

**HANE / S - Vol. V**

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**Editor-in-Chief:** Frederick Mario Fales

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A publication grant of the C.N.R.  
assigned to Mario Liverani  
is acknowledged for this volume

Distributed exclusively by:  
**HERDER EDITRICE E LIBRERIA**  
Piazza Montecitorio 120  
I-00186 ROMA, ITALY

ISSN 1120-4680

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Tipografia Poligrafica Moderna  
Via Vigonovese 52/A - Padova

**History of the Ancient Near East / Studies - V**

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**AKKAD**  
**THE FIRST WORLD EMPIRE**

**Structure, Ideology, Traditions**

**Edited by**  
**MARIO LIVERANI**

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**Sargon srl**  
**Padova 1993**

## THE GENESIS AND COLLAPSE OF THE AKKADIAN EMPIRE:

### THE ACCIDENTAL REFRACTION OF HISTORICAL LAW<sup>1</sup>

Harvey Weiss and Marie-Agnès Courty

"However many the emperor slew  
the scientific historian  
(while taking note of contradiction)  
affirms that productive forces grew."  
E.P. Thompson, *Powers and Names*,  
«London Review of Books»  
January 23, 1986, pp. 9-10.

#### Introduction

A new model of the Akkadian empire results from recent archaeological fieldwork on the Habur Plains. The model situates the Akkadian empire at the end of a lengthy period of southern Mesopotamian state economy evolution and experimentation. The evolution and experimentation were the product of the southern Mesopotamian economy's politically determined need for increasing quantities of convertible wealth in the face of local growth constraints. The Akkadian empire was, therefore, the product of a specific conjunction of southern Mesopotamian environmental, developmental and geographical/location constraints and potentialities in the last half of the third millennium B.C..

The new archaeological data which both suggest and lend support to this model are derived from Habur Plains archaeological research for the period ca. 2600-1800 B.C.. The dry-farming urbanized landscape of the Leilan-Mozan-Brak triangle which developed suddenly at 2600 B.C.

1. Acknowledgments. We wish to thank the Directorate-General of Antiquities, Damascus, and especially Dr. Ali Abou-Assaf, Director-General, and Dr. Adnan Bounni, Director of Excavations, for their collegial assistance over many years, as well as Mohammed Muslim, Anwar abd el-Ghafour, and Mohammed Lahlo, for their devoted services in the course of Leilan fieldwork. We are especially grateful to friends of long-standing at Tell Leilan, Tell Barham, Qahtaniyeh, Siha, Do Gir, and Qamishli, for their help and hospitality. This research was supported by the National Science Foundation (grant BNS-8408217), the National Endowment for the Humanities (grant RO-21990-89), and Leon Levy, The Raymond and Beverley Sackler Foundation, and The Dula Foundation.

was subjected 300 years later to an elaborate Akkadian imperial apparatus implanted across the rain-fed agriculture belt of northern Mesopotamia. The purpose of this apparatus was to increase northern agricultural production and to transfer the increased production to the imperial capital.

This elaborate extractive system was, however, very short-lived. Its collapse was not due to inherent inefficiencies, nor to decreasing returns of agro-production, nor to "its own weight" and inattention to southern Mesopotamian administrative needs<sup>2</sup>. The collapse is, however, susceptible to archaeological analysis. A region-wide abrupt climatic change severely disrupted agriculture, settlement, and politic-economic systems from SE Europe to the Indus Valley, ca. 2200-1900 B.C.. One effect was the desertification and desertion of the Habur Plains, and the collapse of imperialized dry-farming agriculture. Another was the displacement of Habur Plains populations, sedentary and transhumant, "down" the Euphrates and Tigris into southern Mesopotamia. A third effect was the collapse of southern Mesopotamian irrigation agriculture, ca. 2100-2000 B.C., during the Ur III dynasty.

#### The Late Uruk collapse: 3000-2900 B.C.

For three or four hundred years, from ca. 3400-3000 B.C., the early, urban-based, Late Uruk period civilization of southern Mesopotamia both sustained itself and expanded into adjacent rain-fed northern plains, piedmont and plateau regions with "colonies" and colony-related settlements. The object of this expansion remains an enigma, but the lines of colony settlement through the Zagros to Godin<sup>3</sup>, and along the Euphrates to Habuba and Jebel Aruda<sup>4</sup>, are likely to have retrieved for the south "inessential" status-enhancing exotica for nascent elites<sup>5</sup>. Suddenly, however, at about 3000 B.C., and for still unknown reasons, Late Uruk society collapsed in the south and, synchronously, as suddenly as they had appeared, the Late Uruk colonies and related piedmont and plateau settlements also collapsed<sup>6</sup>.

2. E.A. Speiser, *Some Factors in the Collapse of Akkad*, JAOS 72 (1952), pp. 97-101; J. Tainter, *The Collapse of Complex Societies*, New York 1988; N. Yoffee - G. Cowgill (eds.), *The Collapse of Ancient States and Civilizations*, Tucson 1988.
3. H. Weiss - T.C. Young, *The Merchants of Susa*, «Iran» 13 (1975), pp. 1-17, and B. Goff, *Luristan Before the Iron Age*, «Iran» 9 (1971), p. 145.
4. D. Sürenhagen, *The Dry-Farming Belt: The Uruk Period and Subsequent Developments*, in OCDF, pp. 7-43.
5. H. Weiss, *CA Comment, The Uruk Expansion*, CA 30 (1989), pp. 597-598.
6. N. Postgate, *The Transition from Uruk to Early Dynastic*, in U. Finkbeiner - W. Röllig (eds.), *Gamdat Nasr, Period or Regional Style?*, Wiesbaden 1986, pp. 91-106. Some variability within this process, is evident, for instance, on the Habur Plains where an

#### Isolation and Insulation: 2900-2600 B.C.

The collapse, or Jemdet Nasr, period, lasted for about 100 years. For the next 300 years, from ca. 2900-2600 B.C., the cultures of southern and northern Mesopotamia, Sumer and Subir, remained isolated and insulated from each other. To judge from the limited data available for this period, the Sumerian landscape was dominated by cities ranging in size from 20 to 400 hectares, each dominated by temple-based elites, but loosely coordinated, perhaps economically, within an inter-city confederation<sup>7</sup>.

In Subir, northern Mesopotamia, settlements during this period were small, widely distributed villages situated along the perennial streams of the Habur River, the <sup>0</sup>affluents of the Tigris, and the Tigris itself. Only villages and towns, less than ten hectares, are known for this period, and there is no evidence within individual settlements for social stratification or political organization at the state level<sup>8</sup>. The distinctive cylinder seals used during this period in northern Mesopotamia unite the region with the dry-farming stretches of the Zagros piedmont and the proto-Elamite culture area of southwestern Iran. Very few sealings from these northern seals have been retrieved in southern Mesopotamia<sup>9</sup>.

#### 2600 B.C. and Secondary State Formation

At 2600 B.C., after 300 years of effective isolation from each other, the insular worlds of southern Mesopotamia (Sumer), northern Mesopotamia (Subir), and the Indus Valley (Meluhha) were launched upon a regionally interactive trajectory which, of course, transformed each (Figure

isolated Tell Brak settlement remained inhabited during this period, as reported by J. Oates, *Trade and Power in the Fifth and Fourth Millennia B.C.*, WA 24 (1993), p. 415. A partial explanation for the collapse of the Susa-inner Zagros-Godin line, and the replacement of the Godin VI/V settlements around Godin Tepe in this period, may reside within the Khirbet Kerak intrusion which cut the trade routes exploited by some of the Uruk colonies; see Weiss - Young, «Iran» 13 (1975), pp. 1-17. For further illumination of the Late Uruk colony collapse, see G. Schwartz, in O. Rouault (ed.), *L'Euphrate e il tempo*, Roma 1993, pp. 34-39.

