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Jāwa and North Syria¹

The air, now extremely hot, was clearly seen to be divided into four or five layers of unequal depth and transparency, vibrating incessantly and obstructing our view. It was the *sarab* (mirage). At 2.15 on our left we caught a glimpse of the well of al-Bajjuz. To the northwest the horizon was shut in by the elevation of Zetab az-Zerw The two higher volcanoes of al-Hzefat ... appeared to the south of us and, as veiled by a mirage, seemed not unlike two black monsters. From time to time the black Rigm at-Taran emerged from the mirage ... After three o'clock pieces of basalt and lava could be seen... The volcanic area stretches from the Tell Markada... as far as the well of Mlehan.

On May 23, 1912, at 5.02 A.M. we set out toward the northwest in a cold west wind. At 6.30 we observed in a large basin north of us, the ruined mound of al-Malha... From 8.00 to 9.48 we stopped at al-Malha,... a well about 25 meters deep with water nearly fresh to the taste ... We wished to examine the al-Malha ruins because of their similarity to a fortified camp built of basalt blocks, but our guide warned us against the robbers who roam about and were most likely observing our movements all the time ... Our gendarmes ... pleaded with us to turn back ... To humor them we headed west; [by 10.27 he had left]. (Musil 1927: 87-88).

On the 30th of the same month, but 66 years later, another explorer visited the site in the desert steppe; he described it as a "no-man's land" in a salt flat beside the volcanic Jabal Ma'za directly to the east. The weather was dreadful and a sandstorm hindered his sight — he

could only keep his direction by using a compass (Kühne 1983: 300-301).

The landscape described is not the Black Desert, the explorers not Harding or Helms, the site not Jāwa. The site is Malḥat adh-Dharū, the explorers Alois Musil and Hartmet Kühne, and the region: north of the Euphrates, west of the Khābūr and south of Jabal 'Abd al-'Azīz. Yet these accounts describe a place more than reminiscent of Jāwa: isolated, near a volcanic basaltic landscape, virtually deserted, and dry — in a zone receiving between 150 and 200 mm of rainfall in a year, incapable of supporting dry-farming agriculture. If with Helms we marvelled at the large site of Jāwa — more than 10 hectares — how much more so at this 37 hectare site of Malḥat adh-Dharū (FIG. 1).

When Jāwa first came into prominence in the seventies, it seemed unique to the point of being implausible in



1. Tall Malḥat adh-Dharū from the air (Poidebard 1934).

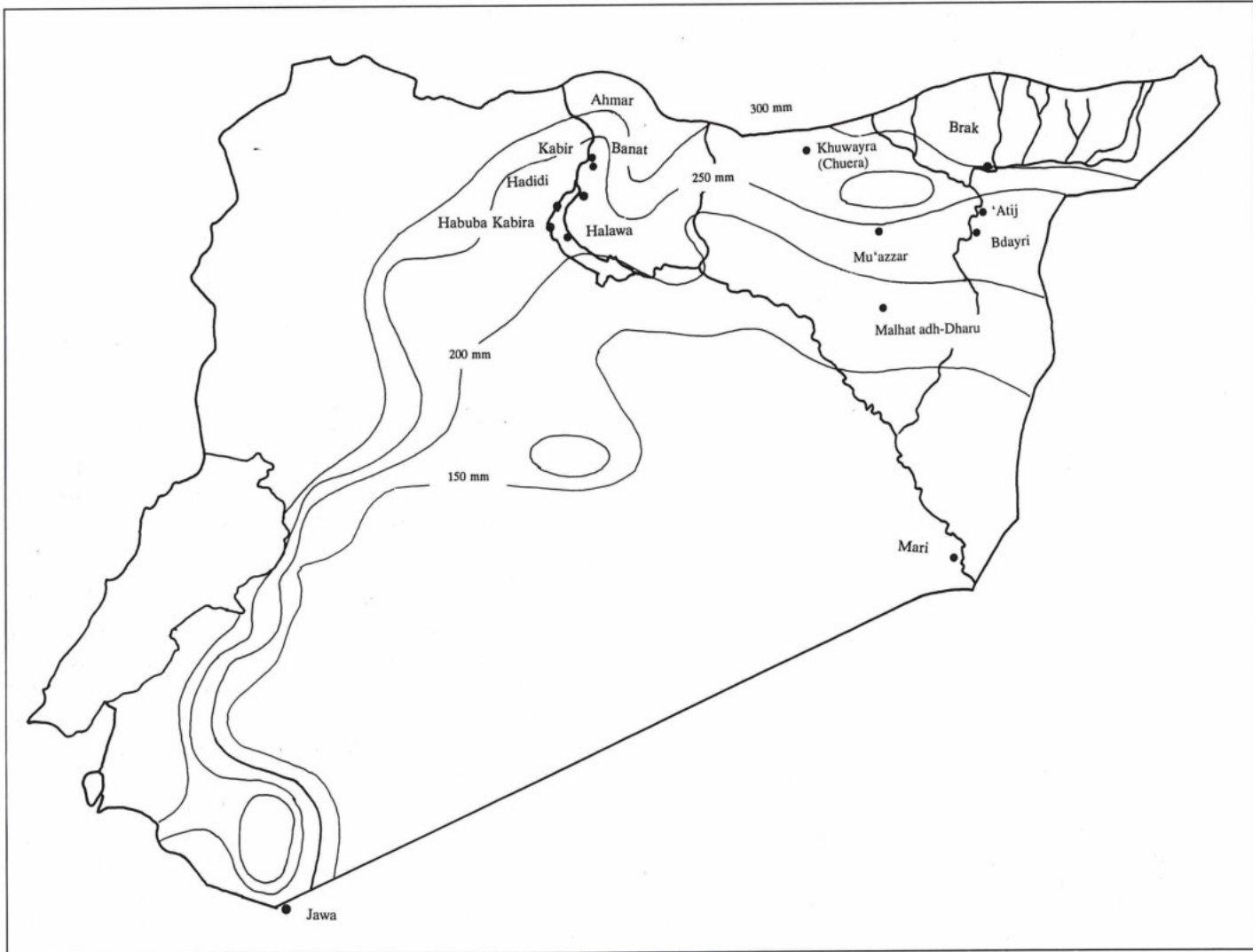
¹ Field Research and analyses were undertaken with Roger Grayson, Brian Finlayson, L. K. Rogers: University of Melbourne, Centre for Environmental Applied Hydrology; and Clifford Ogleby, University of Melbourne, Department of Surveying and Land Information. The authors wish to thank Dr. Safwan Tell, former Director General of the Department of Antiquities of Jordan for inviting us to present this paper. Many persons have assisted us in Syria; we thank Dr. Ali Abu Assaf, Director of Antiquities and Museums, Dr. Adnan Bounni, Director of Excavations, and at the Aleppo Museum Dr. Wah-

id Hayyata and Mr. Hammido Hammade. We thank Dr. Sultan Muhesen for his interest in our project and for arranging for Mr. Ahmed al-Murshedhe, a student at the University of Damascus, to work with us in the field during October 1991. We thank Unocal el-Hassekeh Ltd., and its Deputy General Manager, Mr. John A. Packard, for permission to use the satellite images. This project was supported by the Fulbright Program and the Australian National Research Council.

terms of its inhospitable location, its elaborate hydraulic system, its massive fortifications and its early date (Helms 1981). In fact there are several sites in Syria with similar features and setting. For example, we now know of the presence of hydraulic systems in several periods near Jabal ad-Drūz (Braemer 1988). In northern Syria, large sites with massive fortifications and water harvesting functions in agriculturally marginal areas of low rainfall emerged during the third millennium BC (FIG. 2). Jāwa, we suggest, is part of a larger pattern of expanding settlement and technological development across the drier fringe of the Fertile Crescent. We will describe some of these sites and present new evidence for associated water harvesting systems. We will then review chronological synchronisms of Jāwa with North Syria, consider disparities in Syrian internal chronology and review models which may resolve some of these problems.

In North Syria the so-called *Kranzhügel* (wreath-shaped) sites — a term coined by Oppenheim early in the century (Moortgart-Correns 1972) — are usually large and low; they have an upper/inner mound encircled by a lower/outer one which in turn is encompassed by a remarkably regular polygonal or circular fortification ring, in some cases quite imposing. In addition to these defining characteristics, most *Kranzhügel* sites feature the presence of broad lines that radiate from the site (FIG. 3). Such lines are also found at many other types of site in the Khābūr region, which were occupied during the Early Bronze Age.

The exact number of *Kranzhügel* sites (TABLE 1) varies from author to author (Moortgart-Correns 1972; Warbuton 1985; Lebeau 1990).² For the most part these sites are located south and west of the Khābūr River in areas of low precipitation as illustrated by FIG. 4, where their

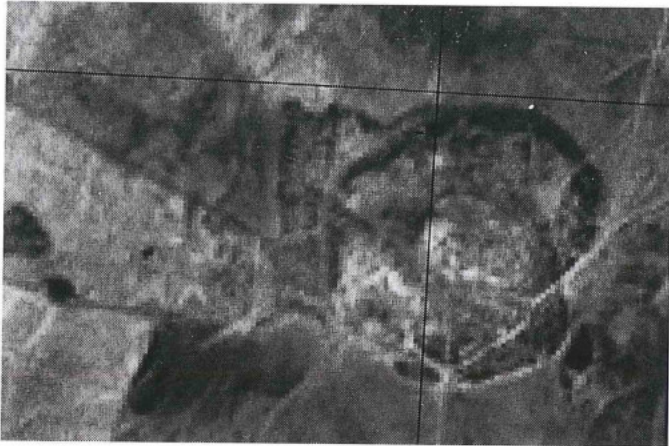


2. Precipitation for Syria with Jāwa and north Syrian sites.

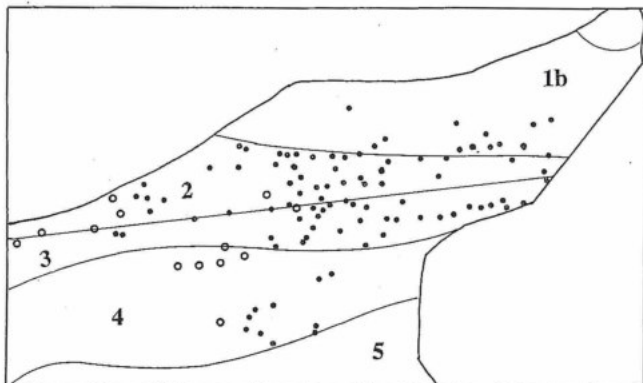
² Tall Ḥammām, located northwest of Tall Mabṭūḥ ash-Sharqī, was first identified from a SPOT image, and verified on the ground.

distribution over four agricultural stability zones (used by the Syrian ministry of Agriculture; Soumi 1991) is given.³ The year to year variability in rainfall is such that five sites in zone 3 will have crops that fail one-third to two-thirds of the time, and five sites in zone 4 will have crops that fail half the time. Tall Malḥat adh-Dharū in zone five is located in an area where dry-farming is not tenable.

