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**ARCHAEOLOGICAL SURVEY IN WADI BAHLA  
(SULTANATE OF OMAN): AN IRON AGE SITE  
ON JEBEL AL-AGMA, NEAR BISYAH**

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**Introduction**

During November 2009 archaeological mission at Salut, the IMTO (Italian Mission To Oman) was been asked<sup>1</sup> to investigate the possible date of a *falaj* recently discovered in the Wadi Bahla, near the village of al-Dhabi, approximately 2.5 km south east of the site.

Gravel extraction from the wadi had exposed part of an underground channel. This appears to be part of the «cut and cover» section of a *qanat*, as described by Wilkinson<sup>2</sup> and



Fig. 1 - Jebel al-Agma, view from south-east.

<sup>1</sup> The survey has been carried out on behalf of the Office of the Advisor to His Majesty for Cultural Affairs, under the aegis of which the excavations at Salut are also being conducted. We also acknowledge the support and encouragement of Prof. Alessandra Avanzini, Director of the Italian Mission to Oman.

<sup>2</sup> WILKINSON 1977, p. 80.

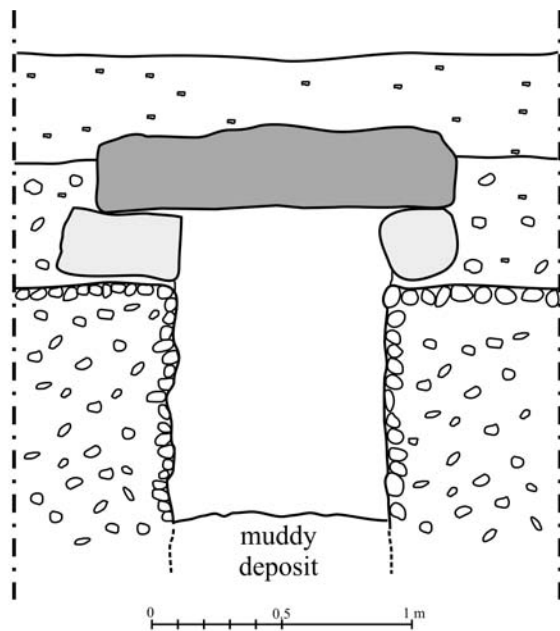
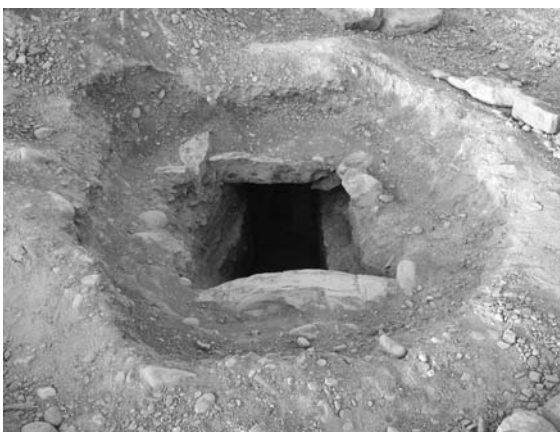


Fig. 2 - Schematic section of the *falaj* gallery.

typical of some small *falaj* systems where the water supply is at no great depth. In this instance, therefore, the channel was excavated from the surface through gravel deposits and partly in to an underlying concreted conglomerate. The upper part of the channel, above the impermeable conglomerate, was then lined and covered with large stone slabs – hence the description «cut and cover». The water supply is probably located a short distance upstream where there is a wide bend in the wadi and a likely place for the accumulation of ground water; there is no evidence for shafts (*thuqbah*) which would indicate a more distant source.

In the limited excavation and cleaning of a small part of the channel (figs. 3, 4) it was observed that the exposed section (fig. 2) reaches a depth of 1.3 metres from the ground surface.

This only represents the top of the muddy sediments accumulated in the channel since maintenance ceased, while the true base of the channel has not been reached. The upper 25 to 30 cm thick, loose sand and gravel layer covering the channel's roof, is constituted by wadi sediments accumulated after its construction. Beneath the upper gravel deposits is another 40 cm thick gravel deposit with brown compacted silt through which the channel was cut, and beneath this lies the consolidated conglomerate deposits into which the approximately 55 cm wide channel was further cut. No pottery sherds or other datable finds were found.



Figs. 3-4 - The retrieval of the *falaj* (3), and a view of its gallery (4).

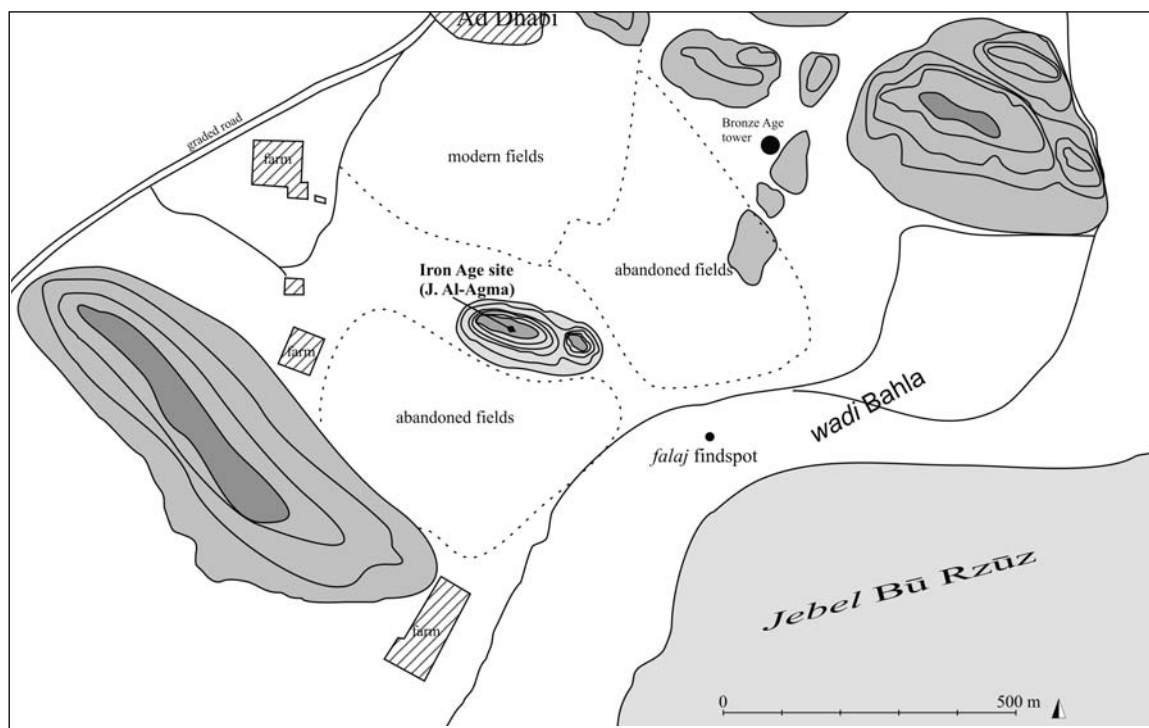


Fig. 5 - The location of the site.