7. ED I-II landscape and society has most recently been summarized by R.J. Matthews, *Fragments of Officialdom from Fara, Iraq* 53 (1991), pp. 1-16.
8. G. Schwartz, *The Ninevite V Period and the Development of Complex Society in Northern Mesopotamia*, «Paléorient» 13 (1987), pp. 93-100.
9. The contact is manifest in the archaeological record of Ninevite 5/"piedmont Jemdet Nasr" seals. Six glazed steatite examples of these have been retrieved at Kish (B. Buchanan, *Catalogue of the Ancient Near Eastern Seals in the Ashmolean Museum, I: Cylinder Seals*, Oxford 1966, nos. 74-78, 80). Such seals and sealings are documented, as well, in the Diyala, but are otherwise "extremely rare in Sumer" (P.R.S. Moorey, *Kish Excavations 1923-1933*, Oxford 1978, p. 156).

1). In Sumer, palaces suddenly appeared within at least seven of the major city-states which previously had only known the politic-economic rulership of temple-based priests. This suggests a radical realignment of internal urban forces in Sumer. The scale and magnitude of the alteration are evident in the urban growth, long-distance trade, and especially expanded agricultural labor deployment documented for the period beginning at ca. 2600 B.C.<sup>10</sup>.

A series of Tell Leilan radiocarbon-dated excavations indicates a radical transformation of social, economic, and political life in Subir at this same time. Three very large cities, with secondary towns and third-level villages, suddenly developed across the Habur Plains landscape formerly occupied only by villages. The synchronous adoption of Sumerian iconography on local-use cylinder seals suggests that contact with Sumer played a role in this secondary state transformation.

New south Asian radiocarbon dates indicate that at ca. 2600 B.C. the Indus flood plain was also suddenly urbanized at Mohenjo Daro, Harappa, and Ganwariwala. In this transformation these cities also adopted the administrative tools of southern Mesopotamia<sup>11</sup>. Here, again, the Sumerian expansion is linked with "secondary state formation"<sup>12</sup>.

The 2600 B.C. "expansions" to the Habur and to the Indus seem to mark, therefore, the first of three third millennium southern Mesopotamian "expansions". The second expansion, towards western Syria, occurred approximately 150 years later, and can be seen in the sudden consolidation of the Eblaite state<sup>13</sup>, and its adoption of southern Mesopotamian ("Kish civilization") cultural attributes<sup>14</sup>. The second expansion probably transformed, as well, Tell Bi'a (ancient Tutul) on the Euphrates River<sup>15</sup> and

10. H. Weiss, *Tell Leilan*, AJA 95 (1991), pp. 703-707; Matthews, «Iraq» 53 (1991), pp. 1-16.

11. G. Possehl, *Revolution in the Urban Revolution: The Emergence of Indus Urbanization*, «Annual Review of Anthropology» 19 (1990), pp. 261-282; R. Mughal, *Recent Archaeological Research in the Cholistan Desert*, in G. Possehl (ed.), *Harappan Civilization*, Delhi 1982, pp. 85-95; *Genesis of the Indus Civilization*, «Lahore Museum Journal» 1 (1988), pp. 45-54; *The Harappan "Twin Capitals" and Reality*, «Journal of Central Asia» 13 (1990), pp. 155-162.

12. T. Stech - V. Pigott, *The Metals Trade in Southwest Asia in the Third Millennium B.C.*, «Iraq» 48 (1986), pp. 39-64, associate Indus urbanization and state formation with southern Mesopotamian exotic resource acquisition. The first appearance of presumably Gujarati carnelian on the Habur Plains, at Chagar Bazar and Leilan, occurs during this period as well; see H. Weiss, "Civilizing" the Habur Plains: *Mid-Third Millennium State Formation at Tell Leilan*, in M. van Loon - P. Matthiae - H. Weiss (eds.), *Resurrecting the Past. A Joint Tribute to Adnan Bounni*, Leiden 1990, pp. 387-407.

13. S. Mazzoni, *Ebla e la formazione della cultura urbana in Siria*, «La Parola del Passato» 46 (1991), pp. 163-194.

14. P. Matthiae, *Ebla: un impero ritrovato*, Torino 1989.

15. E. Strommenger, *Ausgrabungen in Tall Bi'a 1990*, MDOG 123 (1990), pp. 7-34.

the Orontes River cities of Qatna, Hama and Asharné. The third southern expansion occurred during the Akkadian dynasty which destroyed the distant urban centers engendered by its predecessors, and imperialized the rain-fed agriculture belt on the periphery of southern Mesopotamia.

### Subir: The Four Stages

From its genesis to its collapse, a four stage model of the history of third millennium Subir based upon the Leilan-defined developmental chronology for Subir can now be projected. "Subir: The Four Stages" provides the foundation for the analysis of Akkadian imperialism and its collapse.

#### SUBIR: THE FOUR STAGES

**Stage 1. Leilan IIId (ca. 2600-2400 B.C.): SECONDARY STATE FORMATION:** Urbanization and state formation; Leilan Acropolis "palace" and storerooms; administrative iconography/technology change from "piedmont" to local "Subarian" style.

**Stage 2. Leilan IIa (ca. 2400-2300 B.C.): CONSOLIDATION OF STATE POWER:** Acropolis fortification; ceramic technology change to mass production.

**Stage 3. Leilan IIb (ca. 2300-2200 B.C.): IMPERIALIZATION:** Akkadian conquest and reorganization of regional production from nodal Brak imperial administrative center; Leilan City wall construction; *sila* bowl production; channelization.

**Stage 4. Habur Hiatus 1 (ca. 2200-1900 B.C.): COLLAPSE:** Desertification and desertion.

#### Stage 1. Leilan IIId (ca. 2600-2400 B.C.): Secondary State Formation

In stage 1 settlement at Leilan suddenly expanded more than six fold within one or two hundred years, growing from a less than 15 hectare Acropolis-based settlement, to approximately the 100 hectares now

comprising the Lower Town and settled areas outside its walls. This is documented across and around the following seven Leilan *loci*: the Lower Town South, Operations 2 and 3 on the East, Operation 7 and 8 on the North, Operation 6 (the SW "lobe"), and D3 (the "island") on the West (Figure 3).

To judge from the Lower Town South, Leilan settlement at the initial IIId period was a planned city; that is, straight streets, 4.5 meters wide, were laid out with straight street walls providing only limited access to cross alleys (Plate 5)<sup>16</sup>. On the Leilan Acropolis, at the same time, small domestic structures of the earlier Leilan IIc period were now replaced by large storerooms filled with cylinder seal impressions of a new type and, as well, a related large building, still to be excavated, which seems to have been the administrative center for the storerooms and the city at large, i.e., the "palace"<sup>17</sup>. The new "Subarian" cylinder seals, local Habur Plains imitations of Sumerian late Early Dynastic II / early Early Dynastic III banquet scenes, have replaced earlier "piedmont Jemdet Nasr" seals at this juncture<sup>18</sup>. It seems probable that this emulation of southern iconography served to legitimate nascent state power<sup>19</sup>.

Across the Leilan Lower Town, as well as on the Leilan Acropolis, the ceramics in use during this period were those of the late Ninevite 5 incised tradition. The radical social and economic alterations of the period were not accompanied by synchronous changes in traditional ceramic manufacture technologies<sup>20</sup>.

