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Studies on Pre-Islamic Iran
and on Historical Linguistics

Scholarly editor Pavel B. LURJE

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The volume incorporates articles presented by the participants of the Eighth European Conference of Iranian Studies (in St Petersburg 14–19 September 2015) which were focused on Pre-Islamic Iran and on historical linguistics. The collected papers mirror the wide scope of Iranian studies of the present day: from business documents of Tumshuq in Xinjiang to those of the Syrian wars of the early Sasanians, from the etymology of the place-name Sudak to the pottery assemblages of Sistan of the Achaemenian period. The volume is addressed to Iranologists and specialists in neighbouring fields.

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On the front cover:
Medallion with camel on a Sogdian
silver lamp, 8th century, State
Hermitage Museum, St Petersburg

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EDITOR'S NOTE

The Eighth European Conference on Iranian Studies, organized by the *Societas Iranologica Europaea*, took place in Saint Petersburg, Russia, September 14th – 19th 2015. It was hosted by the State Hermitage Museum and by the Institute of Oriental Manuscripts of the Russian Academy of Sciences. At the closing session of the conference, the plans for the publication of the proceedings were announced, and many participants submitted their papers for publication.

As has been customary for previous European Conferences on Iranian Studies which took place in various research centers of Europe once in four years, the proceedings are divided into two volumes, the first on the Iranian peoples of the pre-Islamic period and the second on the Islamic period. We followed this tradition with little modification: three articles technically from the later period are included in the first volume. The two papers on historical linguistics of modern Iranian languages – Kurdish (Sebastian Heine) and Pashto (Matteo De Chiara) – are included in the first volume because the editors' experience suggests that subjects on historical linguistics are of greater interest for the scholars working on Old or Middle Iranian philology rather than those specializing in Persian literature. Camilla Insom's investigation of sacred places in Kurdistan, although focusing on the very recent period, is also included in the first volume since the underlying research was conducted in the framework of the Italian archeological mission to Iraqi Kurdistan, and the main results of that mission are presented here by Julian Bogdani and Luca Colliva, naturally in the first volume.

The wide range of the volume, in chronology, geography and variety of subjects reflects the state of the art in Iranian studies in various centers today. It is important to note that, amid the contributions of senior active scholars, we see the first papers of younger researchers who will form the landscape of Iranian studies in future decades.

Some technical notes are in order. The papers are organized alphabetically by author. We attempted to make a uniform system of notes and references. We did not pursue the goal of making uniform transcriptions or transliterations of Persian, Avestan, Russian or other languages. The different aims of research often dictate different system of rendering of foreign languages.

We are grateful to Doug Hitch (Whitehorse) for his correction of the English grammar and style of the papers as well as for many valuable suggestions on the subjects of many articles on linguistics, to Aleksandr Stadnik (the Hermitage publishers) for careful layout of the volume, to Julia Redkina and Daria Gaskevich for much advice on the final shape of the book as well to the Hermitage publishers in general for accepting for publication the volumes of the proceedings of the Eighth European Conference on Iranian Studies.

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THE POTTERY FROM DAHANE-YE GHOLAMAN (SISTAN): THE STATE OF ART

Summary

Discovered in the early 60s of the past century by an Italian archaeological team of the IsMEO (Istituto per il Medio ed Estremo Oriente) directed by Umberto Scerrato, the site of Dahane-ye Gholaman, in Iranian Sistan, represents a key site in the archaeology of the Achaemenid period on the Iranian Plateau. Italian and Iranian archaeological activities at the site revealed an important complex of buildings dated to the Achaemenid period (interpreted as the main urban centre of ancient *Zranka / Drangiana*) and led to the formation of a large assemblage of pottery fragments. Notwithstanding the scientific efforts made by several Iranian and Italian scholars in recent decades, the corpus of the pottery from Dahane-ye Gholaman remains partially unpublished and more exhaustive publications are still awaited. This paper aims at outlining the state of the research on the topic.

1. Archaeological Activities at Dahane-ye Gholaman and Related Pottery Studies

1. 1. *The IsMEO activities at Dahane-ye Gholaman (1962–1978)*

The archaeological site of Dahane-ye Gholaman, located in Iranian Sistan, at some 30 kilometres southeast of Zabul (Figs. 1–2), was discovered in November 1960 by the Italian archaeologist Umberto Scerrato, as part of the archaeological activities carried out in that region by the Italian team of the IsMEO (Istituto per il Medio ed Estremo Oriente). Already after two brief surveys in the area (in November 1960 and November 1961), the hypothesis that the site had to be interpreted as a complex of buildings dated to the Achaemenid period was put forward (*Scerrato* 1962. P. 186), especially by virtue of preliminary observations concerning the layout of the buildings detectable at the site¹. In addition, pottery fragments collected on the surface (*Ibid.* P. 188, Figs. 13–16) were considered ‘amply comparable’ (*Ibid.* P. 187) with the materials coming from the Sorkh Dagh at Nad-i Ali, in Afghan Sistan, where previous archaeological activities had shown evidence dated to the Achaemenid period².

The IsMEO excavations at Dahane-ye Gholaman were carried out from 1962 until 1965. Features of some of the buildings detected at the site (Fig. 3)³ led it to be interpreted as the possible capital city⁴ of the Achaemenid satrapy mentioned as *Zranka* in the royal Achaemenid inscriptions and also known as *Drangiana* in classical sources (*Scerrato* 1966a; 1966b; 1966c; 1966d; 1970; 1972; 1974; 1979; *Gnoli* 1966; 1967).

Ceramic materials from the site were discussed in the preliminary report of the 1962 and 1963 fieldwork seasons (*Scerrato* 1966b. P. 26–27, 29–30, Figs. 52–61). According

to Scerrato (*Ibid.* P. 29–30), the best comparisons for many pottery vessels at Dahane-ye Gholaman were represented by materials coming from Ghirshman's excavations at Nad-i Ali, especially the ones assigned to Period I by the French scholar⁵. Carinated bowls (*Ibid.*: Figs. 52, 53, 58, 61) and large basins (*Ibid.*: Fig. 59), instead, found closer parallels among the assemblage collected on the surface at Nad-i Ali by Fairservis. Analogies between bowls with horizontal rims attested at Dahane-ye Gholaman (*Ibid.*: Figs. 52, 58) and similar vessels from Persepolis were also stressed by Scerrato, while characteristic large basins on a trumpet base (*Ibid.*: Fig. 60) were compared with materials from Kobadian I and Afrasiyab in ancient Sogdiana and also from Balkh, in ancient Bactria. Cylindrical-conical beakers (*Ibid.*: Figs 54, 58), instead, were considered as a peculiar and unparalleled ceramic form. Among the other vessels attested, flat-bottomed ovoid jars (*Ibid.*: Fig. 59), large polished dishes and polished cone-truncated cups (*Ibid.*: Fig. 61) were reported.

In 1973 Scerrato carried out another survey at Dahane-ye Gholaman in order to plan a new phase of archaeological activities by the IsMEO at the site (*Anonymous* 1973. P. 418). These consisted mainly in a series of restoration and topography campaigns (*Anonymous* 1974; 1975; 1976; 1977; 1978; *Mariani* 1977; 1979). Further excavations, coordinated on the field by Bruno Genito, examined only the exterior façade of the northern wall of building QN3 and wide sectors of building QN4 (*Anonymous* 1975. P. 551–552).

The political events of the late 70s in Iran marked an end for the IsMEO excavations at Dahane-ye Gholaman. The following decade, however, witnessed the publication of several contributions regarding various issues related to those archaeological activities (*Genito* 1986; 1987; 1990).

As far as pottery studies are concerned, some information about the corpus of over 50.000 pottery fragments⁶ from the Italian excavations at the site was preliminarily given in an article written by Bruno Genito, having as its main focus the importance of Dahane-ye Gholaman as part of the urban attestations of the Achaemenid period on the Iranian Plateau and in neighbouring areas (*Genito* 1986). Some emphasis, nevertheless, was given to the relative morpho-typological homogeneity of the ceramic assemblage from the site and to the consequent possibility to infer a high degree of standardisation in the pottery manufacturing processes. Moreover, while some shapes, such as the large cylindrical or globular jars with lower carination, were connected with the Central Asian Late Bronze Age pottery tradition, some others were retained as reflecting a more local ceramic horizon, such as the bowls with carinated profile and the peculiar cylindrical-conical beakers (*Ibid.* P. 302–303, Pl. XXXV). The presence of a large number of the latter vessels within one of the fireplaces in the western portico of building QN3 was connected with the possibly religious character of that building⁷ (*Ibid.* P. 295, Pl. XXXIVa). The pottery assemblages from Nad-i Ali, Mundigak VI and VII and Kandahar were indicated as the best sources for ceramic *comparanda* for the production attested at the site (*Ibid.* P. 303).

