological classification, 364 sherds were drawn during this study season (making a total of 694 sherds drawn in 2019 and 2021). These sherds will be

used to build a preliminary typology of Amyan's sherds. This approach consists of recognizing common characters, allowing them to be grouped into classes, and defining these classes by the set of these characters. The aim of our morphological study is to produce a typology of forms for each chronological phase established according to the stratigraphic study, leading in particular to the study of the standardization of the forms. The aim is then to distinguish the typical forms of each chronological phase. We will also look at the morphological evolution of each ceramic type, according to its chronological development.

Analysis of Fingerprints

This analysis was done using 124 detailed photographs showing fingerprint traces observed on eight sherds. The study was based on the principles described as early as 1892 by Galton concerning moulded traces of human origin.⁴ This type of trace coexists with two other types, that of 'visible' traces and that of 'latent fingerprints',⁵ which require specific protocols to be followed to reveal them. The whole of the palm of the hand contains exclusive markings, specific to an individual, which allow a unique and precise identification. Emphasis is always placed on the prints produced by the third phalanx, which contain particularly rich patterns in terms of identification potential. The digital patterns produced by this third phalanx are always made up, in a decreasing manner, of loops, whorls or arch figures (Fig. 4). The particularities of the papillary ridges, also called 'minutiae', correspond to a classification accepted by the scientific community. It is by following this protocol of observation, analysis and comparison that we have studied the shards of Amyan.⁶

Although of unequal quality, two types of moulded traces are present on the sherds: traces on which the type of figure can be partially determined and traces produced on a wet support.

Considering the sherd AM19. A3.1410. 007, trace A has a minimum of seven minutiae designated by the circles (Fig. 5). The centre of the trace is unclear. It could be a right-hand loop type trace (Fig. 6). Trace B has no more than two minutiae designated by the circles. The centre of the trace is blurred. It could be a whorl type trace. Without presuming the finger at the origin of trace A, the axis of the hand was more or less similar, as regards the production of this trace (Fig. 7).

Several traces produced on wet surfaces have been documented. We will focus on the trace observed on sherd AM19.A2.1212.017 (Fig. 8). The configuration of the traces on this object would confirm the hypothesis of pressure exerted by the tip of the finger. However, the digital drawing does not correspond to any of the known categories (Fig. 9). This trace pattern, which can be attributed to the pressure of the fingertip against a rather wet surface, was also observed on sherd AM19.A3.1411.054 and to some extent on sherd AM19.A2.1212.018, although in the latter case the trace is partially slipped. This phenomenon of alteration of the details of moulded traces produced on a wet, or very wet, clay has already been observed by Sjöquist: 'If the clay is extremely wet – for example, a very fluid clay – when the hand is removed from its surface after it has been affixed, the clay forms a smooth surface. But if the clay is firm,

⁴ Galton 1892.

⁵ Locard 1951.

⁶ Lambert *et. al.* 2018.

the reliefs are so inconsistent that they fall apart. After drying, the ridges are diffuse and prevent the original biological features from being observed.⁷

Finally, three sherds bear traces that may be of non-human origin (Fig. 11). They are aligned on the line of grooves produced on the surface of these pots. Grey segments are superimposed on artifacts observed on the surface of these two traces, located on two distinct elements (Fig. 10): it is likely that these two traces have a common source, and it is possible that they are not traces of human origin, but rather tool marks. The traces observed in detail on the previous image may also have the same source.

Conclusion and Future Objectives

The purpose of this initial approach was to organize the collected data in a clear and exploitable way. The 714 sherds recorded will allow us to sketch out a classification of the existing technical groups and their respective morphological features, and then to place the Amyan assemblages in the regional historical context, by comparison with the productions already uncovered at other sites. More general conclusions will be drawn after the cross-referencing of field results, specialized studies, analyses and possible laboratory studies (petrographic and physicochemical analyses) and the more complete study of the documentation. Future studies, supported by this first approach to the Amyan archaeological material, should allow a second stage of cross-referencing and analysis of the data. The complete results of the typological study will feed the study of the more precise dating of the archaeological contexts. The thorough exploitation of the data will make it possible to refine the identification and typological structure of the ceramics.

