Annales archéologiques arabes syriennes, Cinquantenaire, 2002,

in press.

Revising the Contours of History at Tell Leilan

Harvey Weiss, Francesca deLillis, Dominique deMoulins, Jesper Eidem, Thomas Guilderson, Ulla Kasten, Torben Larsen, Lucia Mori, Lauren Ristvet, Elena Rova, Wilma Wetterstrom

Genesis of north Mesopotamian Cities

Northern Mesopotamia's low grain yield costs and high land transport costs were fundamental forces behind early state growth in the fifth-fourth millennia BC (Weiss 1983, 1986, 1997). That development, as well as the southern Mesopotamian Uruk colonization in northern Mesopotamia, was terminated by the 5.2 ka BP abrupt climate change that persisted for two centuries (Weiss 2001). In its wake, northern Mesopotamia underwent the Ninevite 5 experience: four hundred years of reduced settlement size, limited political consolidation, and abridged contact with southern Mesopotamia (Weiss and Rova eds. 2002).

In the Leilan IIId period, ca. 2600-2400 BC, at the end of the Ninevite 5 period, Leilan suddenly grew from village to city size, 90 hectares, and its politico-economic organization was transformed into a state apparatus (Weiss 1990). The reasons for this secondary state development are still unclear, but seems to have occurred synchronously

across northern Mesopotamia and induced, briefly, the emulation of southern Mesopotamian administrative iconography (Weiss 1990).

Period IIa.

In the late IIId period a cultic platform, ca. 150 square meters, featuring a central mudbrick altar with burnt plaster griddle, and an adjacent line of three storerooms, was constructed on the west side of the Leilan Acropolis (**Figure 1).** Shortly thereafter, at the beginning of the IIa period, a massive wall was constructed around the cultic area of the Acropolis, possibly around the entire northern portion of the Acropolis. The rooms on the eastern side of the cultic platform **(**foreground, **Fig. 2)** have yet to be excavated but the tops of their thickly plastered walls already hint at their importance.

Sixty fragments of impressed clay sealings and two original cylinder seals were recovered from the period IIa levels in the 1993 and 1999 Acropolis Northwest excavations. Together with the period IIa seals and sealings retrieved during the 1985-1987 excavations (Parayre in Weiss et al. 1990, Parayre in press) they define the period IIa distinctive distinctive co-occurrence of local and southern styles: (1) several schools of autonomous glyptic production inspired by southern prototypes; (2) direct contacts with different areas of southern Mesopotamia; (3) deep involvement in a northern cultural environment from western Syria to the Tigris region .

The end of Leilan IIa.

A precise date for the end of Leilan IIa awaits comparison of terminal IIa with early IIb radiocarbon assays. A secure set of five measurements is available from the renovation of the Acropolis IIa grain storeroom adjacent to the cultic platform. The storeroom's liters of carbonized barley represent one harvest, but we do not know the duration of IIa occupation after its combustion. In any case, the storerooms, in contrast to the adjacent platform, are known stratigraphically to have been a mounded ruin when the Akkadians arrived.

CENTER FOR ACCELERATOR MASS SPECTROMETRY

Lawrence Livermore National Laboratory

CAMS	Sample	d13C	fraction	±	$D^{14}C$	±	^{14}C age	±
81869	Tell Leilan 44W13 15 #1	-28	0.6051	0.0021	-394.9	2.1	4035	30
81870	Tell Leilan 44W13 15 #2	-28	0.6059	0.0021	-394.1	2.1	4025	30
81871	Tell Leilan 44W13 15 #3	-28	0.6057	0.0021	-394.3	2.1	4030	30
81872	Tell Leilan 44W13 15 #4	-28	0.6065	0.0021	-393.5	2.1	4015	30
81873	Tell Leilan 44W13 15 #5	-28	0.6052	0.0021	-394.8	2.1	4035	30

The quoted age is in radiocarbon years using the Libby half life of 5568 years.

These IIa grain storeroom single-harvest radiocarbon dates can be averaged, weighting by their standard deviations, to yield 4028±13 BP, which extends across the calibration plateau from 2580 to 2470 BC at two standard deviations (Oxcal 3.5, **Figure 3**).

The grain storeroom combustion is preserved in the room's red and black burnt plaster walls, as well as in the flotation of the room's contents. Exceptional densities of lignified roof materials, phytoliths, and calcitic spherules were produced by high temperature grain combustion and subsequently retrieved from flotation of the room's contents and adjacent passage way floors. The calcitic spherules, first noticed by Wilma Wetterstrom, were analyzed with the electron microprobe and recorded by scanning electron microscopy at Yale University with the assistance of Dr. James Eckert.
The spherules are centimeter to micron scale in size, are comprised mostly of Ca, Si, and O, with a range of sub-micron Fe, Zn, Ag surface features. These spherules are likely to appear in similar contexts elsewhere at Leilan and at other sites.