Some years later, the same scholar published an article entirely devoted to the pottery from the site (*Genito* 1990), taking into account an assemblage made up by 6998 fragments (248 rims) from building QN4 and 3931 fragments (242 rims) from building QN2

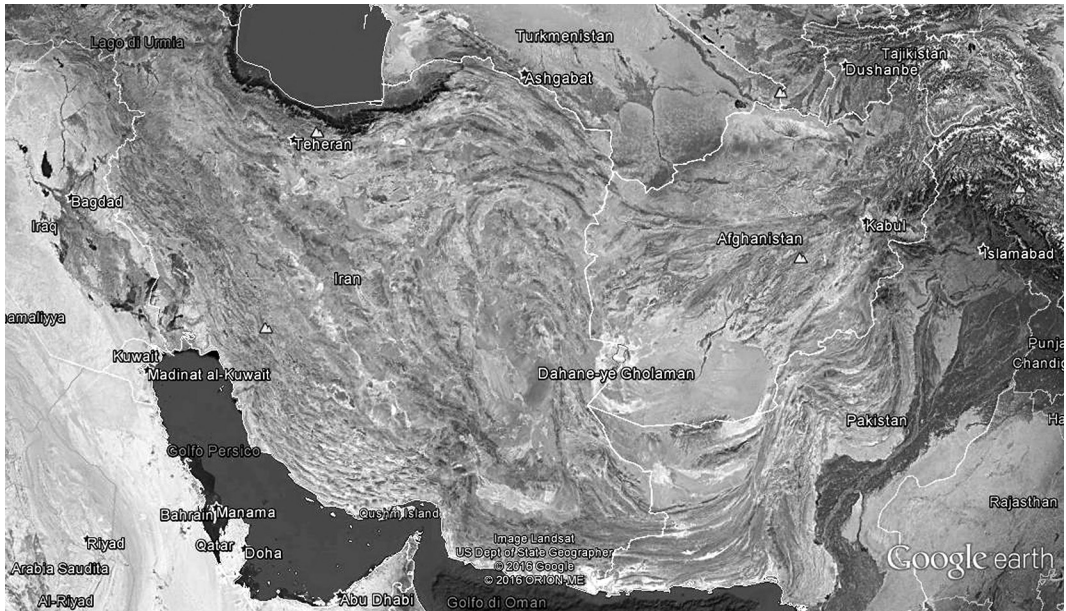


Fig. 1. The location of the site of Dahane-ye Gholaman in Iranian Sistan after Google Earth



Fig. 2. The site of Dahane-ye Gholaman and the surrounding Chahnime 1-4 reservoirs after Google Earth

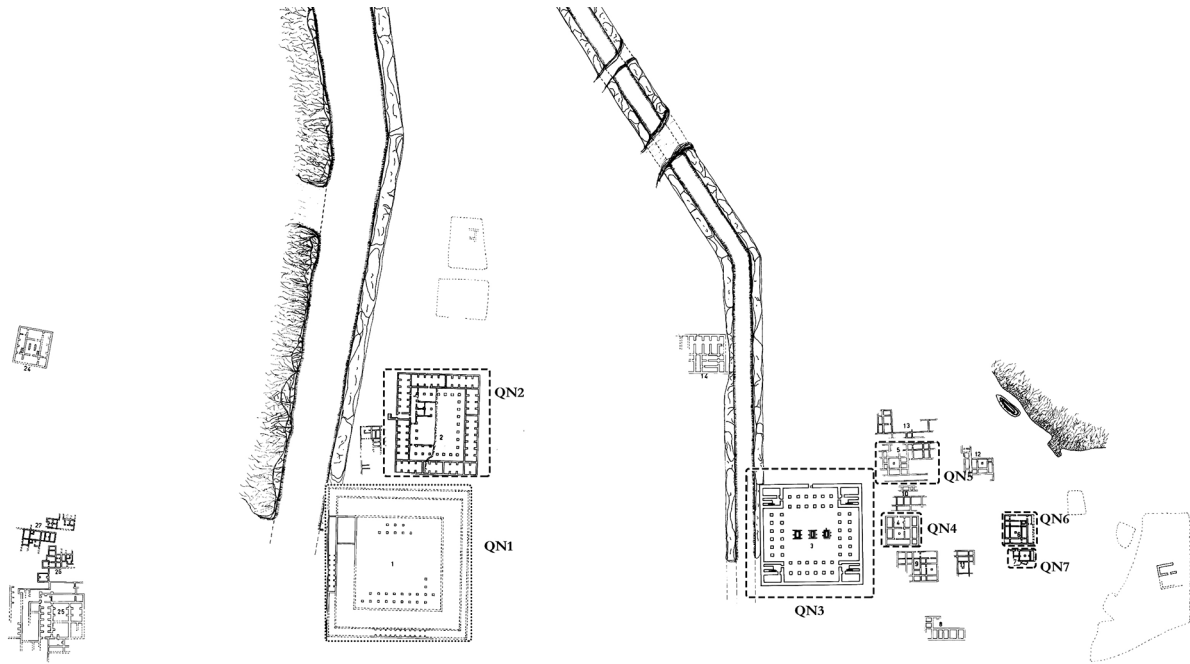
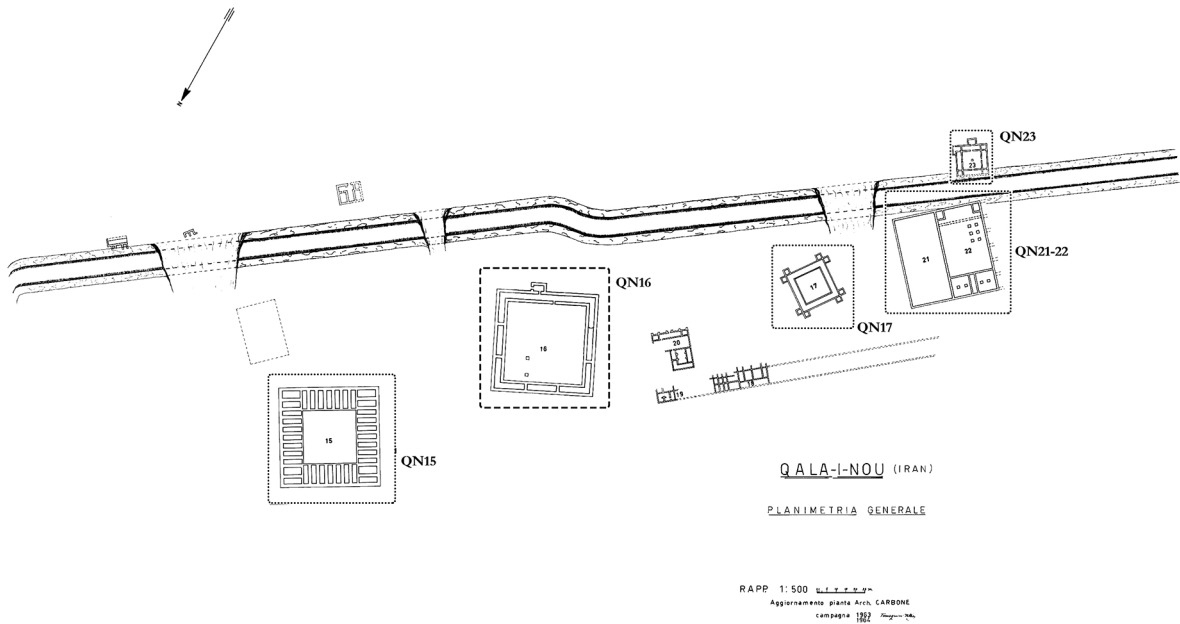


Fig. 3. Plan of the main urban area at Dahane-ye Gholaman with indication of the buildings examined by the IsMEO (in pecked line) and the ICHO / ICHTO (in dotted line) archaeological missions. Adapted from the original general plan of the site drawn in 1964: IsMEO / IsIAO drawings archive inv. No 1082. Not to scale.

(*Ibid.* P. 587 n. 3), that were still stored in the headquarters of the IsMEO Archaeological Missions in Sistan at Zabol⁸. That contribution aimed at detecting the most frequent pottery types in the assemblage and at analysing their spatial variability in correlation with the specific function of the two aforementioned buildings⁹. As part of a well standardised ceramic production, owing its ‘industrial character’ to the very high socio-economic level and to the specific urban nature of the settlement (*Ibid.* P. 600), five ceramic classes were singled out¹⁰, whose inhomogeneous distribution patterns were interpreted as reflecting the different function of the two buildings involved in the study (*Ibid.* P. 599, Fig. 8). As far as morpho-typological issues are concerned, several types of vessels were discussed and compared with ceramic assemblages known from Iran and surrounding areas (*Ibid.* P. 590–598, Figs. 1–7). Some of them were considered of particular interest, as the already mentioned ‘cylindrical-conical beakers’ (*Ibid.* P. 590, 592, Figs. 1g, 2–3) or the so-called ‘carinated cups’. The irregular diffusion of the latter shape on the plateau (at sites as Nad-i Ali, Baba Jan, Pasargadae, Persepolis and Tepe Yahya) was stressed by the author (*Ibid.*



P. 592–593, Fig. 1e). Among the most widespread unrestricted vessels, moreover, ‘large basins with moulded rim, trumpet base and oblique sides’ were reported (*Ibid.* P. 594, Fig. 1c) and compared with similar vessels from Achaemenid levels at Kalai Myr and Bactra, both in ancient Bactria (*Ibid.*: Fig. 4). Two types of jars were instead considered the most representative examples of the restricted vessels at the site. The first one was the ‘large jars with a bulging body on a trumpet base’ (*Ibid.* P. 595, Fig. 5a) for which the scholar reported a rich series of possible comparisons (*Ibid.* Fig. 6) from central Iran (Tepe Syalk) and also from territories corresponding to ancient Parthia (Anau, Namazga VI), Margiana (Yaz Tepe III, Ancyn and Taxirbai), Bactria (Dashli 1 and 3), Arachosia (Mundigak) and Drangiana (Nad-i Ali). The second one, instead, was represented by ‘large jars with cylindrical body on a trumpet base’ (*Ibid.* P. 597, Fig. 5b), a type widely attested at many archaeological sites in north-eastern Iran and Central Asia (*Ibid.* P. 597 n. 18, Fig. 7)¹¹.