The above-ground section of the channel remains to be traced, but probably leads towards a low terrace which has been cultivated in very recent times. Given, however, the importance of the history of the *falaj* and recent evidence that appears to show that its origins can be traced back at least as far as the early Iron Age<sup>3</sup>, the opportunity was taken to survey a wider area which might at some time have been reliant on irrigation and to see what evidence there might be for earlier habitation. A part from the evidence for recent cultivation the only other evidence of occupation was found scattered over and around a conspicuous hill named Jebel al-Agma (fig. 1), approximately 200 meters from the *falaj*. The surface finds clearly indicate this to be an Iron Age site and subsequent investigation revealed a large quantity of pottery and the foundations of stone walls.

This site has not been reported previously, at least not specifically. It has been stated by J. Orchard that it was possible to distinguish «an oasis town of the so-called Iron Age period» within the large area including «not only what are now the outskirts of the oasis of Bisya, but also the districts (Sallūt, Shūh and Farūd) west and north of it, the village of al-Dhabi and its environs, and the tomb covered hills of Jabal Bū Rzūz»<sup>4</sup>. After this observation, no more details regarding the Iron Age evidence have been given by in later publications<sup>5</sup>.

<sup>3</sup> AL-TIKRITI 2002, CORDOBA-DEL CERRO 2005.

<sup>4</sup> ORCHARD 1994, p. 73.

<sup>5</sup> The Iron Age is not mentioned in the summary of the al-Hajar Project published in the Journal of Oman Studies (ORCHARD-ORCHARD 2002).

## The Iron Age remains on Jebel al-Agma

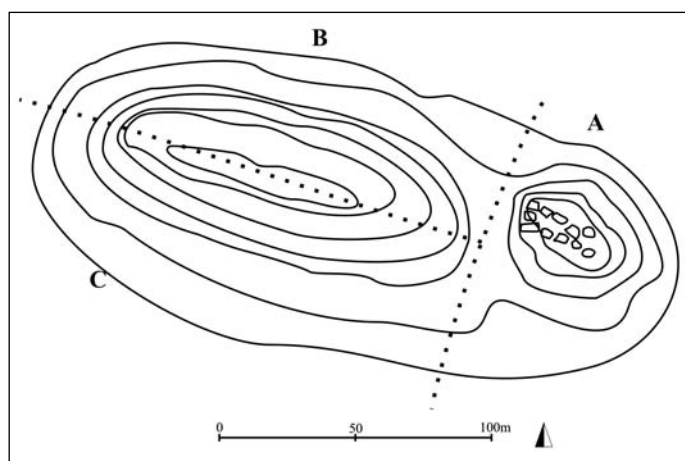


Fig. 6 - Sketch of Jebel al-Agma with contour lines and indication of the survey zones.

The hill<sup>6</sup>, with an E-W oriented elliptical shape, is situated about 500 metres south of the village of al-Dhabi<sup>7</sup>. It shows two main outcropping ridges, the western ridge being the higher, and between them is a narrow saddle (fig. 5).

As mentioned above, evidence for Iron Age occupation was indicated by a remarkable amount of pottery sherds visible on the surface and by stone alignments indicating the plan of several walls (fig. 7).

For the initial survey the hill was divided into three zones, A to C (fig. 6), aiming at spotting any possible differences between the assemblages recovered in each of them.

Zone A corresponds to the area surrounding the lower and easternmost ridge, extending to the middle of the saddle. Zone B includes the northern slope of the main ridge, from the top to the foot of the hill, and zone C corresponds to the opposite slope of the same ridge.

Overall, the ceramic assemblage retrieved is quite homogeneous, and little if any differences can be made between the three zones. Both the typology of the diagnostic sherds retrieved and their fabrics are consistent with a dating of the site to the Iron Age. The only possible differences are the occurrence of necked jars almost exclusively in area B (together with fragments of spouts), while large storage jars occur more frequently in zones A and B.

Scarce differences can be also pointed out concerning the distribution of visible walls; on top of the main ridge, almost no wall is clearly visible, while along its slopes several have been recorded, with a slight majority in zone C where the surface is flatter.

In zone A, the top of the ridge is characterized by massive boulders and the exploitation of these as footings for built structures cannot be ruled out, even if no clear proof remains.

Only excavation can confirm the precise dating of these buried walls but their association with the Iron Age pottery appears almost certain. By comparison, the most prominent structure visible on the ground, a U shaped wall occupying the top and the northern slope of the main outcrop, is clearly relatively modern and the product of a late reuse of the stones scattered around the site.

<sup>6</sup> The area is also known as Taliya' by the locals.

<sup>7</sup> Geo-reference for the highest point of the western ridge is 22°45'6.20"N 57°15'22.28"E.



Fig. 7 - Wall remains on Jebel al-Agma.

## The pottery

The pottery collected on Jebel al-Agma comprises a range of shapes in a variety of fabrics (fig. 8 and pls. 2-6) which can be safely labelled as Iron Age by comparison with other sites in South-East Arabia. Among all the sherds picked up during the survey, only the diagnostic pieces have been stored; the illustrated sherds have been selected as being representative of the whole assemblage, for what concerns both shape and/or fabric.

For the sake of simplicity, fabrics have been distinguished between fine, medium and coarse, with an increased content of grits, that can be white, brown, black or red in colour. In some cases vegetal temper is also present. The majority of sherds is made of a medium fabric, varying in colour from red, red-brown to orange-brown and brown. The occurrence of so-called sandy wares is rare.