### *Habur Triangles*

Although this initial stage of Subarian state development has been explored relatively extensively at Leilan, evidence exists for defining, as

16. H. Weiss, *Tell Leilan 1989: New Data for Mid-Third Millennium Urbanization and State Formation*, MDOG 122 (1990), pp. 193-218. Apart from Tell Taya, there are few contemporary samples of urban residential areas. The Leilan Lower Town traffic/population control expressed here is duplicated at Mohenjo-Daro where B. and R. Allchin, *The Rise of Civilization in India and Pakistan*, Cambridge 1982, p. 178, note that "a distinctive feature of the construction was ... that the roadward side of a block presented a plain blank façade broken only where drainage chutes discharged".
17. See H. Weiss - L. Calderone, *The End of the Ninevite 5 Period at Tell Leilan*, in H. Weiss (ed.), *The Origins of North Mesopotamian Civilization*, New Haven (in press).
18. D. Parayre, *Seals and Sealings from Tell Leilan Acropolis 1987*, in Weiss, *Origins*; and Weiss, in *Resurrecting the Past*, pp. 387-407.
19. Symbol emulation for this purpose is common in such contexts, e.g., at Piedras Negras where "Maya kings, beginning in the Early Classic, used the symbols of a dominant foreign power to declare their 'disconnected' superior status over the people" (A. Stone, in R.A. Diehl - J.C. Berlo [eds.], *Mesoamerica after the Decline of Teotihuacan, A.D. 700-900*, Washington D.C. 1990, p. 178).
20. Weiss, MDOG 122 (1990), p. 217.

well, the Leilan IIId Habur region landscape. By Leilan IIId times, the eastern Habur triangle had been transformed into an urban landscape dominated by three equidistant centers, Leilan, Mozan and Brak, each ca. 75-100 hectares in size, situated on the perennial Jarrah, Jaghjagh and Khanzir drainages (Figure 2). Territorial control, extending up to 25 kilometers round each center, was probably equivalent for each city if Nisibin and the Jaghjagh prove to have been the territorial border between Leilan and Mozan. To judge from the series of Leilan regional surveys (Figure 4), a tight 15 kilometer ring of cereal agriculture settlement, including second and third order towns and villages, surrounded each urban center. A second ring, extending from 15 to 25 kilometers around the primary center, was probably devoted to state controlled sheep and goat herding<sup>21</sup>.

Although some village level settlement is documented along the stream beds west of the Khanzir, the only urban level settlement systems presently known on the Habur Plains during the third millennium developed around Leilan, Mozan and Brak<sup>22</sup>. Leilan and Mozan were situated to maximize cultivable lowland terrain with annual rainfall greater than 400 mm/annum. Brak, which receives ca. 280 mm rainfall/annum, probably supplemented its rain-fed cereal harvests with irrigation agriculture along the middle Habur River, where contemporary grain storage depots, such as Raqai and Atij, have been identified<sup>23</sup>.

### *Climate*

A deterioration of climatic conditions during this period complicates explanations for Subarian state formation and the southern Mesopotamian role within it. While in the century prior to period IIId Leilan was situated in a wide active flood plain with meandering channels, after 2600 B.C. the flood plain stabilized by natural channel entrenchment as

21. H. Weiss, *The Origins of Tell Leilan and the Conquest of Space in Third Millennium Mesopotamia*, in OCDF, pp. 71-108; G. Stein - P. Wattenmaker, *The 1987 Tell Leilan Regional Survey*, MASCA 7 suppl. (1990), pp. 8-18; H. Weiss, *Habur Triangles: Third Millennium Urbanization in Subir*, NABU 1992, pp. 91-94.
22. We ignore for the moment the still problematic *Kranzhügel*, such as Beidar, now the subject of a research project led by M. Lebeau, the possibly similar Bati, and the Jebel Abd al-Aziz fringe sites of Magher, Muezzar, and the Mabthus, east and west. H. Kühne, *Tall Malhat ed-Deru, eine Station auf dem Weg nach Kappadokien?*, in R.M. Boehmer - H. Hauptmann (eds.), *Beiträge zur Altertumskunde Kleinasien*, Mainz 1983, p. 301, dates the sites to the pre-Akkadian urban culture of the Jezira (i.e., Leilan IIId-IIa).
23. G. Schwartz - H.H. Curvers, *Tell al Raga'i 1989 and 1990: Further Investigations at a Small Rural Site of Early Urban Northern Mesopotamia*, AJA 96 (1992), pp. 397-420; M. Fortin, 'Atij, AJA 95 (1991), pp. 698-700.

a result of reduced water discharge in the Jaghjagh catchment basin in the northern Tur Abdin mountains<sup>24</sup>. Local rainfall declined as well; pedogenic carbonates in the soil samples indicate a reduction in soil water percolation and an increase in evapotranspiration. Centrally administered urban economies and mixed land-use strategies may have presented adaptive advantages for maximizing production under such circumstances of increased rainfall/harvest risk<sup>25</sup>. These reductions in precipitation suggest similar reductions in Anatolian plateau precipitation, and therefore a reduction in Euphrates flow within Sumer.

### Stage 2. Leilan period IIa (ca. 2400-2300 B.C.): Consolidation of State Power

Stage 2, the consolidation of state power within the cities of Subir, is marked by the first construction of a defensive wall around the Leilan Acropolis, its storerooms and administrative buildings, to protect and isolate the elite, their wealth, and their administrative power from the residents of the Leilan Lower Town and Leilan region villages. The Acropolis wall, of mudbrick, was 2.5 meters wide<sup>26</sup>. The ca. 100 hectare Lower Town, however, still remained without a wall through this period. Wheel transport of cereal production across the settlement hierarchy was probably horse, mule, or onager drawn, as a tooth from one has been identified by Richard Meadow within the Lower Town street debris.

Stage 2 is the first Subarian state formation period to witness a substantial change in ceramic technologies: the ca. 400 year old tradition of Ninevite 5 period incising disappears almost completely during this period, and ceramic production moved towards "mass production", i.e., simplified, less labor intensive, presumably more efficient production techniques<sup>27</sup>.

This period of state power consolidation remains to be explored, at Leilan, Brak, and Mozan, the Leilan region secondary centers of Do Gir and Mohammed Diyab, and the villages of the surrounding countryside. The abandonment of traditional ceramic production techniques suggests that containers were now serving new purposes influenced or controlled by state authority because ceramic vessels not only served as containers but also as measures<sup>28</sup>. This period's alterations of ceramic production

24. For the drainage and sources of the Jarrah, see L. Dillemann, *Haute Mésopotamie orientale et pays adjacents*, Paris 1962, p. 60.

25. Weiss, in OCDF, pp. 97-98.

26. Weiss - Calderone, in Weiss, *Origins*.

27. See Weiss - Calderone, in Weiss, *Origins*, for the definition of period IIa ceramics.

28. M. Powell, *Masse und Gewichte*, RIA 7 (1990), pp. 457-517. Louise Senior (University of Arizona) is analyzing alterations in Leilan IIIa-IIIb ceramic production technology, vessel standardization, and vessel function.

imply the appearance of state standards of measurement — standard capacities and areas for agricultural production, distribution, collection, taxation, payment, storage, and reinvestment. Limited as the data appear at the moment, it is this period of Subarian state power consolidation, and state culture congealment, which will soon draw considerable research attention. To judge from the Sumerian inscriptions of Eanatum, it was probably at the end of this period that the conflict between Subir and Sumer was launched<sup>29</sup>.

### Stage 3. Leilan period IIb (ca. 2300-2200 B.C.): Akkadian Conquest and Imperialization

Stage 3 is marked by the southern conquest of Subir/Subartu by Naram-Sin, although earlier Akkadian dynasts may have also "conquered" and extracted booty<sup>30</sup>. In marked contrast to distant Akkadian conquests, or possibly earlier Habur Plains "conquests", the conquest of Subartu by Naram-Sin was followed by construction of an Akkadian imperial emplacement at Tell Brak. How was Akkadian control of the Habur Plains effected and towards what ends was this control directed? In the Tell Leilan region five features of Akkadian control have been identified:

**1. population redistribution:** Tell Mohammed Diyab, the large secondary center only 8 kilometers SE of Leilan, was reduced in size from 50 to 10 hectares<sup>31</sup>, its population probably nucleated within Leilan. Do Gir, the comparable satellite site to the north of Leilan, may have suffered a similar fate. Village level settlements appear to have been maintained in place to sustain imperialized production. This redistribution may, therefore, have been directed at removing local second-level centers and elites from the administration of production.