1. 2. The ICHO / ICHTO excavations at Dahane-ye Gholaman (2000–2006)

As part of the activities connected with the creation of the Chahnime 4 reservoir¹² (Fig. 2), new excavations began at Dahane-ye Gholaman in October 2000, on behalf of the Iranian Cultural Heritage Organization (ICHO – later Iranian Cultural Heritage and Tourism

Organization: ICHTO and nowadays Iranian Cultural Heritage, Handicrafts and Tourism Organization: ICHHTO), under the direction of Seyyed Mansur Seyyed Sajjadi¹³. Those activities, carried out until January 2006, were also aimed at detecting the limits of the archaeological site in order to protect it from artificial flooding. The greatest part of the excavation activities concentrated on building QN15 (*Sajjadi* 1380 / 2001a; 1380 / 2001b; 2004; 2007; *Sajjadi, Saber Moghaddam* 1382 / 2003; 2004; *Sajjadi, Casanova* 2006), located in the central-western sector of the settlement (Fig. 3). Moreover, during the fifth and last excavation campaign (October 2005 – January 2006), also buildings QN17, QN21, QN22 and QN23, on the westernmost limit of the main urban area (Fig. 3), were tested (*Sajjadi, Casanova* 2006. P. 357). In addition, one sounding was carried out at the north-eastern portion of building QN1 (*Mohammadkhani* 2012. P. 4).

In the preliminary reports on those archaeological activities, the study of the ceramic materials was somewhat neglected in favour of other issues more strictly connected with the architectural layout and the functional interpretation of building QN15¹⁴. However, several ceramic vessels from the aforementioned building were published, divided into six groups according to morphological criteria (*Sajjadi* 1380 / 2001b. P. 51–73). Besides some fragments of walls with applied decoration (*Ibid.* P. 72–73) probably pertaining to large storage vessels (jars or basins), also published was a number of rims, walls and bases pertaining to rounded hemispherical bowls (*Ibid.* P. 59–61), to bowls with variously moulded carinated profile (*Ibid.* P. 62–63) and to small or medium-sized jars (*Ibid.* P. 67–70). Particular attention, however, was paid to the widely attested cylindrical-conical beakers (*Ibid.* P. 52–58, group A1–A5; *Sajjadi* 2004. P. 248; 2007: 143, Figs. 11, 12; *Sajjadi, Saber Moghaddam* 2004. P. 294, Fig. 5).

Probably due to the very limited extent of the excavations carried out in the other tested buildings, just a few references were made to the pottery recovered there. Indeed, only the fact that building QN23 produced the largest amount of pottery fragments was reported (*Sajjadi, Casanova* 2006. P. 357).

In recent years, however, the pottery from the ICHO / ICHTO excavations at Dahane-ye Gholaman between the years 2000 and 2006 was taken into account as part of the ceramic assemblage on which a team of Iranian scholars has published a series of scientific contributions (see *infra*: 2.2).

1. 3. The ICHHTO surveys at Dahane-ye Gholaman (2008–2012)

A new programme of geophysical prospections as well as field walking surveys sponsored by the ICHHTO was carried out at the site of Dahane-ye Gholaman and the immediately adjacent areas between 2008 and 2012, under the direction of Kourosch Mohammadkhani. The results of those archaeological activities were summarised in an article published in 2012 (*Mohammadkhani* 2012) and constitute the core of the PhD dissertation (under the direction by Rémy Boucharlat) defended by the same scholar in 2012 at the ‘Université Lumière Lyon 2’ (*Mohammadkhani* 2014)¹⁵. Although the study of the pottery did not represent the main focus of that research programme, pottery fragments were collected and

counted within each surveyed square (*Ibid.* Tab. 5–1) during the field walking carried out at the main ‘urban’ area of the site: ‘Zone 1’ (*Ibid.* P. 159–183), in order to obtain a map of their concentration and spatial distribution to be compared with the data obtained by means of the geophysical prospections (*Mohammadkhani* 2012. P. 5; 2014. Pls. 42, 43, 47).¹⁶

The highest concentration of pottery fragments was registered in the northern sector of that area (*Mohammadkhani* 2014. P. 165–181)¹⁷, while in the southern, the density of fragments was revealed to be much more limited (*Ibid.* P. 161–163). And in the space encompassed between the two aforementioned sectors (*Ibid.* P. 163–164), divided by a distance of about 2 kilometres (*Ibid.* P. 234), pottery turned out to be completely absent. The field walking survey in the area located immediately north of the archaeological site: ‘Zone 2’ (*Ibid.* P. 184–185), severely disturbed by modern agricultural activities and road infrastructure, did not reveal any archaeological evidence (either structural or ceramic). A wider survey in the area where the site of Dahane-ye Gholaman is located, *i.e.* the Zahak region: ‘Zone 3’ (*Ibid.* P. 185–187), confirmed the results already obtained by previous archaeological prospections (*Mehrafarin* 1383 / 2004), showing that other existing archaeological sites seem to be dated to later periods, from the Parthian era onwards (*Mohammadkhani* 2014. Tab. 5–2).

2. Recent Reappraisals of the Pottery from Dahane-ye Gholaman

2. 1. *The reappraisal of the assemblage stored in Italy*

During the years of the IsMEO excavations at Dahane-ye Gholaman, several pottery fragments from the excavations at the site were transferred to Italy thanks to an agreement between the IsMEO and the former Imperial Service for the Antiquities of Iran. Unfortunately, it is has not been possible to determine the criteria according to which the selection of fragments was made (*Maresca* 2008. P. 100–101; 2010. P. 424 n. 9; 2014. P. 64 n. 7). Of course, that selection by Scerrato was firmly guided by scientific reasons, but it was also probably influenced by some logistic and bureaucratic issues.

While the majority of fragments were stored in the Centro Scavi e Ricerche Archeologiche of the IsMEO (later IsIAO: Istituto Italiano per l’Africa e l’Oriente, the Institution into which the IsMEO merged in 1995) in Rome, some complete and unbroken vessels were sent to the Museo Nazionale d’Arte Orientale (MNAOr) – later Museo Nazionale d’Arte Orientale ‘Giuseppe Tucci’ (MNAO), merged into Museo delle Civiltà in Rome at the end of 2017 – to be put on display (*D’Amore* 1999).

Between 2005 and 2008, I conducted PhD research about the IsMEO Archaeological Missions at historical sites in Sistan carried out at the Università degli Studi di Napoli ‘L’Orientale’ (UNO) under the supervision of Prof. Bruno Genito¹⁸ (Chair of Iranian Archaeology and Art History at UNO). During that time I had the opportunity to carry out a preliminary study of the assemblage of 3216 pottery fragments from Dahane-ye Gholaman stored in the IsIAO Centro Scavi e Ricerche Archeologiche in Rome. The results of that preliminary stage of research, already discussed as part of my PhD Dissertation (*Maresca* 2008. P. 110–122, 131–135), were published in an article some years

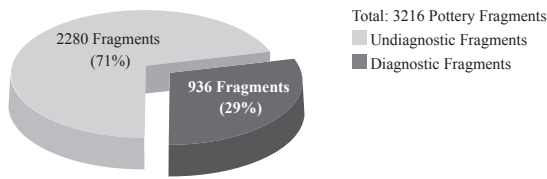


Fig. 4. Amount and percentages of non-diagnostic and diagnostic fragments in the pottery assemblage from Dahane-ye Gholaman stored in Italy

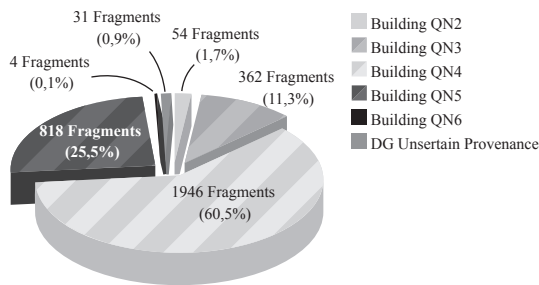


Fig. 5. Amount and percentages of fragments in the pottery assemblage from Dahane-ye Gholaman stored in Italy according to their excavation spot

later (Maresca 2010). According to the information registered on the extant paper labels stored with the potsherds, the assemblage is made up of fragments coming from rooms in five excavated buildings at the site (Fig. 5): QN2 (54 fragments: 1.7%), QN3 (362 fragments: 11.3%), QN4 (1946 fragments: 60.5%), QN5 (818 fragments: 25.5%) and QN6¹⁹ (only 4 fragments: 0.1%). In addition, 31 fragments (0.9% of the assemblage at our disposal) were labelled as being of ‘uncertain’ or ‘unknown’ provenance from the site.

After a preliminary census of these pottery fragments, a total of 936 ‘diagnostic’ potsherds were selected (29% of the assemblage; Figs. 4 and 6), consisting of fragments delivering information about morpho-typological, technical and manufacturing features. These features

include whole profiles, rims, necks, bases, handles as well as fragments of walls carrying decorative motifs, characterised by a specific surface treatment or giving other information about manufacturing processes. The remaining 2280 (71% of the assemblage; Figs. 4 and 6) ‘non-diagnostic’ potsherds (mostly plain walls without any decoration and impossible to be associated with a specific shape, function or technical feature) were merely counted and registered in a specific database, then stored in the MNAOr’s warehouse.

During the following stage of the work, potsherds registered as diagnostic were processed according to the methodological criteria of the fabric analysis, trying to investigate issues related to the sphere of ceramic technology and pottery manufacturing. Macroscopic features of the ceramic body of the fragments (such as colour, hardness, texture, fracture appearance, surface treatment as well as morphology, dimensions, frequency and sorting of inclusions and also morphology, dimensions and frequency of voids) were taken into account in order to obtain a preliminary, general characterization of raw materials and manufacturing techniques (*Ibid.* P. 425).