Akkadian imperialism.

Research at Tell Leilan has defined several attributes of the Akkadian imperialisation of the Habur Plains. Three most significant implementations of Akkadian regional policy are evident in:

1. labor concentration by means of the city's massive circumvallation and the displacement of populations at secondary centers;

2. Akkadian standard labor rationing using *sila* bowls produced in massive quantities for ration distribution.. These vessels, distinguished by their finished bases, are specific to

the Akkadian period at Tell Leilan (Senior and Weiss 1992) and other Akkadian imperialized sites

3. massive administrative fortress construction, The Unfinished Building, to protect Akkadian administrative and revenue collection procedures. This structure was designed to be at least 14 meters from east to west and 9.6 meters from north to south with walls 1.86 meters wide. The basalt blocks were transported 40 kilometers from an basalt outcrop and dressed at the building site (Ristvet and Weiss 2001) (**Figure 4**).

A garbage deposit on the IIb surface of the Unfinished Building contained Akkadian seal impressions studied by Elena Rova, and Akkadian tablet fragments studied by Lucio Milano. The fragmentary L 93-66 sealing, but two centimeters long (**Fig. 5**), shows a bearded hero with a raised leg and outstretched arms beside an inscription of Old Akkadian ductus. This seal design, with symmetric rivals aside the inscription, is typical of the late Akkadian period. Such seals were produced for officials and members of the royal household connected with the uppermost level of the Akkadian administration. The inscription, read by M. Vandemieroop, identifies the presence at Leilan/Shehna of "Hayabum, the *šabra*," the highest rank Akkadian official (Salonen 1968; Visicato 2000). The seal from which L93-66 derives probably came from the south with its owner. Although the inscription is unique, similar designs are known from Tell Brak, Tell Mozan (Matthews 1997, 292, 307-8, 311-325, Buccellati, Kelly-Buccellati 2000, figs 1, 2) and from Mari on the Euphrates (Boehmer 1965, fig. 219).

One seal and three impressions from different cylinder seals were situated in other IIb contexts. These have all the features of southern Akkadian glyptic and none of the previous period's geometric designs, further evidence for the deep integration of the Habur Plains into the Akkadian imperial administration. L 99-1 (**Fig. 6**) a light coloured seal of glazed composition, also reflects the Akkadian presence at Tell Leilan. It shows three naked, bearded heroes, or gods, with prominent nose and elaborate head-dress, kneeling to the right, the right arm bent to the waist, and the left arm raised in front of the face holding an axe, skinning (?) upturned caprids. The position of the hero's arms, his attributes, and the kneeling position, are each standard Akkadian iconography. The headdress, though unparalleled, is similar to Akkadian examples elsewhere. In addition, the seal shows several unusual features: the presence of two horizontal border lines; the three couple sequence of opponents, the upside-down caprid, and the row of *couchant* animals. The schematic style of the seal and its material suggest that it may have been locally manufactured for the Akkadian administration. Contrary to some of the Akkadian seal impressions at Leilan and elsewhere, the Akkadian seals from the Habur Plains do not share the artistic and material qualities of southern Akkadian seals.

State and Imperial Agriculture.

Seventy samples, ten percent, of the third millennium B. C. Leilan flotation collections have been analyzed from:

Acropolis IIIa-d dumps and ash associated with ovens and storage facilities,

Acropolis IIa burned storerooms and a ritual precinct,

Acropolis Period IIb oven,

Lower Town South Period IIa and IIb material from the workmen's quarter.

These samples indicate that the same crops (see **Figure 7: Table 1**) were grown throughout the third millennium.Their economic roles, and their production and distribution, however, changed radically as subsistence farming practices of the Leilan village economy were transformed to yield surplus for Leilan state support, and under Akkadian rule to provide imperial taxes. The paleobotanical analyses suggest how these transformations were realized.

