

THE SAMAD PERIOD IN THE SULTANATE OF OMAN

By PAUL YULE

Although numerous publications on the archaeology of the Sultanate of Oman have appeared, what is still lacking is a readily accessible summary of recent highlights that deals with the Late Pre-Islamic Culture in Mazun/western Maka (cf. Kervran and Hiebert 1991: 337-348; Yule and Kazenwadel 1993: 251-277; Yule 1994: 519-577). Until the publication of the final report on the excavations of the German Archaeological Mission to the Sultanate of Oman appears, the present contribution is intended to summarize the state of research.¹ The cursory term "Parthian" and "Sasanian Oman" (Potts 1992 II: 292-300) reveal the political hegemony and the date, but fail to come to grips with the culture as it is known from illustrated preliminary reports. The same holds for "classical Oman". Oman lies outside of the Mediterranean and outside classical influence. It is not in itself classical in any sense.² The publications which have appeared on late pre-Islamic Central Oman have been understood differently by members of archaeological special interest groups of different nations, isolated experts, and particularly archaeologists oriented toward the archaeology of the neighbouring United Arab Emirates (UAE).

Three main topics shed light on this final Pre-Islamic Arabian culture: the location of Maka and of early historic Oman, early Arabic sources on Oman, and the Samad Culture (post 300 BC-AD 900, Fig. 1). The newly recovered archaeological information combines with that which is known about the historical geography. The following notes are a tribute to the cooperation between Omani and foreign scholars interested in this area of Ancient Near Eastern history.

Oman and Maka

Numerous written, often repetitious, contributions, exist which deal with the location of Magan (Sumerian) and Makkan (Akkadian) from which the subsequent early historic Oman takes its name, Maka (Eilers 1983: 101-19). In recent years a communis opinio has emerged in the specialist literature that in the third and second millennia BC Magan/Makkan straddled the Arab/Persian Gulf and Gulf of Oman (Potts 1986: 271-85). Later, during the early Achaemenid Period, East and West Maka were combined with a satrapal capital at Pura (=Puruš), today known as Bampūr (Stein 1943: 222-3; de Cardi 1970: 240; Cook 1985: 251). Maka thus extended to the Hingol, the border of the Oriets (Arrian Indica 25:3, 26:1, 32:3). On the southern border of the desert belonging to Carmania (Strabo Geographica xv:9) the northern border curves to the east in the direction of the Hamun sea (Jacobs 1994: 248-9). If we assume Maka to lie exclusively in Iran, then problems arise, not the least of which is that the very extensive territory of Oman does not fit into any satrapy. From cuneiform sources, the names Maka and Qade/u, associated with Oman and southwest Iran, mean literally "eastern lands" (Eilers 1983: 101-119). "Maka" developed in medieval times to become Makrān/Mukrān, a composite deriving from the ethnicon Mak° and the substantive karan/kirane meaning "border, bank". Stephanos Byzantios explains in his Ethnika that the Mykoi (Maka) are a people living between Carmania and Arabia (Jacoby 1958: 37, 364). Most experts consider it significant that when Darius I (522-486 BC) of Iran lists the names of his provinces, Maka appears among the last and near India, indicating that it is a peripheral area located in this part of the empire (Koch 1993: 21). Other mentions of Maka are known, including literally "eastern lands" (Eilers 1983: 101-119). "Maka" developed in medieval times to become Makrān/Mukrān, a composite deriving from the ethnicon Mak° and the substantive karān/kirāne meaning "border, bank". Stephanos Byzantios explains in his Ethnika that the Mykoi (Maka) are a people living between Carmania and Arabia (Jacoby 1958: 37, 364). Most experts consider it significant that when Darius I (522-486 BC) of Iran lists the names of his provinces, Maka appears among the last and near India, indicating that it is a peripheral area located in this part of the empire (Koch 1993: 21).

¹In the Sultanate H.H. Sayyid Faisal b. 'Ali b. Faisal } l Saʿd, Minister for National Heritage and Culture and Dr 4Ali b. Aḥmed b. Bakhit al-Shānfari, Director General of Archaeology, sponsored our work. The German Research Society (DFG), Fritz Thyssen Foundation, Deutsch-omanische Gesellschaft, e.V., American Council of Learned Societies, German Foreign Office, and the American Philosophical Society enabled our work financially. In Oman particularly helpful

were the Strabag, Deutsche Tiefbau AG, and Siemens were particularly helpful. The present study is extracted from my *Habilitationsschrift* which was submitted to the University of Heidelberg in March of 1994 (Yule 2001). The German Mining Museum and, 1994-1998, the University of Heidelberg sponsored the project. Jürgen Schreiber kindly catalogued the sherds which are reproduced in Fig. 18. The colour plate was made possible by a grant from the Fritz Thyssen Foundation.

²J. Zarins (1995, 185-6) was evidently unaware of the literature on this topic with regard to the dating of Samad and al Maysar.

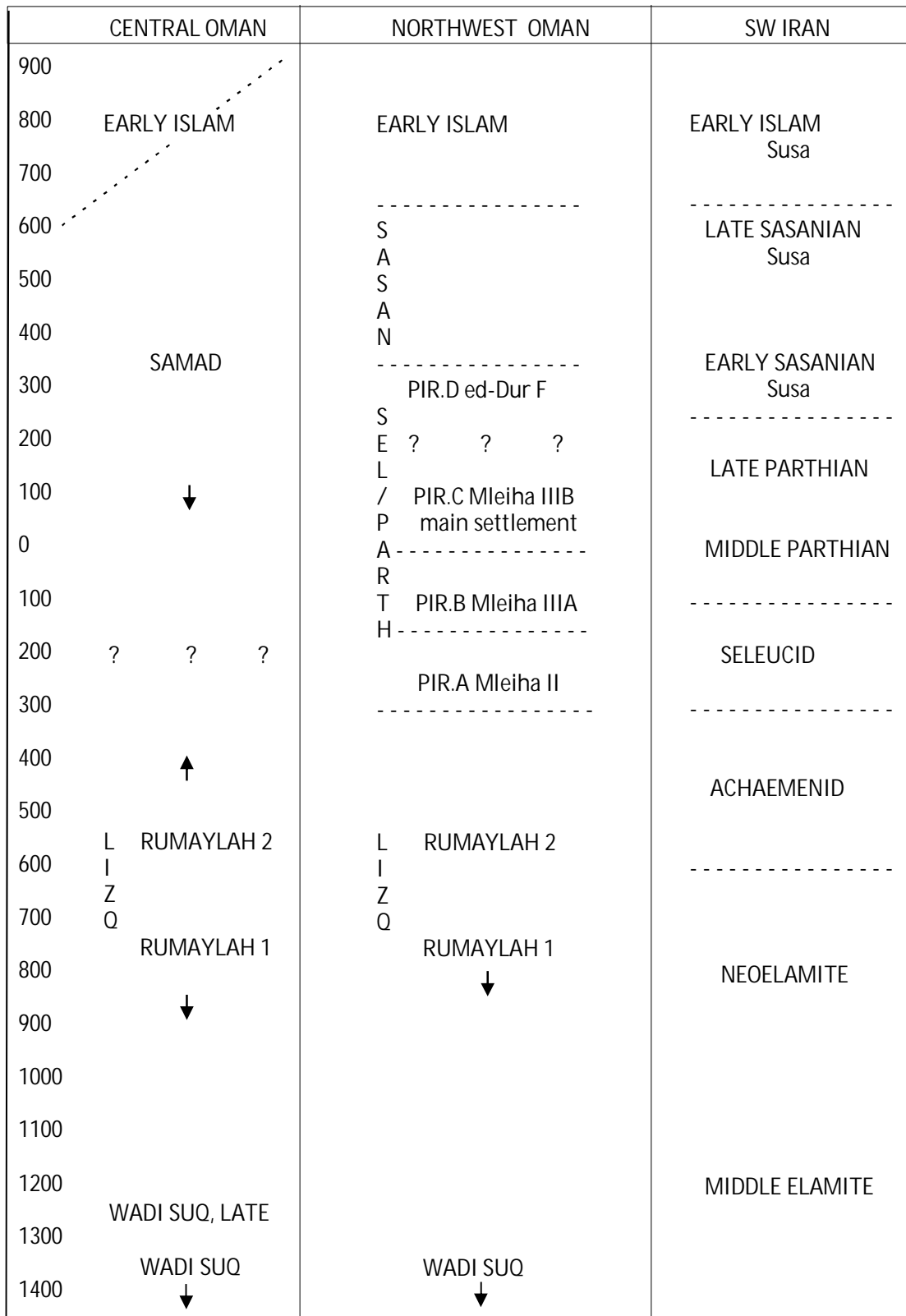


Fig. 1. Chronology for central and northwest Oman, as well as south-west Iran.

Other mentions of Maka are known, including one with coordinates in the geography of the astronomer Claudius Ptolemaios in the 2nd century AD. He and other classical authors provide enough information to make it clear that Maka ("Macae") was located in present day Oman.

The historic relationship of the names Oman and Maka at the turning point of the ages has been discussed by several experts (recently Potts 1992 II: 301-308). "Oman" has several etymologies, but the only serious one links it to the town Omana which appears in ancient sources although its location remains

problematic. Following the author of the *Periplus Maris Erythraei* (Voyage round the Red Sea) which was written in the first century AD, several authors would advocate a localisation on the coast of Carmania. But if one follows Pliny (*Historia naturalis* 6,32), then Omana seems more likely to have been located on the Bāṭinah (Marek 1993: 147-152).

Oman/Maka was a possession of the Achaemenids and later, on the strength of the Periplus, of the Parthians. A decentralized Parthian power was succeeded by a more centralized Sasanian one, but few details are known about the earliest foreign occupation. The Persians taxed merchandise arriving here from further east and south before being transited to the north and northwest. Maka must have served as a market for Persian raw materials and manufactured goods. In return it offered foodstuffs and copper. In all likelihood the Persians ruled at certain times by means of vassals. For the Persians, Oman's strategic role was probably more important than its commercial one. But this tells us little about Central Oman's population, which is known through excavation.

Early Arabic Sources on Oman

Historically and archaeologically speaking, what has become the Sultanate of Oman was and is among the least known regions of Arabia. Although brief textual references from classical sources exist for the early historic period, they are often exasperatingly vague and seldom mention years, rulers, or known places.

The early medieval Arabic texts (al-Balādhuri and al-Ṭabarī), which provide some insight into the structure of society and the history for the first six centuries of the 1st millennium AD, have been studied (especially Wilkinson 1977). Arabic sources collated in the 18th century AD include the anonymous *Kashf al-Ġumma* (the "dispeller of harm", Ross 1874: 111-196; Klein 1938). The work of Nūr al-dīn al-Sālimi and another of Muḥammad al-Sālimi supply important details (Nūr al-dīn 'Abdullāh b. Ḥumaid al-Sālimi 1347-1350ah/1969-1972; Muḥammad b. 'Abdullāh b. Ḥumaid al Sālimi 1961). Sal(a)ma b. Muslim (Musallim?) al-'Awtabi's *Kitāb Ansāb al-'Arab* seems the oldest of these sources.³

The *Kashf*, compiled by Sirhān b. Sa'īd, who lived in Nizwā, in Oman's interior, survives in three incomplete copies, the earliest of which is dated to March 1728. Hedwig Klein submitted her dissertation on chapter 33 of the *Kashf* (dealing with the early history of Central Oman) in 1938 to the University of Hamburg. Owing to a demonstrated grasp of Arabic language and written sources this ill-fated Arabist was well-prepared for the task. She also maintained contact with the family of Emily Ruete (Salima Bint Sa'īd) of the Omani and Zanzibari Āl Sa'īd royal family, who resided in Germany. But this was to be Hedwig Klein's final work, and she died shortly thereafter in a concentration camp, without fulfilling what should have been a promising career. Several observations cited on Omani early medieval history first appeared in her study.