Eleven different pottery fabrics were distinguished in the assemblage and their macroscopic features were described (*Ibid.* P. 425–430). Their main morpho-typological associations can be briefly summarised as follows:

Fabric DG1 (Fig. 7a) occurs mostly on thick-walled, handmade shallow basins, on handmade globular bowls of various dimensions, on large wheel-made globular jars

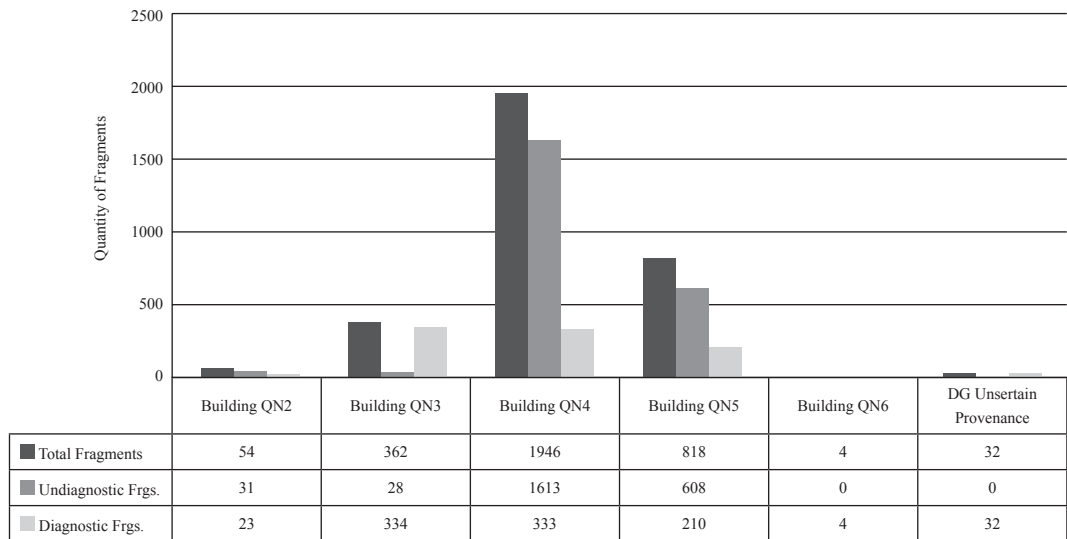


Fig. 6. Amount of non-diagnostic and diagnostic fragments in the pottery assemblage from Dahane-ye Gholaman stored in Italy according their excavation spot

with a wide shallow neck, and also on large wheel-made hole-mouthed cylindrical jars (*Ibid.* Fig. 1).

Fabric DG1.1 (Fig. 7a) is attested on shallow hand-made cone-truncated basins with very thick walls, on large wheel-made basins with cone-truncated profile and variously moulded rims, on cone-truncated bowls, and on many medium-sized or large globular and cylindrical jars (*Ibid.* Fig. 2).

Fabric DG1.2 (Fig. 7a), one the most frequently attested among the assemblage, is highly morphologically differentiated. It occurs on very large wide-mouthed cone-truncated basins with variously moulded rims, on carinated bowls showing different dimensions and various degrees of profile complexity, and also on many medium-sized or large globular and cylindrical jars (*Ibid.* Fig. 3).

Fabric DG2 (Fig. 7a) seems to be the highest morphologically specialised one, attested exclusively on cooking pots (handmade or moulded by means of a slow-turning wheel) with globular profile (*Ibid.* Fig. 4).

Fabric DG3 (Fig. 7a) occurs on tall cone-truncated bowls with burnished decoration consisting of parallel horizontal lines in the area near the rim and zig-zag vertical lines in the immediately lower part of the vessel, on similarly burnished shallow dishes of various sizes, on a wide variety of medium-sized and small cone-truncated or slightly hemispherical bowls, and on some restricted vessels (always with relatively small dimensions) such as ovoid jars with different types of necks (*Ibid.* Fig. 5).

Fabric DG3.1 (Fig. 7a) is especially attested on some cone-truncated basins with moulded rim, on several specimens of carinated bowls showing different dimensions and

various degrees of profile complexity, on small cone-truncated bowls, and on some bi-conical collared bowls, often entirely burnished (*Ibid.* Fig. 6).

Fabric DG3.2 (Fig. 7b) occurs on a great variety of unrestricted vessels: thin-walled and cone-truncated burnished bowls of various dimensions; shallow burnished dishes; globular bowls with plain or ribbed wall profile; and carinated bowls with a prominent horizontal rim. Examples of small and medium-sized ovoid jars with shallow narrow neck are also frequently attested (*Ibid.* Fig. 7).

Fabric DG3.3 (Fig. 7b) occurs on several specimens of carinated bowls showing different dimensions and various degrees of profile complexity, on burnished bi-conical collared bowls with vertical or in-turned neck, on some hemispherical bowls with rounded rims, and on jars with cylindrical or oval profile (*Ibid.* Fig. 8).

Fabric DG3.8 (Fig. 7b), highly morphologically differentiated, occurs mainly on large cone-truncated basins with variously moulded rims, on hemispherical bowls, on large examples of carinated bowls with variously moulded horizontal rims, on cone-truncated thin-walled bowls with burnished decoration, and on bi-conical collared bowls. Restricted vessels like small and medium-sized jars with a shallow narrow neck are less frequently attested (*Ibid.* Fig. 9).

Fabric DG4 (Fig. 7b), quite scarcely attested, occurs on some examples of medium-sized ovoid jars with shallow neck and rounded rim, on larger globular jars with a wide shallow neck, and on bowls with different dimensions and various degrees of profile complexity (*Ibid.* Fig. 10).

The occurrence of Fabric DG7 (Fig. 7b), finally, is limited to a single fragment pertaining to the rim of a small and probably handmade cooking pot (*Ibid.* Fig. 10).

The degree of morphological and functional specialization of the eleven fabrics distinguished revealed to be quite low and, apart from the exceptions represented by Fabric DG2 and DG7, the quite substantial differences in the macroscopic features of the detected fabrics do not seem to be reflected in the morphology of the attested vessels. Such a morpho-technological uniformity in the pottery production at the site was retained as a possible indication of a high level of standardization in manufacturing processes (*Ibid.* 430–431).

After the IsIAO ceased its activity between the end of 2011 and the beginning of 2012, the diagnostic pottery fragments from Dahane-ye Gholaman previously stored in its Centro Scavi in Rome were transferred to CISA (Centro Interdipartimentale di Servizi di Archeologia) at UNO in Naples, while the non-diagnostic fragments remained in the MNAO's storerooms in Rome and were then transferred to Museo delle Civiltà between the end of 2017 and the beginning of 2018.

Having already available at UNO the documental archive of the IsMEO excavations at Dahane-ye Gholaman,²⁰ in the summer of 2012 a new scientific project was launched by the Chair of Iranian Archaeology and Art History at UNO. That project, *ArchaeoPro. Di.Mu.S.* (*Archaeological Project Digital and Multimedia Sistan*), currently in progress, is aimed at storing, managing and disseminating the aforementioned documental dataset and

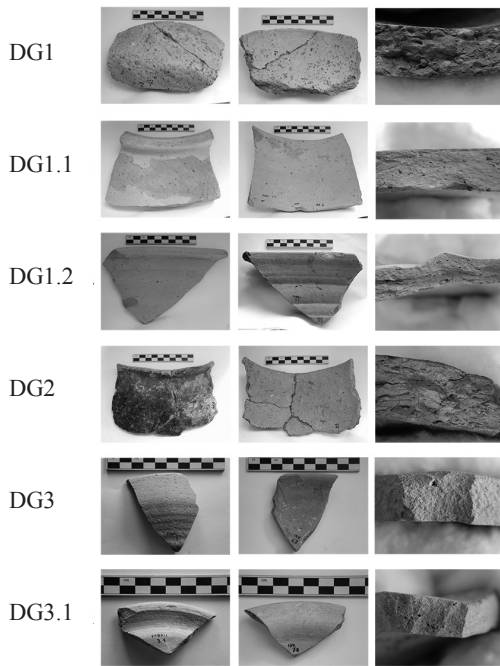


Fig. 7a. Samples of Fabrics DG1, DG1.1, DG1.2, DG2, DG3 and DG3.1 identified in the ceramic assemblage from Dahane-ye Gholaman stored in Italy: exterior surface (left row), interior surface (central row), core (right row) (see colour image on Plate X)

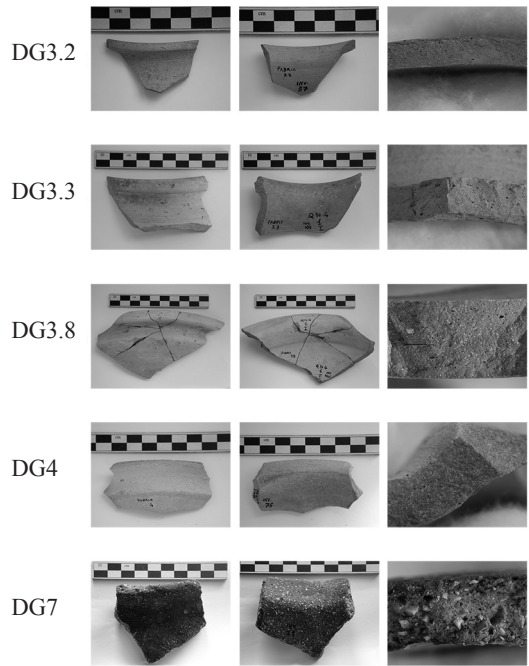


Fig. 7b. Samples of Fabrics DG3.2, DG3.3, DG3.8, DG4 and DG7 identified in the ceramic assemblage from Dahane-ye Gholaman stored in Italy: exterior surface (left row), interior surface (central row), core (right row) (see colour image on Plate XI)

the related amount of archaeological information by means of a WebGIS (*Cocca et alii* 2013; *Genito* 2014a; *Maresca* 2014; *Cocca and Genito* 2014; *Cocca et alii* 2016). As part of the *ArchaeoPro.Di.Mu.S.* project, moreover, new research on the ceramic assemblage from Dahane-ye Gholaman presently at UNO has started (with special attention to archaeometric issues; see *infra*: 2.3), aimed at the definitive and comprehensive publication of that still only partially published corpus.