These preliminary data already open up very interesting perspectives regarding Bronze Age material culture and the synchronization of periodizations of key sites in Iraqi Kurdistan. At this stage, we are considering the implementation of an extensive archaeometric analysis program (physicochemical and petrographic) including the Amyan ceramic material. This approach will provide essential data that will allow us to establish petrographic and geochemical references for this site and region for the first time. The expected results will allow the definition of a regional reference corpus of material and a re-evaluation of the cultural sequence and history of Northern Mesopotamia during the Bronze Age.

Bibliography

Babour T., 2020, "The Pottery", in Couturaud B. (ed.), *Archaeological Expedition in Amyan. Report of the First Campaign (2019)*, Erbil, 66-73.

Galton F., 1892, *Finger Prints*, London.

Lambert A., Desmarais A. & Driard C., 2018, "Le site de la médiathèque Entre Dore et Allier à Lezoux (Puy-de-Dôme) : des traces papillaires antiques en contexte d'atelier de potiers", *Gallia* 75, 49-67.

Locard J., 1951, *Cours de police scientifique*, Joannès Desvigne, Lyon.

Sjöquist K.-E. & Aström P., 1991, *Knossos: Keepers and Kneaders*.

⁷ Sjöquist & Aström 1991.



FIG. 1: Photos of sherd sections, showing vegetal inclusions (MAA)

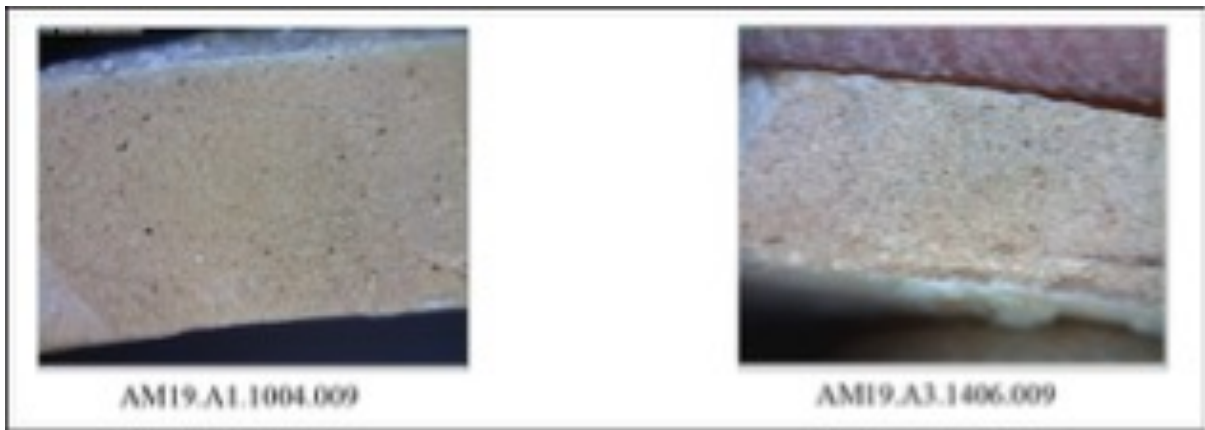


FIG. 2: Photos of sherd sections, showing fine paste (MAA)

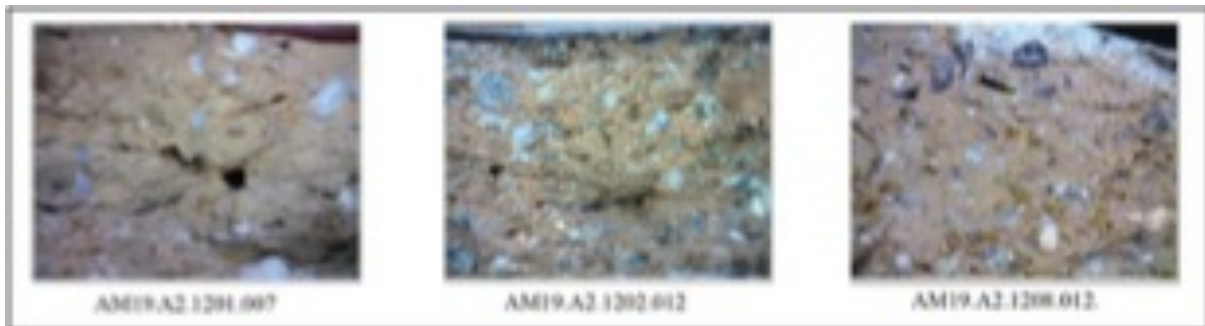


FIG. 3: Photos of sherd sections, showing coarse fabric (cooking ware) (MAA)



FIG. 4: Fingerprint figures: arch, loop and whorl (A. Desmarais)