Almost all the sherds, excluding the large jars, still bear the original slip, often present on both interior and exterior surfaces.

Firing seems to have been quite accurate, and only a small number of fragments show the grey core that can be ascribed to a non-uniform or incomplete baking of the clay.

As far as the shapes are concerned, cups and bowls are the most represented types, followed by necked or globular jars, whilst large storage jars appear less frequent.



Fig. 8 - A selection of pot sherds found on Jebel al-Agma.

Carinated cups are clearly associated with a fine ware and some have black painted decoration both inside and outside, often covering the edge of the rim too.

While the large storage jars are made exclusively in a coarse ware (fig. 9), bowls, necked and globular jars can be made of fine or medium ware, though the latter is by far the most common.

Incised decoration is represented by one or more horizontal wavy lines motifs on the necked jars, while oblique strokes or criss-crossed lines can be observed on the large storage jars. Painted decoration, evident only on six of the retrieved sherds, comprises horizontal wavy lines, horizontal straight lines, hanging oblique lines and pendant squares.

Before making a general comparison with South-East Arabian Iron Age pottery as a whole, it is inevitable and desirable that comparisons are made first with the pottery from Salut, given that the two sites are close to each other and that pottery from Salut comes from excavated contexts which can be related to a sequence of C14 dates<sup>8</sup>. As could be

<sup>8</sup> PHILLIPS 2010.

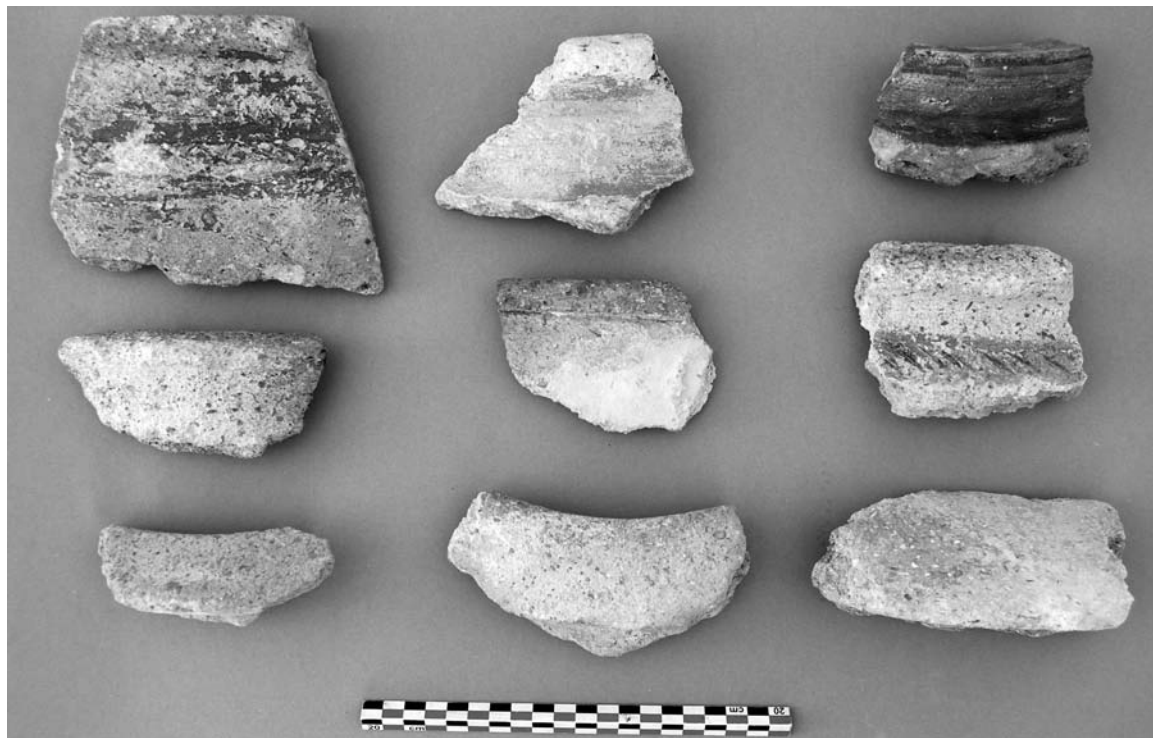


Fig. 9 - Coarse ware storage jars.

expected, the general picture is one of great similarity, and the similarities appear more significant if one considers that a relatively small surface collection is being compared with the pottery retrieved from several seasons of extensive excavation. Given this quantitative imbalance, it is perhaps more interesting to consider anything which has been found at Jebel al-Agma but so far absent at Salut. In this respect, the double carinated open bowl AG09,11 (pl. 4,19), and the sherd AG09,25 (pl. 2,8), also showing a double carination, are peculiar to Jebel al-Agma; there are currently no correlates from Salut. Likewise, two shapes that appear quite unusual when compared with the Salut assemblage are a globular jar AG09,15 (pl. 6, 37) and a necked jar AG09,6 (pl. 6,30).

When compared with other sites, however, these few apparent oddities do not remain unattested, though still their occurrence is in certain cases rare. Double carinated bowls similar to AG09,11 are quite common and found on different sites<sup>9</sup>, with a notable presence at Hili 2<sup>10</sup>. Globular jars with thickened rim resembling AG09,15<sup>11</sup>, appear quite

<sup>9</sup> E.g. BOUCHARLAT-LOMBARD 1985, pl. 49, 5 and BENOIST 1998, fig. 3, 12-14 (Rumeilah period I); MAGEE 1998, fig. 6 (Tell Abraq).

<sup>10</sup> AL TIKRITI 1998, fig. 7, fig. 8, A-C, fig. 9, G-I.

<sup>11</sup> E.g. CLEUZIQU *et al.* 1978, p. 42, fig. 10, 16 (Qarn Bint Sa'ud); Boucharlat and Lombard 1985: pl. 58, 12-13 (Rumeilah period II; though this could raise some doubt about a late date for the Jebel al-Agma sherd, its fabric is completely different from the two from Rumeilah, and perfectly fits an Early Iron Age / Rumeilah I date).