The high productivity and labor advantages of dry-farming supported the emerging Leilan state with the expansion of dry-farming cultivation. (Weiss 1983, 1986).
The 1993 excavations uncovered three adjacent Period IIa storerooms, abutting corridors and a courtyard in an elaborate ritual quarter which had burned in two catastrophic fires. The rooms preserve some of the original content and structure and shed light on grain storage (Wetterstrom forthcoming). Barley was the dominant grain throughout, as can been seen in **Fig 8**, which shows the relative proportions of barley, emmer, and durum. Room 1 was a barley grain bin with a thick layer of charred clean barley grains on its floor. It included a small amount of emmer (4%), but so little as to be only a contaminant. Barley was also found in the debris on the floors of the other two rooms where food was stored in large jars. Barley pervaded the adjacent corridors and courtyard, as well, occurring amongst ash and debris that were scattered during storeroom combustion.

Emmer and durum wheat grains were found in smaller numbers throughout except in one sample (44W13 lot 28 Room 4 jar 8) where emmer outnumbered barley in a ratio of 3 to 1. This sample came from a large storage jar that was recovered intact. Although the two cereals were mixed together it is unlikely that this was an intercropped mix as the two require different processing methods (Charles 1998). More likely the cereals mingled during the fire, along with a mass of emmer chaff (ca. 7,000 glume bases/spikelet forks) also found in the jar.

The composition of the flotation samples suggests that the cereals scattered on room floors and adjoining areas were also cereals in bulk storage. The storeroom samples are shown in Fig. 2, a plot of the relative proportions of chaff, weeds, and cereal grains. All of them, except the barley layer and sample from the "emmer jar," cluster toward weed-grain proportions. Following ethnographic models of traditional cereal processing (Hillman 1981, 1984a, 1984b), this pattern of semi-clean grain would be expected of cereals in bulk storage.

Under Akkadian rule barley was again the predominant cereal. In Leilan IIb flotation samples taken from the courtyard and kitchen adjacent to The Unfinished Building, barley grains vastly outnumbered wheats, in a ratio of 4.5:1 (**de Moulins n.d.).** Relatively free of chaff, this grain appears to have come from a storage context. In a sample from a nearby IIb oven (44W15 lot 17), barley accounted for 68% of the cereal grains (54 out of a total of 80).

In the Lower Town South excavation, a sample of the third millennium workers' residential area, the same pattern is seen in a set of flotation samples: barley outnumbered wheats in both Periods IIa and IIb (69 out of 88 identified cereal grains in IIb and 10 out of 11 in IIa). Barley provides for high yield within high interannual precipitation variability dry-farming and has a shorter growing season (Powell 1985; Weiss 1986). Thus it is not remarkable that barley was also the main cereal at other sites across the dry-farming plains of northern Mesopotamia at this time such as Tell Brak (Charles and Bogaart 2001).

It should be noted, however, that the Tell Brak was in a marginal agricultural region that now averages 289 mm of rainfall per year compared with 450 mm per annum at Leilan (Weiss 1986). The limited rainfall and Brak's deep calcareous soils type cause micronutrient deficiencies in plants (Brady and Weil 1999), while the Leilan region's higher rainfall makes its mediterranean brown and red soils the most productive in the region today (Weiss 1986). These differences in precipitation and soils explain one significant difference between the Leilan and Brak plant assemblages. Einkorn was abundant in flotation samples from Tell Brak (Charles and Bogaart 2001) but so rare at Leilan as to be considered only a contaminant. Out of over 1000 wheat grains recovered at Leilan, only a few have been identified as einkorn. A primitive, hardy wheat, einkorn is grown today primarily in marginal areas, such as mountainous regions, because it will grow "without manure on poor sandy, chalky, and rocky soils where better wheats fail…" (Percival 1921:171). Einkorn is used mainly as fodder (Percival 1921), likely its function at Brak, a third millennium mule breeding center (Archi 1998).

Barley dominated Tell Leilan's Period II agro-production, but it may not have always been the major cereal. The small number of Acropolis flotation samples from Period III suggests a transition from an economy based perhaps equally on emmer, durum, and barley, to one dominated by barley. **Figure 7** shows the relative proportions of the three cereals in pooled samples from Periods IIIa, b, and d. The Period IIIa and b samples have less barley than most of the samples from later periods and the highest proportions of durum of all the Leilan samples examined thus far. By Period IIId, however, with state emergence, barley dominated in two of three sample sets, suggesting a trend toward increasing barley production.