As a source the *Kashf* is superficial, abridges key chapters of Omani history, is full of mistakes of all kinds, and ends at the time in which the compiler lived. Historians would like to know the sources of Sirhān's information, but he does not disclose them. In charming mythopoetic narrative, the *Kashf* relates the coming of Mālik b. Fahm and the al-Azd from Yemen to Oman. N. Al-Sālimi's *Tuḥfat* provides further information on the early period which are lacking in the *Kashf*. The former text was penned by the Ibāḍī scholar, motivated by his wish to revitalize the Imamate.⁴ Many of the textual formulations are identical between the *Kashf*, *Tuḥfat*, and *Kitāb Ansab*.

All three texts recount the cause of the migration from Yemen to Oman: while returning from pasturing their flocks Mālik's relatives passed by the house of a neighbour in the evening. The latter had a bitch who used to bark at them and scatter the livestock. One of Mālik's tribesmen killed the animal with a spear, and complained to him about the incident. Overwrought, Mālik reportedly stated that he would not remain in a country where a person under his protection suffered such treatment. Departing from the Tihāma, Mālik and the al-Azd reach Central Oman and began negotiations with the representatives of the Persian colonial government. Since they did not concede to Mālik's demands for land, his tribes began military action.

³ Bibliothèque nationale, Paris, MSS. arabes 5019. This text is not available to me, oral communication 1990, I. al-Rawas.

⁴ Oral communication, I. al-Rawas.

Parts of Central Oman, especially the well-watered Samā'il gap, certainly were already settled when the al-Azd arrived. Instead of the *Kashf's* lengthy descriptions of Mālik's fiery steed, smart dress, and the inability of his opponents, the historian would prefer to know how the inhabitants of these areas, as well as those from Qalhat to al-Jawf reacted to the newcomers and their desire for land. Mālik got the better of an allegedly larger force under Persian command, and succeeded in settling his tribesmen in Oman. The new settlers are taken here to be the population of the Samad Culture because their trappings represent a break with those of the Early Iron Age Lizq/Rumaylah Culture (1200-300 BC). Written sources complement archaeological information and provide an indication that the arrival of the early tribes coincides with the rise of the Samad Culture. No other large group is known at this time which would be responsible for changes in pottery, settlement patterns, and burial customs. The migration of the tribes, however, cannot be linked with known artefacts or monuments, e.g. the triliths in the South Province Dhofar and Yemen which occur as far north as the Sharqīyah (Yule and Kervran 1993: 94-99). Rarely datable, they neither shed light on the time of the migrations nor can they be attributed to the Samad Culture of Central Oman.

Among the curious mistakes of the *Kashf* is the reference to a Persian commander, or Marzabān, who served the king "Dara bin Dara, son of Bahman". Recognizable is the Achaemenid Darius and the Sasānian Bahram, historically separated by more than 800 years. Largely owing to this passage and the Arab genealogies (cf. Caskel 1966), J.C. Wilkinson argued that the al-Azd emigration to Oman continued from the Achaemenid to the Sasānian Period (Wilkinson 1977: 128). Further events are mentioned in the *Kashf*: to ward off Mālik, the Persian-led army destroyed many 'aflāj (subterranean water channels) which had been built by "Sulaiman bin Daud". But Sulaiman need not be confused with his namesake, King Solomon the son of David, who was not known to the compiler of the *Kashf*. No doubt the author is referring rather to that great Arab hero who bears the same name. Nor is the time in which the historic Solomon lived of help for the dating of the 'aflāj in Oman, for the historical Solomon was unknown in Oman. One of the four great rulers of the world in Arab mythology, Sulaiman possesses superhuman and prophetic abilities. He is wonderfully empowered with secret knowledge. Legions of demons stand at his command to carry out his wishes. For example they dive for pearls for him. The jinns also are compelled to serve him under threat of damnation. They fashion shrines and statues for him. To their credit belongs the erection of palaces, baths, irrigation systems. To house Sulaiman's 700 wives they built 1000 houses with glass roofs.

Discovery of the Samad Culture

In 1972 the "New Archaeology" began in the Sultanate of Oman (cf. Tosi 1989: 135-161). With the newly-derived prosperity, based on the wealth deriving from oil and natural gas, the country became accessible to archaeologists of several countries. The research strategy of the Ministry of National Heritage and Culture's experts was first to survey, gain an overview, and then later to excavate. Prior to this a team fielded by Wendell Phillips had conducted a season of excavation in the historically-rich settlement Ṣuḥār on the Bāṭinah and three brief seasons in the South Province of Ṣafār, especially at Khor Rorī (Albright 1953; idem 1980; idem 1983; Cleveland 1959a; idem 1959b).⁵The latter Haḍramī colony is ascribed popularly to the biblical Queen of Sheba who, if she actually existed, would have lived about a millennium earlier. But until recently the archaeological undertakings of the 1950's in Khor Rorī generated little published information.

Given the size of the task and the brief time available to master it, it is not surprising that even today many aspects of the prehistory of Oman are unclear. Initially, without stratigraphy and with few radiocarbon determinations, the chronology of Pre-Islamic cultures was largely theoretical, based on groupings of typologically associated artefacts loosely dated by outside comparisons. In 1979 the German Archaeological Mission began fieldwork at al-Maysar in the interior about 140 km south-southwest of the capital (Fig. 2). The Mission set out to trace the history of the copper-producing Magan/Makkan, known from cuneiform texts of the late 3rd and early 2nd millennia BC. At the outset, despite the considerable efforts of survey teams, little substantial was available about Oman's antiquity. The German Mission investigated

⁵ In 1979 Wendell Phillips died. His own report regarding Khor Rorī was never published.

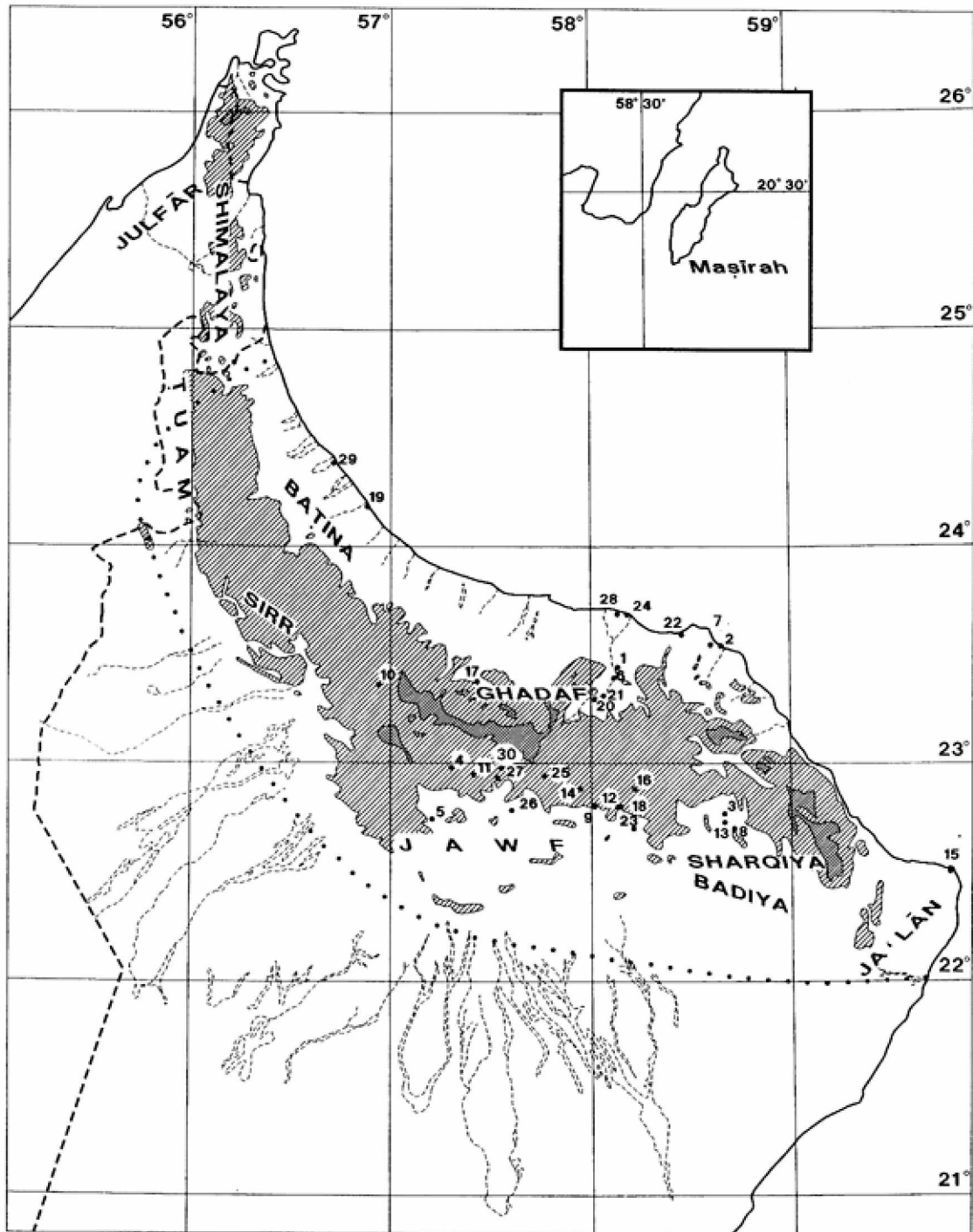


Fig. 2 Findspots relating to the Samad culture and the borders of Oman Proper. Hatching: 500–1000 m, fine hatching: >1000 m. The dotted line shows Oman Proper. Key:

- | | | |
|-----------------------|------------------------|-------------------------|
| 1 al-'Amqāt | 11 al-Maskūteh | 22 al-Sarūq |
| 2 Bandār Jiṣṣa | 12 al-Maysar | - Wādī Bunzar |
| 3 al-Bāṭin | 13 al-Nibā' | Historische Siedlungen: |
| 4 Baḥlā' BB-04 | 14 al-Qaryāṭayn | 24 Damā |
| 5 Baḥlā' BB-15 | 15 Ra's al-Ḥadd, HD 21 | 25 Izkī |
| 6 Bidbid/Outhāya | 16 Rawdah, Muqatta | 26 Manaḥ |
| 7 al-Bustan | 17 al-Rustāq | 27 Nizwā |
| 8 al-Dhurra, W. Aghda | 18 Samad al-Shān | 28 al-Shāriq |
| 9 Khaḍrā' Bani Daffā' | 19 Ṣaḥam | 28 Qīqā |
| 10 al-Maqrūyat | 20 Samā'il, al-Bārūnī | 29 Ṣuḥār |
| | 21 Samā'il, al-Khobbar | 30 Muṭī |

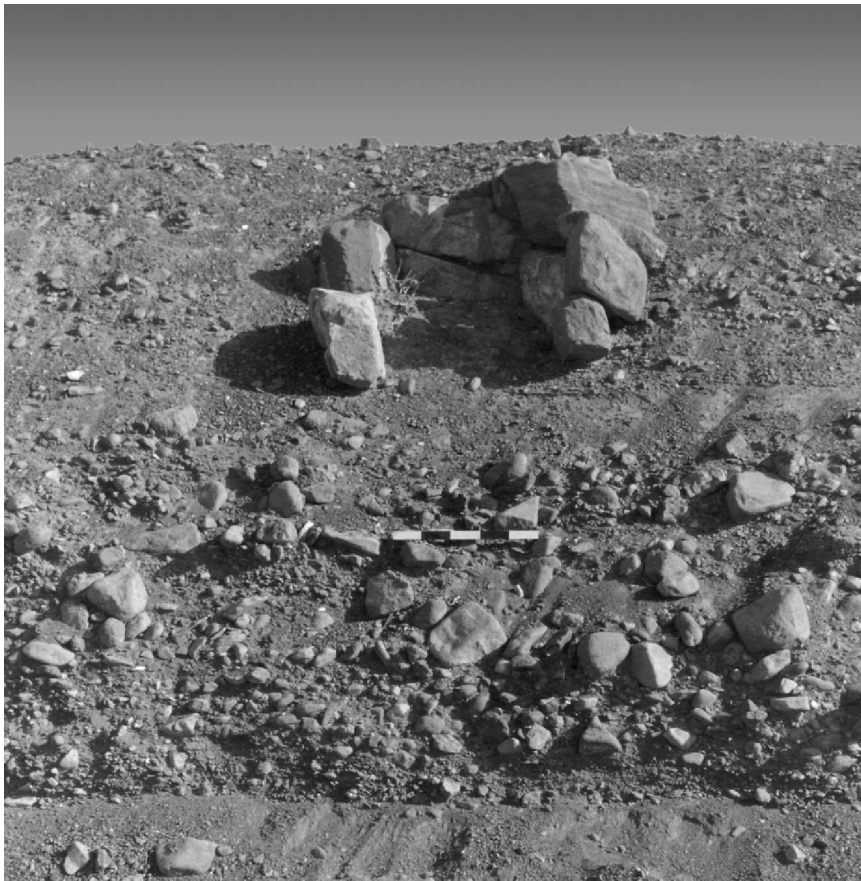


Fig. 3. Grave S101 in Samad S10. Photo G. Weisgerber.

graves and settlements of different periods in order to develop an instrument with which to date the mining and smelting remains, the emphasis of early campaigns.