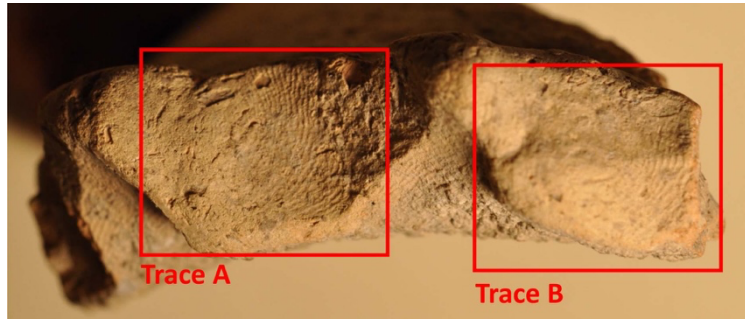


FIG. 5: Two types of traces on sherd AM19.A3.1410.007 (MAA)

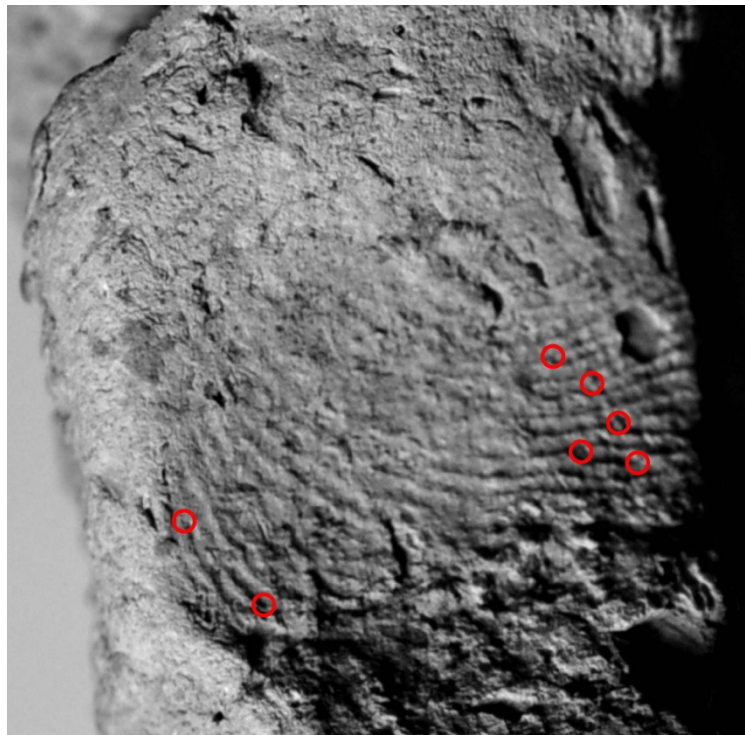


FIG. 6: Trace A on sherd AM19.A3.1410.007, the distal area is directed towards the top of the image. (MAA)

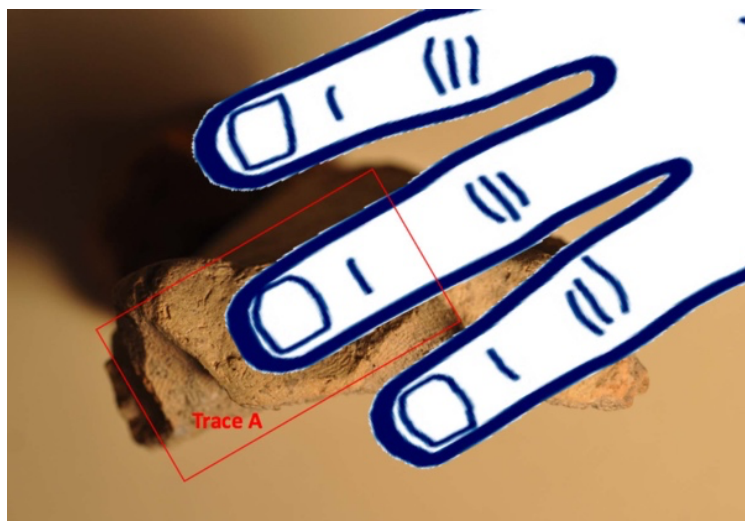


FIG. 7: Possible axis of the hand regarding trace A on sherd AM19.A3.1410.007 (MAA)