**2. regional population control:** Regional control to prevent insurrection, to protect imperial administration, and to protect imperial stores, required the deployment of local populations for defensive/protective and

29. FAOS 5, I, pp. 143, 150.

30. FAOS 7, pp. 249-250, 253. See B. Foster, *An Agricultural Archive from Sargonic Akkad*, ASJ 4 (1982), p. 23, and W.G. Lambert, RA 77 (1983), p. 95, for Naram-Sin's defeat of Taxis-atili (Tîš-atal) at Azuhinum, 300 years later still one of the cities of Subartu (D. Charpin, in *Mémoires de NABU*, 2, Paris 1992, p. 101 note 24). Charpin's localization of Subartu ignores the regional settlement geography which recommends earlier conclusions that Subartu is, from the 19th century Mari perspective, the Habur Plains, including Idamaras, Apum, and perhaps the Tell al-Hawa region, i.e., the region of dry-farming settlement west of the Tigris, east of Ras el-Ain, north of the Jebel Ishkaft-Jebel Sinjar alignment and south of the Tur Abdin.

31. B. Lyonnet, *Prospection archéologique du site de Tell Mohammed Diyab*, in *Cahiers de NABU*, 1, Paris 1990, p. 74.

legitimizing construction works. Substantial numbers of laborers were, therefore, for the first time, deployed to construct a massive city wall around Tell Leilan. At the eastern edge of the Leilan Lower Town settlement the rock hard calcitic virgin soil was first excavated to depths of 0.5 to 1.5 meters. Then two concentric walls of mud brick, each 8 meters wide, a casemate wall, were set into these excavations. A one meter wide middle wall was constructed perhaps to serve as a walkway between the inner and outer walls. On the northern side of the city, where a natural depression and rise afforded protection, an imposing earthen rampart was constructed by excavating a 10 meter wide ditch and then mounding the excavated virgin soil upon the surface of the Lower Town.

**3. agricultural redistribution:** Systematic flotation retrieval of botanical remains within 50 to 100% samples of each Leilan Lower Town South's house floor's debris has generated a data base for Wilma Wetterstrom's analysis of agricultural production and distribution during Leilan IIB Akkadian imperialization. Wetterstrom notes the virtual absence of nodal stems, rachises, and non-seed plant parts from the Lower Town botanical assemblages. The domesticated cereals and pulses – mostly barley and lentils – have already undergone primary and secondary processing – they are clean, ready for storage, cooking and consumption, suggesting that they are the remains of rations previously processed and stored elsewhere prior to distribution. It remains to be determined if a similar labor system was already in existence prior to the Akkadian imperialization.

**4. introduction of Akkadian mensuration and Leilan sila bowls:** An extensive analysis of the pottery retrieved from the Akkadian period Leilan Lower Town settlement has revealed a bowl type distinctive for both its appearance and for its standardized capacities. The bowl is dark green, with no visible temper, wheel made, has a flat base and simple rim, straight sides. Along with 557 sherds of this vessel type which have been retrieved and measured, 27 complete or fragmentary stacked kiln wasters (SKWs) of these vessels have also been retrieved and measured (Plate 6). The SKWs have a tri-modal capacity distribution: ca. 55% range between 0.2 and 0.4 liters, 38% between 0.8 and 1.2 liters, and 6% 1.5 liters. The rim sherds of the fragmented vessels, in general, however, suggest that most derive from vessels of 1 liter capacity. These vessels are the only vessels within the Leilan IIB assemblage for which wasters have been retrieved. It seems likely that they are an administrative artifact of Akkadian imperialism: standardized sila bowls for ration distribution according to the Akkadian imperial standards<sup>32</sup>. Exposure of

indigenous, pre-Akkadian imperialization occupations of the Leilan Lower Town have failed so far to retrieve similar bowls; larger exposures may retrieve the administrative artifacts of the earlier, indigenous, Subarian system of metrology.

**5. the Akkadian intensification of agro-production:** As part of the Akkadian reorganization of production, water courses were stabilized by channelization – deepening and straightening water course channels – to counter the effects of rapid siltation and maintain an efficient water flow. In Trench D, on the western side of Tell Leilan (see Figure 3), this water management is recorded within a 4 meter sequence of repeated entrenchments into calcic virgin soil, embankments of large basalt blocks, and masses of water borne silt and pebbles cleared from the channel. Leilan period IIB potsherds, stratified on the beds of the stabilized channels, date these labor intensive projects to the period of Akkadian imperialization. The effects of channelization, in spite of the large labor costs, prevented wasteful, if not destructive channel meandering, and may have permitted the planting and harvest of a summer crop to supplement winter wheat production. Akkadian canal construction and management experience may have been applied to this innovative intensification of northern agro-production.

#### Stage 4. "Habur Hiatus 1" (ca. 2200-1900 B.C.): Desertification and Desertion

The extractive organization imposed upon the Habur Plains by the Akkadian dynasty was interrupted by its unexplained collapse in the south, and the collapse of its imperial control centers in the north. The succeeding interregnum is of still uncertain duration, the time for which the Sumerian King List records control of southern Mesopotamia passing briefly to the "Gutians". However, the successor Ur III southern state never reestablished, during its 100 year reign, extractive or political control over the Habur Plains.

There is, in fact, no evidence for settlement at Tell Leilan between periods II and I, i.e., between 2200 and 1900 B.C. Similarly, there was no sedentary settlement at Tell Chuera, Tell al-Hawa, Tell Taya, Tell Khoshi, Chagar Bazar, Germayir, Tell Mohammed Diyab, Gawra, Billa, Bderi, Melebiya, Abu Hgeira 1, and the hundreds of other settlements within northern Mesopotamia. On the Habur Plains, apart from one structure at Tell Brak (Mallowan's "red libn building") possibly dating to a time within this 300 year period, no archaeological project has ever published a building of this period, nor a stratified assemblage of ceramics

32. L. Senior - H. Weiss, Tell Leilan "sila-bowls" and the Akkadian Reorganization of Subarian Agro-Production, «Orient-Express» 1992/2, pp. 16-23.

from an exterior living surface<sup>33</sup>. This assessment applies to settlements of all sizes: cities, towns and villages. Only a few sherd types retrieved through regional surface surveys<sup>34</sup>, some unassignable with certainty to other periods, document perhaps some remnant sedentary human activity.

The epigraphical data for this period is also quite uncertain. The Akkadian collapse and the subsequent abandonment of Tell Leilan coincide with some documentation for local Habur Plains rulers, with Hurrian names, using the title "king of Urkish and Nawar", and for persons from Urkish and Nineveh, and possibly a few other northern cities, noted in contemporary (dependent upon the chronology selected) southern Ur III records<sup>35</sup>. A reduced local power emerged perhaps at this time to control briefly the remnant populations of Mozan and Brak<sup>36</sup>.

The desertion of the Habur Plains, synchronous with the collapse of Akkadian imperialized settlement, surfaces as a rare example of archaeological documentation for massive population movement. A fundamental series of questions is thereby raised within the Mesopotamian historical record:

1. why was Akkadian control disrupted by invading Gutians<sup>37</sup>?

33. For the Brak area FS house sequence, see D. Oates, *Excavations at Tell Brak 1985-86*, «Iraq» 49 (1987), p. 179; Mallowan, «Iraq» 9 (1947), p. 23, noted that Brak "shrank to one half of its original area" during this period.

34. B. Lyonnet, *Reconnaissance dans le haut Habur*, in *Mémoires de NABU*, 2, Paris 1992, fig. 4. Some surface retrieved ceramics assigned to this period are found in Akkadian contexts, e.g. "comb-impressed" rows of dots at Taya (J. Reade, *Tell Taya 1967, Summary Report*, «Iraq» 30 [1968], pl. LXXXIV: 9, 12, 13), and Khoshi (C. Kepinski, *Hoši*, AJA 94 [1990], p. 276, fig. 21).

35. D. Edzard - A. Kammenhuber, *Hurriter*, RIA 4 (1975), p. 509; RGTC 2, s.v. *Urkiš*; C. Wilcke, *A Note on Tiamat Bašti*, *Drevnii Vostok* 5 (1988), pp. 225-227; and the Akkadian through Ur III *Tiṣ-atals*: R. Whiting, *Tiṣatal of Nineveh and Babati*, *Uncle of Šu-Sin*, JCS 28 (1976), pp. 174-178; D. Collon, *The Life and Times of Teheš-Atal*, RA 84 (1990), pp. 129-136; D. Owen, *Syrians in Sumerian Sources from the Ur III Period*, in M. Chavalas - H. Hayes (eds.), *New Horizons in the Study of Ancient Syria*, Malibu 1993, pp. 105-173, comprehensively reviews the epigraphic data.