A distinctive morphological feature of *Kranzhügel* sites is their outer fortification ring as seen in aerial photo-



3. Satellite image of Tall Mabṭūḥ al-Gharbī (courtesy of UNOCAL).



4. Agricultural Stability Zones for northeastern Syria. *Zone 1b*: The zone has between 350-600 mm of rain per year, but not less than 300 mm in any 2 out of 3 years. Main crops are wheat, pulses and summer crops. *Zone 2*: The zone has an average rainfall between 250-300 mm, but not less than 250 mm every 2 out of 3 years. At least 2 crops are grown every 3 years. Crops are barley, wheat, pulses and summer crops. *Zone 3*: The mean annual precipitation is greater than 250 mm, but not less than 250 mm every 2 out of 4 years. Barley is the main crop; some pulses may be grown. *Zone 4*: Average rainfall is between 200-250 mm, but not less than 200 mm every 2 out of 4 years. Barley is grown and the land is used for grazing. *Zone 5*: Average annual rainfall is less than 200 mm. Some winter pasturage, but unsuitable for agriculture without irrigation (Soumi 1991).

³ Analysis of a longer span of annual precipitation records in North Syria indicates that three of the sites [Khuwayra (Chuera), Khanzīr and Bugha] ac-

Table 1. Size and location of *Kranzhügel* sites.

ID	Site	Size in Ha.			Stability Zone
		Total	Inner	Rampart	
1	Khuwayra	64	27	.	2 (3)
21	Mabṭūḥ E.	50	12	.	4
112	Malḥat adh-Dharū	37	7	9	5
46	Baydar	34	9	.	2
18	Mabṭūḥ W.	24	3	.	4
107	Ḥammām	22	3	.	4
22	Mu'azzar	14	3	4	4
	Dalīz	.	.	.	3
2	Abū Shahat	.	.	.	3
4	Bugha	.	.	.	2 (3)
3	Khanzīr	.	.	.	2 (3)
19	Mūghar	.	.	.	4
20	Khazna	12	3	.	4
58	Aswad Foqānī	.	.	.	3

tographs and sketch plans. None of these rings has been excavated so their composition and construction techniques are not verified, but at Tall Mu'azzar and elsewhere there is clear evidence for borrow pits on the exterior side of the ring, from which much of the soil for the fortifications comes. It is probable that these rings are earthen ramparts heaped up in a manner similar to Middle Bronze Age fortifications at Carchemish and Ebla, mainly because their very size renders it unlikely that they are ruins of solid mudbrick walls. Also we have failed to find evidence of large mudbrick walls in places where erosion has occurred. On the other hand, lines of stone curtain walls are visible on top of the ramparts of Tall Mu'azzar, Tall Malḥat adh-Dharū and Tall Mabṭūḥ ash-Sharqī. Stone ruins in deep troughs in the rampart of Tall Mu'azzar are probably remains of city-gates. *Kranzhügel* sites are often described as having double, or concentric, rings of fortifications under the assumption that a second ring circumvallates the inner mound. A good example of the inner fortification is the stone curtain wall on the perimeter of the inner mound of Tall Mu'azzar; as in that case, the fortifications of inner mounds are less substantial than the outer rings and there is some question whether large earthen ramparts encircle the inner mound.

The outer fortification rings are often quite huge. At Tall Malḥat adh-Dharū and Tall Mu'azzar they are extant in places up to 6-8 meters high from their base on the outer side of the *tall*, and 2-4 meters high on the inner side of the ring, although at Tall Mabṭūḥ ash-Sharqī and Tall Ḥammām they are lower. The widths at two sites

tually have conditions typical of zone 3 (pers. comm. G. Walker, ICARDA).

have been measured by pacing, and on average are 29 m wide at Tall Mu‘azzar and 43 m wide at Tall Malḥat adh-Dharū, so that depending on the radius of the ring, the fortifications may comprise large areas of land: 9 hectares, or 24% of the total size of Tall Malḥat adh-Dharū and 4 hectares, or 29% of Tall Mu‘azzar. Given the marginal location and isolation of the *Kranzhügel* sites, as well as the potential cost of construction, it is puzzling that such large fortifications were erected, a consideration also raised in regard to Jāwa.

The inner mound, and the outer mound girding, are described as higher and lower platforms that lie above the surrounding terrain and are relatively flat. In some instances the platform of the outer city is irregular; at both Tall Mu‘azzar and Tall Malḥat adh-Dharū the eastern and northeastern areas of the outer settlement are 2-3 m lower than the other parts. These low spots are, in effect, enclosed depressions within the outer settlement. It is possible that they and others elsewhere may have been excavated by the inhabitants as a source for soil to build the outer defensive ring or mudbrick structures inside the site.

The monumental fortifications of the *Kranzhügel*, the two-tiered structure of an upper and lower town, to use the terminology of Jāwa, their large size and their agriculturally marginal location are comparable to Jāwa, but one other key feature of Jāwa is its water management system. Helms' (1981) study provides a detailed description which may be summarized in four headings:

1. *Source*: water harvesting refers to the collection of rainwater from slope runoff and ephemeral flow in wadis. At Jāwa the bulk of the water is obtained from Wādī Rājil but some is slope runoff defined as five micro-catchments.
2. *Conveyance*: water was transported to the storage areas in channels called gravity canals. Slope runoff would in most cases flow obliquely into a channel along much of its length, and water from Wādī Rājil was diverted by dams into the channels. The channels are narrow (1-3 m wide), and rock cut or stone built (Helms 1981: FIG. 76). One substantial diversionary dam was found at Jāwa, the reconstructed plan of Deflection Dam DaI; the other two points of diversion (DaII and DaIII) are not very substantial affairs.
3. *Storage*: water is stored at Jāwa in a series of ten pools or reservoirs, three of which (P2-P4) border the lower town. Pool 4 was formed by the construction of a large holding dam D1 which is a major construction.
4. *Usage*: the impounded water provided drinking water for the inhabitants of Jāwa and their livestock. Water may have been used for irrigation but there is no direct evidence for it (Helms 1981: 183-187).

Over ten years ago Helms wrote:

The contention then is that the hydro- and urban

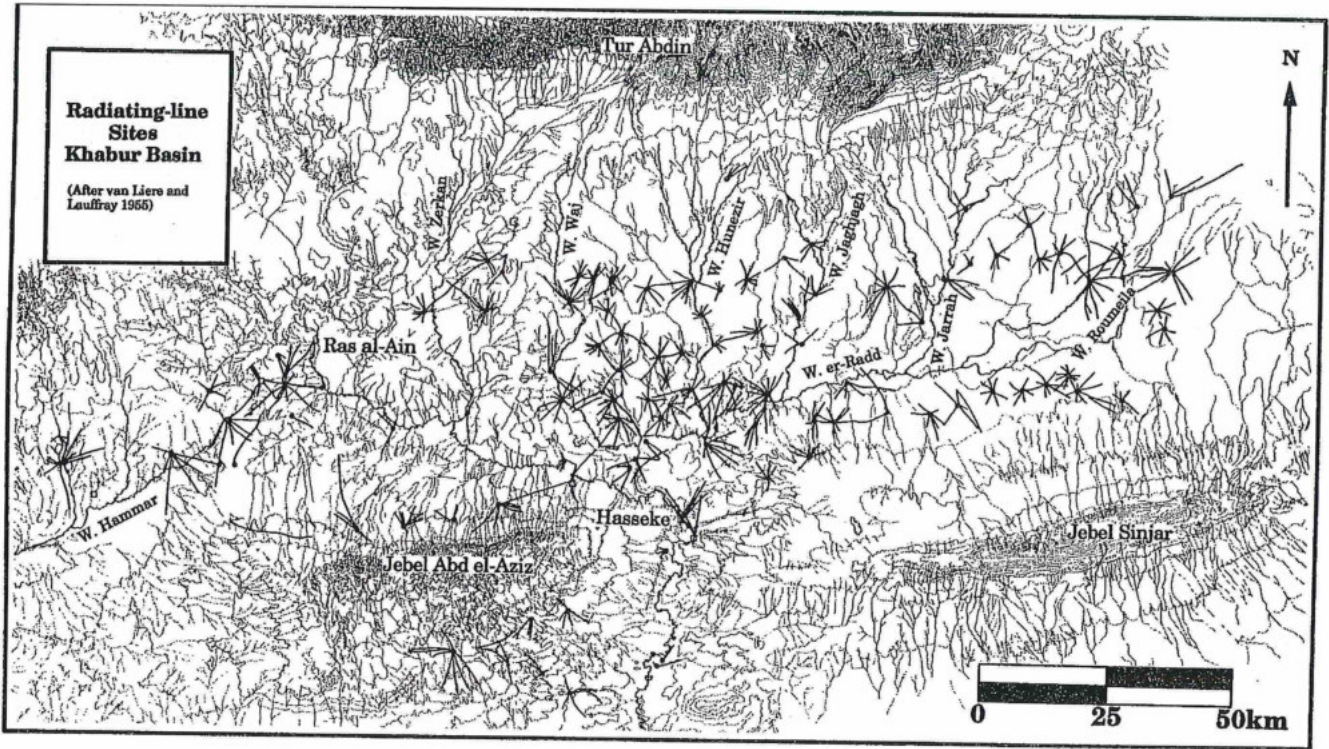
technology evident in the achievement at Jāwa was very likely known and developed long before the fourth millennium in northern Mesopotamia and north-eastern Syria (Helms 1981: 167)... However unless they are sited in deserts and have not been covered with the normal millennial debris that characterizes tells in the Near East there is very little chance that anything as complete as Jawa will ever be uncovered (Helms 1981: 159).