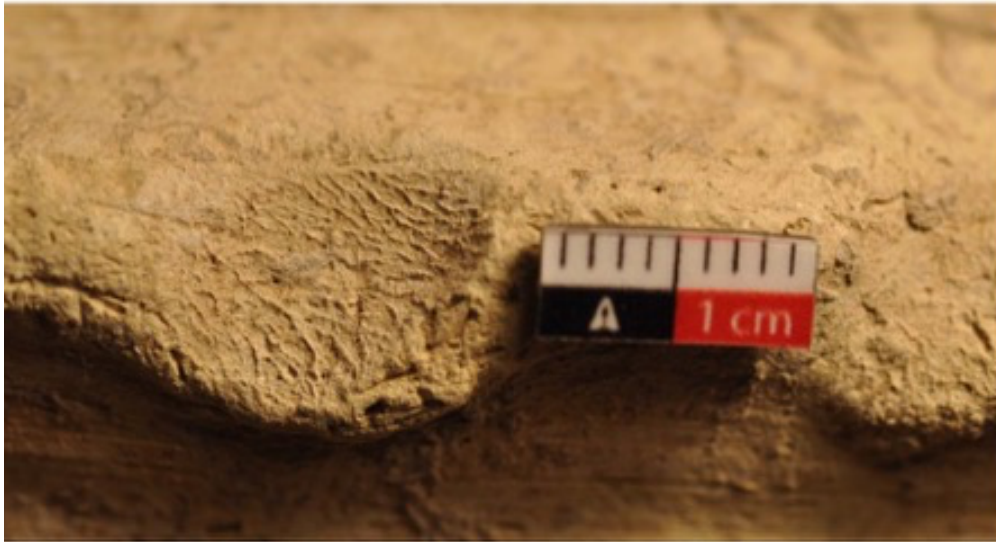


FIG. 8: Traces produced on wet surfaces observed on sherd AM19.A2.1212.017 (MAA)

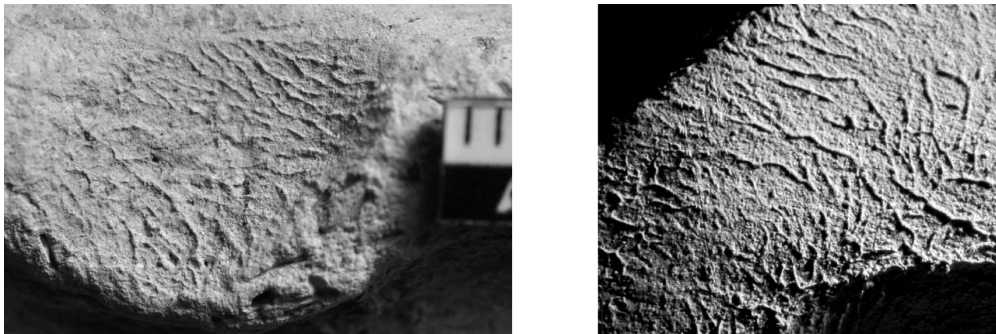


FIG. 9: Topography of a digital trace produced without a wet substrate as an experiment (right) compared to the trace present on AM19.A2.1212.017 (left) (MAA)