By 1975 the outlines of the Pre-Islamic periods had all but emerged, with exception of the latest stage. Umm an Nar Period (2500-2000 BC) sites at Samad al-Shān and al-Maysar were recorded in the 1970's by other foreign teams (Hastings, Humphries and Meadows 1975: 12-15, 17-19; Doe 1977: 46, pl. 9 (map)). Then in 1980, while driving from al-Maysar to "Maysar-gadeed" (new Maysar), just south of the Samad oasis, a member of the excavation team spotted a grave exposed by erosion in the bank of the Wādī Samad (Figs. 3, 4, 5). Test excavations in this cemetery, "Maysar-9", conducted in this same year, revealed a hitherto unknown handmade pottery together with iron arrowheads and daggers in skeletal burials. In the following two years 50 more graves were investigated in this same burial ground. "Samad Culture" was selected as a name for the culture because it was chronologically neutral. It is considered prehistoric (thus "Late Iron Age", LIA) because the earliest locally-written documents known, date perhaps to the 8th or 9th century AD. In 1984 the first definitive publication of graves containing the materials of the Samad Culture (Vogt 1981: 219-222; idem 1984: 271-284) appeared (cf. Fig. 6. hence "Samad graves"). In the early 1980's the local inhabitants called the settlement consisting of two houses near the newly-discovered graves "Maysar gadeed". But thereafter they consistently referred to this place as al-Ma'mūrah (the "established settlement"), a part of Samad al-Shān. The Samad Period hill fort al-Maysar M34 also was investigated in 1981 (Fig. 7, Tillmann 1981: 233-238; Weisgerber 1982: 81-93). By 1987 the number of sites known in al-Maysar and Samad had increased and a new registration of sites was needed. In the course of this the Pre-Islamic cemetery "Maysar-9" became "Samad S10", conforming with local usage of the place-names. Current population growth has resulted in the residential development in the Wādī Samad which brings with it a need for rescue work (Fig. 8).



Fig. 4. Wadi Samad to the south, 1987. Photo G. Weisgerber.

In the 1970s archaeologists had not yet recognized the Samad Culture, since what few sherds existed could not be distinguished from those of the preceding Lizq/Rumaylah Complex. Most of the pottery at that time from the central and northern parts of the Sultanate was known from surface survey. The surveys of the 1970s logged some 321 findspots, counting only those of the American and British teams.⁶ Curiously in the publication of these surveys no more than nine sherds can now be recognized as belonging to the Samad Culture.⁷ One reason for the scarcity of the sherds is that usually in Central Oman burial sites are poorer in sherds than settlements. The settlements that would yield sherds are heavily disturbed in the oases.

In the early 1980s the cultures of the Early and newly discovered Late Iron Age were named for the places where the finds were first excavated (Boucharlat and Lombard 1985: 44-73 + plates; Kroll 1981: 174-263, 226-231), Rumaylah in Abū Ḥabīb, Lizq and Samad al-Shān in Central Oman. Previously, prehistoric pottery not obviously attributeable to the 3rd and 2nd millennia BC, by comparison with material from South-west Iran, was subsumed as "Iron Age". Excavations at Lizq, Rumaylah, and elsewhere reveal an Early Iron Age (EIA) culture largely contemporary with that of iron-using neighbours in Iran and Iraq. In all of Oman, based on relatively few contexts and on rare comparisons with dated foreign artefacts, the final date of the Early Iron Age has been subject to greater attention in the past few years.⁸ Even less is known about the beginnings of the Samad Culture.

⁶ Hastings, Humphries and Meadows 1975: 15 note 2: 180 findspots; de Cardi, S. Collier, D.B. Doe 1976: 101-187: 62 findspots; Doe 1977: 35-57: 79 findspots. M. Tosi, G. Weisgerber, P.M. Costa, and K. Frifelt also conducted surveys.

⁷ Humphries 1974: 64 fig. 6b (BB-4); 69 fig. 8i (BB-15); 76 fig.

121 (SH-11); de Cardi 1977: 64 fig. 3.93, 100, 103-105 (al Dhurra); *ibid.* 66 fig. 4.118 (al-Niba).

⁸ Yule and Kazenwadel 1993: 256. This article went to press in 1992 when, on the basis of the information available at that time, a different dating seemed possible for the transition.



Fig. 5. The burial ground Samad S10, c. 1981. In the background is al-Ma'mūrah. Photo G. Weisgerber.



Fig. 6. A grave of the Samad period being clear (gr. S2613). Photo P. Yule.

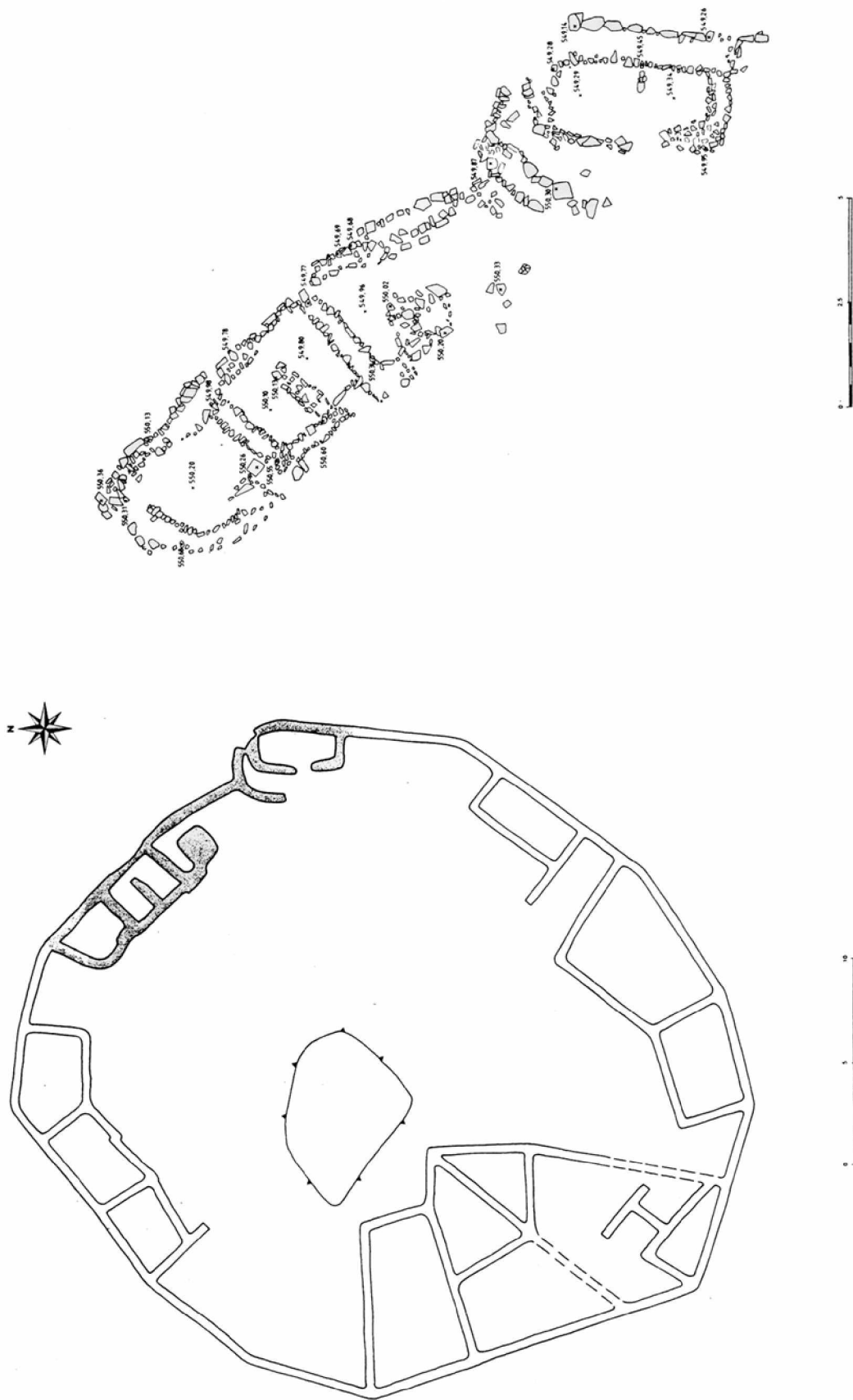


Fig. 7. Al-Maysar fort M34, plan (left) and detail of northeast area (right). Source: German Minging Museum.



Fig. 8. Rescue operation in Samad cemetery S23. Photo P. Yule.

Excavations at Rumaylah enabled a stratigraphic and artefactual differentiation of the Early Iron Age into an early and late phase (Boucharlat and Lombard 1985: 44-59). The dating of this period in the Sultanate rested on investigations which took place at the mountain fort of Lizq (Kroll 1981: 226-231; *idem* in prep.). At Lizq early and late EIA pottery are distinguishable, but not by means of stratification.⁹ The pottery of the late phase at Rumaylah in Northwest Oman (the present-day United Arab Emirates) has not as yet been identified clearly in Central Oman, even if there (at al Maysar M42 and M43) a late phase of Early Iron Age settlement is clear. Recently progress has been made in firming up the definition of the end of the Early Iron Age of Northeast Oman at around 300 BC, largely on the basis of Iranian parallels (Magee 1996: 249-250). This argument rests on the occurrence of burnished maroon slipped ware, trilobate arrowheads and ¹⁴C determinations in Rumaylah 2 and Tell Abraç. The stone vessels from Bawshar, in the coastal capital area (Fig. 9), form in the sketchy style and manner of execution of their motifs (despite Boucharlat and Lombard 1985: 59) a stylistically homogeneous body which correspond nicely to certain ones from Rumaylah 2 (Costa, Yule and Weisgerber in press 2) which seem to date to the end of that phase. In 1996 the German Archaeological Mission also investigated sites in order to shed light on the transition between the Early and Late Iron Ages. Early Iron Age sites were investigated in al-Rākī near Yānqūl (1995-1997), al-Maysar M42 and M43 (1996). A non-Samad Culture Late Iron Age cemetery was investigated just east of ‘Amlah in 1997 (Yule in press 1).

The distinction between Early and Late Iron Age metallic vessels, bangles, and weapons, was clarified with the help of a hoard of metallic objects which accidentally came to light on the Daressala’am Farm at ‘Ibrī/Selme in 1979 (Yule and Weisgerber in press).¹⁰ Just prior to the Late Iron Age, grave robbers working in the vicinity, exploited the grave goods in order to obtain metal. Most of the finds are attributed to the Lizq/Rumaylah Period by virtue of stratified parallels and comparable pottery forms. Within and between artefact classes many of the objects share morphological features, thus strengthening their dating. As is often the case with hoards, certain pieces do not belong chronologically to the bulk of the finds. But for

⁹ Kroll 1991: 315-320. The vast majority of Kroll's comparisons of Lizq/Rumaylah pottery with that of Iran are chronologically significant.