In North Syria, new research (Grayson *et al.* nd; McClellan *et al.* nd) shows that water harvesting was likely to have been a significant aspect of *Kranzhügel* and other Bronze Age sites. When we consider the same four points as above, we note that: 1) the water source was rainwater runoff 2) that was conveyed by radial lines 3) to storage areas near sites 4) to be used by the inhabitants for drinking and for watering livestock. There is no direct evidence for field irrigation but it may have been practiced.

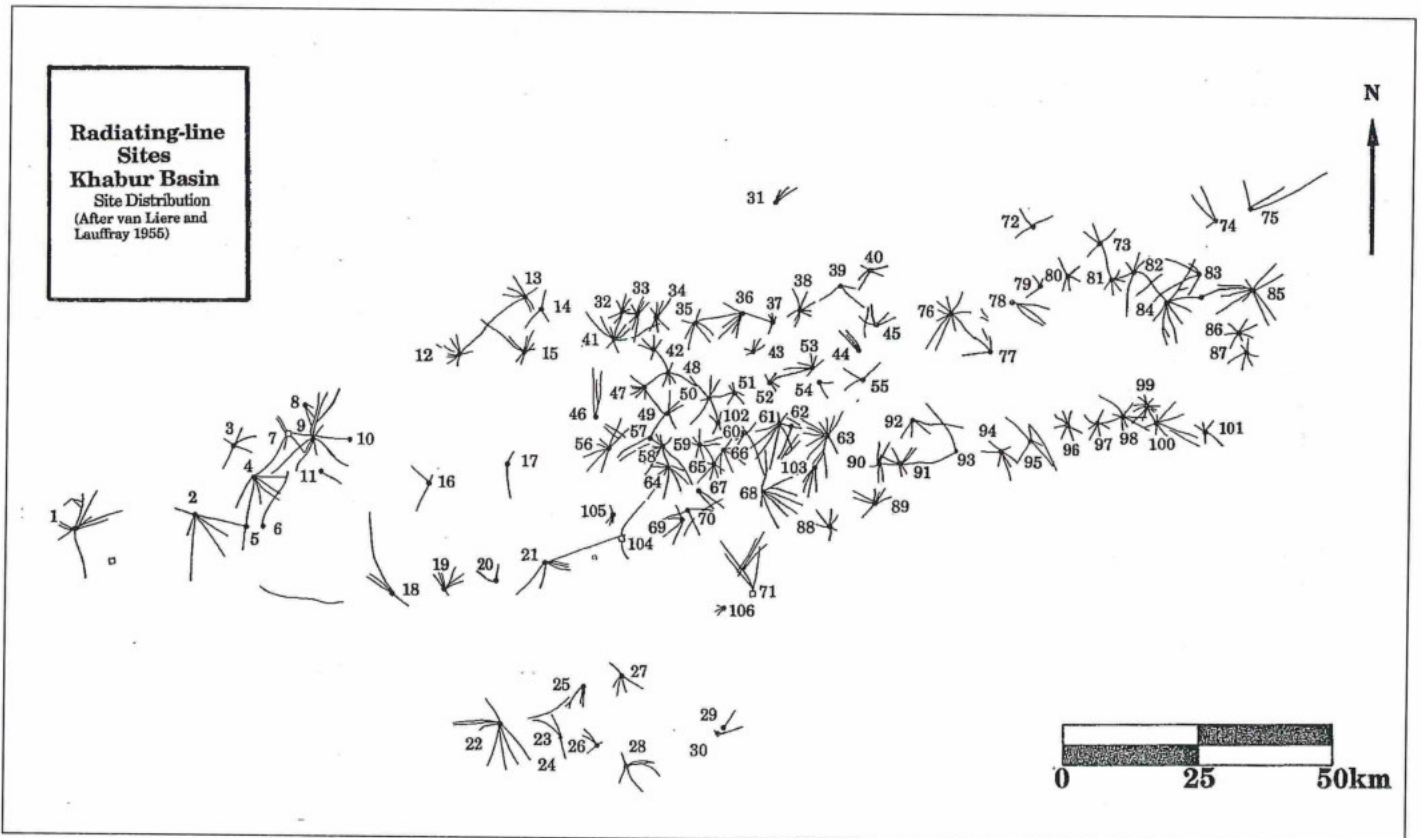
Evidence for water harvesting is seen in two elements, conveyance: lines radiating from sites, and storage: enclosed depressions adjacent to sites. Over 35 years ago van Liere and Lauffrey (1955) published a map of the Khābūr showing radial lines at more than 100 sites, including all *Kranzhügel* sites except for Tall Daliz and Tall Malḥat adh-Dharū (FIG. 5). They interpreted the lines as transportation routes that were formed by traffic.

Despite the lines being recognized by others (Buringh 1960; Oates 1968) little mention was made of them until Wilkinson (1990a; 1990b; Ball *et al.* 1989) discussed their presence in the Tall Hawa area of Iraq, due east of the Khābūr catchment. He assumed they functioned as routes and named them "hollow ways", a term used to describe sunken lanes in England and Europe. Independently McClellan (nd) proposed these lines may have had a hydraulic function. There has been no direct evidence to support either the road or hydraulic interpretations, however counter arguments have been made against each. For example many of the lines do not lead anywhere, few connect satellite sites to hub sites and several major sites are not linked by radial lines, unexpected results if they were communication/transportation routes. In turn arguments against the hydraulic interpretation have been put forward, the two main ones being: a) slope reversal along radial lines means they could not have conveyed water; and b) there are no signs of spoil heap along the lines, which one might expect if they were deliberately dug and cleaned canals.

Data has been collected to directly address these objections and formally test McClellan's ideas. SPOT satellite images verified the existence of these lines through remote sensing, but they are of insufficient resolution to develop maps with the required vertical accuracy. No aerial photography available. Thus a conventional



5a. Radiating-line sites, Khābūr Basin: Topography.



5b. Radiating-line sites, Khābūr Basin: Site numbers.

ground survey was undertaken. In preliminary field work a region was sought where radial lines visible in the SPOT images approximately coincided with the van Liere and Lauffrey map, as well as observations on the ground today. Modern agricultural activity including irrigation and land forming has made the task more difficult.

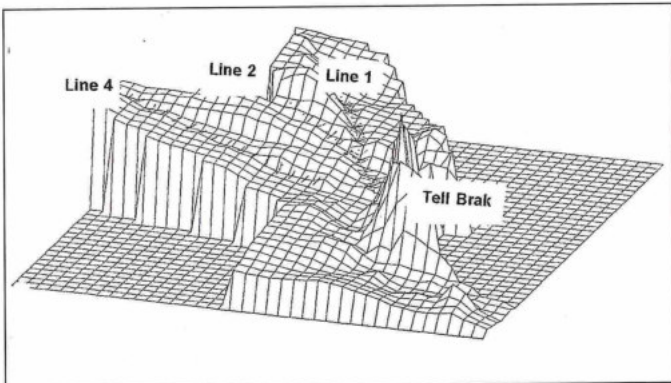
One area fulfilling the requisite conditions is near Tall Brāk. It is not a *Kranzhügel*, but at 43 hectares in area and very high, Tall Brāk is one of the most important sites in the Khābūr region. It was first excavated by Mallowan (1947) in the thirties and since 1967 has been under renewed excavation by D. and J. Oates (D. Oates 1977; 1982; 1985a; 1987). We wish to thank the Oates for their interest and cooperation in this work. Northwest of the site a general survey of the area surrounding several radial lines was made, including detailed surveys of long and cross sections of three lines and the collection of soil profile samples from transects across the lines. The long sections display a remarkably constant grade given the surrounding topography. The grade of the lines is quite different to the undulating land around them (FIGS. 6, 7).

This work demonstrates that these lines would have acted as a rainwater harvesting system; it is estimated

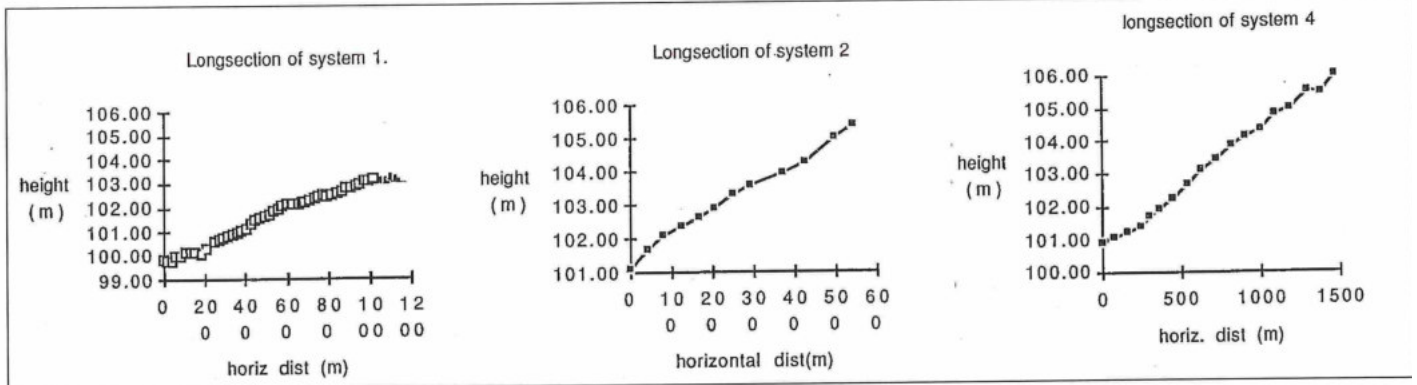
that the runoff contributing area is increased approximately seven-fold from 1.3 km² to 9.5 km². This figure is for the three lines surveyed, when other lines sloping toward the site are considered the area would be even larger. Without the effect of the radial lines it is calculated that 130 Ml of water would collect around the base of Tall Brāk, but the additional runoff diverted there by the radial lines would provide an annual total of 950 Ml, which has a volume of 9.5×10^6 m³.