As barley gained a preeminent role with state emergence, the business of its cultivation, and perhaps the cultivation of other cereals, came under the direct control of a central administration. At the same time a separate informal household economy may have continued to operate (or emerged). At Tell Brak Charles and Bogaart (2001:325) have suggested, on the basis of archaeobotanical and textual evidence, that during the Akkadian period a "specialized 'public-sector' agriculture concentrated on barley and other cereals" functioned "alongside 'private-sector' cultivation of a wider range of crops including pulses." While pulses were absent in the public areas at Brak, they occurred in two household contexts. A similar pattern is seen in flotation samples from Tell Leilan Period IIa. No pulses were found in the Acropolis storerooms except for a few lentils which were probably contaminants (0.02%, 3 out of 13,981 cultivars) (Wetterstrom

forthcoming). But lentils represented 6% (9 out of 150 seeds and fruits) of the cultivars in IIb and 12% (3 out of 51) in IIa samples from the Lower Town South.

Emmer, also stored on the Akkadian Acropolis, was probably not an important component of the long-distance Akkadian tribute system. Emmer is a very labor-intensive cereal to process, requiring repeated mortar pounding to break the spikelets, followed by sieving (Samuel 1989, D'Andrea and Haile, in press). In highland Ethiopia, emmer processing was the most onerous chore of village women, consuming 10 to 14 hours per day every other day until the recent introduction of mechanized communal millling machines (D'Andrea and Haile, in press). If emmer had been dehusked in bulk at Leilan for shipment as grains, it would have had very high labor costs. But it is unlikely that it was shipped in spikelet form, since this would have been costly too. The additional mass of the glumes, glume bases, and rachis segments would have added substantially to the bulk and weight, and therefore to transport costs (it was replaced by durum in Hellenistic and Roman Egypt [Crawford 1979]). On the other hand, emmer is one of the least demanding cereals on the threshing floor since it only needs a single threshing to break the heads into spikelets (D'Andrea and Haile, in press). Thus for the state, this cereal would have required little labor to produce for workmen households, where the real chore of dehusking would be carried out.

Another component of state agriculture was the production, storage, and distribution of cereal by-products—straw, chaff, and weed seeds. These were taken for fodder, fuel, or mud brick and cached in the central storerooms of the Acropolis. The thousands of

emmer glume bases and spikelet forks found in the flotation sample from the emmer storage jar (44W13 lot 28 Room 4 jar 8) represent far more chaff than would be expected if this material were simply a by-product of the grains in the jar **(Figure 9)** If the 270 emmer grains recovered had been stored as spikelets, a common method for storing emmer, the glume bases/spikelets to which they were attached would total only 135. In the Lower Town South, on the other hand, the Period IIb and IIa pooled samples from the Lower Town South had less chaff than any of the other samples. This would be consistent with a practice of extracting the by-products before distributing the grains (see **Figure 9).** One of the major challenges for the indigenous state and for the Akkadians was managing the risks of uncertain rainfall, especially as precipitation declined through the mid-third millennium (Weiss 2001). Barley monoculture was risky since monocropped fields were especially vulnerable to rainfall fluctuations; barley harvests, stored on the Acropolis, however, could carry the state apparatus through interannual precipitation failures (Weiss 1986). Outside of the monocropped barley fields, Leilan farmers may have used a variety of strategies to hedge against interannual precipitation variability. For example, two wheat species may have been raised at Leilan in part to guarantee at least a partial wheat harvest, as the ancient Romans did (Jasny 1944). Emmer, the predominant wheat, was most likely the hardier one given that it was cultivated throughout northern Europe, whereas durum was adapted to the milder Mediterranean climate. But under favorable conditions, durum was probably more productive. Another strategy was to plant two or more crops together in a field. Because of the crops' different tolerances and requirements, one might succeed in the field's microhabitat if the other failed.

Some of these hedging tactics may not have been the purview of the state, but were instead carried out by the informal household economy. During the second millennium, while the palace focused on expansive fields of barley, “smaller farming units” might have planted crop combinations that aimed for “guaranteed annual returns” (Weiss 1986: 97). This may have been true for the third millennium as well.

One form of insurance which the state probably managed actively was herding, a bank on the hoof that could be tapped in bad times. Surplus crops, crop by-products, and inedible vegetation (such as steppe plants) could be fed to herds, which in turn converted these into valuable products (meat, milk, hides, hair, dung, labor). In poor years, fodder crops (raised to feed livestock during dry months when graze was unavailable) could be consumed by humans, and under dire circumstances the herds might be eaten too (Jones and Halstead 1995, Jones 1998).

Under the indigenous Leilan state, the storeroom on the Acropolis, stuffed with barley, typified urban productivity. The surpluses generated by Leilan’s dry-farming land use strategies were both expended for state activity and banked against interannual precipitation variability. Under Akkadian domination in Period IIb some, if not all, of the same strategies generated still greater surpluses for imperial taxes.