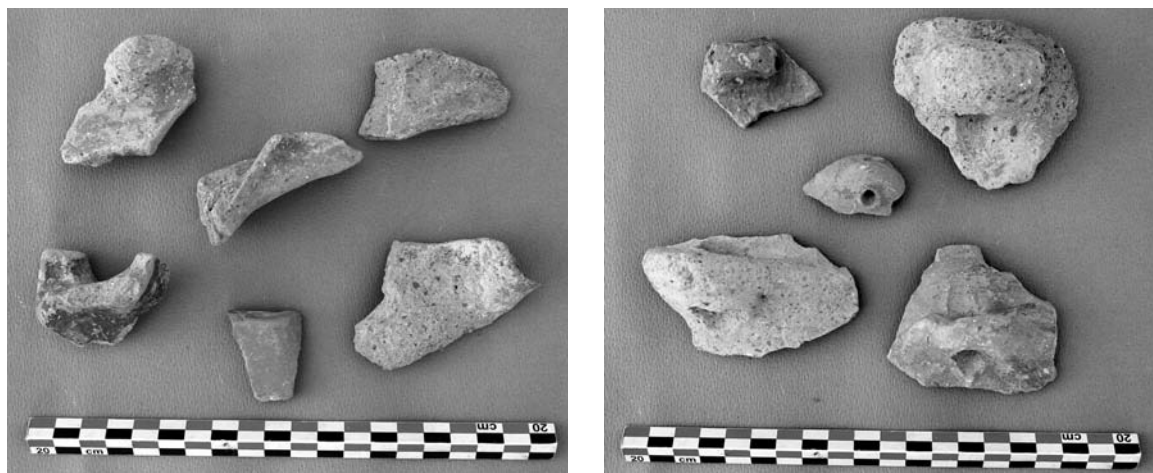
rare, while no precise parallel can be found for necked jars analogous to AG09,6. The peculiar sharp corners between the shoulder and the neck and between the neck and the rim of AG09,6, hint at a later Iron Age (cf. Iron Age III) «nuance» and constitute a possible element of ambiguity regarding the final date of the settlement.

As a whole, the collection from Jebel al-Agma shows a great predominance of bowls over other shapes, in particular above coarse storage jars, somehow differing from the nearby site of Salut where these vessels are widespread; the overwhelming presence of carinated cups on the latter, also seems not to be mirrored at Jebel al-Agma but, as intimated above, any comparisons made between a small survey collection and a much larger assemblage acquired from excavation need to be treated with caution.

Only a few spout fragments were found during the survey of Jebel al-Agma (fig. 10); two of them could represent bridged-spouted jars but the poor state of preservation hampers further inference about the original vessel.

Horizontal handles and lugs, whose morphology points to a use both for suspending and handling vessels, are also present in Jebel al-Agma assemblage (fig. 11), indicating the presence of particular types of jars and vessels, examples of which can equally be seen at Salut<sup>12</sup> or at Lizq<sup>13</sup>, for example.

Decorative motifs seen on the Jebel al-Agma pottery are also consistent with what is found at other sites. Incised decoration of the same kind is frequently found on jar-necks and on the applied cordons around large jars. Painted bowls of the same type as those presented here have been recovered on many Iron Age sites. Painted wavy lines are among the most common design elements and hanging oblique lines are also not uncommon, with a particularly high frequency found at Lizq<sup>14</sup>.



Figs. 10-11 - Fragmentary spouts (10), lugs and handles (11).

<sup>12</sup> AVANZINI, SEDOV, CONDOLUCI 2005, p. 383, pl. 5,1.

<sup>13</sup> KROLL 1998, fig. 6, 49.

<sup>14</sup> KROLL 1998, fig. 1, 1-2 and 4-6.



Apart from the single sherds discussed above, the pottery from Jebel al-Agma can, therefore, be safely compared with other Iron Age sites of South-East Arabia. In particular, affinities are evident with the Rumeilah period I assemblage<sup>15</sup> and Lizq.

No shape or ware of distinctly Rumeilah period II type was recovered during the survey and thus suggests that Jebel al-Agma was abandoned by the 6<sup>th</sup> century B.C. The current state of research, however, urges caution on the issue of Iron Age pottery sequences and chronology<sup>16</sup>. Data from Salut clearly indicate that the Iron Age was well established in the 13<sup>th</sup> century B.C.<sup>17</sup> and pottery from Jebel al-Agma can be compared with pottery found at Salut from this early date and throughout the early first millennium B.C. At some date, however, probably around the 6<sup>th</sup> century B.C., new pottery types appear at Salut which can be accurately compared with the wheel-turned and burnished slipped ware known as Burnished Maroon Slipped Ware (BMSW<sup>18</sup>). At Salut, earlier pottery types continue to be used alongside new additions to the assemblage, such that, without further quantitative and typological analyses the later Iron Age pottery assemblage is more easily defined by the arrival of new elements rather than the disappearance of older elements. As regards the end of the occupation at Jebel al-Agma, all that can be said is that no sherd shows the burnishing and maroon slip typical of BMSW which would confirm a later Iron Age (Iron III) occupation.

## Discussion

The presence of an Iron Age site on Jebel al-Agma has been confirmed. The presence of a *falaj* in the adjacent wadi might suggest that the choice of this location was related to the access to local resources, which included cultivable land and a means of irrigation. The latter, however, could possibly have been obtained by wells only and it is important to emphasise that so far there is no evidence whatsoever which proves a connection between the presence of the *falaj* and the Iron Age site. Likewise, however, there is nothing to disprove this either! Future excavation at Jebel al-Agma would no doubt enable more information to be gained regarding the nature of the occupation there and a more accurate indication of the date of the settlement. It would be more difficult to date the *falaj* though all the possible techniques to do this should be considered.

A few observations can, nevertheless, be made regarding the Iron Age sites of Salut and Jebel al-Agma and their spatial relationship to known *aflaj*. In both cases the settlement occupies a spot downstream from a group of Bronze Age sites located in the Wadi Sayfam and Wadi Bahla respectively, and it is possible that this shift in the location of sites is related to different irrigation technologies and/or local environmental circumstances. If the earlier Bronze Age sites were dependant on some kind of *falaj* irrigation,

<sup>15</sup> BOUCHARLAT-LOMBARD 1985, pls. 45-52.

<sup>16</sup> SHREIBER 2010.

<sup>17</sup> PHILLIPS 2010.