The increased surface runoff draining to the site may have been treated by the inhabitants in one of two ways — either as beneficial or as a nuisance. Given the relatively low annual precipitation and the even drier areas of *Kranzhügel* sites south and west of Tall Brāk, it is most probable that the extra water would have been welcomed. It may have been stored at the site in several ways. The simplest option is to recharge the shallow groundwater which would insure that loss through evaporation is minimized, although the water stored below ground would depend on the capacity of the aquifer to contain the excess water. In effect this strategy would counteract or reduce the effect of the dropping water table during the dry months. It would slow or prevent the drying up of water holes and wells.⁴ Another option is to divert the water directly into agricultural fields, and a third is to store the water above ground in enclosed depressions (pools or reservoirs) adjacent to the site.

Whether stored as recharge of local ground water or above ground, a large depression would be required — artificially enclosed or dug below ground level. Today such a depression surrounds Tall Brāk, but the site is highly eroded and much of its soil has washed down to the base of the *tall*, so it is feasible that the depression was much larger in antiquity. Furthermore it is likely that much of the accumulated volume of soil at Tall Brāk and other mudbrick sites originated from the immediately surrounding area; on that assumption crude volume balance analysis indicates large borrow pits adjacent to the sites. The soil that forms Tall Brāk may have accumulat-



6. Radial lines at Tall Brāk, wireframe model.



7. Longsections of radial lines 1, 2 and 4 at Tall Brāk.

⁴ Water holes dating as early as the Hassuna/Sammara period have been discovered at sites in the Tall Hawa region (Wilkinson 1990b).

ed over thousands of years of occupation, but at the *Kranzhügel* sites there is a greater likelihood that the massive outer ring fortifications and their borrow pits were formed over much shorter periods of time. As we have seen at Tall Maḥat adh-Dharū and Tall Mu‘azzar, with ring fortifications of 9 and 4 hectares respectively, considerable quantities of soil were required, most of which must have come from the outer ditch. This fosse may have served a military function, but it also certainly acted as storage for rainwater runoff.

Calculations for Tall Brāk on the increased water volume and projected water consumption by humans and animals from the settlement indicate that large surpluses of water would have been available for field irrigation. While it is difficult to verify the practice of irrigation at *Kranzhügel* sites, their location in areas of low rainfall indicates the need for supplemental, or in the case of Tall Maḥat adh-Dharū, full irrigation. Even in areas with greater rainfall, the practice of supplemental irrigation would serve to buffer the community against interannual variability, of significant impact to the stability and longevity of a settlement when we consider that many of the Khābūr sites are located in areas where crops fail from once every three years, to once every two years, as noted above. Supplemental irrigation also substantially increases crop yields (Perrier 1986; Perrier and Salkini 1991).

The issue of water management in northern Syria has not been sufficiently considered. Although we acknowledge the difficulties of proving intentionality in the construction of radiating lines and enclosed depressions, water harvesting at Jāwa serves to demonstrate that such systems were on occasion deliberately designed and executed at least as early as the third millennium BC.

The presence of a water harvesting action for radial lines and depressions at Tall Brāk suggests that water harvesting occurs at the more than one hundred sites where there are radial lines. Many of these sites are situated in small natural depressions and close to wadis, locations where water collection could be readily amplified. Although we extrapolate from the Tall Brāk evidence to generalize about these other sites, each site, each radial line and each enclosed depression must eventually be evaluated separately.

It must be stressed that this technology is found over all agricultural stability zones in Syria, not just in those areas where it may have functioned as an essential sur-

vival mechanism. It features in the productive rain-fed farming zones, such as at Tall Laylān, as well as the more modest precipitation areas around Tall Brāk. The focus on Jāwa's location in a highly marginal zone, while highlighting the achievement of its builders, has perhaps served to eclipse the significance of the site in developmental terms. Another contributing factor is of course the question of chronology.⁵

While one of the prominent concerns with the chronology of Jāwa has been the anomaly of its early date in comparison to Palestinian urbanism and state formation, we note the same anomaly when Jāwa is considered in relation to indigenous developments in Syria. There is a widely held view that the presence of Uruk colonies in the late fourth millennium in Syria had little lasting effect and did not lead to the later emergence of state formation there. This has been most strongly espoused by Weiss (1986; 1988; 1991) who sees secondary state formation in the dry farming regions of Syria as occurring only in the middle of the third millennium — 2600 BC (Weiss 1991), some 500-700 years after the colony period. Numerous parallels for the pottery of Jāwa have been found in the Uruk period in northern Syria, predominantly at the Uruk colony site of Ḥabūba Kabīra South (Helms 1987; Betts 1991). These parallels may provide a *terminus ante quem* for Jāwa's ceramics in as much as: a) the occupation at Ḥabūba was short-lived; b) there was little continuity of ceramic styles, particularly southern Uruk styles, after the collapse of the colonies; and c) there was a subsequent gap in occupation on the Middle Euphrates.

However, recent publications and new work at a number of sites in the Middle and Upper Euphrates necessitates a re-evaluation of specific chronological issues in the Uruk and subsequent periods. This affects not only the details of Jāwa's ceramic relationship to the north, but our understanding of its place in the emergence of complex societies in the Near East. It is proposed here that the chronological gap between Jāwa on the one hand, and the *Kranzhügel* sites on the other, may be narrower than previously thought. On the basis of ceramic comparisons from, among others, area RII at Ḥadidi (Dornemann 1988), Area A at Tall Aḥmar (Til Barsip, Jamieson 1990), Chantier B at Mari (Lebeau 1985; 1987), and an intensive surface survey from a six-site cluster at Tall Banāt (Porter 1991; McClellan and Porter nd) the time span for the Syrian parallels at Jāwa must be

⁵ There is nothing more vexing than attempting to date hydraulic systems, as has been pointed out at Jāwa, since datable artefacts and sealed deposits are usually not associated with them. Unless there is specific evidence available for individual instances, when we speak of the radial line and *Kranzhügel* sites in the aggregate we must use very broad chronological terms and expect to find exceptions to the rule. Nevertheless there is a case to be made that most sites with radial lines are occupied primarily in the third millennium. In any event they are unlikely to date later than the Middle Bronze/Old Babylonian period after which there was a significant decline in settlement in the

Khābūr. This working assumption regarding the chronology is based on excavations at sites with radial lines (Tilāl Brāk, Barri, Laylān, Muzān, Khwayra) and surface surveys of unexcavated sites with radial lines (Meijer 1986; B. Lyonnet pers. comm.); there are in fact several sites that appear to have been occupied only in the third millennium. It is assumed that radiating lines can be dated by the occupation of the sites with which they are associated. However we cannot be certain whether the lines were developed over a short time span, or over a long period with constant and gradual modifications and additions.

extended into the third millennium. Further, not only does the material from these sites clearly demonstrate that there is continuity in the region around Ḥabūba Kabira in terms of occupation and ceramic styles, it also provides some evidence to suggest that there was lineal and uninterrupted development in complexity from the Uruk colony period onwards.

Stratum I, area RII at Ḥadidi, despite the limited amount of material excavated, contains elements typical of the Uruk colony period as well as the grit tempered wares of 'Amūq G.⁶ This has given rise to some debate as to whether Stratum I does indeed belong to the Early Bronze I as Dornemann (1988) labelled it, or is more properly to be seen as Uruk (see for example Algaze 1986, who does not accept the use of the term EB I until after bevelled rim bowls have dropped from the assemblage). In fact the question is largely one of terminology and somewhat misses the point. Stratum I is most appropriately understood as transitional to both periods — following on from the collapse of the Ḥabūba colony, preceding the Early Bronze proper, and equivalent to the "post Uruk" settlement at Hassek Höyük, where subsequent to the destruction of the main Uruk level, Uruk type ceramics are found with new and local materials. This parallels the situation at Karatut Mevkii, where Schwartz (1988b) has proposed that rather than representing functional variation in the Uruk scheme of colonies and trading stations, disparities in the nature and quantities of Uruk material at some sites is indicative of chronological differences. The presence of the conical bevelled rim bowl with string cut base, one of the few distinct markers of the Jamdat Naṣr period elsewhere, firmly places the "Uruk" levels at Karatut Mevkii after the period of the Ḥabūba colony (Schwartz 1988b). Similarly J. Oates (1990) divides the later Uruk material at Tall Brāk into Middle/Late Uruk and Latest Uruk/Jamdat Naṣr.⁷ At Kurban Höyük, the separation of the Late Uruk material into at least two phases has been proposed by Algaze (1986). There is little question at this point that Ḥadidi Stratum I belongs to this latest phase, and that it dates to the end of the fourth millennium, whether it is called Late Uruk, Latest Uruk, Jamdat Naṣr, Protoliterate C and D, or Early Bronze I.