¹⁰ Find notices: Weisgerber et al. 1981: 232-233; Yule and Kervran 1993: 74-75; Yule and Weisgerber in press 2.

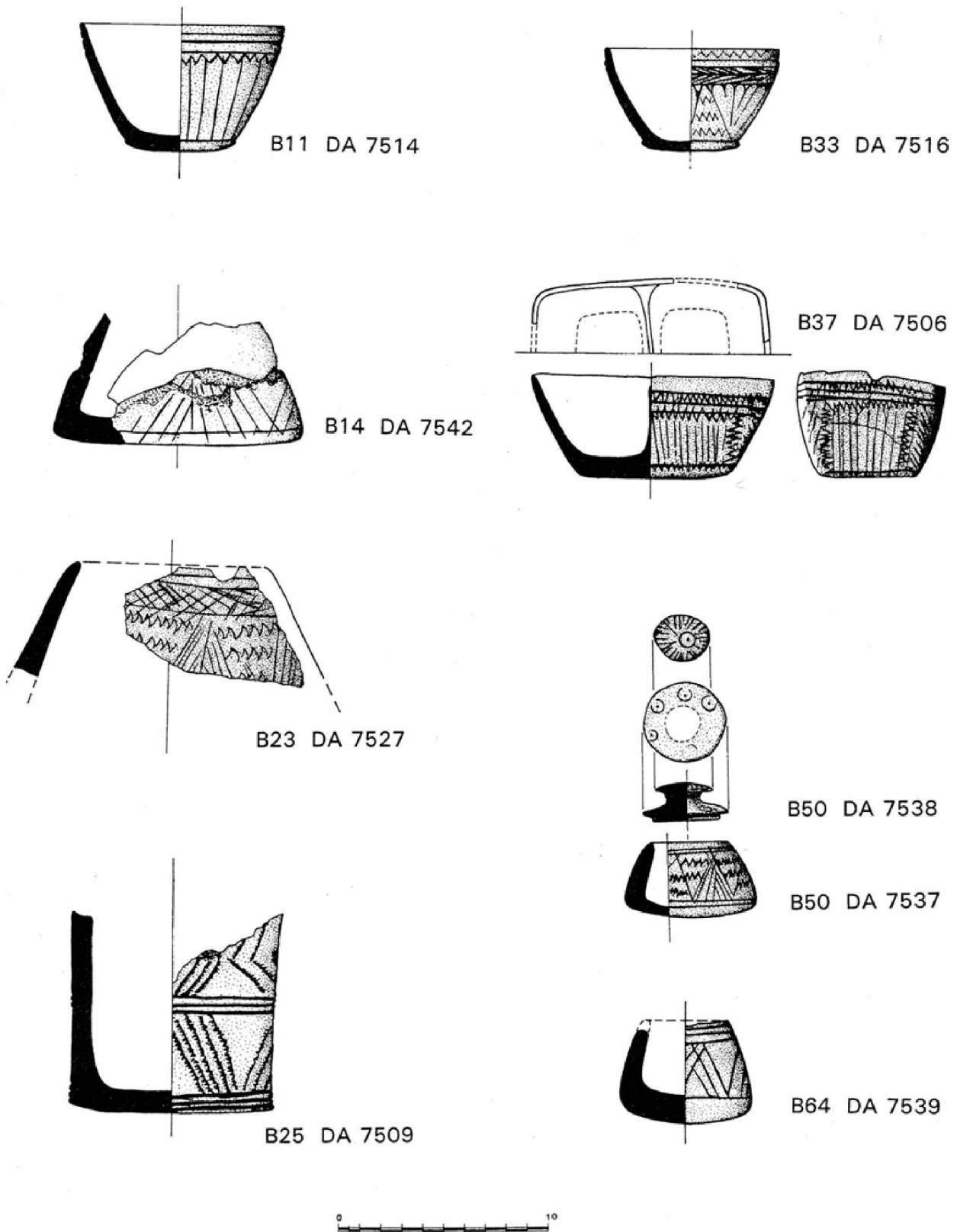


Fig. 9. Stone vessels from the "honeycomb cemetery" at Bawshar. P. M. Costa.

pieces do not belong chronologically to the bulk of the finds. But for these exceptions the range of shapes is limited. With nearly 600 mostly metallic objects it is the largest known hoard from the entire Near East. The study and restoration of the Selme hoard required several year's work.

The Samad Culture is the main archaeological manifestation at the turn of the millennium

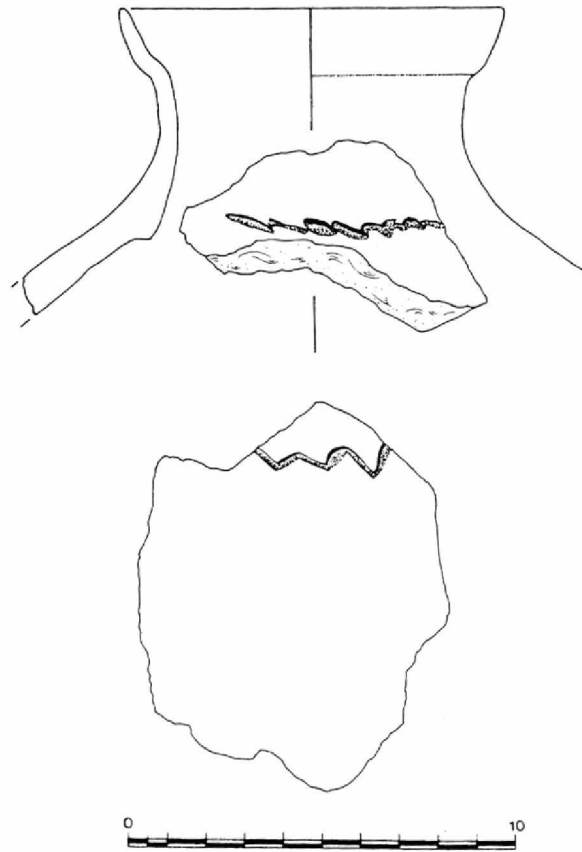


Fig. 10. Samad sherds from al-Shariq, gr. Sha2, DA 12702.

BC/AD in what has become the Sultanate. It is represented at over 20 different sites (Fig. 2).¹¹ These are located largely in the Sharqīyah and Dakhlīyah, mostly in al-Jawf. As is clearly demonstrated from the cemeteries at al-Bustān and al-‘Amqāt, which the German Mission tested for the Ministry of National Heritage and Culture in 1991, associated settlements which contain remains characteristic of the Samad Culture extend to the coast and lie in the Samā’il pass. In 1995 at Maḥalīya, Wādī ‘Andām (23° 22’N; 58° 03’E), and at al-Multaqá near Sarūr (23° 23’N; 58° 06’E) large new cemetery sites were visited in which both finds and debris from Samad graves (iron weapons and long roof stones of grave chambers) were strewn about. In 1996 a pottery bowl and arrowheads of this culture came to light in the Wādī Muhārak (22°10’N; 59°14’E) near al-Wāfi during a visit. Partially ringed in by mountains and desert, al-Jawf is a watered area of a kind which in German is called a “*Siedlungskammer*”. Important for the genesis of Oman, the Ibāḍīyah began in this heartland of “Oman Proper” (Miles 1919: 6 for the latter term) more specifically in interior Central Oman after its arrival from Basrah in the 8th century AD. While a few objects linkable to the Samad cultural repertoire have come to light in Ra’s al-Ḥadd (oral information J. Reade), in al-Shāriq (Fig. 10, 23°54’N; 58°53’E), near Bilād Bānī Bū Hassān (unpublished survey results), and possibly even on Maṣīrah island (al-Shanfari 1987: Fig. 15.1, 17.8, 22.7), the centre of the Samad Culture lies in al-Jawf, the area which is the stage for the Omani national epic, the *Kashf al-ḡumma* and N. al Sālimi’s *Tuḥfat* (see above).

¹¹ Samad and al-Maysar themselves contain several sites but count here as two.

Relative Chronology

Except for the same usually handmade technique, Samad Period pottery differs entirely from that of the preceding period. Nonetheless a few vessels exist from the Samad Period graves which seem transitional in their shape and/or fabric from those of the Lizq/Rumaylah Period. Standard Samad funerary shapes include large open-mouthed storage vessels, elongated bottles, squat bottles, small bottles, balsamaria, glazed "perfume bottles", pitchers, elongated pitchers, bellied vases, pilgrim bottles, and various minor forms (Figs. 11 and 12). Most numerous are bottles and small bottles. Bowls are rare. Ten preserved flask and 10 glazed "perfume bottles" comprise heterogeneous classes, morphologically speaking.

Five ceramic fabrics occur in the funerary pottery of the Samad Period, corresponding respectively to 1) large (usually over 30 cm) storage vessels, 2) balsamaria, 3) pilgrim flasks, 4) glazed vessels, and 5) the largest group - all remaining vessels including small bottles, bottles, storage jars, and pitchers. The clay of these last Samad vessels is lightly gritted with fine to medium grain size mineral platelets (serpentinite). Its hardness corresponds to Moh's 2-4 (soft) with the majority at the softer end of the range. This same hardness scale is used occasionally in the catalogue below. Large storage vessels have a coarser temper. Entirely different is the fabric of the dark, little-tempered, levigated, soft-fired, mostly wheel-thrown balsamaria. All of these fabrics are finer than those of vessels of corresponding size and function (e.g. storage vessels) of the Lizq/Rumaylah Period, and with a little practice they are readily recognizable as of the Samad Period. Both the handmade and wheel-thrown vessels are surprisingly asymmetrical. Except for the balsamaria, on about half of the vessel surfaces a usually thin orange to red slip was applied. Brush strokes in the slip often are visible.

Other kinds of finds reveal less about chronology, but more about the international trade contacts of Central Oman during this period. Large numbers of beads (Figs. 13 and 14) are difficult to date precisely within the Samad Period; they point to trade relations with South Asia (Rösch et al. 1997: 763-783). The originally bright colours of these glass beads are visible beneath a layer of oxidation products.

Signs of an internal chronology for the Lizq/Rumaylah and Samad Cultures derived from the *falaj*-settlements north of al-Maysar (Figs. 15 and 16). The *falaj* M46 was built in order to supply water to the EIA settlement M42. As the water table sank, the *falaj* was deepened and the water exited at a place deeper than M42, and to the south where M43 succeeded it. The settlement M43 is a chain of small settlement tells up to 10 m in diameter, ordered north-south along the length of the old *falaj*. At the end of the Samad Period the floor of the *falaj* again was lowered one or more times in order to water the subsequent settlement and its gardens to the south. By virtue of a thermoluminescence determination (Hd TL 10: 280 BC) and the appearance of the pottery, the settlements M42 and the northernmost ones belonging to M43 date to the end of the Lizq/Rumaylah Period (Yule and Weisgerber in press 1). This dating is buttressed by the occurrence of bowls in soft stone with depleted decoration (cf. Fig. 9 upper left), that is, simple verticle lines and a horizontal line or two at the rim. Some of the pottery from M42 and M43 may be even later than 300 BC (Yule and Weisgerber in press 1). One sherd shows a painted plant-motif similar to those of Nabataean pottery. The hill fort M34 was suspected to belong to the early part of the Samad Period, owing to its close proximity to the settlements M42 and M43 a few hundred metres north near the head of the *falaj*. Following the Samad Period, and owing to diminishing water resources, the villagers reexcavated the *falaj* which caused the village to move further south where the elevation was less.