36. B. Anderson, *Imagined Communities*, London 1983, illuminates the social process of post-imperial state formation for the modern period in ways that suggest ancient analogies.

37. Gutium might be located immediately north of the Habur Plains and/or Diyarbakr Plains to judge from (1) the Gutian population and/or cultural legacy remnant there as late as the 19th century B.C. documented by J.J. Finkelstein, *The Genealogy of the Hammurapi Dynasty*, JCS 20 (1966), pp. 95-118, and (2) its frontier identified, as early as the reign of Samsuiluna, with Idamaras (J.D. Hawkins, *Idamaras*, RIA 5 [1980], p. 29) on the Habur Plains (M. Anbar, *Les tribus amurrites de Mari*, Freiburg 1990, p. 102), between the Habur and the Jaghjagh (M. Falkner, *Studien zur Geographie des alten Mesopotamien*, AfO 18 [1957-58], pp. 12, 36 and D. Charpin, *Mohammed Diyab, une ville du pays d'Apum*, in *Cahiers de NABU*, 1, Paris 1990, p. 118). The localization of Gutium adjacent to Subir/Subartu/the Habur Plains resolves perhaps the long-standing historical geographical cruxes of the equation of Gutium with Subartu and ARM VI, 27, "the 'queen' of Nawar" (Tell Brak) and her "10,000 Gutian troops" in the "land of Subartu", in spite of reservations expressed by B. Groneberg, RGTC 3, p. 176.

2. why was the southern successor state, the Ur III dynasty, unable/uninterested to reinstate southern control of the Habur Plains after the Gutian interregnum<sup>38</sup>?

3. why is this period of collapse on the Habur Plains synchronous with other unexplained population movements and increases in southern Mesopotamia?

4. why was this period of "collapse" on the Habur Plains synchronous with similar large-scale "collapse" phenomena in the Aegean, Egypt, Palestine, southern Mesopotamia, and the Indus?

5. why did Habur Plains sedentary settlement resume in the 19th century, but now under Amorite political leadership at Tell Leilan/Shubad Enlil?

Toward an understanding of the Leilan hiatus, which can be termed "Habur hiatus number 1", soil micromorphology studies — thin sections of datable pedostratigraphic units — have been undertaken at Tell Leilan and sites within the surrounding countryside<sup>39</sup>. These studies have revealed an abrupt climatic change characterized by:

1. a rapid intensification of wind circulation
2. an increase in atmospheric dust
3. the establishment of arid conditions.

This "desertification" of the Habur Plains explains its "desertion". Two populations were displaced:

1. sedentary agriculturalists, including perhaps 14,000 sedentary inhabitants of the Leilan sustaining area alone, and totalling perhaps three times that number when adjacent Habur drainage and settlement systems are considered<sup>40</sup>.
2. pastoral nomads, Amorite-speaking Hanaean tribal units, who moved between the Euphrates in winter and the Habur Plains in summer when the Habur Plains were no longer useful for summer post-harvest foraging<sup>41</sup>.

38. P. Steinkeller, *The Administrative and Economic Organization of the Ur III State: the Core and Periphery*, in SAOC 46, pp. 15-34; T. Maeda, *The Defense Zone During the Rule of the Ur III Dynasty*, ASJ 14 (1992), pp. 135-170. The absolute chronology of this period remains uncertain. The reduction of the Gutian interregnum proposed by S. Pallis, *Chronology of the Shubad Culture*, Copenhagen 1921, p. 143, and *The Antiquity of Iraq*, Copenhagen 1956, p. 483, is followed by W. Hallo, *Gutium*, RIA 3 (1971), p. 714; see G. Schwartz - H. Weiss, *Syria 10,000-2000 B.C.*, in R. Ehrich (ed.), *Chronologies in Old World Archaeology*, vol. II, Chicago 1992, p. 185, Table 1. P. Huber, *Dating by Lunar Eclipse Omina*, in J.L. Berggren - B.R. Goldstein (eds.), *From Ancient Omens to Statistical Mechanics*, Copenhagen 1987, pp. 3-13 defends a high chronology for the Ur III dynasts and Sollberger's middle chronology for the accession of Sargon.

39. The micromorphology detailing third millennium climatic conditions is reported in H. Weiss - M.-A. Courty - W. Wetterstrom - F. Guichard - R. Meadow - L. Senior - A. Curnow, *The Genesis and Collapse of Third Millennium North Mesopotamian Civilization*, «Science» 260 (1993), in press.

40. Weiss, NABU 1992, pp. 91-94; for quantification, see note 20.

41. Anbar, *Tribus amurrites*.

These groups stayed along the Euphrates River and gradually moved along its banks southward to Sumer and Akkad (Figure 5).

Remarkably, the colonial observers of the early 20th century recorded similar seasonal transhumant responses as were experienced 4000 years earlier. At systemic drought intervals, the same geo-climatic determinants forced the pastoral tribal population of the Euphrates-Habur seasonal exploitation route to remain on and along the Euphrates, exploiting riverain vegetation<sup>42</sup>. For this "trickling in" (or "down") to southern Mesopotamia, the Euphrates River banks were an excellent vehicle: seasonal flooding and deep-rooted perennial weeds provided the necessary forage for sheep and goat flocks<sup>43</sup>.

The abrupt climatic change and the desertion of the Habur Plains, therefore, explain the previously unexplained historical "events" of late third millennium southern Mesopotamia:

1. the sudden Gutian invasion of Mesopotamia<sup>44</sup>;
2. the sudden increase in the incidence of Hurrian personal names within contemporary documents<sup>45</sup>;
3. the sudden increase in the incidence of Amorite personal names within contemporary documents<sup>46</sup>;
4. the sudden construction of the 180 km long *muriq Tidnim* ("Repeller of the Amorites") wall from Badigihursaga on the Euphrates to Simudar on the Diyala (Figure 5) to halt Amorite infiltration into Sumer and Akkad<sup>47</sup>;
5. the sudden doubling of sedentary occupation in the south, with most of the increase occurring within settlements of village size, an increase explicable only as the product of an immigration into the southern region<sup>48</sup>;
6. the sudden decline in agricultural productivity detailed within mid-Ur III dynasty administrative records and the agricultural collapse at the dynasty's end<sup>49</sup>.

42. A. de Bouchéman, *La sédentarisation des nomades du désert de Syrie*, «L'Asie Française» 320 (1934), pp. 140-143; N.N. Lewis, *Nomads and Settlers in Syria and Jordan, 1800-1980*, Cambridge 1987.

43. R. McC. Adams, *Heartland of Cities*, Chicago 1981, pp. 135-136. Integration of Habur hiatus 1 with available ethnographic and historical models of West Asian nomad-sedentary interaction is now necessary.

44. See note 37. Apart from the localization of Gutium, the role of Diyarbakr Plains populations will need to be incorporated into any detailed model of Habur hiatus 1 collapse.

45. I.J. Gelb, *Hurrians and Subarians*, Chicago 1944, pp. 112-114.

46. C. Wilcke, *Zur Geschichte der Amurriten in der Ur III-Zeit*, WO 5 (1969-70), pp. 5-31.

47. Wilcke, WO 5 (1969-70), pp. 5-31; H. Gasche, *Mauer, B*, RIA 7 (1990), p. 594.

48. Adams, *Heartland*, p. 143.

49. T. Jones, *Sumerian Administrative Documents: an Essay*, in S.J. Lieberman (ed.), *Sumerological Studies in Honor of Thorkild Jacobsen*, Chicago 1976, p. 60, documents a 27% decrease in land under temple cultivation within the 32 years from Shulgi 32 to Shu-Sin 7, and a 25% decline in per hectare yields. D. Snell has observed (p.c.),

The synchronous agricultural and economic collapse in the Aegean<sup>50</sup>, in Egypt<sup>51</sup>, in Palestine<sup>52</sup>, suggests the hemispherical, perhaps global, extent of this abrupt climatic change<sup>53</sup>. Although these region-wide disturbances have been attributed to invasion<sup>54</sup>, earthquakes<sup>55</sup>, and still larger disasters<sup>56</sup>, our new data confirm Liverani's identification of climatic change as the cause of these disturbances<sup>57</sup>.