The main difference between Ḥadidi Stratum I and

Stratum 2 lies in the absence of any Uruk features in the latter. There is otherwise a strong degree of continuity to be seen in many forms. Dornemann (1988) attributes Stratum 2 Level 1 to the EB II, and Stratum 2 levels 2A and 2B to the EB III. However the published ceramics for these levels show an internal coherence that suggests that they are better treated as one chronological unit, despite the appearance here of corrugated cups. There seems to be little overlap between these levels and the tomb groups, which appear to come much later in the sequence.⁸ Using Algaze's terminology, Stratum 2 equates to the EB I, in Dornemann's, the EB II, and in that of Oates or Lebeau, Early Dynastic I. It is contemporaneous with Swayhāt Phases A-F (Holland 1976; 1977), Ḥalāwa B (Orthmann 1981), Area A at Tall Aḥmar and levels 18-9, Chantier B at Mari.

The importance of Ḥadidi in this context is that it is one of the few sites in the Middle Euphrates area that provides excavated material demonstrating ceramic and occupational continuity from the Uruk colony period well into the third millennium, although this material appears to be present at a surprising number of sites.⁹ One or two bevelled rim bowl fragments at Tall Aḥmar suggest that there is an earlier level there which corresponds to Ḥadidi Stratum I, and at the Tall Banāt site cluster the recent discovery of Uruk occupation completes the ceramic and developmental sequence. As Dornemann (1988) notes, there are indications that there is also material at Ḥadidi which may be contemporary with Ḥabūba Kabira South. Ḥadidi then provides a link to the Uruk colony period for that area; other Euphrates sites — especially Tall Aḥmar and Mari — can be confidently accommodated to its stratigraphic sequence, and demonstrate a continuity in ceramic forms for some Uruk types,¹⁰ which must be understood as occurring after the colony period, and for indigenous types. Ceramics in the sequence from post-Uruk colony period sites offer direct parallels to several genres and types from Jāwa. A small sample of these are provided in FIGS. 8-12.

Thus from the perspective of North Syria at least,¹¹ the chronological and geographical span into which Jāwa can be placed should be broadened. This should not be limited to purely ceramic considerations. Dating difficulties, and the fact that there has been comparatively

⁶ Although grit-tempered wares are found in smaller quantities towards the end of Amuq F, just as chaff tempered wares are found in smaller quantities in the Amuq G.

⁷ There is considerable dissension over the Jamdat Naṣr period itself — whether as a chronological term it can be used outside Mesopotamia, indeed whether such a period exists within Mesopotamian chronology at all.

⁸ Although it is possible that differences between occupation levels and tomb groups at Ḥadidi are functional rather than purely chronological, Tomb 1 at Tall Banāt, dated to the EB III, shows close affinities with the EB III tombs at Ḥadidi. In the Tall Banāt tomb a large number of ordinary domestic wares, typical of domestic contexts at the site, have been included with the specialized, or luxury wares most frequently found in tomb settings.

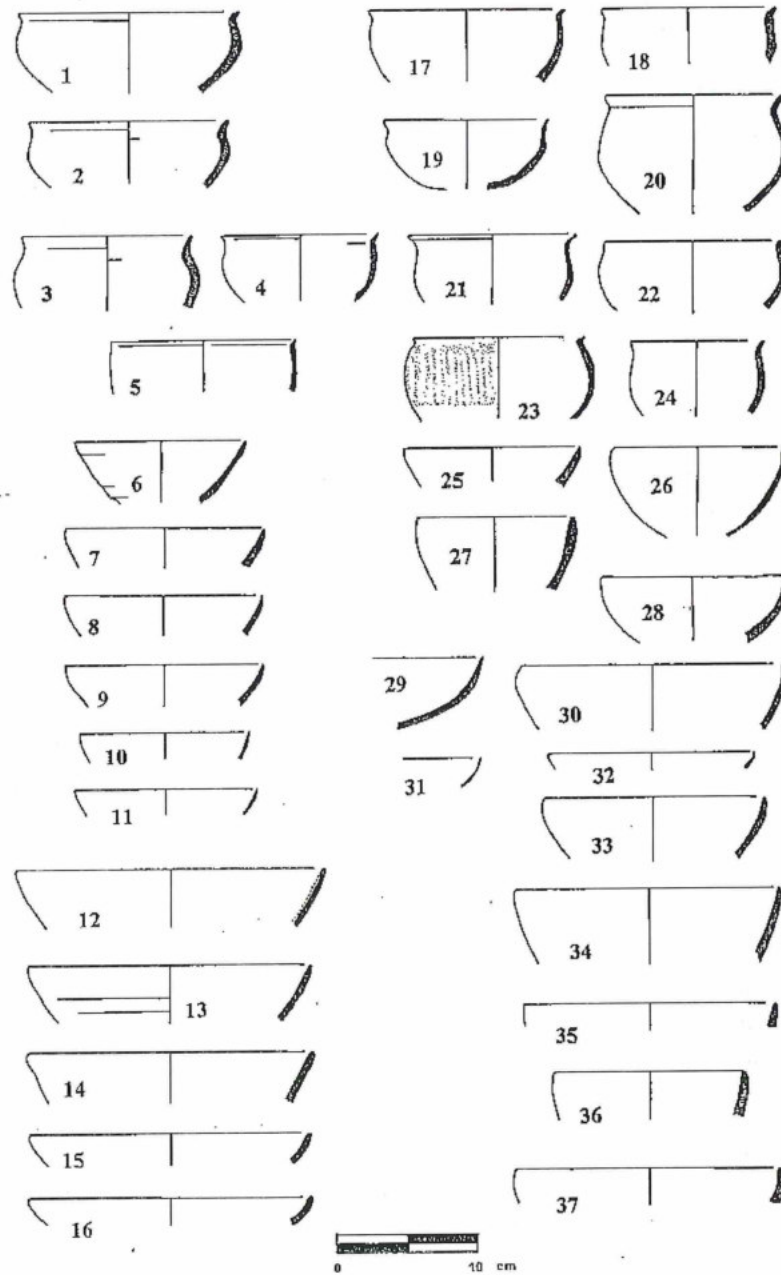
⁹ Most of which, however, have yet to be excavated in such a way as to pro-

vide sequential links between the different phases of the late fourth to mid-third millennia.

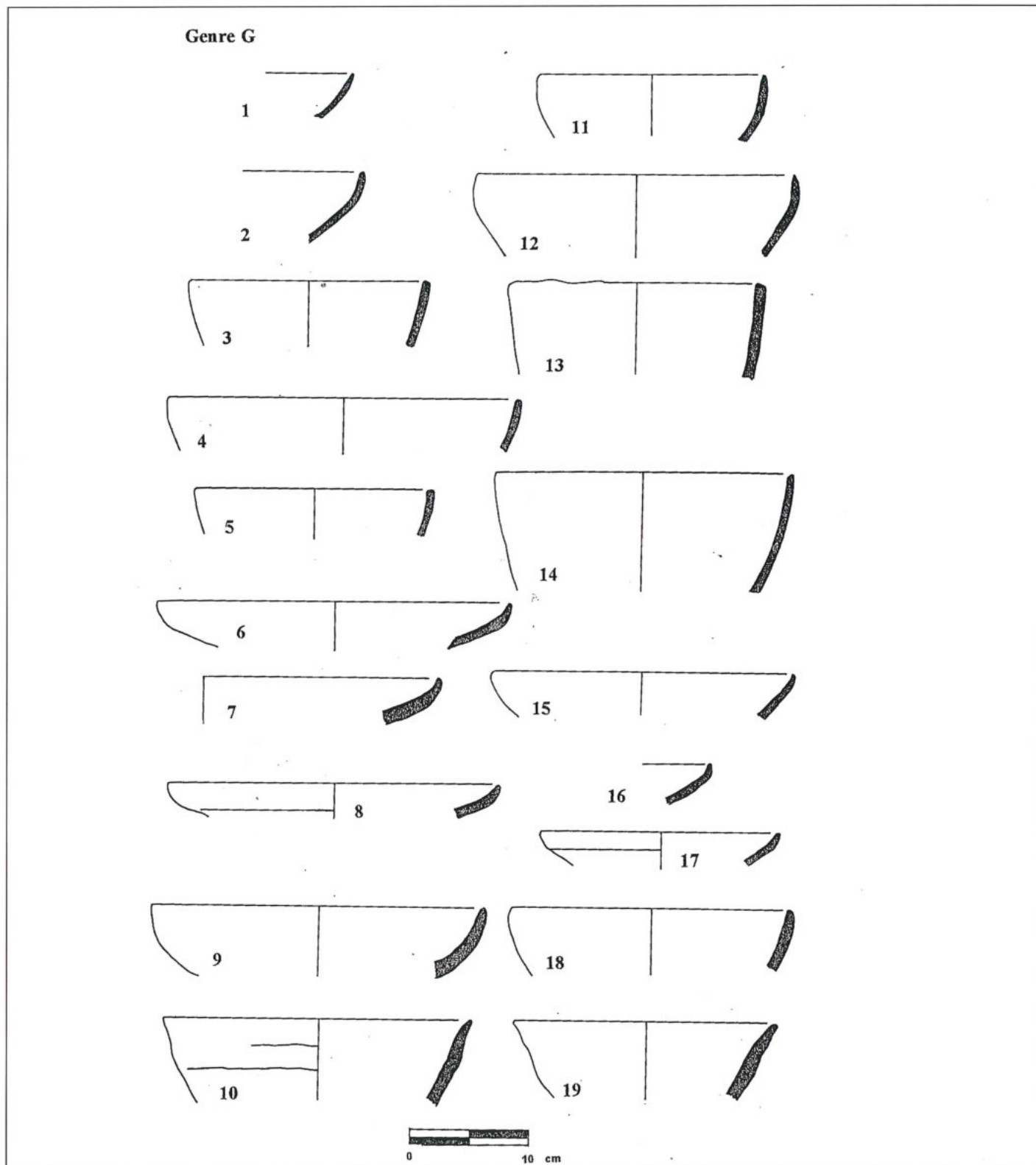
¹⁰ *Contra* D. Surenhagen (pers. comm.) who argues that Uruk forms cease with the collapse of the colony period, and that therefore any "Late Uruk" material must be dated to that period. K. Kohlmeyer (pers. comm.) on the other hand recognizes a later form of the bevelled rim bowl.