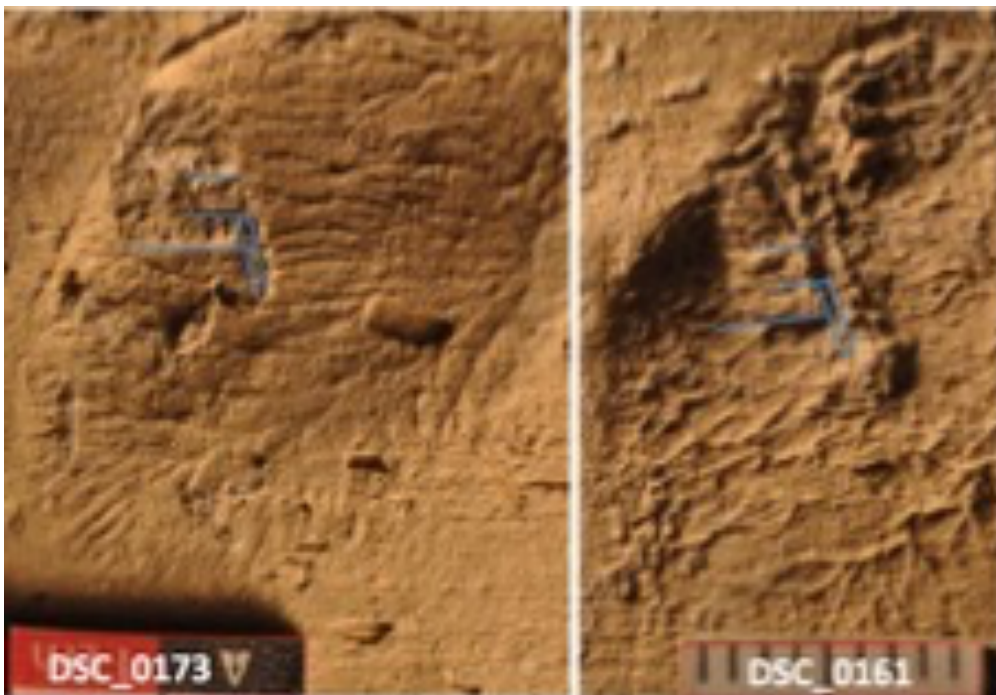


FIG. 10: Details of non-human traces (MAA)

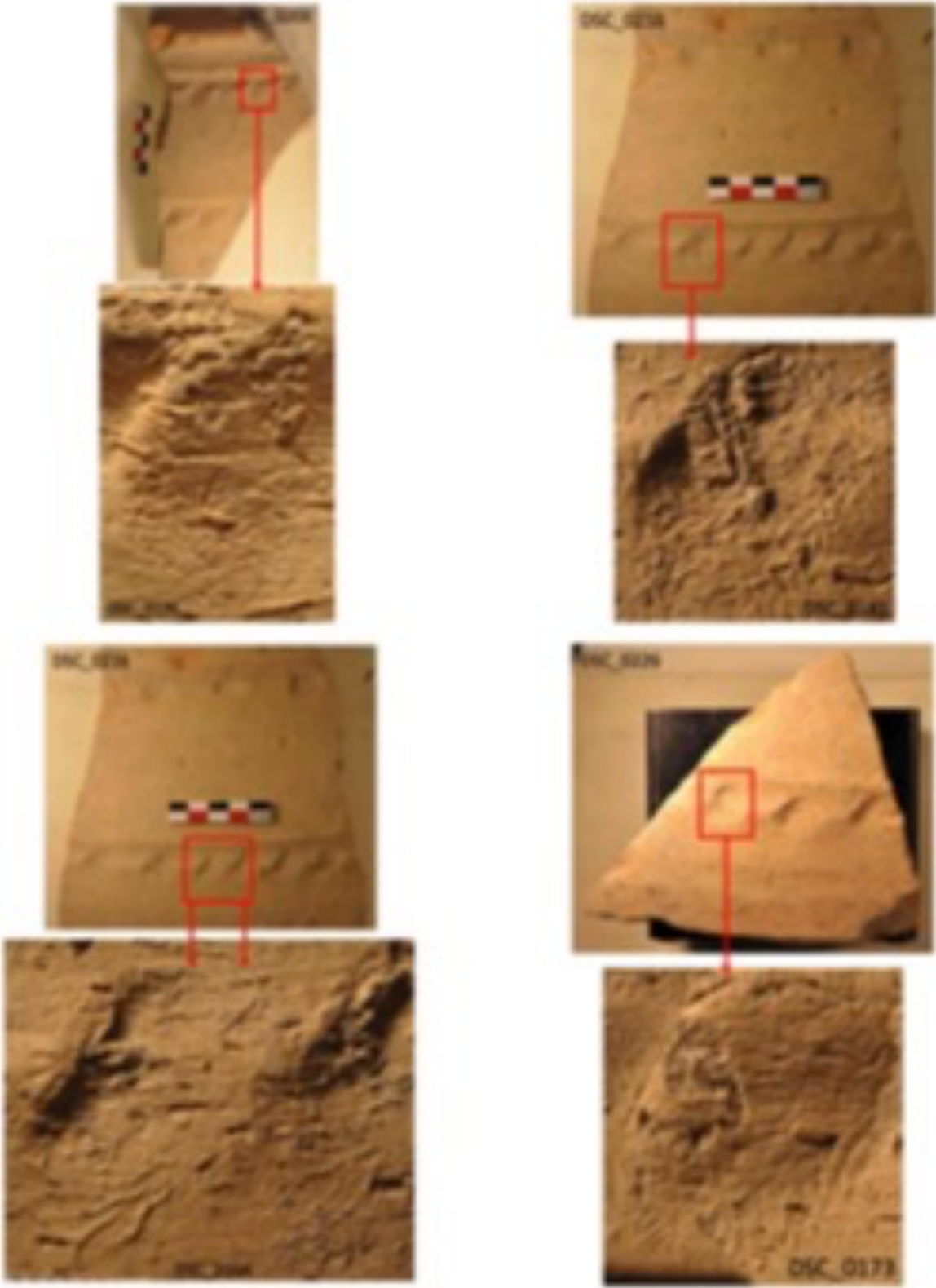


FIG. 11: Traces that may be of non-human origin (MAA)