In Syria, this period also sees the emergence of the remarkable water conserving towns in the Hauran at, for instance, Khirbet al-Umbashi<sup>58</sup>, the abandonment of Ebla and its replacement by Tell Tuqan at the edge of the Madekh Lake<sup>59</sup>, and the disappearance of much of the settlement along the Balikh River<sup>60</sup>. In adjacent Turkey, settlement was abandoned along the Euphrates River above Birecik<sup>61</sup>. Further east, settlement

however, that the texts that Jones cites may not derive from the same archive. But the disastrous crop yields of the period are also noted by Adams, *Heartland*, pp. 146, 151, 152, and there was little barley in the granaries of Ur by Ibbi-Sin years 7 and 8.

50. J. Forsén, *The Twilight of the Early Helladics: Disturbances in East Central and Southern Greece towards the End of the Early Bronze Age*, Jonsö 1992.

51. B. Bell, *The Dark Ages in Ancient History, I: The First Dark Age in Egypt*, AJA 75 (1971), pp. 1-26; F. Hassan, *Historical Nile Floods and their Implications for Climatic Change*, «Science» 212 (1981), pp. 1142-1145; F. Hassan - B.R. Stucki, *Nile Flood and Climatic Change*, in M. Rampino - J. Sanders - W. Newman - L. Königsson (eds.), *Climate History, Periodicity, and Predictability*, New York 1987, pp. 37-46; D. O'Connor, *A Regional Population Perspective in Egypt to circa 600 B.C.*, in B.J. Spooner (ed.), *Population Growth: Anthropological Implications*, Cambridge 1972, pp. 78-100.

52. G. Palumbo, *The Early Bronze Age IV in the Southern Levant: Settlement Patterns, Economy and Material Culture of a "Dark Age"*, Roma 1990; A. Rosen, *Environmental Change at the End of the Early Bronze Age in Palestine*, in P. Miroslawski (ed.), *L'urbanisation de la Palestine à l'âge du Bronze ancien*, Oxford 1989, pp. 247-255.

53. See the alpine glacier advance and retreat records, northern hemisphere, southern hemisphere, and global, outlined in T.M.L. Wigley, *Climate Variability on the 10-100-Year Time Scale: Observations and Possible Causes*, in R.S. Bradley (ed.), *Global Changes of the Past*, Boulder 1991, pp. 83-101, and fig. 2.

54. K. Kenyon, *Amorites and Canaanites*, Oxford 1966.

55. C.F.A. Schaeffer, *Stratigraphie comparée et chronologie de l'Asie occidentale*, London 1948.

56. J. Mellart, *The Chalcolithic and Early Bronze Ages in the Near East and Anatolia*, Beirut 1966.

57. M. Liverani, *Variazioni climatiche e fluttuazioni demografiche nella storia siriana*, OA 7 (1968), pp. 7-89.

58. S. Helms, *Jawa*, Ithaca 1986; F. Braemer, *Prospection et analyse régionale des vestiges preromains en Syrie du Sud*, in *Archéologie et Espaces*, Juan les Pins 1990, pp. 25-34; *Formes d'irrigation dans le Hawran*, in B. Geyer, (ed.), *Techniques et pratiques hydro-agricoles traditionnelles en domaine irrigué*, Paris 1990, pp. 453-470.

59. Matthie, *Ebla*, p. 34.

60. H.H. Curvers, *Bronze Age Society in the Balikh Drainage*, Ph.D. diss. Universiteit van Amsterdam, 1990, pp. 197-201.

61. T.J. Wilkinson, *Town and Country in Southeast Anatolia*, Chicago 1990, p. 105.

suddenly collapsed at Seistan phase Shahr-i Sokhta and Mundigak, and throughout the Harappan phase Indus Valley<sup>62</sup>.

Only at the end of this desertification period, with the reestablishment of favorable climatic conditions in the 19th century B.C., was sedentary settlement reestablished upon the Habur Plains by those previously displaced. Amorite chiefs, acculturated in southern Mesopotamia after decades of sedentary life there, led the resettlement of the Habur Plains, and under the paramountcy of Shamshi-Adad selected the abandoned urban center at Tell Leilan to be the new Habur Plains regional administrative center.

### An Explanation of the Akkadian Empire

This new explanation for the Akkadian empire's collapse suggests new explanations for its genesis. If the collapse of Akkadian control of the Habur Plains was only due to "accident", i.e., climatically conditioned abandonment of the dry farming zone, what were the functions, purposes, and goals of the Akkadian control of the Habur Plains prior to the collapse? We suggest that Akkadian imperialization extended intensified agro-production into an available, adjacent, eco-niche: the broad dry-farming belt surrounding the narrow irrigation agriculture strip of the lower Euphrates floodplain. Why the Akkadians did this, however, remains an undeveloped research problem. Here an attempt can be made to sketch an explanatory model of this phenomenon.

Euphrates flow was the constraint on the extension of third millennium irrigation agriculture in southern Mesopotamia. Euphrates flow was a function of (1) the intensity of snow melt on the high Anatolian plateaus of the upper Euphrates drainage and (2) precipitation in that region during the rainy season<sup>63</sup>. Euphrates flow was therefore a function of third millennium climatic conditions, which we suggest varied considerably<sup>64</sup>. Hence it is not yet possible to determine the amount of Euphrates

62. S. Cleuziou - M. Tosi, *The Southeastern Frontier of the Near East*, in K. Frifelt - P. Sorensen (eds.), *South Asian Archaeology 1985*, London 1989, p. 39; C. Shaffer, *The Indus Valley, Baluchistan and Helmand Traditions*, in Ehrich, *Chronologies*, pp. 450, 464.

63. J. Kerbe, *Climat, hydrologie et aménagements hydro-agricoles de Syrie*, vol. II, Talence 1987, p. 676.

64. We assume that the third millennium Mediterranean cyclone paths responsible for both central plateau and Tur Abdin precipitation were similar to those of the present (see E. Wirth, *Syrien*, Darmstadt 1971, pp. 73-87, and P. Beaumont - G.H. Blake - J.M. Wagstaff [eds.], *The Middle East, a Geographical Study*, Chichester 1976, pp. 52-66). P.A. Kay - D.L. Johnson, *Estimation of Tigris-Euphrates Stream Flow from Regional Paleoenvironmental Proxy Data*, «Climate Change» 3 (1981), pp. 251-263, fig. 4, infer

flow available for irrigation agriculture at different intervals during the third millennium.

The available data suggest the hypothesis, however, that at the beginning of late Early Dynastic III times southern Mesopotamian settlement limits had been reached<sup>65</sup>. Essentially, only Ur III period settlement and its overflow into the Old Babylonian period, inflated by Habur-central Euphrates immigration and flirting with disastrous production levels, exceeded the late Early Dynastic population levels<sup>66</sup>. Not until the Sassanian deployment of the Tigris were such population levels reached again<sup>67</sup>.

Under maximizing conditions such as these, which tested the margins of production, successive stages of politico-economic experimentation ensued<sup>68</sup>. Initially, local inter-city warfare over water rights, as well as long range conquest and booty-taking, were able to satisfy urban elites. This period extended from the reigns of Ur-Nanshe and Eanatum through Sargon<sup>69</sup>. The rearrangement of water rights could only provide short term relief, however, and the wealth obtained by the plunder of hoards amassed over years could only be taken once, a lesson learned similarly by late 15th and 16th century Europeans as well<sup>70</sup>.