¹¹ We do not attempt here to address the various problems presented by the Jāwa ceramics in terms of Palestinian chronology. However the divergence between the dating for the EB I in Syria and in Palestine, and concomitant differences in levels and types of social organization, is a serious problem, and one that needs to be resolved before we can arrive at any valid explanation for the secondary origins of urbanism and the state.

Genre G

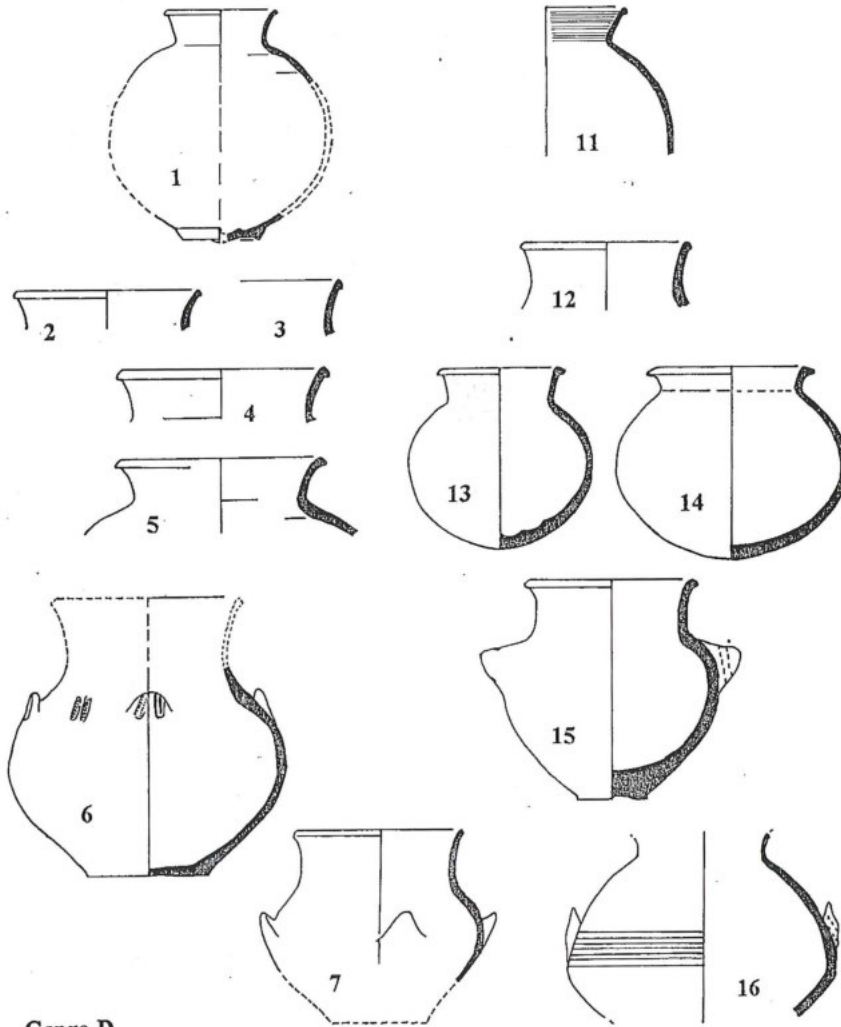


8. Parallels for Jāwa ceramics with post-Uruk colony sites in Syria (Genre G): 1. Jāwa (Betts 1991: FIG. 145.470); 2. Jāwa (Betts 1991: FIG. 145.471); 3. Jāwa (Betts 1991: FIG. 145.472); 4. Jāwa (Betts 1991: FIG. 145.476); 5. Jāwa (Betts 1991: FIG. 145.482); 6. Jāwa (Betts 1991: FIG. 145.484); 7. Jāwa (Betts 1991: FIG. 145.487); 8. Jāwa (Betts 1991: FIG. 145.485); 9. Jāwa (Betts 1991: FIG. 145.486); 10. Jāwa (Betts 1991: FIG. 146.489); 11. Jāwa (Betts 1991: FIG. 146.488); 12. Jāwa (Betts 1991: FIG. 146.490); 13. Jāwa (Betts 1991: FIG. 146.492); 14. Jāwa (Betts 1991: FIG. 146.491); 15. Jāwa (Betts 1991: FIG. 146.494); 16. Jāwa (Betts 1991: FIG. 146.495); 17. Aḥmar (Jamieson 1990: FIG. 21.10); 18. Aḥmar (Jamieson 1990: FIG. 21.2); 19. Karatut (Schwartz 1988b: FIG. 9.3); 20. Ḥalāwa (Orthmann 1981: FIG. 56.23); 21. Ḥalāwa (Orthmann 1981: FIG. 56.21); 22. Aḥmar (Jamieson 1990: FIG. 21.9); 23. Hassek (Behm-Blancke 1981: FIG. 9.2); 24. Ḥadīdi (Dornemann 1988: FIG. 4.37); 25. Ḥadīdi (Dornemann 1988: FIG. 4.17); 26. Ḥalāwa (Orthmann 1981: FIG. 56.4); 27. Mari (Lebeau 1987: FIG. 2.22); 28. Mari (Lebeau 1987: FIG. 7.6); 29. Brāk (Fielden 1981: FIG. 1.4); 30. Ḥadīdi (Dornemann 1988: FIG. 5.6); 31. Brāk (Fielden 1981: FIG. 1.9); 32. Ḥadīdi (Dornemann 1988: FIG. 5.7); 33. Ḥadīdi (Dornemann 1988: FIG. 5.34); 34. Bdayri (Pfalzner 1988: FIG. 33.c); 35. Bdayri (Pfalzner 1988: FIG. 33.b); 36. Ḥadīdi (Dornemann 1988: FIG. 6.25); 37. Bdayri (Pfalzner 1988: FIG. 31.d).

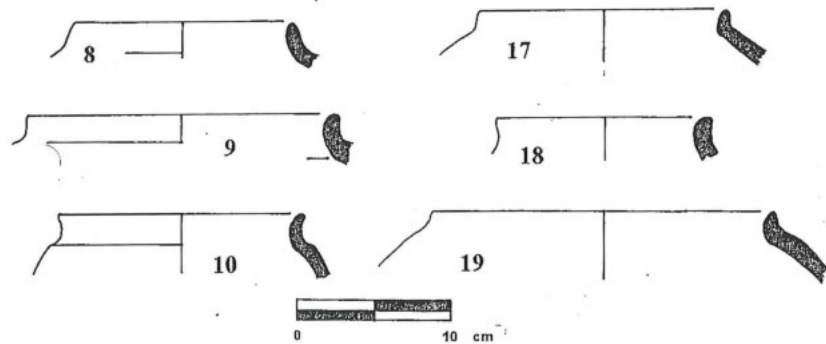


9. Parallels for Jāwa ceramics with post-Uruk colony sites in Syria (Genre G): 1. Jāwa (Betts 1991: FIG. 146.493); 2. Jāwa (Betts 1991: FIG. 146.496); 3. Jāwa (Betts 1991: FIG. 146.500); 4. Jāwa (Betts 1991: FIG. 146.497); 5. Jāwa (Betts 1991: FIG. 146.499); 6. Jāwa (Betts 1991: FIG. 147.512); 7. Jāwa (Betts 1991: FIG. 147.511); 8. Jāwa (Betts 1991: FIG. 147.513); 9. Jāwa (Betts 1991: FIG. 148.522); 10. Jāwa (Betts 1991: FIG. 148.525); 11. Mari (Lebeau 1987: FIG. 2.18); 12. Bdayri (Pfalzner 1988: FIG. 33.1); 13. Aḥmar (Jamieson 1990: FIG. 38.2); 14. Ḥalāwa (Orthmann 1981: FIG. 56.11); 15. Ḥalāwa (Orthmann 1981: FIG. 56.9); 16. Brāk (Fielden 1981: FIG. 1.7); 17. Ḥadidi (Dornemann 1988: FIG. 4.35); 18. Bdayri (Pfalzner 1988: FIG. 31.2); 19. Aḥmar (Jamieson 1990: FIG. 19.12).