THE ARCHAEOLOGICAL OBJECTS

Ali OTHMAN¹

Introduction

All the objects discovered in 2019 were hand-drawn by Ali OTHMAN, independent researcher. The drawings were then digitalized, giving the most accurate and sensitive rendering of the objects (Fig. 1). The study was undertaken in the Ifpo building during a week in June 2021, and has allowed a new detailed study of the objects, which were brought there from Akre where they are permanently stored.²

Drawings of the 2019 Artefacts

There are 25 objects in total, without including the pieces of slag; most of them are in a fragmentary state. These objects can be classified in 5 categories:

- 9 terracotta objects, consisting of 3 wall nails, 2 animal figurines, 2 clay scrapers or jar-stands, 1 lid and 1 playing dice or clay token;
- 9 objects made of various stones, including 4 weaver's weights, 3 fragments of basalt millstones, 1 pestle and 1 weight;
- 2 iron objects, namely 1 knife and 1 arrowhead with a triangular section;
- 1 flint blade;
- 4 very fragmentary stone objects.

The most notable of all these objects are the clay nails, which came in two forms, cylindrical and pyramidal. After cleaning object AM19-A2-1212-01, we identified a kind of incision running in lines, most likely an indication of a number (Fig. 2). We were also able to understand that the nail AM19-A2-1201-01 was complete and not the upper part of a broken nail, and that what we thought was a fourth clay nail, object AM-19-A1-1001-02, was actually a jar stopper (Fig. 3).

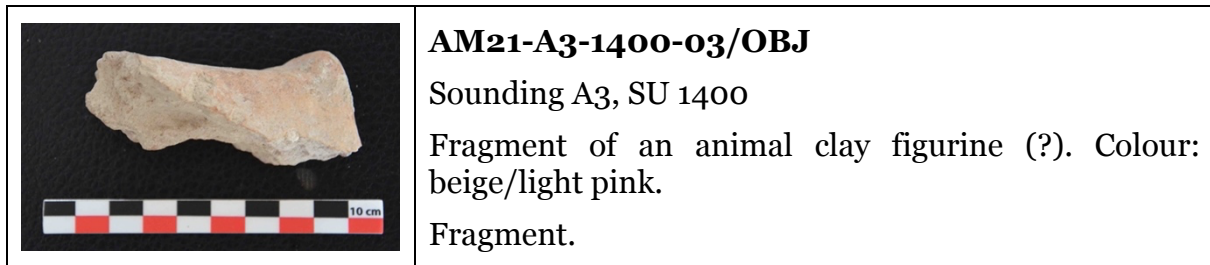
¹ Independent Researcher.

² For the previous publication of the objects, see Couturaud 2020.

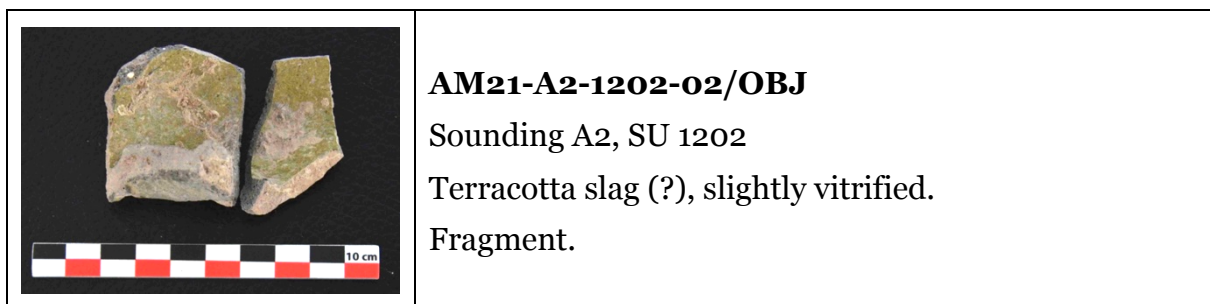
New Objects Found in 2021

While sorting the ceramics, two new objects were found among the sherds.