The termination of Akkadian imperialism.

The abandonment of the Akkadian emplacement at Tell Leilan occurred within decades of the onset of the 4.2 ka BP aridification, dust, and cooling event that is marked in more

than 30 region-wide paleoclimate proxies. In south Asia, the Indian monsoon that provides 80% of the Nile flow, was deflected, while in west Asia precipitation from the Mediterranean westerlies diminished by at least 20% (Weiss 2001).

At Tell Leilan, evidence for the ACC consists of a stratigraphic marker, tephra, that underlies fine dust deposited upon terminal Akkadian floors. This tephra marker has been identified in the Gulf of Oman core (Cullen et al 2001) immediately preceding the 4.2 ka BP event's dust spike there. At Tell Leilan this tephra has been retrieved by M.-A. Courty in three terminal period IIb loci:

a. Operation 8

b. Operation B

c. Operation 3

In each case, however, the tephra is a minor component of its soil matrix and the available samples from Tell Leilan were insufficient for trace element analyses. Substitute samples from Abu Hgeira, although stratigraphically insecure and lacking photographic record, have been utilized (Weiss et al 1993; Cullen et al 2001). Although a significant chronological marker, this volcanic event, for several reasons, cannot be understood to have generated the abrupt climate change (Weiss et al 1993: 1002). The date of the abandonment of Tell Leilan is given by the date of the last Akkadian floor on the Leilan Acropolis from which a jar filled with barley was retrieved.

CENTER FOR ACCELERATOR MASS SPECTROMETRY

Lawrence Livermore National Laboratory

CAMS	Sample	d13C	Fraction	±	D14C	±	14C age	±
81861	L99 44W16 29#1 A	-28	0.6254	0.0022	-374.6	2.2	3770	30
81862	L99 44W16 29#1 B	-28	0.6235	0.0021	-376.5	2.1	3795	30
81863	L99 44W16 29 #2	-28	0.6244	0.0023	-375.6	2.3	3785	30
81864	L99 44W16 29 #3 A	-28	0.6232	0.0020	-376.8	2.0	3800	30
81865	L99 44W16 29 #3 B	-28	0.6211	0.0022	-378.9	2.2	3825	30
81866	L99 44W16 29 #4 A	-28	0.6258	0.0021	-374.2	2.1	3765	30
81867	L99 44W16 29 #4 B	-28	0.6262	0.0022	-373.8	2.2	3760	30
81868	L99 44W16 29 #5	-28	0.6239	0.0025	-376.1	2.5	3790	35

The quoted age is in radiocarbon years using the Libby half life of 5568 years.

A and B denote individually processed replicates of cereal grains from the same sample.

The weighted average for these dates is calibrated (Oxcal 3.5) in **Figure 10**, and cannot be earlier than 2300 BC.

Regional abandonment

Most settlements on the Habur Plains were abandoned, in whole or in part, during the 4.2 ka BP abrupt climate change. In the Tell Leilan region, the entire site appears to have been abandoned, while the Tell Leilan Region Survey has observed only scant village level occupation along the region's wadis **(Figure 11, 12.)** A similar Akkadian period urban abandonment appears at Tell Hamoukar.

At Tell Brak, the area occupied diminished by at least three-quarters, with only the Naram-Sin fortress (ca. 1 ha.) possibly still in use with the area FS (ca. 0.5 ha.) residential buildings (Oates, Oates, and McDonald 2001). The Tell Brak "post-Akkadian" ceramic assemblage, however, is reported to be the "Akkadian" ceramic assemblage at Tell Chuera; the 75% reduction in occupation now understood at Tell Brak might, therefore, be a 100% abandonment.

The only public building of the post-Akkadian period on the Habur Plains is the large building at Tell Mozan retrieved by Peter Pfälzner (Dohmann-Pfälzner and Pfälzner 1999). Here too, however, there is a diminution of settlement as the Hurro-Akkadian palace area, with its Leilan IIb ceramic assemblage, was now abandoned and, like Tell Taya 5, may have become a sheep stall (M. Liverani 2002 p.c.; Reade 1979). This building raises many long-standing questions about the brief post-Akkadian Hurrian rule at Tell Mozan, including how Mozan agriculture survived this interval of regional decline.

The Akkadian collapse, including the ritual abandonment of Tell Brak administrative buildings, the Akkadian departure from Mozan, and the hasty interruption of Akkadian public building at Leilan, was part of the region-wide process that included indigenous settled population abandonment and disruption of the seasonal transhumance utilizing post-harvest Habur stubble. Synchronous habitat-tracking down the Euphrates into southern Mesopotamia seems reflected, as well, in southern Mesopotamian survey data and southern construction of the Repeller-of-the-Amorites Wall (Weiss et al 1993).