<sup>18</sup> Burnished Maroon Slipped Ware, see MAGEE 2005.

be it of the *ghayl* or *qanat* type<sup>19</sup>, a lowering of the water table would necessitate a relocation downstream. So, if this shifting settlement pattern can be identified on a more widespread scale it could infer that in the Iron Age it became necessary to adopt and adapt earlier irrigation technology or develop completely new ways of irrigation. When precisely the introduction of the *falaj* as we understand it today first took place is still to be confirmed, but as stated above, the results from some sites appear to show conclusively that the technique was fully understood at the beginning of the Iron Age. It remains to be shown how widespread the phenomenon was at the beginning of the Iron Age and more widespread surveys and excavation need to be envisaged.

This short report about Jebel al-Agma thus represents a preliminary stage in the wider survey of Iron Age sites in the area of Wadi Bahla and Wadi Sayfam, the courses of which almost converge in close proximity to the site of Salut.

Although several archaeological surveys were conducted in the Wadi Bahla and Wadi Sayfam over the last 40 years<sup>20</sup>, most of them mainly recorded tombs and monumental sites datable to the Bronze Age<sup>21</sup>. Others have dealt exclusively with the Islamic period<sup>22</sup>.



Fig. 12 - Wadi Bahla seen from top of the site.

<sup>19</sup> WILKINSON 1977, p. 74.

<sup>20</sup> From the first survey held in the '70s by the Harvard team (HUMPHRIES 1974) down to the long-term work of the Birmingham team in Wadi Bahla (see more recently ORCHARD-ORCHARD 2006).

<sup>21</sup> HUMPHRIES 1974; DE CARDI *et al.* 1976.

<sup>22</sup> WHITCOMB 1975.

In these earlier surveys Iron Age occupation was identified at two sites by the Harvard Archaeological Survey in 1973. One of these sites was Salut, recorded as BB-15, and another, BB-4, which was located further north, south of Bahla on the bank of the main wadi<sup>23</sup>. The current excavations at Salut are proving it to be an important site<sup>24</sup>, but what is lacking is clear evidence for the surrounding Iron Age archaeological landscape, despite an abundance of nearby Bronze Age tombs and settlements which have contributed to a possible explanation of town development during the Early Bronze Age in the al-Hajar region of Oman<sup>25</sup>. Something similar needs now to be done for the Iron Age and the discovery of Jebel al-Agma and its relationship with Salut represents a preliminary step. In addition another brief survey has already been conducted near the town of Bahla where, in February 2010, the precise location of BB-4 was sought; its location was identified but regrettably the site had been bulldozed recently. A few hundreds meters from it, however, a hill, comparable in size with Jebel al-Agma, was recognized as a continuation of the Iron Age site, as well as indicating more ancient Bronze Age activity. It is hoped that further examination of this site, comparison with Salut and Jebel al-Agma, and further survey will help reveal a more complete picture of Iron Age settlement in this specific part of Oman.

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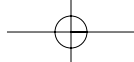
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<sup>23</sup> HUMPHRIES 1974, p. 52.

<sup>24</sup> AVANZINI-PHILLIPS 2010.

<sup>25</sup> Among others, ORCHARD-STANGER 1994; ORCHARD 1995; ORCHARD-STANGER 1999. *Contra* POTTS 1997.

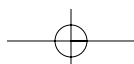
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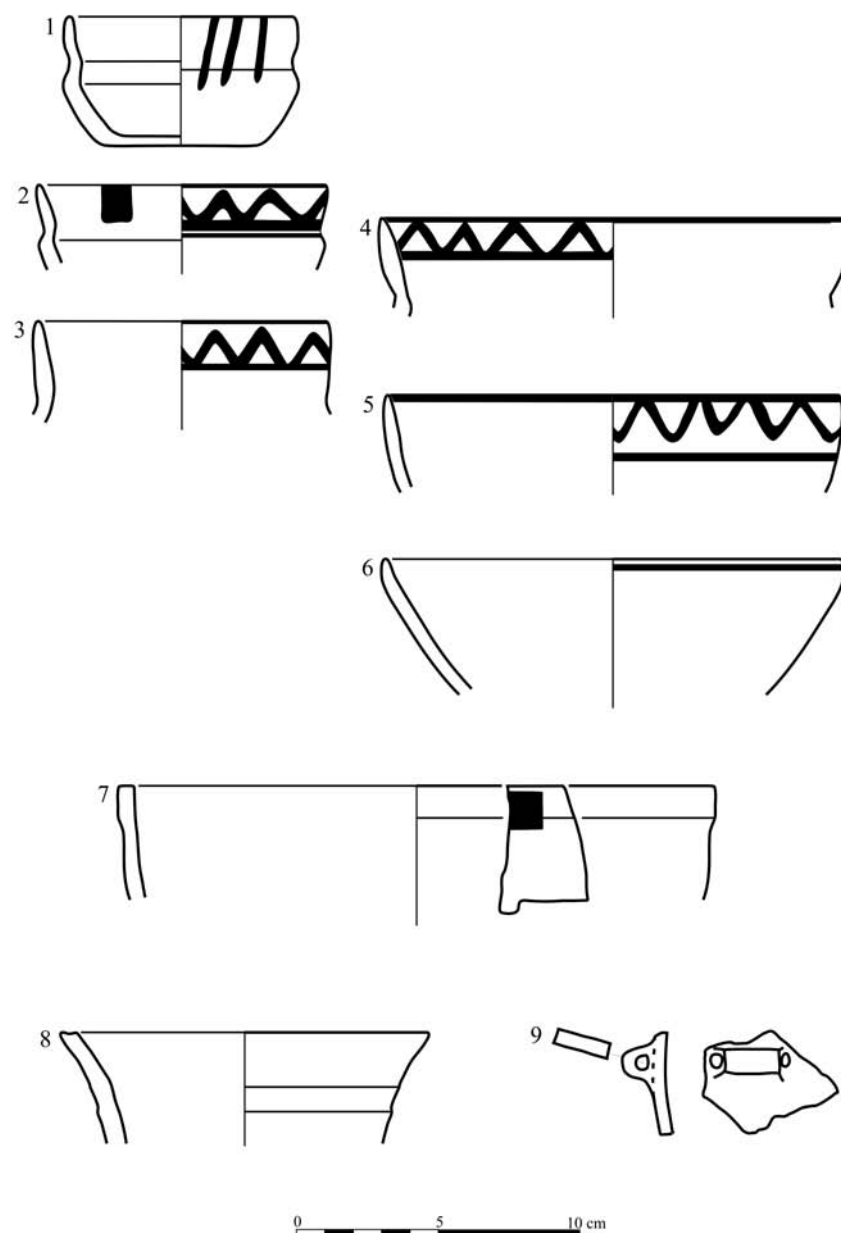
**PLATE 1**



1. South-East Arabia and the Iron Age sites mentioned in the text. 2. The location of Jebel al-Agma and Salut (elaborated from G.E.).