Although the funerary pottery of the Samad Period is well-documented, that from settlements is known only from drawings (Weisgerber 1982: 87-92 Fig. 5-9, 10.2). A restudy of the pottery from the settlement M34 lends support to the early dating of this site (Figs. 17 and 18). The settlement pottery differs in its forms, coarser fabrics, and details of manufacture from burial pottery, both, however, are hand-made. The sample studied from M34 consists mainly of large and medium-size storage jars and bottles. Rare decorated sherds show incised wavy lines. Very deep incisions and gouges in the pottery occur several times and are characteristic of the pottery finds at this site. Several sherds appear to be harder fired than is usual for Samad Period-pottery.

In addition to the proximity of LIA al-Maysar M34 to the late EIA site M42 along the *falaj*,

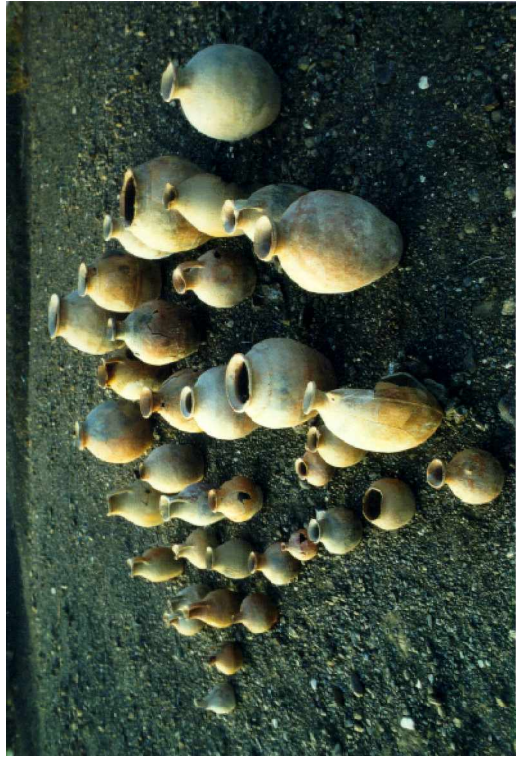


Fig. 11. Selected funerary vessels of the Samad period. Photo G. Weisgerber.



Fig. 13. Beads from gr. S10683. Photo P. Yule.



Fig. 14. Restored crumb glass bead from gr. S2304, Samad period. Photo P. Yule.



Fig. 22. Silver bowl from gr. S10815. Photo W. Klein, Bonn.

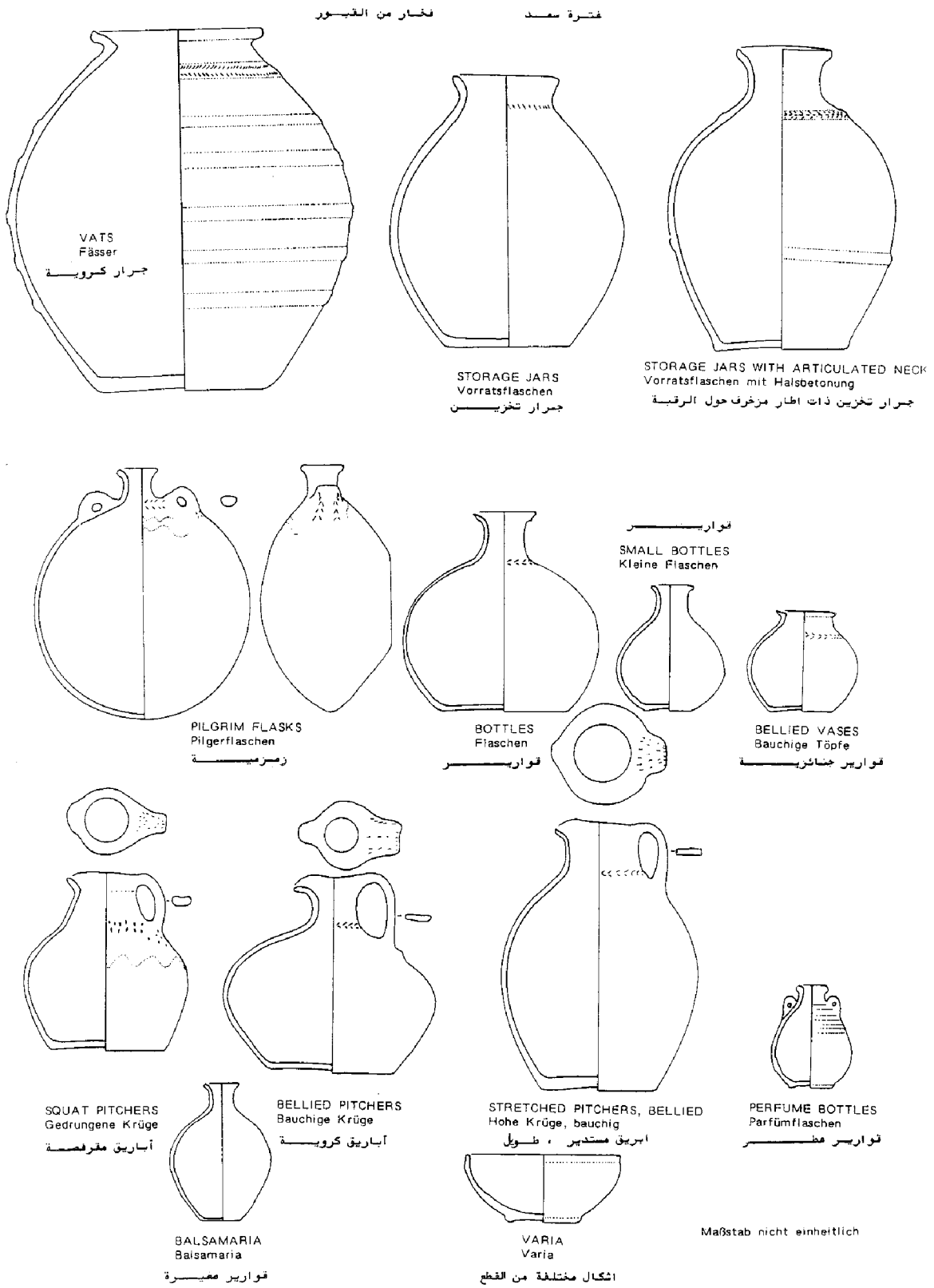


Fig. 12. Funerary vessels of the Samad period.

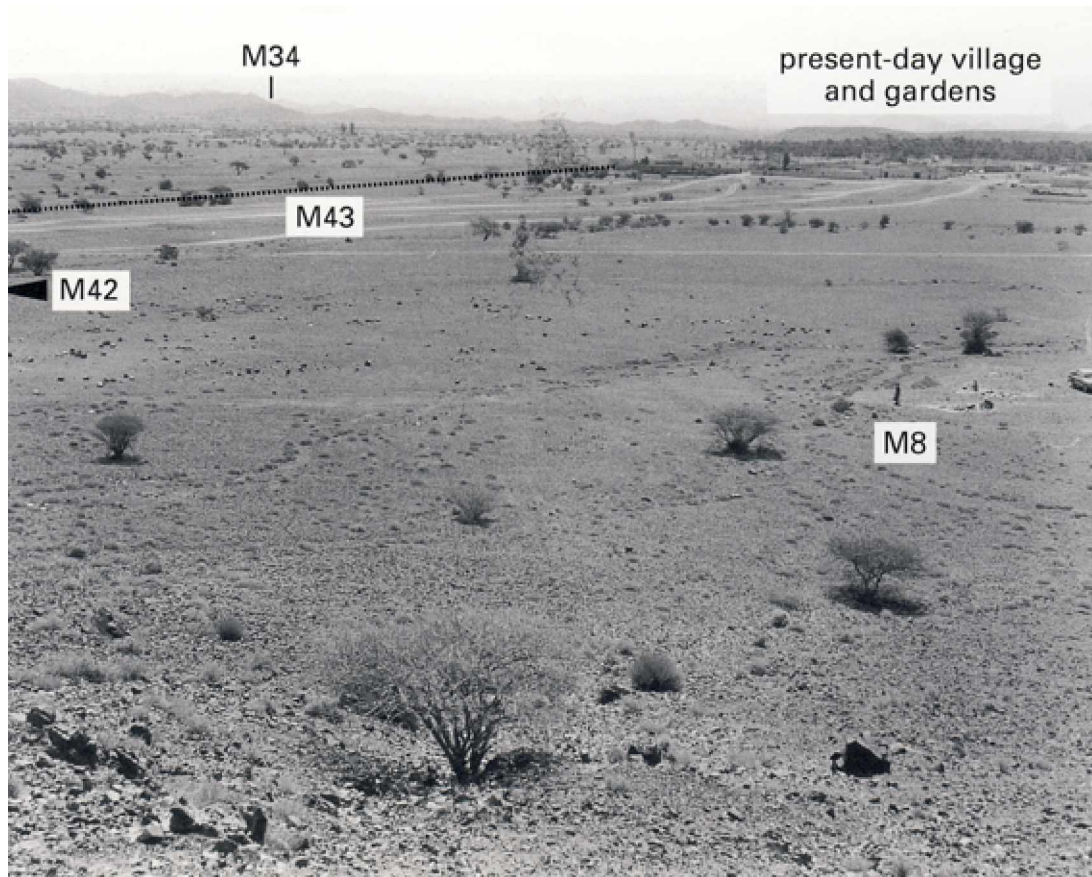


Fig. 15. Al-Maysar north, 1988. Photo P. Yule.

other considerations point to a dating early in the Samad Period for this site: The use of stone balls is characteristic of the Early Iron Age (Fig. 18.3), as at Rākī 2 near Yānqūl and al-Maysar M42. Elaborate EIA pouring spouts from so-called *sahālya* (Fig. 18.4) occur, for example also at the late EIA settlement M43 02. Wide spouts (Fig. 17.7) are best known from the late EIA honeycomb cemetery at Bawshar. Vertical lugs (Fig. 17.5) and so-called double-rim bowls (Fig. 18.6 and 7) also date predominantly to the EIA. Some of the sherds are clinky, a characteristic of the local Lizq/Rumaylah pottery.

Absolute chronology

During the early 1980s, as a first estimate, the Samad Period/Culture was dated to the so-called Hellenistic/Parthian Age, or alternatively to the last three or four centuries BC (Vogt 1981: 243. But Vogt also states that it could continue later). The dating rested on the appearance of iron arrowheads and other implements, a bronze bowl with constricted rim in gr. S101124 (Yule and Weisgerber 1988: Fig. 2), and an iron sword (Fig. 19) from gr. S101125 the latter which lowered the date somewhat. The Samad Culture was considered to succeed the Lizq/Rumaylah Culture in a linear fashion, and to end as a result of the country's Islamization in the early 7th century AD.

Comparative finds for dating purposes have come to light in Northwest Oman at ed-Dūr (Umm al-Qaiwain) and Mleiḥa (Sharjah) in recent years which are currently under study. The finds from the UAE shed indirect light on the kinds of finds dating to the beginning of the Samad Period, for which little information is available in Central Oman. One example is pattern burnishing (Mouton 1992: 45-46, Figs. 12.1-9; 17.1-7) of the PIR.A (3rd-1st half of the 2nd century BC) also occurring on the pottery of the early Samad Period (Samad gr. S2137 and S2138). Spouts in the shape of the foreparts of a horse derive from Central (Figs. 20 and 21) and also Northwest Oman (Haerinck 1992: 199 Fig. 16). They are stylistically unrelated to each other.