The first one is a terracotta object, perhaps a figurine or part of a chariot:



The second object is a slag of a ceramic pot:



Bibliography

Couturaud B., 2020, "The Artefacts", in Couturaud B. (ed.), *Archaeological Expedition in Amyan. Report of the First Campaign (2019)*, Erbil, 74-83.

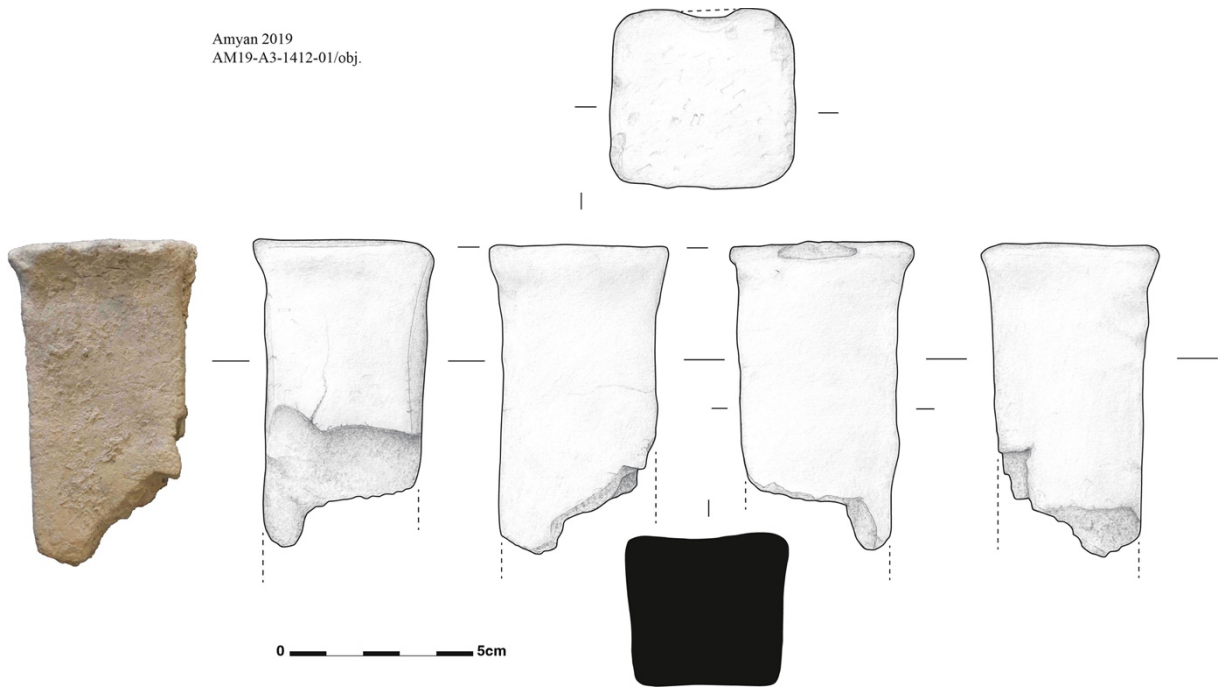


FIG. 1: Wall nail AM19-A2-1412-01 (MAA)