2. 2. *The reappraisal of the assemblage stored in Iran and the study of the pottery from the ICHO / ICHTO excavations*

After the end of the ICHO / ICHTO excavations at Dahane-ye Gholaman in 2006 (See *supra*: 1.2), a team of Iranian ceramics specialists and archaeologists (Reza Mehr Afarin, Seyyed Rasoul Musavi Haji, Zohreh Zehbari²¹ and Fatemeh Alizadeh) started examining the pottery assemblage from the Iranian excavations at the site, taking also into account the pottery from the old IsMEO excavations stored in Iran and publishing a series of articles about that topic.

There is an article on the cultural interactions between ancient *Zranka* and other eastern Satrapies of the Achaemenid Empire in the light of their pottery tradition (*Mehrafarin et alii* 1392 / 2013). There is another comparing the pottery from the eastern Iranian territories and the Fars Province during the Achaemenid period (*Zehbari, Mehrafarin* 1393 / 2014). A third is on the relationships between the pottery production at Dahane-ye Gholaman and the one attested at western regions of the Achaemenid empire (*Zehbari et alii* 1393 / 2014). But their main scientific contribution is represented by an article on the structural characteristics of the pottery from Dahane-ye Gholaman (*Zehbari et alii* 2015a). That study was based on an assemblage of 2370 potsherds selected among the fragments coming from the old IsMEO excavations at buildings QN2, QN3, QN4, QN6, QN6-7 and from the ICHO / ICHTO excavations at buildings QN15, QN16, QN22, QN23, including some fragments having uncertain provenance (*Ibid.* P. 220, Tab. I).

Macroscopic observations concerning the manufacturing processes of the pottery attested at the site (colour and tempering materials²² of the ceramic pastes as well as moulding techniques and firing temperatures) were the main concern of the study (*Ibid.* P. 220–225, Figs. 4–11). Moreover, the presence of different types of decoration and / or peculiar kinds of surface treatments on the analysed potsherds were discussed and put in correlation with the repertoire of the attested shapes (*Ibid.* P. 225–228, Figs. 12–13, Tab. 2).

A total of 152 significant pottery fragments, classified into eight groups according to the colour of their external surfaces²³ and, subsequently, to morphological criteria (*Ibid.* P. 228, Fig. 15), were selected for publication (*Ibid.* Figs. 16–33) and a brief catalogue synthesising their main characteristics was provided (*Ibid.* P. 246–254).

Integrating information already given in previous works by the same research group, a rich series of ceramic parallels (mostly morpho-typological, but sometimes simply concerning the decoration attested or the colour of the external coating) was proposed for the majority of the published fragments (*Ibid.* P. 228–245). Ceramic *comparanda* were sought among materials from excavations and surveys carried out both on the Iranian Plateau and in neighbouring areas as well. The majority of the fragments (several only by virtue of the presence of the already mentioned characteristic incised motif; see *infra*: n. 5) were compared with materials from Nad-i Ali, in Afghan Sistan (*Ibid.* Nos 6, 13, 14, 21, 27–29, 33, 41, 44, 47–53, 55, 60, 65–68, 74, 78, 80–84, 89, 90, 95, 114, 119, 141–144). Other published vessels, instead, were put in comparison with pottery from Iranian sites and archaeological areas: Susa (*Ibid.* Nos 1, 39, 42, 108) and Chogha Mish (*Ibid.* Nos 10, 95, 105), in Khuzestan; Tepe Darooqeh (*Ibid.* Nos 16, 32, 121) and other sites surveyed in the Miyanab plain of Khuzestan (*Ibid.* Nos 37, 97, 111, 122, 123); the area of Persepolis (*Ibid.* Nos 4, 12, 16, 22, 33, 37, 38, 58, 88, 95, 97, 106, 110, 111, 136, 138) and Naqsh-e Rostam (*Ibid.* No 2), in Fars; Qaleh Kali (*Ibid.* Nos 2, 16, 24, 31, 36, 85), Tol-e Spid (*Ibid.* Nos 13, 37, 46, 56, 97, 111, 113) and Toll-e Nurabad (*Ibid.* Nos 15, 101, 103), in the Mamasani District of Fars; the area of Bushehr (*Ibid.* No 4); Hasanlu (*Ibid.* No 10) and Qalaychi (*Ibid.* Nos 35, 54), in West Azerbaijan; Baba Jan (*Ibid.* Nos 5, 10) and Qaleh Khezerlu (*Ibid.* No 26), in East Azerbaijan; Agh Tappeh, in the Ardabil Province (*Ibid.*

No 34); Narges Tepe, in Gorgan (*Ibid.* Nos 11, 37, 76, 97, 111); Tepe Yahya (*Ibid.* Nos 10, 23, 37, 43, 97, 109, 111, 112) and the area of Bardsir (*Ibid.* No 3), in the Kerman Province. More limited comparisons, in addition, were provided by materials from Erk Kala, in Turkmenistan (*Ibid.* No 14); Akra (*Ibid.* Nos 55, 66) and Charsada (*Ibid.* Nos 55, 57, 66), in Pakistan; Cimin Tepe, in Turkey (*Ibid.* No 64) and Ur, in Iraq (*Ibid.* No 67).

As far as chronological issues are concerned, the reported presence within the assemblage of bowls comparable with materials generally dated to the late Achaemenid period from Persepolis and Pasargadae as well as ‘fishplates’ of Hellenistic tradition, lead the authors to consider also a later date (at least from the second half of the fourth century BCE onwards) for some of the vessels taken into account (*Ibid.* P. 255).

Very recently, finally, a study specifically devoted to the cylindrical-conical beakers attested at the site was published by the same research team (*Zehbari et alii* 1393 / 2015b). It took into account an assemblage made up by 412 potsherds²⁴ coming from buildings QN2 (185 fragments), QN4 (4 fragments), QN6 (25 fragments), QN6-7 (10 fragments), QN7 (8 fragments), QN15 (29 fragments), QN16 (11 fragments), QN23 (70 fragments) and including also fragments (70) from unknown provenance at the site (*Ibid.* P. 59, Tab. 1).

Specific manufacturing characteristics as the colour and the tempering materials of the ceramic pastes as well as moulding techniques, surface treatments, decorations and firing temperatures were taken into account, analysed and put into correlation (*Ibid.* P. 59–62, Figs. 1–7, Tabs. 3–14).

On the basis of the extant evidence, moreover, the rims of the cylindrical-conical beakers were classified into seven groups (A–G) and twenty-one subgroups according their profile (*Ibid.* P. 62, Pl. 15), while their bases were classified into four groups (H, M, N, P. according the same criterion (*Ibid.* P. 62–63, Pl. 16).

The peculiar morphology of this kind of beakers, unparalleled in the ceramic assemblages known from other sites of Achaemenid period (*Ibid.* P. 64), lead the authors to consider them as an original and specific vessel shape of Dahane-ye Gholaman (*Ibid.* P. 58).

2. 3. Recent Archaeometric Analyses on Pottery Samples from Dahane-ye Gholaman

During an archaeological survey carried out on behalf of the ICHHTO in southern Sistan between 2009 and 2010 (*Musavi Haji, Mehrafarin* 1389 / 2010) as the second phase of a wider project of archaeological survey in the entire Iranian Sistan already started in 2007 (*Musavi Haji, Mehrafarin* 1387 / 2008)²⁵, about 110 sites were identified as dated to the Achaemenid Period (*Mehrafarin* 2016. P. 4, Fig. 2) by virtue of the comparison between the ceramic fragments recovered at their surface and the pottery assemblage from Dahane-ye Gholaman (*Ibid.* P. 5, Figs. 3, 4). The highest concentration of these possibly Achaemenid sites was observed in three districts (*howza*) of Southern Sistan: Howza-ye Gerdi (*Mehrafarin, Musavi Haji* 1394 / 2015), Howza-ye Jonub-e Qal’a-ye Rostam and Howza-ye Shileh (*Mehrafarin* 2016. P. 6). Together with the area located immediately south of the Hamun Lake, they should have represented the most extensively settled area in Iranian Sistan during the Achaemenid period (*Sarhaddi-Dadian* 2013; *Sarhaddi-Dadian et alii*

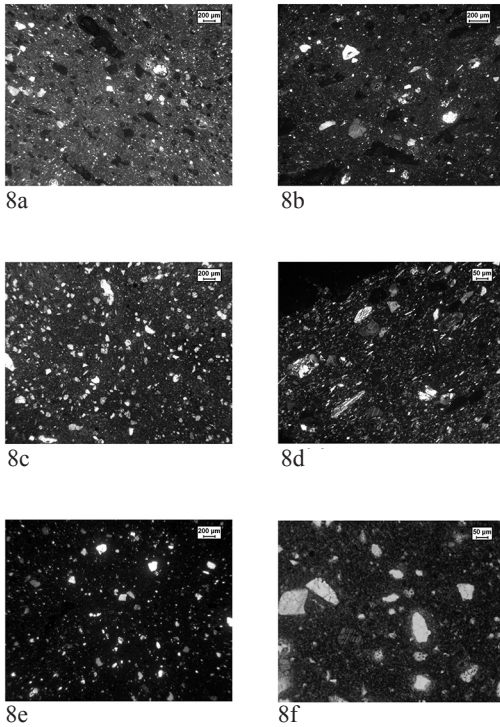


Fig. 8. Polarised Light Microscopy (PLM) in thin section of samples of Fabrics DG1.2, DG3 and DG3.8. a) sample of Fabric DG1.2 (crossed polars); b) sample of Fabric DG1.2 (crossed polars); c) sample of Fabric DG3 (parallel polars); d) sample of Fabric DG3 (crossed polars); e) sample of Fabric DG3.8 (crossed polars); f) sample of Fabric DG3.8 (parallel polars) (see colour image on Plate XII)

liminary archaeometric analyses carried out in Italy²⁶ on pottery fragments from Dahane-ye Gholaman and from the site of Qal'a-ye Sam²⁷ (Maresca 2016a. P. 204–205). Such analyses were aimed at evaluating some elements of technical continuity and / or discontinuity between two of the most frequently attested pottery fabrics in the assemblage from Qal'a-ye Sam (Fabrics QS1 and QS2) and three pottery fabrics largely attested in the assemblage from Dahane-ye Gholaman (Fabrics DG1.2, DG3, DG3.8) by virtue of Polarised Light Microscopy (PLM) in thin sections (Fig. 8).