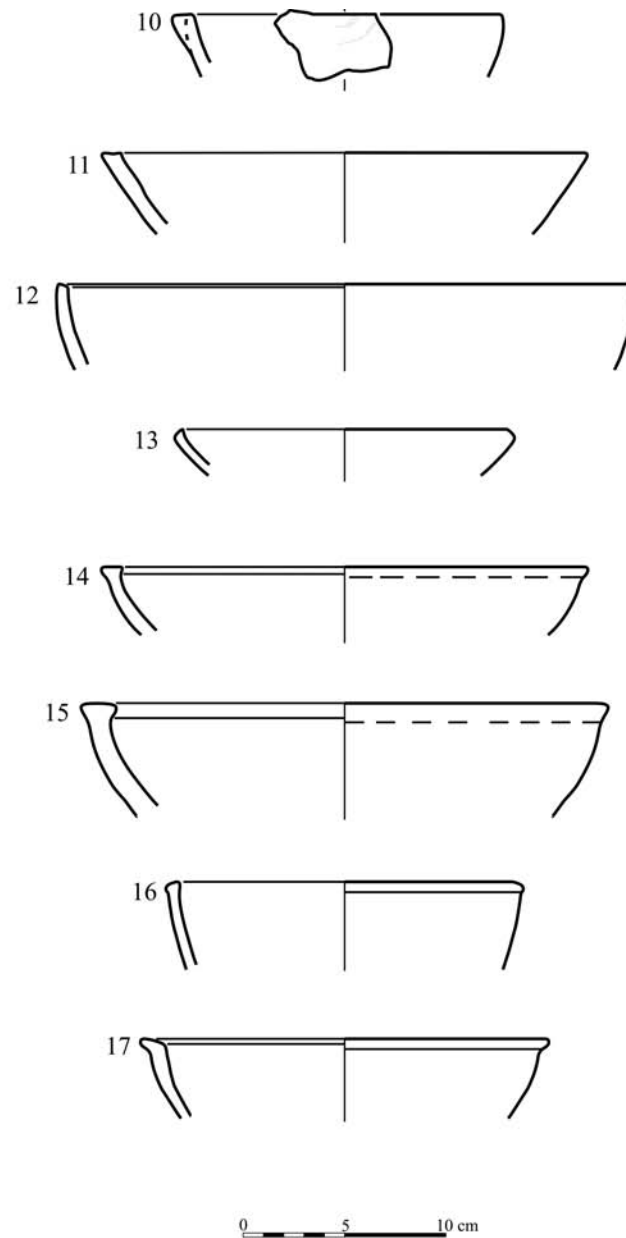


## PLATE 2

**Jebel al-Agma: painted pottery, deformed bowl, lug**

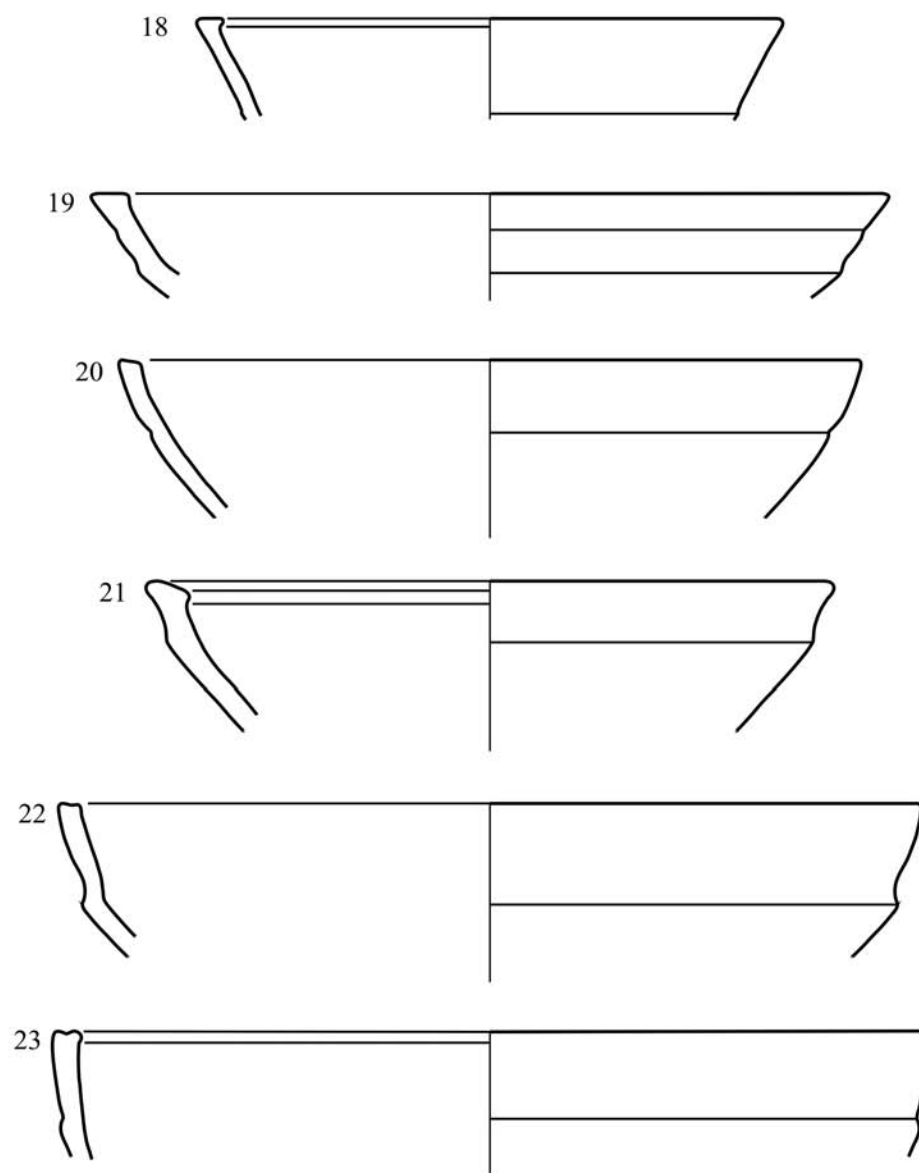
1. (AG09,1) Fine brown fabric with some small white grits. Orange-brown slip exterior, interior dark brown. Black painted decoration exterior. 2. (AG09,2) Fine orange-brown fabric. Brown slip exterior and interior. Black painted decoration exterior and interior. 3. (AG09,5) Fine orange-brown fabric with few red brown grits. Black slip exterior-interior more brown. Black painted decoration exterior. 4. (AG09,3) Medium red-brown fabric with few white and brown grits and vegetal temper. Brown slip exterior and interior. Black painted decoration interior. 5. (AG09,4) Fine red-brown fabric. Orange slip exterior and interior. Black painted decoration exterior. 6. (AG09,12) Fine orange-brown fabric with few small brown and white grits. Brown slip exterior and interior. 7. (AG09,22) Fine light brown fabric with small brown grits. Orange brown slip exterior and interior. Black painted decoration. 8. (AG09,25) Fine brown fabric with few brown and black grits and some vegetal temper. Black slip exterior and interior. Deformed by fire. 9. (AG09,30) Medium-fine orange-brown fabric with brown and white grits and vegetal temper. Brown slip exterior and interior.