A sword (Fig. 19), excavated from the grave of a man, has become a topic of controversy with regard to

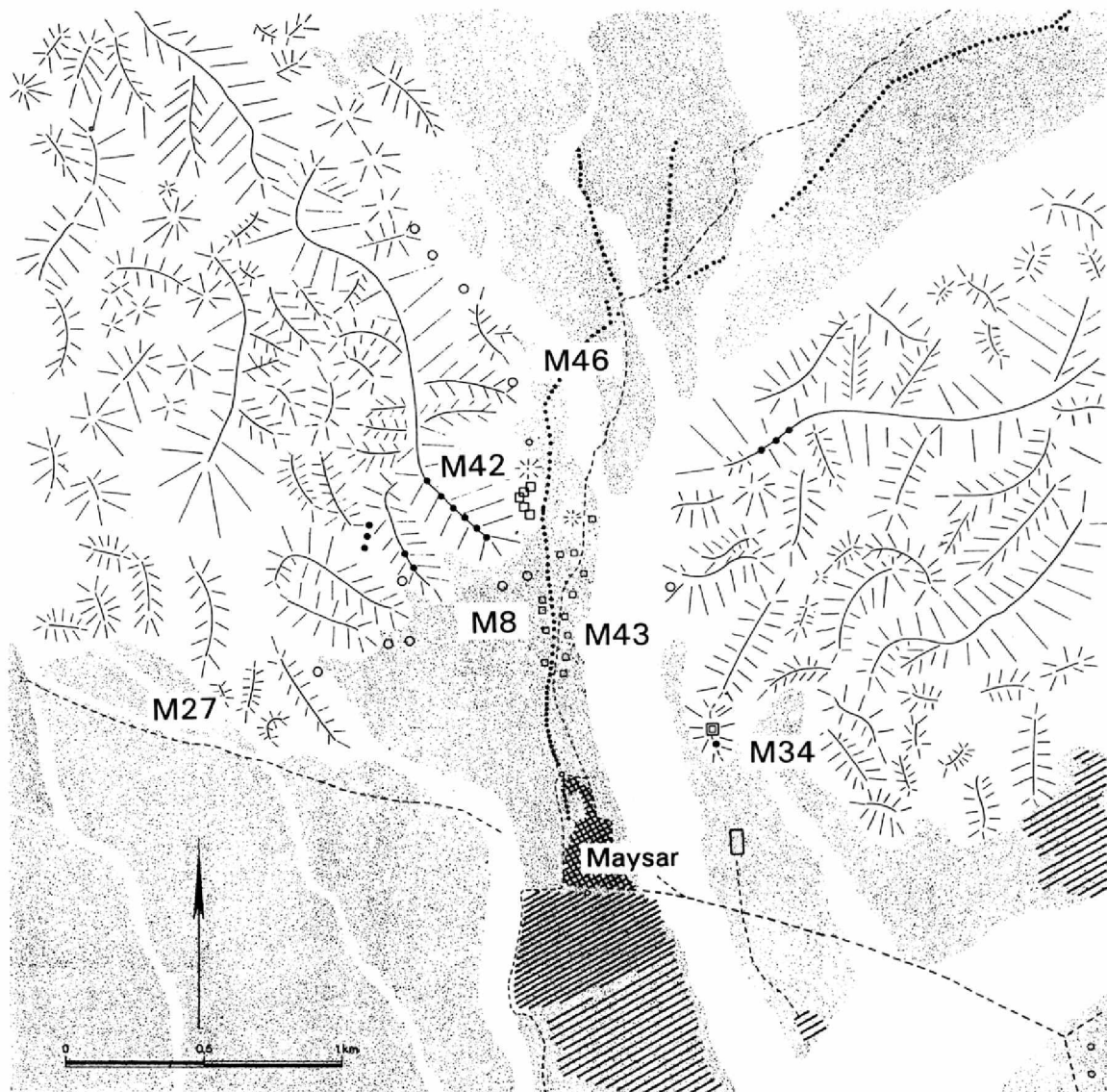


Fig. 16 Al Maysar north. Key: ●●● = *falaj*, □□□ = house mounds, □□□ = large ruins, ●●● = beehive tombs, ○○○ = other pre-Islamic tombs, cross hatching = modern village, hatching = gardens.

this period (Vogt 1984: 274; Yule and Kazenwadel 1993: Fig. 9.37). It has been discussed unconvincingly as a Roman import (Potts 1992 II: 295; Marek 1993: 146). It was found corroded in its scabbard slide with suspension clasps. Unusual are the double-edged blade combined with a hook-shaped butt. The edges have spalled off and the scabbard rotted away. We do not know if the Samad sword was worn slung over the shoulder or was worn at the waist, although the first is more practical and historically more widespread. The baldric or cingulum is ageless and is, for example, a heroic motif in Persian and Arabic medieval poetry postdating the Pre-Islamic Period. Roman *spatha*-like swords suspended from the shoulder came into use in Mesopotamia in the 2nd century AD, although forerunners in the Neo-Assyrian reliefs also come to mind. But neither is the sword in question Roman, nor does it have a "birdhead grip", as some would have it for dating purposes. The hooked end of the grip is a functional feature in order to make the hold on the heavy weapon more secure. This same feature occurs on subrecent swords from Oman. Roman *gladii* normally have a rod grip with a pommel and not a flanged one. Early medieval weapons are heterogeneous in shape, as a result of being imports from diverse areas, usually from the East in Iran, India, and Ceylon.¹²

At first the arrowheads seemed one of the few means available for dating by comparison with those of Persepolis and Failaka (Vogt 1984: 284 Fig. 5). But in their form the arrowheads from the Samad graves relate poorly to dated examples from neighbouring areas.

Metallic bowls with a constricted rim (Fig. 22) occurred in Samad graves bring to mind similar ones depicted on the processional reliefs of the Apadana at Persepolis. But these bowls, in fact need not date solely to the Achaemenid Period, and have a far wider chronological distribution extending earlier and later, even into the Common Era (Pfrommer 1987: pl. 62: A29 (Tuch al-Karamus, Egypt), A113 (Radüvene, Thrace) of the "asiatischer Typos"). Outside comparisons exist for other finds from the Samad graves, but most of these are themselves insecurely or problematically dated, for example, an alabastron (Fig. 23) which may date from 1000-700 BC (cf. Kortüm 1993: 29 Fig. 4). This also holds for the broad-ended bangles (Fig. 24). The development in grave structures of the Samad Period is difficult to judge since they and the grave goods change in an extremely conservative way. Stone bowls, sometimes lathe-turned (Weisgerber 1981: 216 Fig. 50.29 from al-Maysar M43 04), contrast strongly in shape, decoration, and technique with those of the preceding period.

The first ¹⁴C assays, which became available around 1981, pointed to a dating for the Samad Period overlapping or immediately succeeding the Lizq/Rumaylah Period. Two radiocarbon determinations initially available from the graves of this culture yielded implausible dates in the first half of the 1st millennium BC. One Samad grave (S101130) contained an Early Iron Age stone compartment vessel, now recognized to be an heirloom. A second sample (from gr. S101128) yielded bizarre results.¹³ In addition, the above-mentioned thermoluminescence assay suggested the date of the Lizq/Rumaylah period settlement al-Maysar M42.

By 1993, owing more to radiocarbon results than artefactual comparisons, the dating of the Samad Culture ranged decidedly later than expected at the beginning of the project (Fig. 25). Comparative finds date between 100 BC and 1000 AD. The majority of the calibrated and $\delta^{13}\text{C}$ -corrected ¹⁴C datings cluster from 250 to 1050 AD. Owing to a lack of a well-preserved and securely dated site documenting both the late part of the Lizq/Rumaylah Period (Rumaylah 2 Phase) and the Samad Period, the transition is difficult to pinpoint. Considering the substantial amount of dated materials from the earliest post Early Iron Age contexts in the UAE, including a few imports either from the Samad Culture or at least with close affinities to it, one theoretically could use the date for the beginning of the Samad Period at the presumed end of the EIA (Yule and Katzenwadel 1993: 261), but a 500 year lacuna exists until the first firm datings for the Samad Culture. The sites M42 and M43 respectively contain stratified pottery probably from this time, but are of limited help

Key to Fig. 17

- 1 Slip inside and out: pale red, break: light reddish brown, heavy amount of very coarse brown, black and white grits, DA 4950
- 2 Surface accreted, break: grey, heavy amount of coarse grit and grog temper, DA 4950
- 3 Inside, break: pink, outside: reddish yellow, heavy amount of coarse grit and grog temper, DA 4950
- 4 Inside: pinkish grey, outside accreted, break: grey, medium amount of coarse grog temper, DA 4952
- 5 Inside, outside and break: pink, heavy amount of coarse brown, fine white grits, DA 4950
- 6 No information
- 7 Inside: reddish yellow, outside: light reddish brown, break: grey, heavy amount of coarse brown grits, DA 4953
- 8 Slip poorly preserved, inside, outside: reddish yellow, break: reddish brown, medium amount of medium black and white grit temper, DA 4950
- 9 Inside, outside and break: very pale brown, medium amount of medium brown grit temper, DA 4950
- 10 Inside and outside: pink, break: grey, heavy amount of small white, medium brown grit temper, DA 4950

¹²The Omani *kat-rah*, such as in modified form in the national symbol, derives from the Sasanian long sword.

¹³ Respectively BLN 2724 ¹⁴C 2730±50 BP; HD 8526-8711 ¹⁴C 2410±80 BP.

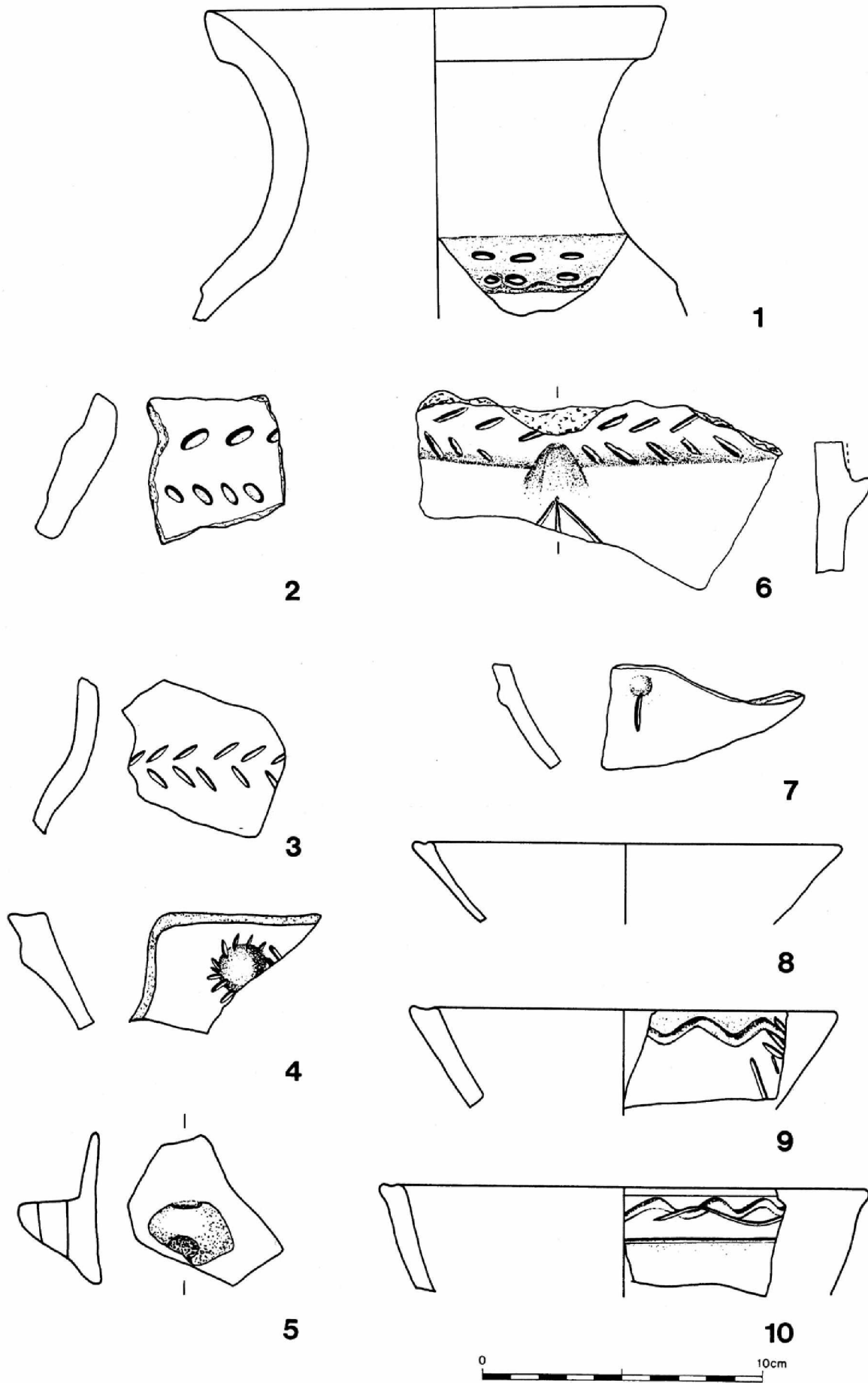


Fig. 17. Pottery from the hill fort al-Maysat M34. From G. Weisgerber 1982: 90 fig. 8.

since they have yielded no good samples for ^{14}C assaying. The gap in the ^{14}C assays is a result of archaeological sampling and not one in the measurement of the decay of ^{14}C . In light of the evidence summarized here, in the Sultanate "Iron Age" should be reserved for sites and artefacts which cannot be more specifically dated. For the Samad Culture the evidence from ^{14}C and antiquarian comparisons can be supplemented by means of a correspondence analysis to correct the relative sequence of artefact classes and graves.