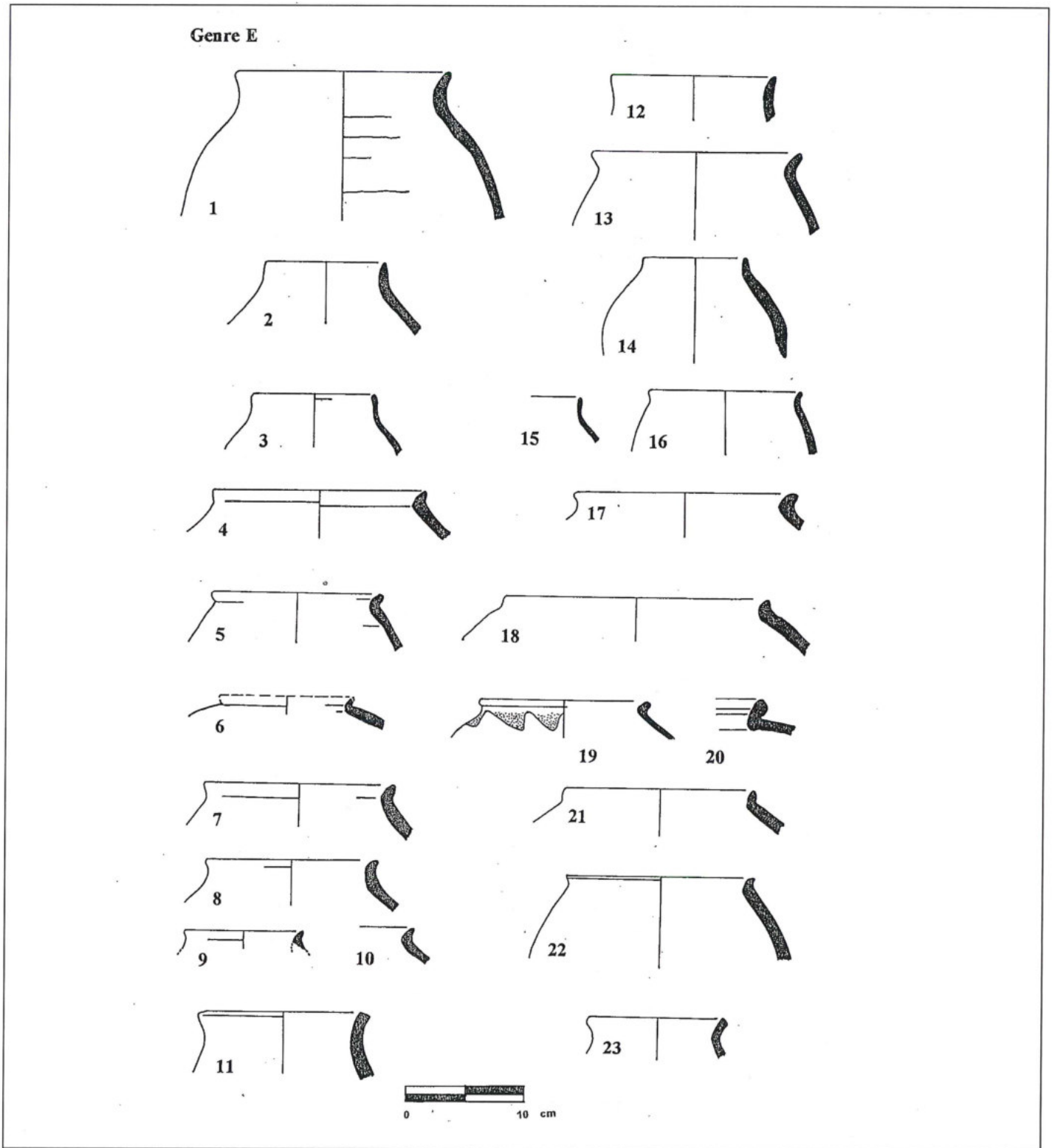
Genre C



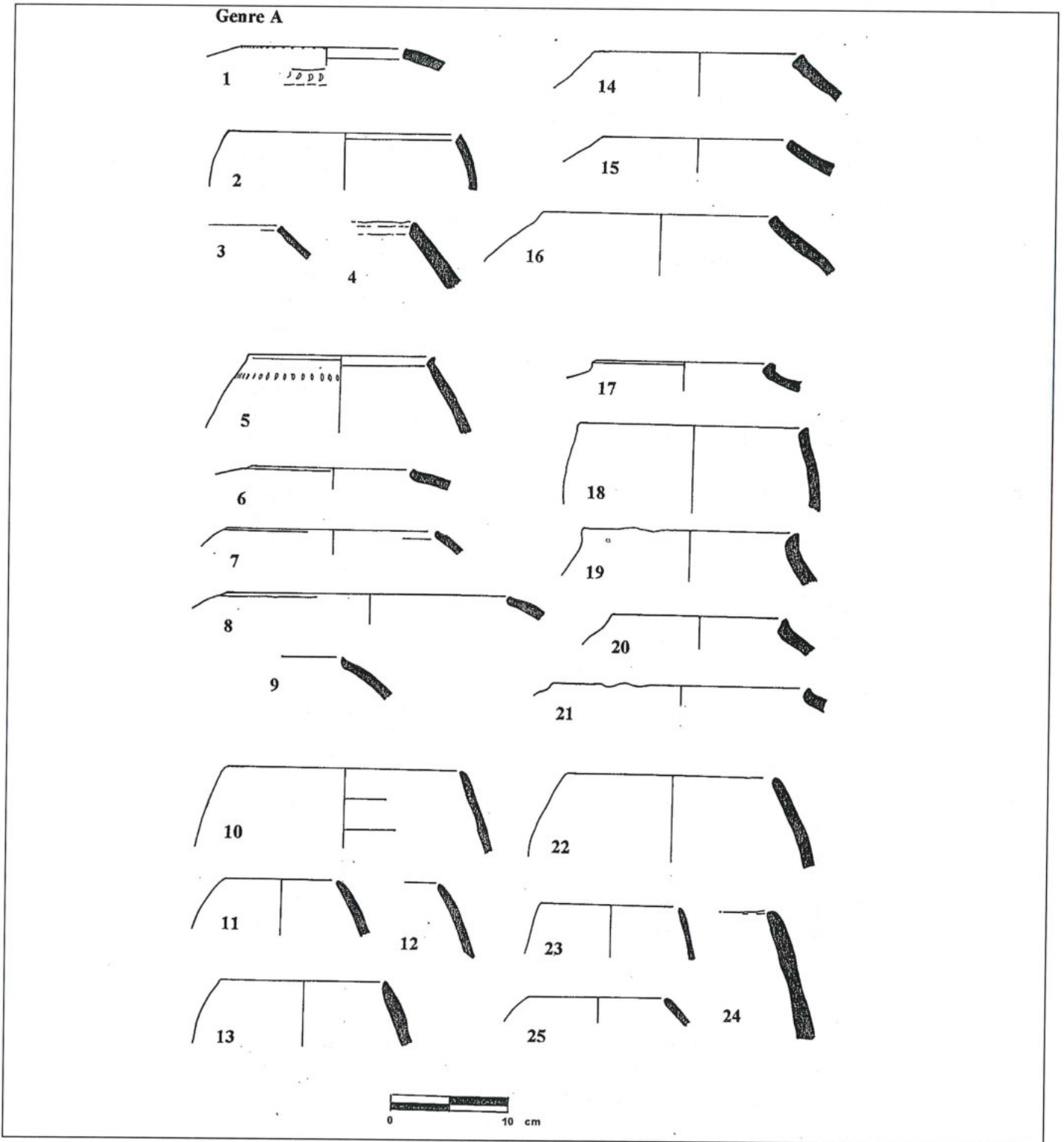
Genre D



10. Parallels for Jāwa ceramics with post-Uruk colony sites in Syria (Genre C and D): 1. Jāwa (Betts 1991: FIG. 130.259); 2. Jāwa (Betts 1991: FIG. 130.270); 3. Jāwa (Betts 1991: FIG. 130.272); 4. Jāwa (Betts 1991: FIG. 130.263); 5. Jāwa (Betts 1991: FIG. 130.260); 6. Jāwa (Betts 1991: FIG. 122.162); 7. Jāwa (Betts 1991: FIG. 122.163); 8. Jāwa (Betts 1991: FIG. 135.332); 9. Jāwa (Betts 1991: FIG. 135.336); 10. Jāwa (Betts 1991: FIG. 135.335); 11. Brāk (Fielden 1981: FIG. 1.14); 12. Aḥmar (Jamieson 1990: FIG. 36.4); 13. Raqa'ī (Curvers and Schwartz 1990: FIG. 16.13); 14. Mari (Lebeau 1987: FIG. 1.3); 15. Brāk (Oates and Oates 1991: FIG. 8.4); 16. Brāk (Oates and Oates 1991: FIG. 8.3); 17. Aḥmar (Jamieson 1990: FIG. 39.13); 18. Aḥmar (Jamieson 1990: FIG. 39.11); 19. Aḥmar (Jamieson 1990: FIG. 39.12).



11. Parallels for Jāwa ceramics with post-Uruk colony sites in Syria (Genre E): 1. Jāwa (Betts 1991: FIG. 136.341); 2. Jāwa (Betts 1991: FIG. 136.343); 3. Jāwa (Betts 1991: FIG. 136.345); 4. Jāwa (Betts 1991: FIG. 138.362); 5. Jāwa (Betts 1991: FIG. 138.363); 6. Jāwa (Betts 1991: FIG. 138.366); 7. Jāwa (Betts 1991: FIG. 139.378); 8. Jāwa (Betts 1991: FIG. 139.380); 9. Jāwa (Betts 1991: FIG. 139.387); 10. Jāwa (Betts 1991: FIG. 139.388); 11. Jāwa (Betts 1991: FIG. 137.361); 12. Aḥmar (Jamieson 1990: FIG. 29.1); 13. Ḥadidi (Dornemann 1988: FIG. 7.5); 14. Aḥmar (Jamieson 1990: FIG. 29.4); 15. Mari (Lebeau 1985: FIG. 27.23); 16. Ḥadidi (Dornemann 1988: FIG. 6.31); 17. Aḥmar (Jamieson 1990: FIG. 36.16); 18. Aḥmar (Jamieson 1990: FIG. 39.12); 19. Hassek (Behm-Blancke 1981); 20. Mari (Lebeau 1985: FIG. 26.8); 21. Aḥmar (Jamieson 1990: FIG. 39.13); 22. Aḥmar (Jamieson 1990: FIG. 39.14); 23. Aḥmar (Jamieson 1990: FIG. 36.1).