PLM observation of Fabric DG1.2 (Fig. 8a–b) highlighted an optically birefringent matrix. Large pores were clearly visible and the percentage of inclusions was low (10–15%). Moreover, inclusions were poorly sorted (with dimensions ranging from 20 to 250 µm). Abundant quartz, minor feldspars (alkali feldspar and plagioclase) and sporadic sandstone fragments occurred in the coarse fraction. Finer inclusions, instead, were represented

2015. P. 47). Preliminary studies on the pottery fragments sampled during those surveys took into account both morpho-typological (Musavi Haji, Atai 1389 / 2010) and archaeometric issues (Sarhaddi-Dadian *et alii* 2015).

X-Ray Diffraction (XRD) and X-Ray Fluorescence (XRF) analyses carried out on a pottery fragment from Dahane-ye Gholaman as part of those researches (*Ibid.* P. 47, Fig. 1) showed a major content of minerals such as quartz, diopside and albite, together with a high concentration of silica (50.51%) and aluminium (16.67%), followed by iron (7.82%), calcium (6.11%) and other minor elements such as manganese, potassium and sodium (*Ibid.* Tabs. 1–2). A very similar composition was also evaluated for the rest of the analysed pottery fragments dated to the historical period, pointing to an almost exclusive utilisation of the same local raw materials in the ceramic production processes during historical phases in Sistan (*Ibid.* P. 49–50).

A quite evident continuity in the utilisation of similar and locally available raw materials for the ceramic production between the Achaemenid and the Parthian period in Sistan was also highlighted by pre-

by quartz, micas (biotite and muscovite) and rare amphibole. In addition, secondary calcite was frequently observed in pores.

Also the ceramic matrix of the sample of Fabric DG3 revealed an evident birefringence, as in the case of Fabric 1.2. The analysed sample (Fig. 8c–d) was characterised by a low degree of porosity and a very low (5–10%) percentage of poorly sorted inclusions (ranging from 20 to 150 μm in size). The coarse fraction was represented by abundant quartz, by feldspars (alkali feldspar and plagioclase) to a lesser extent and by sporadic sandstone fragments. The finer fraction, instead, revealed to be made up by quartz, micas (biotite and muscovite), sporadic sparry calcite and rare amphibole.

The isotropic matrix of the sample of Fabric DG3.8 indicated, instead, that some vitrification of the ceramic body was achieved during firing. The analysed sample (Fig. 8e–f) was characterised by a medium degree of porosity. Inclusions, attested at a low percentage (10–15%), showed a bimodal distribution. The moderately sorted coarse fraction (100–200 μm) was mainly represented by quartz. Also feldspars (alkali feldspar and plagioclase) were frequent, while sandstone fragments, biotite and amphibole were attested only in a moderate amount. A particularly significant and noticeable finer fraction (20–50 μm) was similarly represented by quartz, feldspars, biotite and sporadic muscovite.

However, although thin section microscopy revealed evident similarities in the petrographic composition of samples both from Dahane-ye Gholaman and from Qal'a-ye Sam (characterised by inclusions mostly represented by abundant quartz and minor feldspars with lower amounts of sandstone, micas and amphibole), it also highlighted some significant differences in the optical activity of the ceramic matrix of the samples (those from Qal'a-ye Sam generally revealed a relatively higher firing temperature) as well as differences in the percentage and sorting of the inclusions (lower amounts of poorly sorted inclusions evaluated on the samples from Dahane-ye Gholaman possibly indicate a relatively low accuracy in the preparation of ceramic pastes), suggesting that some technological features probably changed over time (*Maresca* 2016a. P. 205).

3. Conclusions

Dahane-ye Gholaman, in Iranian Sistan, can be considered without any doubt as a key site in the archaeology of the Achaemenid period on the Iranian Plateau and in neighbouring areas as well.

Although started in the 60s of the past century, at the time of the first excavations carried out by the IsMEO team directed by Umberto Scerrato, the study of the pottery assemblage from the site has never been addressed in a comprehensive way. Notwithstanding the scientific efforts made by several Iranian and Italian scholars (unfortunately based on separate assemblages and carried out according to different methodological criteria), the corpus of the pottery from Dahane-ye Gholaman remains partially unpublished and related specific and more exhaustive publications are still awaited. However, beside indispensable in-depth analyses taking into account both morpho-typological and archaeometric issues, new research should be necessarily connected with a general reassessment

of the chrono-stratigraphy at the site and with the definitive publication of the extant data from the IsMEO excavations. The on-going research based at the Università degli Studi di Napoli 'L'Orientale' point just towards that direction and important results are expected in the near future.

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- ¹ The layouts of the buildings at Dahane-ye Gholaman were detectable at the site even before the first excavations by virtue of characteristic saline outcrops which had left some well-defined and regular whitish traces on the terrain where the old walls were buried (*Scerrato* 1962. P. 186–187).
- ² Located at about 30 kilometres north-east from Dahane-ye Gholaman, in Afghan Sistan, the Sorkh Dagh ('Red Mound') at the site of Nad-i Ali was investigated by several scholars between 1938 and 1968 (*Ghirshman* 1942; *Fairservis* 1961; *Dales* 1977). At the time of the IsMEO excavations at Dahane-ye Gholaman, an Achaemenid date for the main phase attested at the mound was generally accepted by the scientific community. Some decades later, however, the traditional chronology of the site was challenged: on the basis of a reappraisal of the architectural, stratigraphic and ceramic evidence, the Surkh Dagh monumental platform was dated to the Bronze Age, specifically to the second half of the third millennium BCE (*Besenal, Francfort* 1994).
- ³ Seven buildings (QN2, QN3, QN4, QN5, QN6, QN7 and QN16) were completely or partially brought to light by the Italian excavations among the twenty-eight detected.
- ⁴ According to *Scerrato*, the settlement was founded approximately between the sixth and the fifth century BCE and was abandoned by its original inhabitants quite shortly after (notwithstanding at least two different phases of building activities are attested), probably because of sudden and unexpected changes in the water resources connected with the shifting of the Helmand River's bed (*Scerrato* 1966b. P. 11). After its abandonment, the town served as a seasonal shelter for groups of shepherds, but not for a long time (*Ibid.* P. 10).
- ⁵ Moreover, Nad-i Ali was (and still remains today) the only site which offers parallels (*Ghirshman* 1942. Pl. IV Nos 70 and 55) also for the characteristic motif of an upside-down 'trident' surmounted by a small circle incised on several vessels from Dahane-ye Gholaman (*Scerrato* 1966b: Fig. 58; *Sajjadi, Moghaddam* 2004: Fig. 5; *Sajjadi* 1380 / 2001b. P. 53 Nos 1–5; *Sajjadi* 2007. Fig. 12; *Maresca* 2010. Fig. 3 No 54, Fig. 6 Nos 74, 100 and 33; *Zehbari et alii* 1393 / 2015a. Fig. 17 Nos 13–14, Fig. 19 Nos 27–29, Fig. 22 Nos 47–53 and 60, Fig. 25 No 74, Fig. 26 Nos 80–84, Fig. 30 Nos 114 and 119, Fig. 32 Nos 141–142 and 144; *Zehbari et alii* 1393 / 2015b. Fig. 1, Fig. 6 Nos 1–4 and 12, Fig. 7 Nos 13–17).
- ⁶ The unique reference to the total number of ceramic fragments recovered during the IsMEO excavations at the site was given by *Genito* (1986. P. 302).
- ⁷ For an up-to-date reappraisal of the archaeological evidence represented by building QN3 see the contribution by Bruno Genito in these Proceedings (*Genito* 2019).
- ⁸ Between April and October / November 1984, a delegation of Italian scholars (archaeologists, restorers and experts in cultural heritage) appointed by the IsMEO was sent to Sistan (*Anonymous* 1984) as part of a joint Iranian / Italian programme aimed at registering all the archaeological materials coming from the IsMEO excavations in Sistan still stored in the former house of the IsMEO Missions in Zabul (definitely closed on that occasion), in order to deliver them partly to Zahedan and partly to the Iran Bastan Museum in Tehran. As part of those activities, Bruno Genito, entrusted by Umberto Scerrato with the responsibility of the Achaemenid materials from Dahane-ye Ghulaman, had also the opportunity to study a part of that ceramic assemblage before it was delivered to Zahedan and Tehran (*Tosi, Pracchia, Macchiarelli* 1984. P. 468–469; *Genito* 1990. P. 601).
- ⁹ The building QN2 had already been interpreted as the 'thesauros' of the ancient city (*Scerrato* 1970. P. 133; *Genito* 1986. P. 296), while the building QN4 had already been considered as a private house (*Scerrato* 1966b. P. 25; *Anonymous* 1975. P. 551; *Genito* 1986. P. 297).
- ¹⁰ A widely attested 'common ware' (made by a pink, red-orange or buff sandy clay paste, usually covered by a clear slip), a frequent 'coarse ware' (made of red clay and large amounts of