The potential politico-economic conflict between decreasing *per capita* yields and expansive secular elite demand was resolved in a second stage of experimentation during the reigns of Rimush, Manishtushu and Naram-Sin: imperialization and intensification of rain-fed agro-production, and appropriation and centralization of adjacent irrigation agriculture territories.

a decrease in Tigris-Euphrates stream flow from ca. 2500 B.C. - 2000 B.C. utilizing published studies of Lake Van varve thickness, sedimentation and oxygen isotope variations.

65. Adams, *Heartland*, p. 6, estimates 12,000 or 8,000 square kilometers, "or even less", as the area which the Euphrates flow might have irrigated under some circumstances.

66. Adams, *Heartland*, p. 142, Table 13.

67. Adams, *Heartland*, pp. 210-211.

68. D.L. Johnson - H. Gould, *The Effect of Climate Fluctuations on Human Populations: a Case Study of Mesopotamian Society*, in A.K. Biswas (ed.), *Climate and Development*, Dublin 1984, pp. 117-138, develop a potential collapse model ("IRRIG") for southern Mesopotamian civilizations based upon relationships between climate change, as represented by alterations in Euphrates stream flow, and other variables such as population growth. Their general conclusion, "that within the constraint of a fixed resource base, climate variability leads to collapse", accompanies the insight that "historically, irrigation civilizations of the Tigris and Euphrates lowland were able to reduce their vulnerability to environmental risk by gaining access to outside resources by trading activities or military conquest" (pp. 134, 136).

69. J. Cooper, *Sumerian and Akkadian Royal Inscriptions*, I, New Haven 1986; RHA1.

70. E.J. Hobsbawm, *The Crisis of the Seventeenth Century*, in T. Aston (ed.), *Crisis in Europe 1560-1660*, New York 1967, p. 24.

The scale of the Akkadian imperialization of the Habur Plains can be understood from the Leilan, Brak and related data:

1. a sukkal-headed administration of the three Habur Plains urban centers and their hinterlands<sup>71</sup>,
2. guruš-workers receiving standard rations<sup>72</sup>,
3. intensification of agricultural production through channelization and perhaps irrigation,
4. equid transport of imperialized production to central stores at the Brak fortress,
5. grain shipment down the Habur River<sup>73</sup> to Akkadian controlled Mari<sup>74</sup>, and subsequently Akkad.

If confined solely to the urban triangle of the Habur Plains, the Akkadian administration at Brak controlled ca. 6,000 sq. kms.; if adjacent western Habur Plains drainages (Awedj, Zergan, and Djirdjib) were tapped as well, the area under Akkadian imperialization would have been twice that amount. It remains to be seen if the *Kranzhügeln*, utilized perhaps for range herding of sheep, continued to be used by the Akkadians<sup>75</sup>. Variants of this imperial apparatus were implanted across the dry-farming belt at Nineveh<sup>76</sup>, probably Arbilum, Gasur<sup>77</sup>, and Susa<sup>78</sup>. This was, however, only the complement to the Akkadian imperialization of Sumer, within which "imperial domains", ranging from 1,270 hectares (Me-ság) to 129,000 hectares were created<sup>79</sup>. In Sumer individual royal domains

71. Weiss, NABU 1992, pp. 91-94; D. and J. Oates, *Akkadian Buildings at Tell Brak*, «Iraq» 51 (1989), pp. 193-212; *Excavations at Tell Brak 1990-91*, «Iraq» 53 (1992), pp. 127-146.
72. I. Finkel, *Inscriptions from Tell Brak*, «Iraq» 47 (1985), p. 190, text no. 5.
73. The inscribed bulla from Chagar Bazar (AOAT 3/1, p. 68) notes grain quantities and a boat. Following Habur hiatus 1, Habur region shipments of grain to Mari were not unusual; see A. Finet, *Le Habur dans les archives de Mari*, in *Symposium international, Histoire de Deir ez-Zor et ses antiquités*, Damascus 1983, pp. 89-97 and J. Margueron, *Mari, l'Euphrate et le Khabor au milieu du IIIe millénaire*, BSMS 21 (1991), pp. 79-100. Akkadian period reorganization of settlement along the middle Habur consolidated smaller sites within Melebiya and B'deri, sites without evidence of large scale cereal storage at this time; see Schwartz - Curvers, *AJA* 96 (1992), p. 418.
74. For Akkadian period Mari see the synthesis of J.-R. Kupper, *Mari, A*, *RIA* 7 (1990), p. 384.
75. See note 22.
76. Manishtushu's construction of the temple of Emenue, within which he deposited his "monumental and clay inscriptions", probably accompanied construction of a storage depot similar to the one which accompanied the Akkadian religious structures at Brak. For the Akkadian period wall of the city, see now D. Stronach, *UC Berkeley's Excavations at Nineveh*, «Biblical Archaeologist» (1992), p. 229.
77. For the recalculation of local into Sargonic capacities at Gasur, see B. Foster, *People, Land and Produce at Sargonic Gasur*, in *NH* 2, pp. 89-105.
78. B. Foster, *International Trade at Sargonic Susa*, *AOF* 20 (1993), pp. 59-68.
79. B. Foster, *The Sargonic Victory Stele from Telloh*, «Iraq» 47 (1985), pp. 15-30; *AUIL*.

were three times the size of the entire Leilan-Mozan-Brak sustaining area.

The intensified, imperialized, agricultural production of Sumer and Subir, their convertible wealth, was transferred at negligible water-borne cost to the imperial capital at Akkad, where it was transformed through labor deployment of several kinds to secure and further increase imperial wealth:

1. the administration of the complex imperial system through officials, messengers, roads, standing armies, and equid transport,
2. generation of increased imperial surpluses for additional conversion both local and external, probably in textile factories and Tigris region extension of irrigation agriculture<sup>80</sup>,
3. "paving the road" for private commercial trade and investment<sup>81</sup>,
4. providing expendable wealth for non-productive imperial consumption<sup>82</sup>.

This model of Akkadian imperial formation, process, and collapse, forces consideration of two categories of questions. First, archaeological tests of this model's fundamental assumptions might be developed, including (1) quantification of the variability of Euphrates and Euphrates effluents' flow through the early historic period<sup>83</sup> and (2) quantification of Habur hiatus 1 climatic changes.

Secondly, this model raises questions of evolutionary process. The mechanics, and surely the dynamics, of third millennium West Asian economies are still ill-defined. The systemic relationships between (1) southern Mesopotamian ration-labor, both in the fields and the "factories", and (2) neighboring economies, some similarly structured, others less developed, also remain ill-defined. Nevertheless, the fundamental limitation on subsistence, agricultural production, and economic and settlement growth, remained the Euphrates flow.

80. The massive deployment of female weavers in the Ur III period was likely modeled after Akkadian innovations; see K. Maekawa, *Female Weavers and their Children*, *ASJ* 2 (1980), pp. 81-125, and pp. 93 ff. for female weavers and their children at Sargonic Susa, and "gur of Agade" barley rations to weavers and their children in post-Sargonic and early Ur III Lagash. The role of textile production in the development of early capitalist Europe is well known; for the central role of textile manufacture in the transformation of agricultural production within pre-capitalist imperial economies, see J. Schneider, *Was there a Pre-capitalist World System?*, «Peasant Studies» 6 (1977), pp. 20-29. The large Sargonic excavation/agricultural project undertaken at Sabum was, possibly, a canal construction project; see S. Monaco, *OA* 24 (1985), pp. 310-315.
81. See B. Foster, *Commercial Activity in Sargonic Sumer*, «Iraq» 39 (1977), pp. 31-43, and *Sargonic Trade at Susa*.
82. Most notably the boats of Dilmun, Magan and Meluhha tied at the quay of Akkad, in H. Hirsch, *Die Inschriften der Könige von Agade*, *AfO* 20 (1963), pp. 37-38, and projects such as reconstruction of the Ekur temple undertaken by Naram-Sin and Sharkalisharri at Nippur, documented by A. Westenholz, *OSP* 2, and discussed by B. Foster, *BO* 46 (1989), pp. 357-361.
83. Kay - Johnson, «Climate Change» 3 (1981), pp. 251-263.