Repopulation

The return of stable climatic conditions at ca. 1900 BC, documented in the Soreq Cave speleothem, the Lake Van varves and the Gulf of Oman marine core, induced the repopulation of the Habur Plains (Weiss 2001), that is also noted in the Assyrian King List's "return of Shamshi-Adad." The abandoned site of Tell Leilan was selected as the center of regional agricultural production around which hundreds of villages were settled. Tell Leilan remained a "hollow capital" however, filled only sparsely with elaborately decorated administrative buildings, such as the Acropolis temples excavated in 1982.

The Lower Town Palace at Leilan, excavated in 1985 and 1987, initially constructed in the reign of Shamshi-Adad, had rooms filled with ca. 800 tablets that exemplify the administrative and political affairs following upon his death. Leilan was then the capital of Apum, "Reeds," probably so named after the Radd swamp. Apum controlled the eastern part of the Habur Basin in the 18th century BC, extending its control beyond Hamoukar, a vacant non-participant in the Amorite repopulation.

The Lower Town palace archives document a period not recorded in the Mari archives, when scant other epigraphic data is available (Whiting 1990, Eidem 1991a, c.). These archives belong mainly to the three last kings of Leilan and include administrative accounts, letters, and political treaties. Two unique documents are a large tablet with the text of a treaty concluded between the trading city of Assur and the Leilan king Till-Abnû (Eidem 1991b), and substantial fragments of a copy of the Sumerian King List (Vincente 1995). The dated administrative records have been analyzed (Ismail 1991, Vincente 1991), and a complete edition of the letters and treaties will soon be available (Eidem n.d.).

The archives span the reigns of Mutiya, Till-Abnû, and Yakun-Ashar, and provide synchronisms with Babylonian material that make it possible to date the texts. The earliest king, Mutiya, is associated with a year-eponym found in texts from Sippar dated to ca. 1750 B. C. Virtually all the evidence for Mutiya's reign at Leilan seems to date to this one year.. He was succeeded by Till-Abnû, who was succeeded by his brother Yakun-Ashar. The reign of Yakun-Ashar ended in 1728 B. C., when Samsu-iluna of Babylon conquered Leilan. The archives therefore date to the time ca. 1750 to 1728 BC, but predominantly from the beginning and the end of the period.

The uneven temporal distribution of the archives reflects the palace administration at the time of its conquest. The large group of tablets from Rooms 17, 22 and 23 belonged to prior reigns while the groups of administrative tablets from Rooms 2 and 5 were part of

the active administration of Yakun-Ashar. Among the tablets in the large “inactive" archive are more than 200 letters sent to Mutiya or Till-Abnû from other kings asnd official in the region that inform us about international and regional events. Northern Syria was then dominated by the state of Yamhad, centered on Halab/Aleppo. The struggle for control of northern Syria among regional powers is referred to in a Leilan letter reporting that the king of Halab deploys an army of 10,000 troops in the Sinjar Plain, south of Leilan, in expectation of a Babylonian attack. Some years later Samsu-iluna of Babylon led an army north and sacked Leilan.

The two successors of Mutiya, the brothers Till-Abnû and Yakun-Ashar, were stationed initially at towns on the borders of Apum to the southeast and to the west, a situation reminiscent of Shamshi-Adad and his two sons. The letters addressed to Mutiya mostly concern a war between two coalitions of city-states ranged against each other, both coalitions using *habbatum* mercenaries (Eidem 1996). The appearance of a large army of such mercenaries to support Mutija's enemies forced him and his coalition to make peace. A unique aspect of the Leilan archives is that they include several tablets with the text of such peace treaties.

Till-Abnû had close connections with the king of Kahat documented by the treaty L.87-1363 (**Figure 14**). The complete tablet must have measured nearly 30 by 15 cms and had some 4-500 lines of text in 6 columns. The text is script for an oral treaty ceremony; like other treaties, it is unilateral and contains the oath sworn by one of the parties, in this case the king of Kahat.

The local and inter-regional disturbances of this period, filled with urban war and peace, *šarru* and *kinâtu*, â*lu* and *dimtu*, returns the Mesopotamian trajectory to its developmental pathway after a relatively brief environmental refraction.

Acknowledgements.