- tempering materials), a ‘fine polished ware’ (made of very purified clay in various shades of red, salmon, pink, tan and brown), a rare ‘grey ware’ and a sporadic ‘painted ware’ (*Genito* 1990. P. 589–590).
- ¹¹ Other types of vessels were reported among the assemblage, as ‘truncated-conical cups’ (*Genito* 1990. P. 593, Fig. 1h), ‘oblique-sided cups’ (*Ibid.* P. 594, Fig. 1b), ‘dishes’ (*Ibid.* P. 594, Fig. 1c), ‘globular bowls’ (*Ibid.* P. 594, Fig. 1d), ‘bowls with inverted rim’ (*Ibid.* P. 594, Fig. 1f), ‘flat-bottomed oval-shaped jars’ (*Ibid.* P. 598, Fig. 5c) and ‘small jars’ (*Ibid.* P. 598, Fig. 5d).
- ¹² Chahnime (Čahnima) is a local term to designate three natural depressions (Chahnime 1–3) existing in the same flat quaternary terrace where also the site of Dahane-ye Gholaman was founded. After the severe drought crisis of the early 1970s in the entire Sistan area, a programme of water management was launched. Thanks to hydraulic engineering techniques, since 1981–82 the three Chahnime were turned into permanent water reservoirs catching Helmand’s excess waters during the damp season (Fig. 2). In 2008, moreover, a fourth, artificial reservoir (Chahnime 4) was built further west and it was filled with water the following year. Today, the archaeological area of Dahane-ye Gholaman is bordered by Chahnime 3 on its eastern limit and by Chahnime 4 on the western one. An artificial canal connecting Chahnime 3 and Chahnime 4 was cut, instead, at the southern limit of the site, at about 130 metres south of building QN28.
- ¹³ The same scholar had been already appointed as Director of the Iranian excavations at the proto-historic site of Shahr-e Sukhte (also in Sistan) as early as 1997. Nevertheless, his previous interests in the archaeological activities at Dahane-ye Gholaman were witnessed by some publications of the late 90s (*Sajjadi* 1375 / 1997; 1375–76 / 1997–98; 1379 / 2000).
- ¹⁴ In the opinion of the excavator, building QN15 is interpretable (at least at a certain phase of its life) as a workshop where artifacts with a possibly religious character were produced and probably also consecrated (*Sajjadi* 1380 / 2001b. P. 47; 2004. P. 249; *Sajjadi, Saber Moghaddam* 2004. P. 287–288; *Sajjadi* 2007. P. 132–133).
- ¹⁵ A report about Mohammadkhani’s first activities at Dahane-ye Gholaman had already been submitted to the ICHHTO some years before (*Mohammadkhani* 1388 / 2009), while a preliminary geophysical study of the site was a part of his MA Dissertation submitted in 2010 to the ‘Université Paris 1 Panthéon-Sorbonne’ (*Mohammadkhani* 2010).
- ¹⁶ In the case of the most significant and diagnostic pottery fragments, in addition, some photographs were taken (*Mohammadkhani* 2014. Pl. 50, 51) and drawings were carried out (*Ibid.*: P. 177, Fig. 5–3).
- ¹⁷ It is very interesting to note that some pottery fragments were also found just at the north-western limit of Chahnime 3, in the vicinity of some structural remains (*Mohammadkhani* 2014. P. 175–176). Already in the opinion of Umberto Scerrato, indeed, other possible residential quarters and / or crafts centres should have existed in that area, mentioned as Namaki by the Italian scholars (*Scerrato* 1972. P. 202; *Anonymous* 1978. P. 329; *Genito* 2001. P. xxxiii; 2007. P. 267; 2010b. P. 103; 2012. P. 369 n. 3; 2014b. P. 174).
- ¹⁸ After the demise of Umberto Scerrato on February 2004, the IsIAO officially entrusted Prof. Bruno Genito with the scientific responsibility of the data of the IsMEO archaeological activities at Dahane-ye Gholaman and the other historical sites investigated in Sistan by the IsIAO.
- ¹⁹ In a previous article about this topic, I wrongly reported these fragments as coming from building QN7 (*Maresca* 2010. P. 424 n. 9). This mistake was due to a misreading of the information written on the original paper label (in a bad state of preservation) stored with the fragments. A later, closer scrutiny of that label revealed, instead, a provenance from building QN6.
- ²⁰ Since 2003, on the basis of an agreement between IsIAO and UNO, all the documents, drawings and photographs pertaining to the archive of the IsMEO archaeological missions at Dahane-ye Gholaman and at the historical sites of Qal’a-ye Tepe and Qal’a-ye Sam (located in Sistan as well) were progressively transferred to CISA at UNO in order to be properly archived in a digital format (*Genito* 2010a. P. 77, 80 n. 9; *Cocca et alii* 2013. P. 187–189; *Genito* 2014a. P. 20 n. 5; *Maresca* 2014. P. 63–64; 2016b. P. 149; *Cocca et alii* 2016. P. 395).
- ²¹ Zohreh Zehbari started studying the pottery assemblage from Dahane-ye Gholaman as part of the research for her MA Dissertation, submitted to the Department of Literature and Humanities at the University of Sistan and Baluchestan in Zahedan (*Zehbari* 1391 / 2012).

- ²² Particularly interesting are the results of experimental procedures which demonstrated that the mica particles clearly visible in many fabrics at the site were not intentionally added to the clay by the potters but were a consequence of the abundant content of mica in soils of the Sistan region (Zehbari *et alii* 2015a. P. 222).
- ²³ ‘Buff’ (Zehbari *et alii* 2015a. P. 228–233, Figs. 16–19, Nos 1–30), ‘Yellowish Buff’ (*Ibid.* P. 233–235, Figs. 20–22, Nos 31–53), ‘Orange’ (*Ibid.* P. 235–237, Fig. 23, Nos 54–61), ‘Pink’ (*Ibid.* P. 237–239, Figs. 24–26, Nos 62–84), ‘Red’ (*Ibid.* P. 239–240, Figs. 27–28, Nos 85–104), ‘Brown’ (*Ibid.* P. 241–245, Figs. 29–31, Nos 105–134), ‘Grey’ (*Ibid.* P. 245, Fig. 32, Nos 135–144) and ‘Black’ (*Ibid.* P. 245, Fig. 33, Nos 145–152).
- ²⁴ A total of 227 rims, 28 walls, 98 bases, 10 complete vessels and 49 whole profiles were analysed as part of that study (Zehbari *et alii* 1393 / 2015b. P. 59, Tab. 2).
- ²⁵ That project represented a continuation of the archaeological surveys already started in different areas of the Iranian Sistan by Musavi Haji and Mehrafarin as part of their PhD researches (Musavi Haji 1382 / 2003; Mehrafarin 1383 / 2004).
- ²⁶ The analyses were carried out as part of the *Archaeo. Pro.Di.Mu.S.* project, in collaboration with a team of geologists at the DiSTAR (‘Dipartimento di Scienze della Terra, Ambiente e Risorse’), Università degli Studi di Napoli ‘Federico II’.
- ²⁷ The site of Qal’-a-ye Sam is located at about twenty-seven kilometers south-west of Zabol and about twenty kilometers west of Dahane-ye Gholaman. It consists of a citadel surrounded by a perimeter of walls having a sub-quadrangular shape. In 1964, the ISMEO Archaeological Mission headed by Umberto Scerrato carried out some trenches at the site. According to the extant information, the excavations discovered structural remains pertaining to at least two different chronological phases. While the more recent phase was dated by Scerrato to a timespan between the late Parthian and the early Sasanian period, the deeper one was dated to the early Parthian period. A third and more ancient phase was detected and partially investigated only in one of the trenches, where it was tentatively dated to the late-Seleucid period (Scerrato 1966a. P. 466–467; 1970. P.137–138; 1972. P. 202–203; Genito 2010b. P. 104; Maresca 2014. P. 62–63; 2016a. P. 198–199; 2016b. P. 150, 153).

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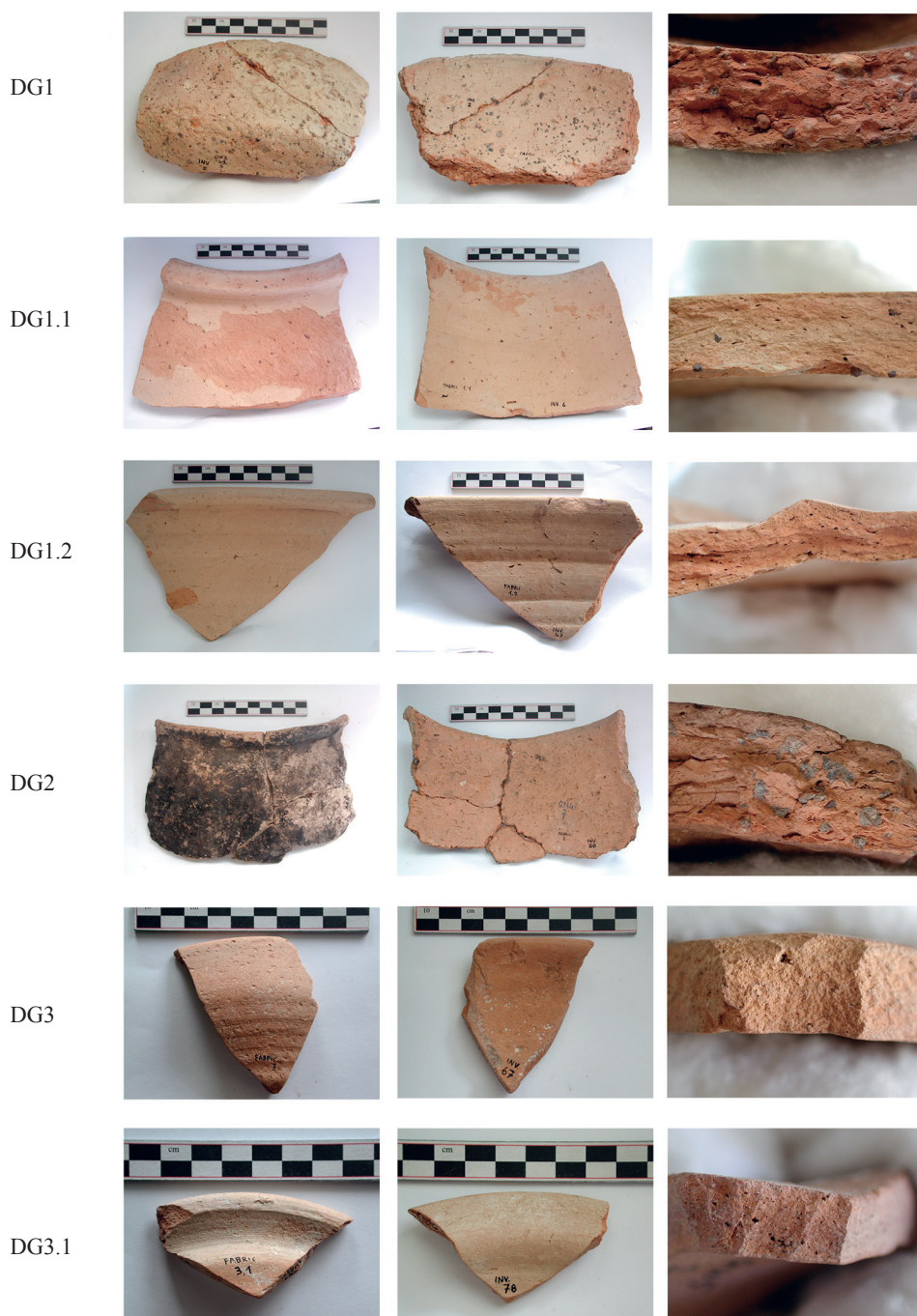
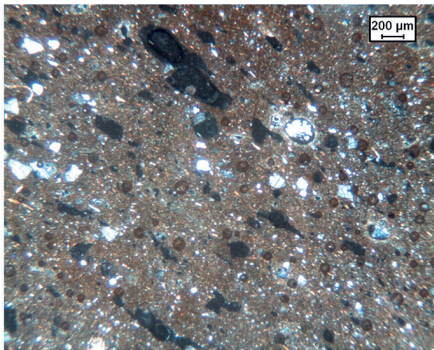