## PLATE 3

**Jebel al-Agma: bowls**

10. (AG09,29) Medium brown fabric with brown and white grits. Orange-brown slip exterior and interior. 11. (AG09,23) Fine black fabric. White grit temper, some large >5mm. Smoothed or black slip exterior and interior. 12. (AG09,37) Medium orange-brown fabric with black and brown grits and vegetal temper. Light-brown slip exterior and interior. 13. (AG09,24) Fine orange fabric with some small white grits and vegetal temper. Orange-brown slip exterior and interior. 14. (AG09,20) Medium brown fabric with brown grits and vegetal temper. Traces of orange slip on interior and upper rim. Black painted decoration on upper rim. 15. (AG09,10) Medium light-brown fabric with abundant small brown grits and vegetal temper. 16. (AG09,16) Medium-fine orange fabric with few brown and white grits and vegetal temper. Light brown slip exterior and interior. 17. (AG09,34) Medium orange-brown fabric with brown and white grits and vegetal temper. Light brown slip exterior and interior. Incised decoration on upper rim done before firing.

## PLATE 4



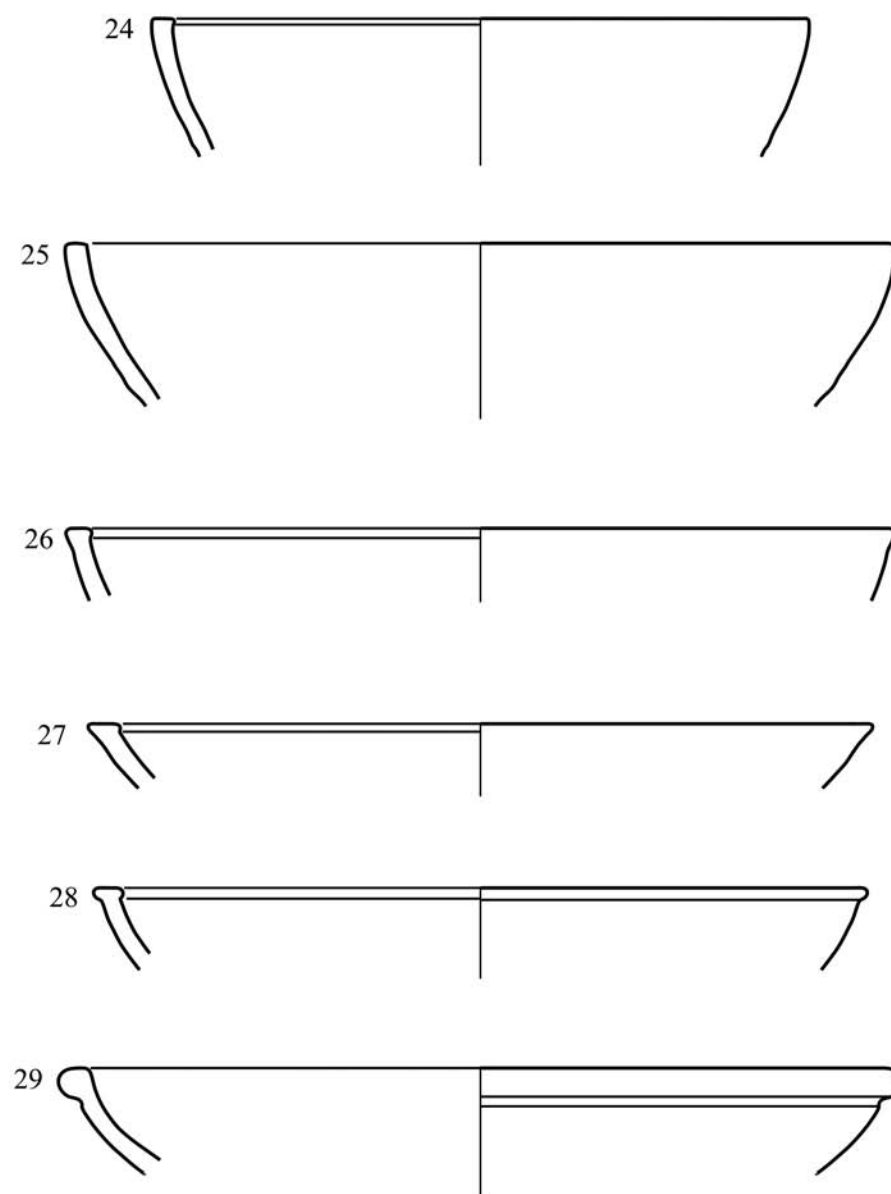
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**Jebel al-Agma: carinated bowls**

18. (AG09,9) Fine light-brown fabric. Occasional grit and some vegetal temper. Red-brown slip exterior and interior.  
 19. (AG09,11) Medium brown fabric with black and brown grit temper. Light brown-buff slip exterior and interior. Thick grey core. Incised decoration on upper rim done before firing.  
 20. (AG09,32) Medium orange-brown fabric with small brown grits and vegetal temper. Sandy texture. Brown slip exterior and interior.  
 21. (AG09,35) Medium light-brown fabric with brown and black grits and vegetal temper. Light-brown slip exterior and interior.  
 22. (AG09,13) Fine orange-brown fabric with few brown grits and some vegetal temper. Orange slip exterior.  
 23. (AG09,33) Medium orange-brown fabric with black and brown grits and vegetal temper. Red-brown slip exterior and interior.