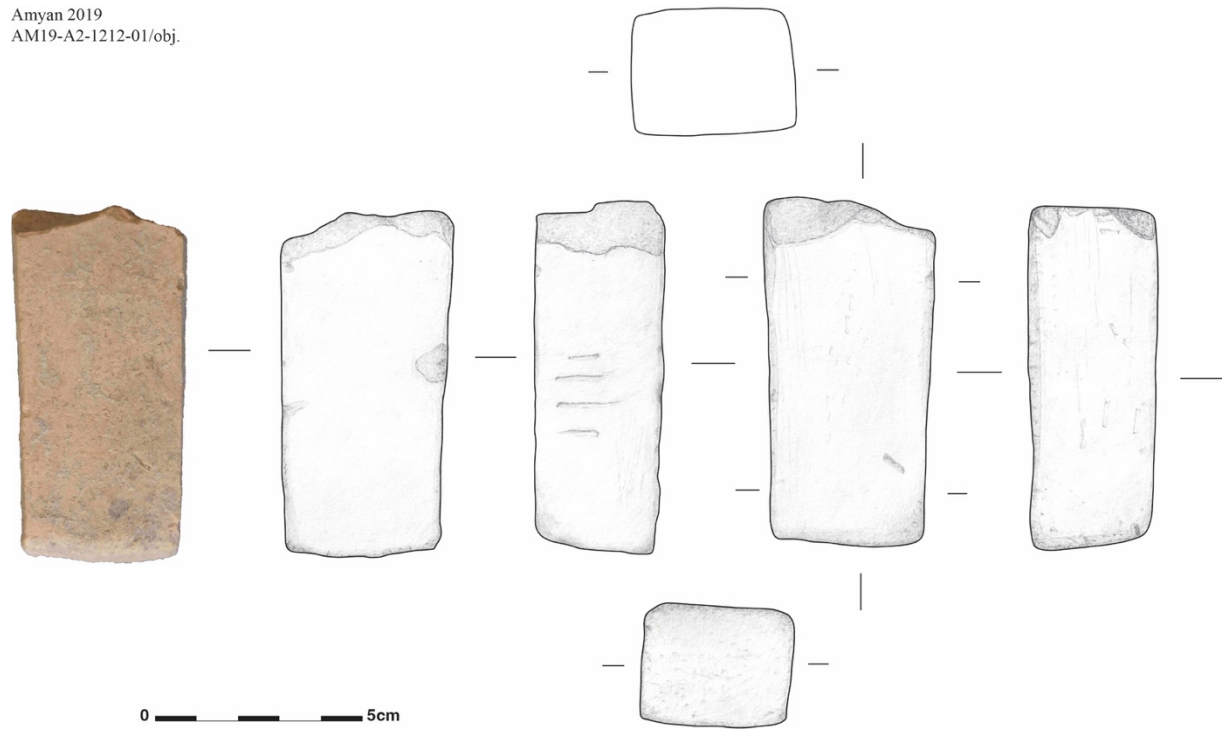
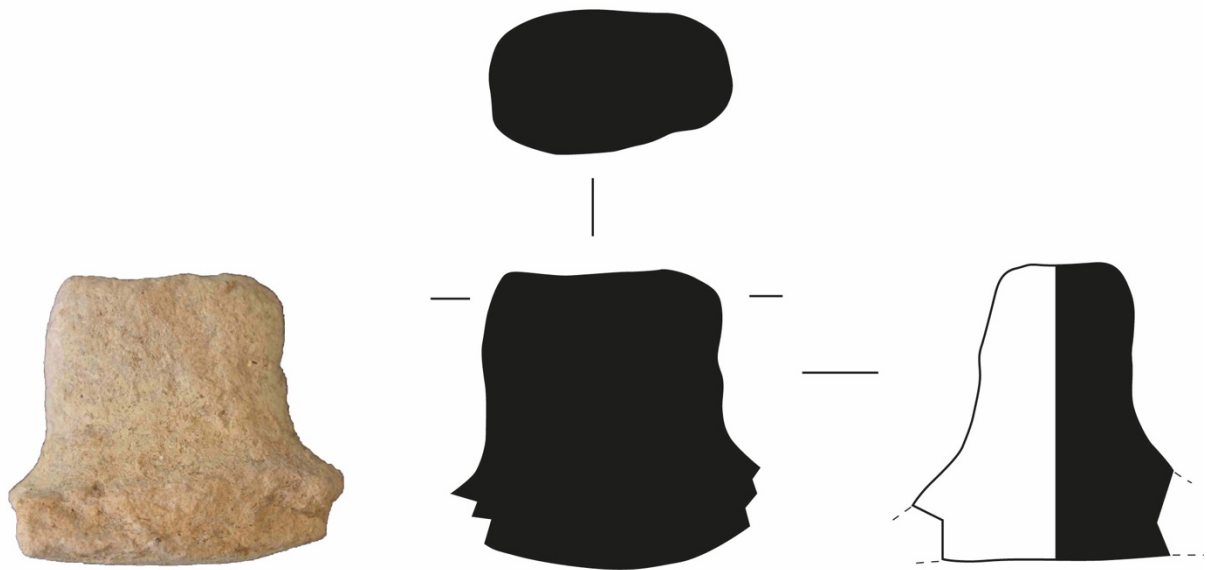


FIG. 2: Wall nail AM19-A2-1212-01 (MAA)



AM19-A1-1001-02/obj.

0  5cm

FIG. 3: Jar stopper AM-19-A1-1001-02, previously registered as a wall nail (MAA)