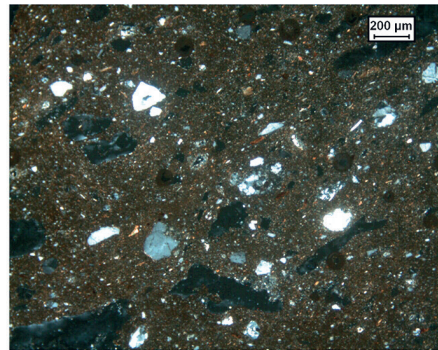
Fig. 7a. Samples of Fabrics DG1, DG1.1, DG1.2, DG2, DG3 and DG3.1 identified in the ceramic assemblage from Dahane-ye Gholaman stored in Italy: exterior surface (left row), interior surface (central row), core (right row).



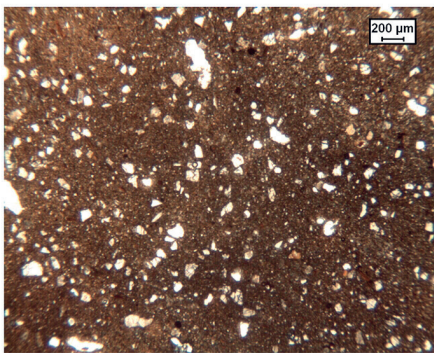
Fig. 7b. Samples of Fabrics DG3.2, DG3.3, DG3.8, DG4 and DG7 identified in the ceramic assemblage from Dahane-ye Gholaman stored in Italy: exterior surface (left row), interior surface (central row), core (right row)



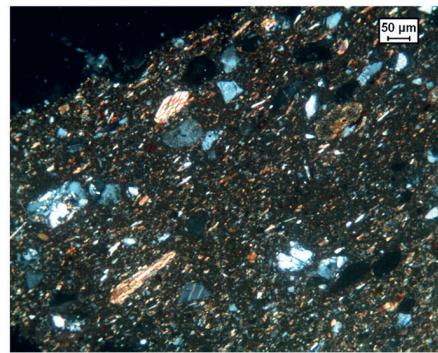
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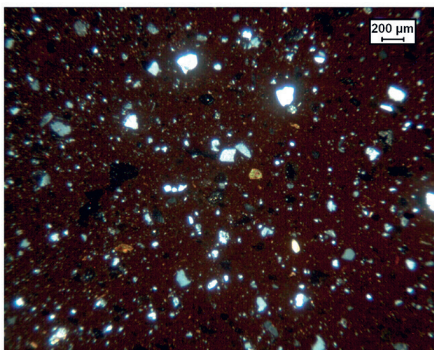
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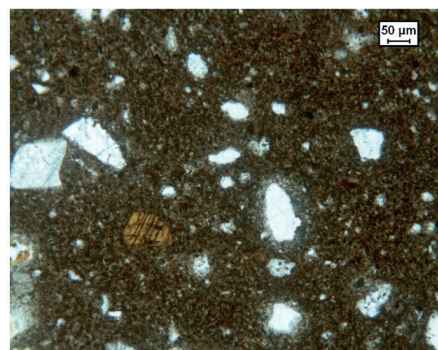
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Fig. 8. Polarised Light Microscopy (PLM) in thin section of samples of Fabrics DG1.2, DG3 and DG3.8. a) sample of Fabric DG1.2 (crossed polars); b) sample of Fabric DG1.2 (crossed polars); c) sample of Fabric DG3 (parallel polars); d) sample of Fabric DG3 (crossed polars); e) sample of Fabric DG3.8 (crossed polars); f) sample of Fabric DG3.8 (parallel polars).

ABBREVIATIONS

AAASH	Acta Antiqua Academiae Scientiarum Hungaricae	CRAIBL	Comptes rendus des séances de l'Académie des Inscriptions et Belles-Lettres
ACSS	Ancient Civilizations from Scythia to Siberia	DOP	Dumbarton Oaks Papers
AH	Anno Hegirae	EaS	Eurasian Studies
AI	Acta Iranica	EI NE	The Encyclopaedia of Islam. New Edition.
AM	Asia Major	EIr	Encyclopaedia Iranica. Vol. I–XIV.
AMI(T)	Archaeologische Mitteilungen aus Iran (und Turan)	EIr online	Encyclopaedia Iranica. Online edition. Available at http://iranicaonline.org/
An. Isl.	Annales Islamologiques	EW	East and West
An. ION	Annali dell'Istituto Orientale di Napoli	FO	Folia Orientalia
AOASH	Acta Orientalia Academiae Scientiarum Hungaricae	HdO	Handbuch der Orientalistik / Handbook of Oriental Studies
AoF	Altorientalische Forschungen	HUS	Harvard Ukrainian Studies
APAW	Abhandlung der (Königlichen) Preussischen Akademie der Wissenschaften, phil.-hist. Klasse	IaC	Iran and the Caucasus
Ar. As.	Arts Asiatiques	IAK	Известия (императорской) археологической комиссии
ARTA	Achaemenid Research on Texts and Archaeology	IJCT	International Journal of the Classical Tradition
AY	Anno Yazdigerdi	IPNB	Iranisches Personennamenbuch
BAI	Bulletin of the Asia Institute	Ir. Ant.	Iranica Antiqua
BAR IS	British Archaeological Institute. International Series.	Ir. St.	Iranian Studies
BASOR	Bulletin of the American Schools of Oriental Research	Izd AN (SSSR)	Издательство Академии наук (СССР)
Blr	Beiträge zur Iranistik	JA	Journal Asiatique
BO	Bibliotheca Orientalis	JAAS	Journal of Asian and African Studies
BSL	Bulletin de la Société de Linguistique	JAOS	Journal of the American Oriental Society
BSO(A)S	Bulletin of the School of Oriental (and African) Studies	JCOI	Journal of the K.R. Cama Oriental Institute
CHI	Cambridge History of Iran	JIES	Journal of Indo-European Studies
CII	Corpus Inscriptionum Iranicarum	JNES	Journal of Near Eastern Studies

ABBREVIATIONS

JPS	Journal of Persianate Studies	St. Ir.	Studia Iranica
JRAS	The Journal of the Royal Asiatic Society of Great Britain and Ireland	TAVO	Tübinger Atlas des Vorderen Orients
KSIA	Краткие сообщения института археологии.	TGÉ	Труды Государственного Эрмитажа
MRDTB	Memoirs of the Research Department of the Toyo Bunko	TIES	Tocharian and Indo-European Studies
MSS	Münchener Studien zur Sprachwissenschaft	TPhS	Transactions of the Philological Society
NTS	Norsk tidsskrift for sprogvidenskap	Trudy YuTAKE	Труды Южно-туркменистанской археологической комплексной экспедиции.
OIJa	Основы иранского языкознания	VDI	Вестник древней истории.
OLP	Orientalia Lovaniensia Periodica	VÖAW	Verlag der Österreichischen Akademie der Wissenschaften
Or. Ant.	Oriens Antiquus	WMO	Written Monuments of the Orient
Or. Ar.	Oriental Art	WZKM	Wiener Zeitschrift für die Kunde des Morgenlandes
PV	Петербургское востоковедение	XYWS	Xiyu Wenshi 西域文史 [Literature and History of the Western Regions]
RHR	Revue de l'histoire des religions	ZDMG	Zeitschrift der Deutschen Morgenländischen Gesellschaft
Rig. Ber.	Riggsberger Berichte	ZGAIW	Zeitschrift für Geschichte der arabisch-islamisches Wissenschaften
RO	Rocznik Orientalistyczny	ZPE	Zeitschrift für Papyrologie und Epigraphik
RSO	Rivista degli Studi Orientali	ZVORAO	Записки восточного отделения российского археологического общества
SA	Sovetskaya arkeologiya		
SBE	Sacred Books of the East		
SIAL	Studies on the Inner Asian languages		
SPAW	Sitzungsberichte der (königlich) Preußischen Akademie der Wissenschaften		
SR	The Silk Road		
SRAA	Silk Road Art and Archaeology		
St. As.	Studia Asiatica		

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