There is no clear indication that the Samad population declined or was assimilated immediately following the onset of Islam. One reason is that early Islamic graves which might illuminate this matter were not excavated. Nor does it seem likely that the battle of Samad al-Shān in 280/893 directly resulted in the demise of the non-Muslim Samad folk. But a military campaign directed against the Ibadī population and leadership may well have had wider-ranging effects on the environment, for example as a result of the destruction of 'aflāj. A few radiocarbon determinations postdate the battle of Samad, but ranging over a 200 year timespan, those available do not pinpoint a single date for the end of the Samad Culture. The battle of Samad coinciding with the latest cluster of calibrated radiocarbon determinations, signifies conventionally the end of the Samad Period at c 900 AD. The location of the cemetery for the Muslim victims of this catastrophic battle against Muḥammad bin Nūr ("al-Būr"), the Abbasid viceroy of Baḥrain, is commonly known among the local population of Samad. Local tradition has it, that Samad al-Shān means "greater Samad", a reference to this ancient battle. When one considers that it took place over 1000 years ago, it is striking how widespread the memory of this event still is.

Identity of the population

Following the Early Iron Age, the culture of this area, eastern Central Oman, contrasts that of Northwest Oman, which is historically and culturally more closely linked to Iran and Iraq. In terms of trade and immigration, Central Oman had closer contact with South Asia and East Africa. The traditional designation "Oman" for both at this time blurs differences for the two distinct cultural areas as we know them from their finds and contexts. In the centuries thereafter the cultural similarities of the two areas again outweigh the differences.

Anthropological data show that the population just prior to the Samad Period, as known from the cemetery in Bawshar (mostly late Early Iron Age, partly possibly Samad Period, Kunter 1997 in: Costa, Yule and Weisgerber in press), is essentially similar to that of the Samad Period for instance from the graves at Samad al-Shān. The skeletons of both are gracile and of South Arabian type. The men average 166.9 cm and the women 155.8 cm in height.

The inhabitants of Central Oman spoke Arabic, probably in contrast to their neighbours in eastern Māka, i.e. in Iran. On the basis of early Arabic texts, Central Oman (especially al-Jawf), was described as a Persian colonial system with an Arab ethnic overlay (Wilkinson 1973: 40).

Key to Fig. 18

- 1 Inside and outside: pink, break: reddish-yellow-light brownish grey, medium to heavy amount of black grit temper, DA 4950, Weisgerber 1982: 92 fig. 10
- 2 Inside: pale brown, outside: pale brown and very pale brown, break: light brownish grey, heavy amount of red, black, and white minerals, DA 4457.3
- 3 Stone ball, DA 4960
- 4 Inside: grey, outside light yellowish brown - very pale brown, break: -, few red mineral grits, mica, DA 4457.1
- 5 Inside: light red, outside: reddish brown, break: reddish yellow, middle amount of black and red grits, DA 4457.2
- 6 Inside and outside: light reddish brown - pink, with traces of weak red, break: reddish yellow, white and red grits, DA 4950.3
- 7 Slip inside and outside: light reddish brown, ground: pink, break: reddish yellow, few red and black grits, DA 4950.5
- 8 Surface covered with accretions, inside: light reddish brown, outside: very pale brown, break: red, mittlere Menge black and red grits, isolated white and grey minerals, DA 4950
- 9 Slip inside and out, inside and outside: light brown - pink, break: grey, grey, black and red grits, heavy white particles, DA 4950

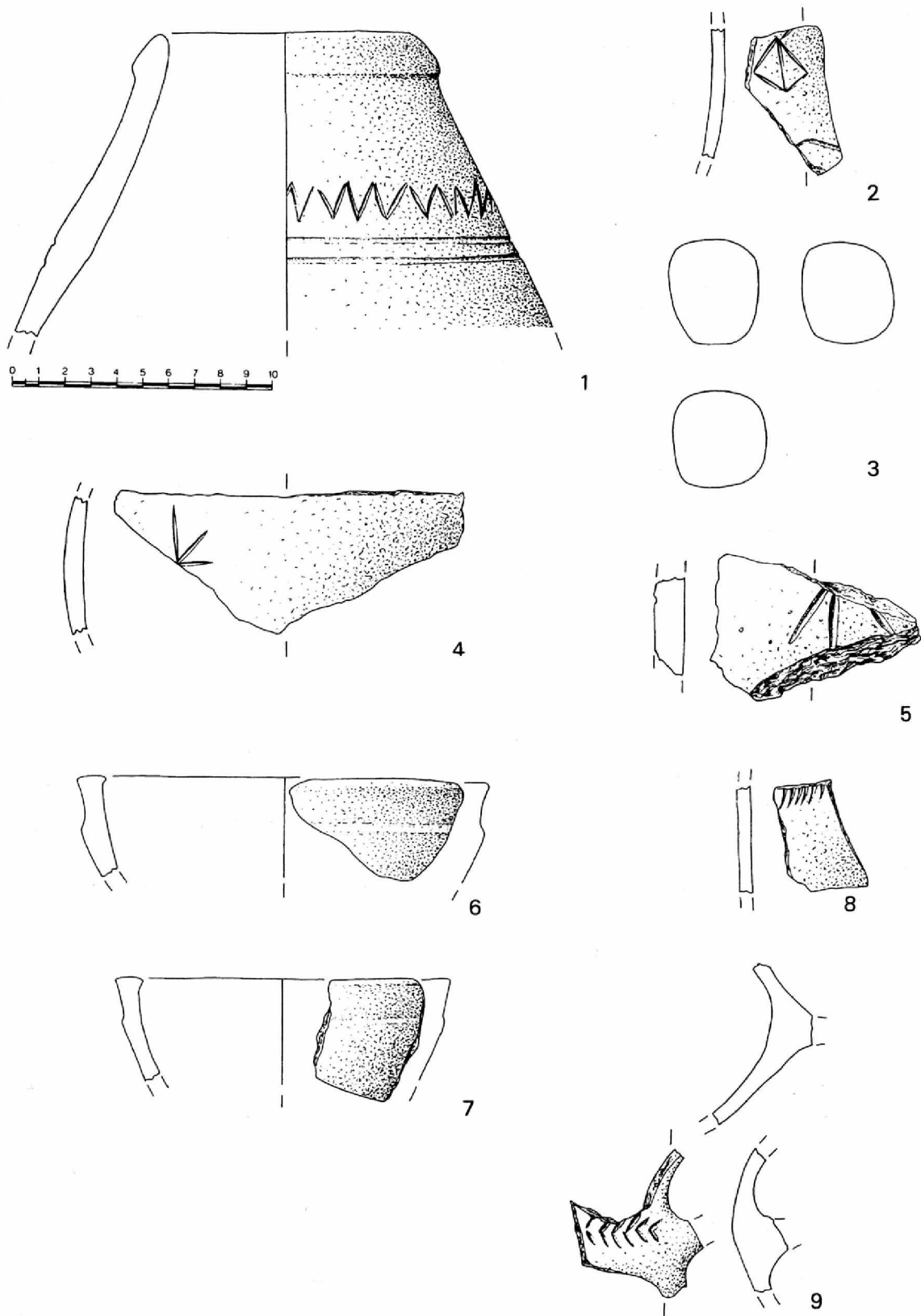


Fig. 18. Excavated finds from the hill fort al-Maysar M34.



Fig. 19. Sword from gr. S101125. Photo German Mining Museum.



Samad period. Photo T. Schierholz.

Fig. 20. Vessel spout from gr. S2020 of the

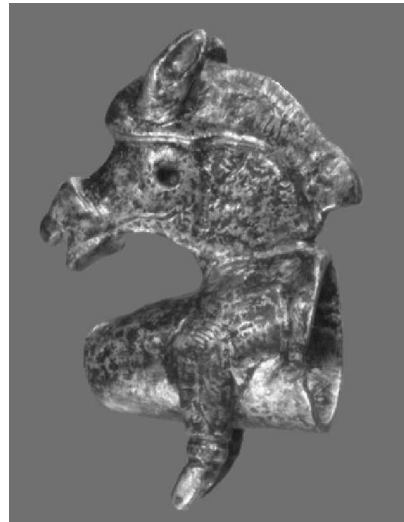


Fig. 21. Vessel spout from gr. Bar1 from al-Bārūnī, Samail. Photo P.Yule.

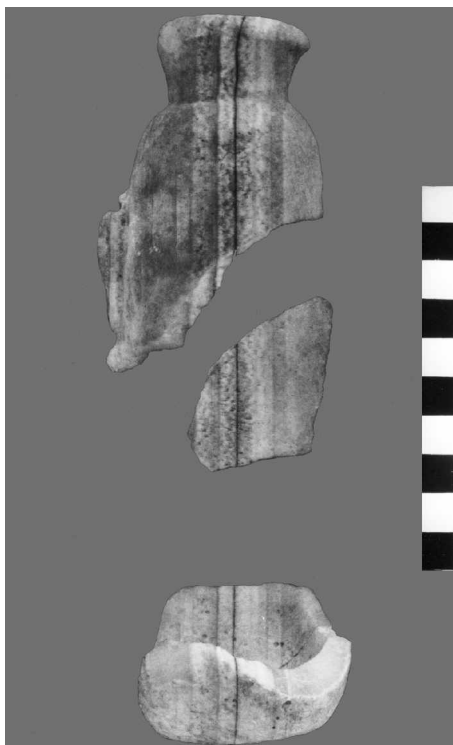


Fig. 23. Alabastron from Samad grave S10607. Photo T. Schierholz.



Fig. 24. Silver bangles from a child's grave, gr. S101123. Foto German Mining Museum.

N.B. Fig. 22 is on p.134.

The Persians possessed the garden property, and the Arabs the desert periphery. At the base of this interpretation lie legal (fiqh) documents from the First Imamate (793-893 AD) in which Persian settlers (Majus dhimmi) are said to be named (Wilkinson 1983: 182-183).¹³Wilkinson leaves the possibility open that some al-Azd tribes might have been settled in the area alongside the "Persians" in Sasānian times (Wilkinson 1972: 73; idem 1977: 206 note 14), but his research took place before the Samad Culture was known.