12. Parallels for Jāwa ceramics with post-Uruk colony sites in Syria (Genre A): 1. Jāwa (Betts 1991: FIG. 117.92); 2. Jāwa (Betts 1991: FIG. 121.150); 3. Jāwa (Betts 1991: FIG. 117.100); 4. Mari (Lebeau 1987: FIG. 4.8); 5. Jāwa (Betts 1991: FIG. 117.94); 6. Jāwa (Betts 1991: FIG. 121.145); 7. Jāwa (Betts 1991: FIG. 121.144); 8. Jāwa (Betts 1991: FIG. 121.142); 9. Jāwa (Betts 1991: FIG. 121.143); 10. Jāwa (Betts 1991: FIG. 120.130); 11. Jāwa (Betts 1991: FIG. 120.135); 12. Jāwa (Betts 1991: FIG. 121.160); 13. Jāwa (Betts 1991: FIG. 120.131); 14. Aḥmar (Jamieson 1990: FIG. 38.5); 15. Aḥmar (Jamieson 1990: FIG. 39.1); 16. Aḥmar (Jamieson 1990: FIG. 38.6); 17. Aḥmar (Jamieson 1990: FIG. 37.4); 18. Aḥmar (Jamieson 1990: FIG. 38.11); 19. Aḥmar (Jamieson 1990: FIG. 37.3); 20. Aḥmar (Jamieson 1990: FIG. 38.10); 21. Aḥmar (Jamieson 1990: FIG. 38.13); 22. Aḥmar (Jamieson 1990: FIG. 37.1); 23. Mari (Lebeau 1987: FIG. 2.13); 24. Mari (Lebeau 1987: FIG. 4.11); 25. Aḥmar (Jamieson 1990: FIG. 20.5).

little exposure of pre-EB IV levels in the Euphrates area, have inhibited attempts to investigate the nature of settlements in the first half of the third millennium, and to ascertain their developmental status. It is generally assumed that sites such as Ḥadīdī, Swayhāt and Ḥalāwa in this earlier phase represent small to medium sized, individual and localized occupation, somewhat isolated from the rest of the third millennium world. However, evidence is emerging from recent survey and excavation work at a group of sites in the vicinity of and including Tall Banāt on the left bank of the Euphrates, north of Ḥadīdī, which suggests that during the early third millennium there was a two or three tiered, and functional differentiated hierarchy of sites there, with elite burials, centralized ceramic production and public architecture (McClellan and Porter *nd*; Porter 1991; McClellan 1991). The analysis of the material from the Tall Banāt project is not yet concluded, but is sufficiently advanced to place these settlements in the first half of the third millennium — the earliest post-colony material corresponds to Ḥadīdī strata 1 and 2. In conjunction with the recently published Early Dynastic remains from Mari, in particular with the ED I and II period, this warrants a reassessment of our current perception of the developments in Syria at this time. It is suggested here that urbanization and state formation may have taken place in the Euphrates area somewhat earlier than is presently proposed, and that it is unlikely to have been an isolated process.

For example, the possibility that the Middle Khābūr sites of Tall ‘Atij, Tall Judayda (Gudeda) and Tall ar-Raqā‘ī may be part of an embryonic state system must be considered. These sites seem to be a) contemporaneous and b) to perform related specialized functions in a regional and economic system. Fortin (1990a; 1991a) associates the function and location of ‘Atij and Judayda to the establishment of Mari and cites Margueron for the potential dating of the latter to the beginning of the third millennium (see for example Margueron 1991).

Mari at its foundation was a major settlement according to Lebeau (1987) who states that ED I material is distributed across the whole extent of the site. Margueron argues that the hydraulic system, with its large concentric earthen rampart and its canals, also dates to the beginning of occupation there. This implies a planned and constructed community, rather than one that gradually developed on an *ad hoc* basis. Moreover, part of the hydraulic system at Mari (Margueron 1987; 1991) essentially uses water harvesting, since one canal conveys rainwater runoff diverted from a wadi by a dam. Mari might now be considered the largest *Kranzhügel* as it shares with them two key features: a large earthen out-

er ring (although interpreted as a dike to protect the interior from flooding) and radial lines, i.e. canals transporting rainwater runoff, etc. We also note similarities between Mari and Jāwa.

Mari indeed seems pivotal at this juncture. Strong connections can be made between the ceramics of its levels 18-9 and the Middle Euphrates sites, the small Middle Khābūr sites (but not the more northerly site of Tall Laylān), the *Kranzhügel* sites, and even to Jāwa. With regard to the Middle Khābūr, these parallels may offer an explanation for the puzzling nature of the small specialized sites of ‘Atij, Judayda and Raqā‘ī, which seem to have functioned as collection, processing and shipment stations for agricultural products. It is postulated that these products may have been directed towards Mari, rather than to the north, which, it is argued, would have had little need to exploit this area to supplement its own agricultural production (Fortin 1990a; 1991b; Curvers and Schwartz 1990).

If the location of such sites on the Middle Khābūr is problematic, where labor intensive irrigation was required (Curvers and Schwartz 1990), so too is the question of why — and when — the *Kranzhügel* sites were established in the less productive regions. Moortgart-Correns (1972) has placed Khuwayra (Chuera) and the *Kranzhügel* sites in the Early Dynastic/Mesilim period, i.e. the first half of the third millennium BC. In his study of the ceramics of Tall Khuwayra, in which he concentrated on the so-called Metallic Ware, Kühne (1976) also dated the occupation of the Period I strata to the Early Dynastic period. Some scholars on the other hand have suggested that the ceramics and occupation at Tall Khuwayra were dated too high, and have argued that they are better placed in the second half of the third millennium BC (Schwartz 1988a), and a major disagreement has arisen. The excavator of Tall Khuwayra indicates that the site was founded in the Early Dynastic period and that this occupation ended at the beginning of the Akkadian period (Orthmann 1986; 1990). While he dates the ceramics to the later third millennium, Orthmann states that there is clear evidence of ED I and ED II non-ceramic material at the site. Lebeau (1990) has recently reviewed the chronological problems and outlines a solution to the dilemma based on the suggestion that there are two kinds of Metallic Ware, the “Chuera Metallic Ware”, which dates to ED I-III, and “Akkadian Metallic Ware” (also called “Stone Ware” by J. Oates), dating from the end of the ED III to the end of the third millennium BC. Lebeau (1990) also argues that the founding and main occupation of the *Kranzhügel* sites, including Tall Khuwayra, dates to the second and third quarters of the third millennium BC. This corresponds to

the founding of Mari.¹² Recent “grab-sample” surface collections from other *Kranzhügels* (Tall Mu‘azzar, Tall Ḥammām, Tall Mabṭūḥ ash-Sharqī) verify that they were occupied during the third millennium, with at least a component of the assemblage datable to the first half on the grounds of parallels with the Early Dynastic material at Mari.

Although it could then be argued that levels 18-9 in Chantier B at Mari should be down-dated to better fit with the later dating of Khuwayra, the relationship of this material to other sequences on the Euphrates counteracts this. Khuwayra parallels Mari ED I (Lebeau 1985; 1987), which in turn has many good correlations with Tall Banāt, Tall Aḥmar, Ḥalāwa Tall B, (all of which correspond to Ḥadidī Stratum 2), as well as to Ḥadidī itself. There are, however, no direct parallels that we have ascertained between Khuwayra and Ḥadidī in the area RII material. Dornemann has noted the association of the Ḥadidī tomb material with Metallic Ware at Khuwayra, and there is certainly a general affinity between some of the tomb forms and the Khuwayra shapes.

While it is not here argued that the Khuwayra corpus *must* be updated, the foregoing review serves to show that the dating of Khuwayra is by no means resolved.¹³ Therefore in an alternative chronological scenario, Tall Khuwayra and the *Kranzhügel* sites could have been established in the first half of the third millennium BC, perhaps sometime during 2900 - 2700 BC. South and west of the Khābūr River, agriculturally peripheral areas were settled and large-scale public works employed in the form of earthen rampart fortifications and water harvesting lines.

Conclusion

The similarities between sites in north Syria and Jāwa, in terms of public works, technological development, ceramics and expansion into agriculturally marginal regions, are not fortuitous. This is not to argue that the relationship between Jāwa and the north is a direct or causal one, which might imply colonization or implantation, rather that the process which led to the development of technologically sophisticated, and by inference, organizationally advanced, settlements in disparate areas affected much of the Fertile Crescent. It seems that these processes represent not merely a cyclical population fluctuation but are related in some way to state formation and urbanization.

Having said this, we must face one remaining problem central to both regions:

The location and complexity of the site generated

the most difficult questions. The construction of Jawa was obviously an enormous undertaking, a great investment of human energy and ingenuity which found expression in the massive stone fortifications, extensive water harvesting systems, and densely packed domestic quarters. Over ten hectares were enclosed in two rings of walls.... the very existence of the site demands answers to so many questions, the most problematic of which are, of course, why was Jawa established and how did the population exist in the semi-arid region... (Helms 1981: 12).

We need only replace *Kranzhügel* or Malḥat adh-Dharū for Jāwa, mud for stone, and increase the size of the site to ask this question of North Syria. Various explanations have been put forward. D. Oates (1985b) has proposed that the outer settlements were “places of refuge for the agricultural population of the countryside”. Alternatively he suggested that the imposing earthen fortifications were symbolic markers of prestige. On the other hand Kühne (1976; 1983) understands the presence of *Kranzhügel* sites in these marginal areas as part of the expansion of trade activity by southern Mesopotamia with Anatolia. Such an explanation meshes with that for the establishment of Mari on the Euphrates (Margueron 1987), and the organization of agricultural supply centers on the Middle Khābūr where foodstuffs were gathered to sustain Mari. It is also possible that population pressures led to this expansion into marginal areas. However some years ago van Liere (1963: 115) suggested that “... their [the *Kranzhügel* sites] position in a low rainfall zone may be indicative that these people were at least partly pastoral”. Hole has recently enlarged on this possibility to explain the storage facilities at Raqā‘ī, ‘Atij and Kirma on the Middle Khābūr, but which might be extended to the *Kranzhügel* sites; he sees the former as centers that “...would have served a ‘tribe’ of people, most of whom were absent for the winter, and most of whom actually lived in tents or other impermanent shelters...” (Hole 1991: 17). The answers to the questions about Jāwa and its place in the Jordanian desert are not yet in, but they are surely to have implications for the north — a key to interpretation of these phenomena is their interconnectedness.

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¹² The only other *Kranzhügel* for which dating information has been published is Tall Malḥat adh-Dharū; Kühne (1983) has stated that its main occupation was during the third millennium BC., based on surface sherds including Ninevite V, Metallic and Simple wares, as well as triangular ledge handle cooking pots. Sherds from the Uruk, Middle Bronze, Late Bronze and Iron

Age period were also found.
¹³ Helms (Betts 1991) notes many parallels with the later third millennium in north Syria, including Tall Khuwayra, but treats these as “developed forms” which indicate the possibility that earlier examples may match fourth millennium Jāwa.

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