## PLATE 5

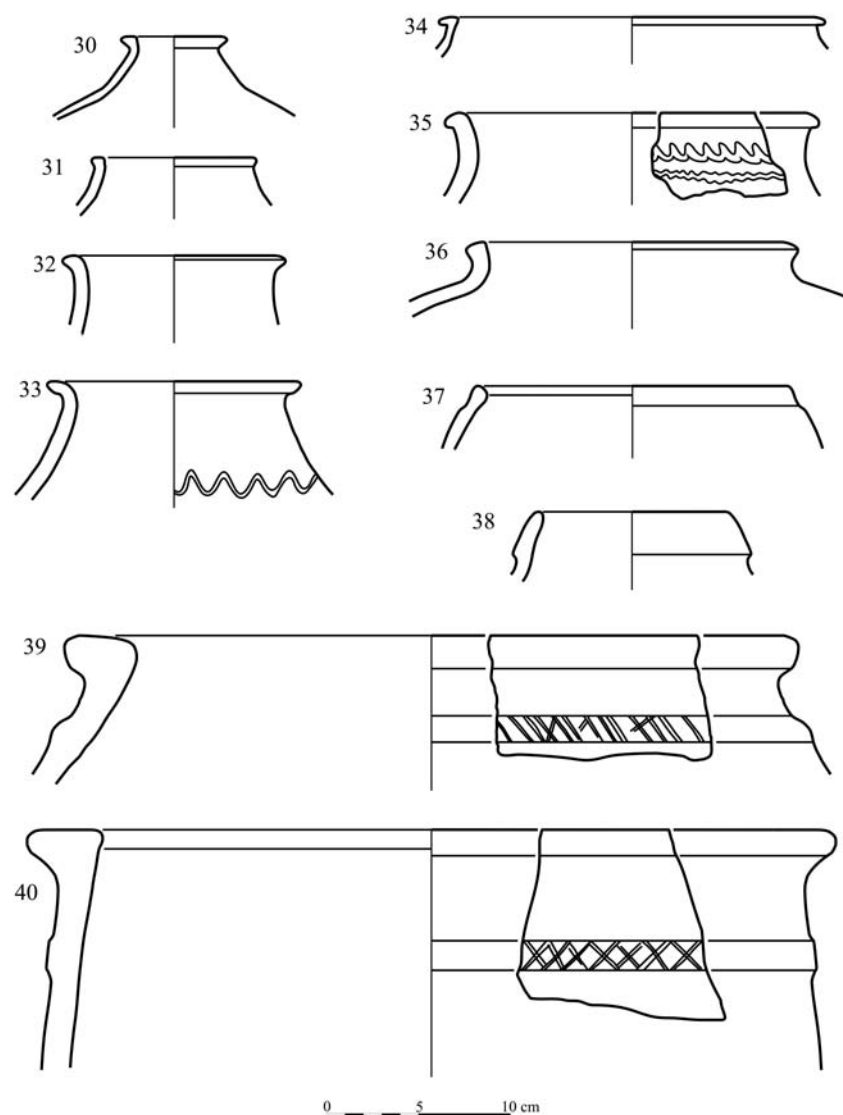


0 5 10 cm

**Jebel al-Agma: large bowls/basins**

24. (AG09,36) Medium brown fabric with brown grits and vegetal temper. Occasional large black or white grit >5mm. Black slip exterior and interior. 25. (AG09,31) Medium orange-brown fabric with white grits. Orange slip exterior and interior. Horizontal burnished streaks on interior surface. 26. (AG09,17) Medium orange fabric with small brown grits and vegetal temper. Brown slip exterior and top of rim. 27. (AG09,18) Medium orange-brown fabric with brown and white grits and vegetal temper. Thick grey core. Orange-brown slip exterior and interior. 28. (AG09,19) Medium brown fabric with white grits and vegetal temper. Brown slip exterior and interior. 29. (AG09,27) Medium light-brown fabric with abundant grits. Traces of orange slip on exterior.

## PLATE 6

**Jebel al-Agma: jars and storage jars**

30. (AG09,6) Medium-fine brown fabric with some brown grits and vegetal temper. Grey core. Orange slip, burnished exterior. 31. (AG09,14) Fine orange fabric with occasional small brown grits and vegetal temper. Orange slip exterior and interior. Possibly burnished exterior. 32. (AG09,26) Medium-fine brown fabric with a few brown grits. Brown slip exterior and interior. 33. (AG09,38) Medium brown fabric with brown and white grits and vegetal temper. Orange-brown slip exterior and upper part of interior. Incised wavy-line decoration done before firing. 34. (AG09,21) Medium-fine brown fabric with some white grits and vegetal temper. Orange-brown slip exterior and interior. 35. (AG09,7) Medium orange-brown fabric with brown grits and vegetal temper. Orange slip exterior and upper part of interior. Incised wavy-line done before firing. 36. (AG09, 28) Medium orange fabric with brown and white grits and some vegetal temper. Orange-brown slip exterior and upper part of interior. 37. (AG09,15) Medium orange fabric with small brown grits and vegetal temper. Orange-brown slip exterior and traces of black painted decoration. 38. (AG09,8) Medium light-brown fabric with black grits. Brown slip exterior and interior. 39. (AG09,39) Coarse light-brown fabric with numerous black and brown grits and vegetal temper. Traces of brown slip on exterior. Incised decoration on cordon beneath rim done before firing. 40. (AG09,40) Coarse brown fabric with black, brown and white grits and vegetal temper. Black slip exterior and interior. Incised decoration on cordon beneath rim done before firing.