The Directorate-General of Antiquities has generously provided administrative support to the Tell Leilan Project since 1978. Funding for this research has been granted by the National Endowment for the Humanities, National Science Foundation, Yale University, Raymond and Beverly Sackler, Malcolm Wiener, Leon Levy, and Barbara Clay Debevoise. We are especially grateful to Adnan Bounni, Michel al-Maqdissi, Maryam Bshesh, Anwar abd-el-Ghaffour, Marhaf Halaf, Assad Mahmoud and Mohammed Muslim. Many friends at Tell Leilan, Qahtaniyeh, and Siha have sustained this project with their skillful and gracious assistance.

This report is dedicated to the memory of Ahmed Ramadan.

Bibliography

Buccellati, G. and M. Kelly-Buccellati.

2000 Urkish Newsletter. Malibu: Undena.

Charles, Michael

1998 "Fodder from Dung: the Recognition and Interpretation of Dung-Derived Plant Material from Archaeological Sites," ***Environmental Archaeology*** 1:111-122.

Charles, Mike and Amy Bogaard.

2001 "Third-millennium BC Charred Plant Remains from Tell Brak." in D. J. Oates, J. Oates and H. McDonald 2000: 301-326.

de Moulin, Dominique

n.d. "Tell Leilan. Floor Samples from 44W16, charred plant remains. Unpublished manuscript dated July 2001.

Dohmann-Pfälzner, H. and P. Pfälzner

1999 Ausgrabungen der Deutschen Orient-Gesellschaft in Tall Mozan / Urkeš. Bericht über die Vorkampagne 1998, ***Mitteilungen der Deutsche-Orient Gesellschaft*** 131: 17-46

Eidem, Jesper

1991a Tell Leilan Tablets 1987 A Preliminary Report ***Annales Archeologique Arabes Syriennes*** 37/38: 110-127.

1991b An Old Assyrian Treaty from Tell Leilan in D. Charpin and F. Joannes, eds., Marchands, Diplomates et Empereurs .Paris: ERC. pp. 185-207.

1991c The Tell Leilan Archives 1987, ***Revue d'Assyriologie*** 85: 109-135.

1996 North Syrian Social Structure in the MB Period New Evidence from Tell Leilan in F. Ismail, ed., Proceedings of the International Symposium on Syria and the Ancient Near East 3000-300 B.C., Aleppo: University of Aleppo. pp. 77-85.

n.d. The Royal Letters and Treaties, Yale Tell Leilan Research. New Haven: Yale University Press.

Hillman, Gordon.

1981 Reconstructing Crop Husbandry Practice from Charred Remains of Crops, in R. Mercer, ed., Farming Practice in British Prehistory, pp. 123-62. Edinburgh: University Press.

1984a Interpretation of Archaeological Plant Remains: Ethnographic Models from Turkey, in W. van Zeist and W. A. Casparie, eds., Plants and Ancient Man: Studies in Palaeoethnobotany." Rotterdam: Balkema, pp. 1-42.

1984b Traditional Husbandry and Processing of Archaic Cereals in Modern Times: Part I, the Glume-Wheats," ***Bulletin on Sumerian Agriculture*** 1:114-152.

Ismail, Farouk

1991 Altbabylonische Wirtschaftsurkunden aus Tall Leilan (Syrien). Ph.D. diss., Eberhard-Karls-Universität Tübingen.

Jasny, N.

1944 The Wheats of Classical Antiquity. The Johns Hopkins University Studies in Historical and Political Science, Series LXII, No. 3. Baltimore: Johns Hopkins Press.

Jones, Glynis

1998 Distinguishing Food from Fodder in the Archaeobotanical Record ***Environmental Archaeology*** 1:95-98.

Jones, Glynis, and Paul Halstead

1995 Maslins, Mixtures and Monocrops: On the Interpretation of Archaeobotanical Crop Samples of Heterogeneous Composition*," Journal of Archaeological Science* 22:103-114

Matthews, Donald.

1997 The Early Glyptic of Tell Brak (Orbis Biblicus et Orientalis 15) Freiburg: Freiburg University..

Oates, David, Joan Oates and Helen McDonald

2001 Excavations at Tell Brak. vol. 2. London: British School of Archaeology in Iraq.

Powell, Marvin A.

1985 Salt, Seed, and Yields in Sumerian Agriculture. A Critique of the Theory of Progressive Salinization ***Zeitschrift für Assyriologie*** 75:7-38.

Reade, Julian

1979 Tell Taya ***Iraq*** 35: 155-187.

Ristvet, L. and H. Weiss

2000 Imperial Responses to Environmental Dynamics ***Orient-Express*** 2000.4: 94-99.

Salonen, Armas

1968 Agricultura Mesopotamica nach sumerisch-akkadischen Quellen eine lexikalische und kulturgeschichtliche Untersuchung. Copenhagen: Copenhagen University.