The Falaj

Early 'aflāj existed in the Yemen, Oman, Iran, Asia Minor and in other places. There is no evidence that the al-Azd brought the all-important falaj with them from Yemen to Oman. Given the existence of well-developed historic examples in Persia, several specialists have argued for their origin in Oman as an Iranian import. Whether this transfer of technology began as a part of a politically inspired programme of financial development, or took place outside of political structures remains unknown. As early as 1000 BC the falaj is attested in Bint Sa'ūd in the United Arab Emirates (pers. comm. W. Yasin al Tikriti, May 1997). The 'aflāj clearly existed in Central Oman during the early part of the Parthian domination, as is known from M46 which watered the Late Lizq/Rumaylah Period settlement M42. This is certainly not the Sultanate's earliest falaj, but rather the earliest dated one. The fact that the first cuneiform references in the 8th century BC for the existence of 'aflāj come from eastern Anatolia and Erbil in northern Iraq does little to strengthen an argument for a Persian origin for this ubiquitous technical innovation. Inasmuch as Solomon, king of Israel from about 961-922 BC, is the hypostasis of Sulaiman, it has been argued that the former also dates the introduction of the 'aflāj to Oman (Wilkinson 1977: 122-123).

But the introduction of the falaj to Oman early in the 1st millennium BC need not coincide with its widespread use there. Indications exist for its spread first during the Samad Period, at a time when the Sasānian government sponsored such developmental works for example in southeastern Iraq. This resulted in part in a tremendous expansion of the population there (Adams 1965: 71-73). To judge from the large proportion of known Samad graves relative to the total number of Pre-Islamic graves, this period seems also to have enjoyed population growth which resulted from increased agricultural production. For other reasons it has been argued that the Sasānian Period resulted in a major boost for Oman's 'aflāj and the amount of cultivated land (Wilkinson 1977: 132) [see also above, pp. 96-101 (ed.)].

References

- Adams, R.M. 1965. *Land Behind Baghdad - A History of Settlement on the Diyala Plains*. Chicago
- Albright, F. 1953. The Himyaritic Temple at Khor Rory (Dhofar, Oman). *Orientalia* 22: 284-287 pl. 71-72
- Albright, F. 1980. Sumhurām. In: A. Jamme (ed.), *Miscellanées d'anciennes Arabe* 11 Washington, D.C. 61-66, + pt. 8-11
- Albright, F. 1983. The American Archaeological Expedition in Dhofar, Oman, 1952-1953. *Publ. of the American Foundation for the Study of Man*, 6. Washington, D.C.
- Boucharlat, R. and P. Lombard 1985. The Oasis of Al Ain in the Iron Age - Excavations at Rumeilah 1981-83, Survey at Hili 14. *Archaeology in the United Arab Emirates* 4: 44-73
- de Cardi, B. 1977. Surface Collections from Oman Survey, 1976. *Jour. Oman Stud.* 3.1: 59-70
- de Cardi, B. 1970. Excavations at Bampur, a Third Millennium Settlement in Persian Baluchistan, 1966. *Anthropological Papers of the American Museum of Natural History* 51.3: 231-356
- de Cardi, B., S. Collier and D.B. Doe 1976. Excavations and Survey in Oman. *Jour. Oman Stud.* 2: 101-187
- Caskel, W. 1966. *ʿAmharat an-Nasab - das genealogische Werk des Hišam Ibn Muhammad al-Kalb?*. Leiden.
- Cleveland, R. 1959a. Preliminary Report on Archaeological Soundings at Sohar (Oman). *BASOR* 153: 11-19
- Cleveland, R. 1959b. The Sacred Stone Circle of Khor Rori (Dhofar). *BASOR* 155: 29-31
- Cook, J.M. 1985. The Rise of the Achaemenids and Establishment of their Empire. In: *Cambridge History Iran* 2: 200-291. Cambridge
- Costa, P./P. Yule and G. Weisgerber in press, *Archaeological Research in the Area of Muscat (Sultanate of Oman) 1981, 1982 and 1991*. In: P. Yule in press 1
- Doe, D.B. 1977. Gazetteer of Sites in Oman, 1976. *Jour. Oman Stud.* 3.1: 35-57

¹³ This text is unavailable to me.

- Eilers, W. 1983. Das Volk der Makā vor und nach den Achämeniden. Arch. Mitt. Iran Ergänzungsband 10: 101-11
- Haerinck, E. 1992. Excavations at ed-Dur (Umm al Qaiwain, U.A.E.) - Preliminary Report on the Fourth Belgian Season (1990). Arab. Arch. Epig 3: 190-208
- Hastings, A., J.H. Humphries and R.H. Meadows 1975. Oman in the Third Millennium BCE. Jour. Oman Stud. 3.1: 9-55
- Humphries, J.H. 1974. Harvard Archaeological Survey in Oman: II. Some Later Prehistoric Sites in the Sultanate of Oman. Proc. Sem. Arab. Stud. 4: 49-76
- Jacobs, B. 1994. Die Satrapienverwaltung im Perserreich zur Zeit Darius' III. [Habilitationsschrift Basel] Beih. des TAVO Nr. B87. Wiesbaden
- Jacoby, F. 1958. Die Fragmente der griechischen Historiker (F GR HIST). 3 Leiden
- Kervran, M. 1984. À la recherche de Suhar: État de la question. In: R. Boucharlat and J.-F. Salles (eds.), Arabie Orientale, Mésopotamie et Iran méridional de l'âge du fer au début de la période islamique. Mémoire Editions Recherche sur les civilisations 37: 285-293. Paris
- Klein, H. 1938. Kapitel 33 der anonymen arabischen Chronik Kašf al-Ġumma al-ġāmi' li-aḥbār al-Umma betitelt Aḥbār ahl Omān min auwal Islāmihim ilḥtilāf kalimatihim. (Geschichte der Leute von 'Omān von ihrer Annahme des Islam bis zu ihrem Dissensus) Dissertation. Hamburg
- Koch, H. 1993. Achämeniden-Studien. Wiesbaden
- Kortüm, K. 1993. Ein römisches Marmor-Alabastron aus Heitersheim, Kreis Breisgau-Hochschwarzwald. Archäol. Nachr. aus Baden 49: 4-31
- Kroll, S. 1981. Die Bergfestung Lizq-1. In: Weisgerber et al 1981: 226-231
- Kroll, S. 1991. Zu den Beziehungen eisenzeitlicher Keramikkomplexe in Oman und Iran, in: Golf-Archäologie Mesopotamien, Iran, Kuwait, Bahrain, Vereinigte Arabische Emirate und Oman. Internationale Archäologie 6: 315-320
- Idem in prep. Der Burgberg von Lizq
- Kunter, M. 1997. Anthropologische Individualdiagnosen (Daten). In: Yule, P. in press 1
- Magee, P. 1996. The Chronology of the Southeast Arabian Iron Age. Arab. Arch. Epig 7: 240-252
- Marek, C. 1993. Die Expeditionen des Aelius Gallus nach Arabien im Jahre 25 v.Chr. Chiron 23: 121-156
- Miles, S.B. 1919/1966. The Countries and Tribes of the Persian Gulf. London
- Mouton, M. 1992. La péninsule d'Oman de la fin de l'âge du fer au début de la période sassanide. Unpublished dissertation Université de Paris I
- Pfrommer, M. 1987. Studien zu alexandrinischer und großgriechischer Toreutik frühhellenistischer Zeit. DAI Archäol. Forsch. 16. Berlin
- Potts, D.T. 1986. The Booty of Magan. Oriens Antiquus 25: 271-285
- Potts, D.T. 1992. The Arabian Gulf in Antiquity. 2 vols. Oxford
- Al-Rawas, Isam b. Ali. 1990. Early Islamic Oman A Political History. Unpublished dissertation, University Durham
- Rösch, C., R. Hock, U. Schüssler, P. Yule and A. Hannibal. 1997. Electron Microprobe Analysis and X-ray Diffraction Methods in Archaeometry: Investigations on Pre-Islamic Beads from the Sultanate of Oman. European Journal of Mineralogy 9: 763-783
- Ross, E.C. 1874. Annals of 'Oman, from Early Times to the Year 1728 A.D. from an Arabic MS by Sheykh Sirhā'n b. Sa'īd b. Sirhā'n b. Muḥammad, of the Benu 'Ali tribe of Omān, translated and annotated. Jour. As. Soc. Bengal 43.1: 111-196
- Al-Sālimi, Nūr ad-dīn 'Abdullāh b. Ḥumayd 1347-1350/1969-1972. Tuḥfat al-a'yān bi Sirat ahl 'Umān. Cairo
- al Sālimi, Muḥammad b. 'Abdullāh b. Ḥumayd. 1961. Nahḍat al-a'yān bi ḥurriyat 'Umān. Cairo
- al-Shanfari, 'Ali b. Aḥmed b. Bakhit 1987. The Archaeology of Masirah Island Sultanate of Oman. Unpublished dissertation, University Naples
- Stein, M.A. 1943. On Alexander's Route into Gedrosia: an Archaeological Tour in Las Bela. Geog Jour 102: 193-227
- Tillmann, A. 1981. Die Burg Maysar-34, in: Weisgerber et al. 1981: 233-238
- Tosi, M. 1989. Protohistoric Archaeology in Oman: the First Thirty Years (1956-1985). In: P.M. Costa and M. Tosi (eds.), Oman Studies. Papers on the Archaeology and History of Oman. Serie Orientale Rome 63. Rome. 135-161
- Vogt, B. 1981. Die Gräber in Maysar-9. In: Weisgerber et al. 1981: 219-222
- Vogt, B. 1984. 1st Mill. BC Graves and Burial Customs in the Samad Area (Oman). In: R. Boucharlat and J.-F. Salles (eds.), Arabie Orientale, Mésopotamie et Iran méridional de l'âge du fer au début de la période islamique. Mémoire Editions Recherche sur les civilisations 37: 271-284
- Weisgerber, G. 1982. Aspects of Late Iron Age Archaeology in Oman: the Samad Civilization. Proc. Sem. Arab. Stud. 12: 81-93
- Weisgerber, G. et al. 1981: Mehr als Kupfer in Oman. Der Anschnitt 33: 174-263
- Wilkinson, J.C. 1972. The Origins of the Omani State. In: D. Hopwood (ed.), The Arabian Peninsula: 67-88. London
- Wilkinson, J.C. 1973. Arab-Persian Land Relationships in Late Sasānid Oman. Proc. Sem. Arab. Stud. 6: 40-51

- Wilkinson, J.C. 1977. *Water and Tribal Settlement in South-East Arabia: A Study of the 'Aflaj of Oman*. Oxford
- Wilkinson, J.C. 1983. The Origins of the 'Aflāj of Oman. *Jour. Oman Stud.* 6.1: 177-194
- Yule, P. 1994. Grabarchitektur der Eisenzeit im Sultanat Oman. *BaM* 25: 519-577
- Yule, P. in press 1. Yule, P. (ed.) *Studies in the Archaeology of the Sultanate of Oman*. Espelkamp
- Yule, P. in press 2. Die Gräberfelder in Samad al-Shān (Sultanat Oman) *Materialien zu einer Kulturgeschichte*. Espelkamp
- Yule, P. and Kazenwadel, B. 1993. Toward a Chronology of the Late Iron Age in the Sultanate of Oman. In: U. Finkbeiner (ed.), *Materialien zur Archäologie der Seleukiden- und Partherzeit im südlichen Babylonien und Golfgebiet*. 251-277. Tübingen
- Yule, P. and Kervran, M. 1993. More than Samad in Oman: Iron Age Pottery from Ṣuḥār and Khor Rorī. *Arab. Arch. Epig.* 4: 69-106
- Yule, P. and Weisgerber, G. 1988. *Samad ash Shan Preliminary Report 1988*. Bochum
- Yule, P. and Weisgerber, G., in press 1. Preliminary Report of the 1996 Season of Excavation in the Shar-qīyah and al-Zāhirah, Sultanate of Oman. In: Paul Yule (ed.) in press
- Yule, P. and Weisgerber, G., in press 2. The Metal Hoard from 'Ibrī/Selme, Sultanate of Oman. *Präh. Bronzefunde*. Stuttgart.
- Zarins, J. 1995. Oman. In: *Oxford Encyclopedia of Archaeology of the Near East*. 184-187. Oxford