Senior, L. and H. Weiss

1992 Tell Leilan "sila bowls" and the Akkadian Reorganization of Subarian Agricultural Production ***Orient-Express*** 1992.2: 16-24.

van Zeist, William and J. A. H. Bakker-Heeres

1988 Archaeobotanical Studies in the Levant, 4. Bronze Age Sites on the Northern Syrian Euphrates ***Palaeohistoria*** 27:247-316.

Vincente, C.,

1991 The 1987 Tell Leilan Tablets Dated by the Limmu of Habil-kinu. Ph.D. diss., Yale University.

Vincente, C.,

1995 The Tall Leilan Recension of the Sumerian King List, ***Zeitschrift fűr Assyriologie*** 85:. 234-270.

Visicato, Giussepe

2000 The Power and the Writing. Bethesda: CDL.

Whiting, R. M..

1990 The Tell Leilan Tablets A Preliminary Report ***American Journal of Archaeology*** 94: 568-579.

Weiss, Harvey

1983 Excavations at Tell Leilan and the Origins of North Mesopotamian Cities in the Third Millennium B.C. ***Paléorient*** 9(2): 39-52.

1986 The Origins of Tell Leilan and the Conquest of Space in Third Millennium Mesopotamia, in: H. Weiss, ed., The Origins of Cities in Dry Farming Syria and Mesopotamia in the Third Millennium B.C. Guilford: Four Quarters. pp. 71-108.

1990 Tell Leilan 1989: New Data for Mid Third Millennium State Formation ***Mitteilungen der Deutsche-Orient Gesellschaft*** 122:

1990 “Civilizing"the Khabur Plains: Mid-Third Millennium State Formation at Tell Leilan, in P. Matthiae, M. van Loon, H. Weiss, eds., Resurrecting the Past: a Joint Tribute to Adnan Bounni, Leiden. pp. 387-407.

1997 Tell Leilan, in H. Weiss, ed., Archaeology in Syria***, American Journal of Archaeology*** 101: 97-148.

2001 Beyond the Younger Dryas: Collapse as Adaptation to Abrupt Climate Change in Ancient West Asia and the Eastern Mediterranean, in: G. Bawden and R. M. Reycraft, eds., Environmental Disaster and the Archaeology of Human Response. Albuquerque: University of New Mexico Press, pp. 75-98.

Weiss, H., M.-A. Courty, , W. Wetterstrom, L.Senior. R. Meadow, F. Guichard, A. Curnow

1993 The Genesis and Collapse of Third Millennium North Mesopotamian Civilization ***Science*** 261 (20 August): 995-1004.

Weiss, H.., G. Stein, P. Akkermans, D. Parayre, R. Whiting.

1990 1985 Excavations at Tell Leilan, Syria, ***American Journal of Archaeology*** 94: 529-581.

Wetterstrom, Wilma

In Press Ninevite 5 Period Agriculture at Tell Leilan: Preliminary Results, in: Harvey Weiss and Elena Rova, eds., The Origins of Northern Mesopotamian Civilization: Ninevite 5 Chronology, Economy Society,. Turnhout: Brepols Publishers.

Forthcoming Tales from the Storeroom: The Plant Remains from the Acropolis Storage Facilities, 1993, ***American Journal of Archaeology***.

List of Figures.

1. Leilan 1993, Acropolis West, Period IIa cultic platform, with Period IIb The Unfinished Building (basalt blocks and square bricks) superimposed upon it.

2. Leilan 1993, Acropolis West, eastern portion of the cultic platform, with Period IIb The Unfinished Buiilding (basalt blocks and square bricks).

3. Leilan IIa Acropolis Grain Storeroom radiocarbon dates, 1 harvest, weighted average, calibrated.

4. Leilan IIb, The Unfinished Building, walls of basalt and two courses of brick.

5. L93-66, “Hayabum, the šabra”.

6. L99-1.

7. Table 1 Cultivated Taxa within Tell Leilan Flotation Samples

8. Period III pooled paleobotanical samples.

9. Periods IIa, IIId, IIa, IIb paleobotanical samples.

10. Leilan IIb Acropolis last floor weighted average, calibrated, 8 barley (1 harvest) radiocarbon samples.

11. Leilan regional survey, period IIb

12. Leilan regional survey, period “IIc”

13. Leilan regional survey, period I.

14. L87-1363