We assume that the post-2600 B.C. palace-dominated society of Sumer was growing in scale and complexity, but may have reached the limits of Euphrates flow extensions of irrigation agriculture by ca. 2400 B.C. Would it have been possible for population, technology and niche expansion to have stabilized thereafter, as apparently were the case, for some 1000 years, in the Basin of Mexico<sup>84</sup>? Or, were economic and population growth a correlate feature of southern Mesopotamian political economy, generating an incessant demand for increases in agricultural production? Or, was secular diminution in Euphrates flow ca. 2600-2200 B.C. the accidental accelerator of imperial expansion, much as the abrupt climatic change of 2200-1900 B.C. was its accidental refractor?

The case of Sumer and Subir suggests that some ancient agricultural systems, at specific junctures, experienced local growth constraints which, in the absence of immediate, yield-increasing technological innovation, required expansionary activity<sup>85</sup>. The genesis and collapse of the Akkadian empire suggest that, as in the development of earlier Mesopotamian socio-economic formations, both causality and chance require historical definition.

84. G. Cowgill, *Quantitative Studies of Urbanization at Teotihuacan*, in N. Hammond (ed.), *Mesoamerican Archaeology: New Approaches*, Austin 1974, pp. 363-396; W.T. Sanders - J.R. Parsons - M.H. Logan, *Summary and Conclusions*, in E.R. Wolf (ed.), *The Valley of Mexico*, Albuquerque 1976, p. 178; W.T. Sanders - J.R. Parsons - R.S. Santley, *The Basin of Mexico: Ecological Processes in the Evolution of Civilization*, New York 1979, fig. 6.1.

85. Similarly, the limitations of cultivable land were the stimuli for Hellenistic imperialism in southwest Asia and Wari imperialism in Peru. For the Hellenistic empire, see W.W. Tarn, *Hellenistic Civilization*, New York 1951, pp. 100-101; G.E.M. de Ste. Croix, *Origins of the Peloponnesian War*, Ithaca 1972, pp. 46-49; *The Class Struggle in the Ancient Greek World*, Ithaca 1981, pp. 294-300. M. Rostovtzeff, *Social and Economic History of the Hellenistic World*, I, Cambridge 1941, pp. 94-125, and C. Mossé, *La fin de la démocratie athénienne*, Paris 1962, pp. 123-132 document the contraction of Greek markets, the source of food purchasing capital, as peripheral areas began production of imitation Greek textiles and foodstuffs. For Wari imperialism, see K. Schreiber, *Wari Imperialism in Middle Horizon Peru*, Ann Arbor 1992, the contributions of R. Feldman and P. Goldstein in W. Isbell - G. McEwan (eds.), *Wari Political Organization: Prehistoric Monumental Architecture and Big Government*, Washington D.C. 1991, and M. Moseley, *The Incas and their Ancestors*, London 1992.

B.C.	Ebla (Aleppo)	Leilan (Habor)	Southern Mesopotamia	Malvan (Fars)	Yahya (Kerman)	Indus Valley
1900	IIIA	I	Old Babylonian			
2000		Habor hiatus	Isin-Larsa			
2100		I	Ur III	Kaftari		
2200	II B2		Guti			
2300		(Lower Town: 4)	Naram-Sin (2210-2174)?			
2400	II B1	(Lower Town: 5)	Rimush/Manishtushu			
2500		(Lower Town: 6)	Sargon (2290-2235)?			
2600	IIA	IIa (Lower Town: 7)	ED IIIb	hiatus	IVB	mature urban Harappan
2700	IIc	IIId (Lower Town: 8-12)	ED IIIa	late Banesh	hiatus	
2800	IIb		late ED II			
2900		IIIa	early ED II	middle Banesh		
3000	I	IV	ED I	early Banesh	IVC	early Harappan
			Jemdet Nasr		hiatus	
			late Uruk			

Fig. 1: Southwest Asia Third Millennium Chronology.

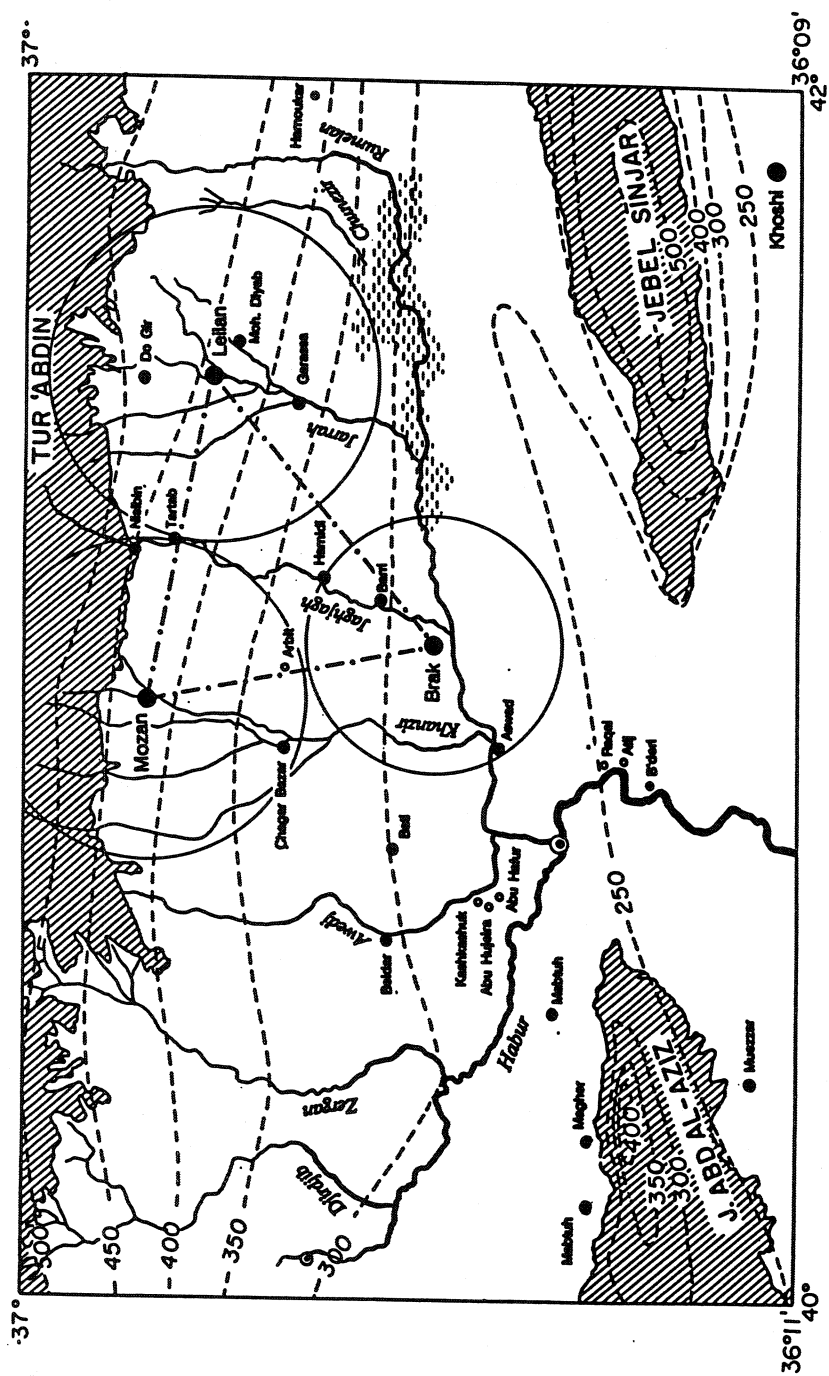


Fig. 2: Habur Plains settlement ca. 2600 B.C. and modern rainfall (mm.;  $\geq 500$  meters above sea level *en hachure*).



Fig. 3: Tell Leilan: Topographic map and Excavations through 1991.

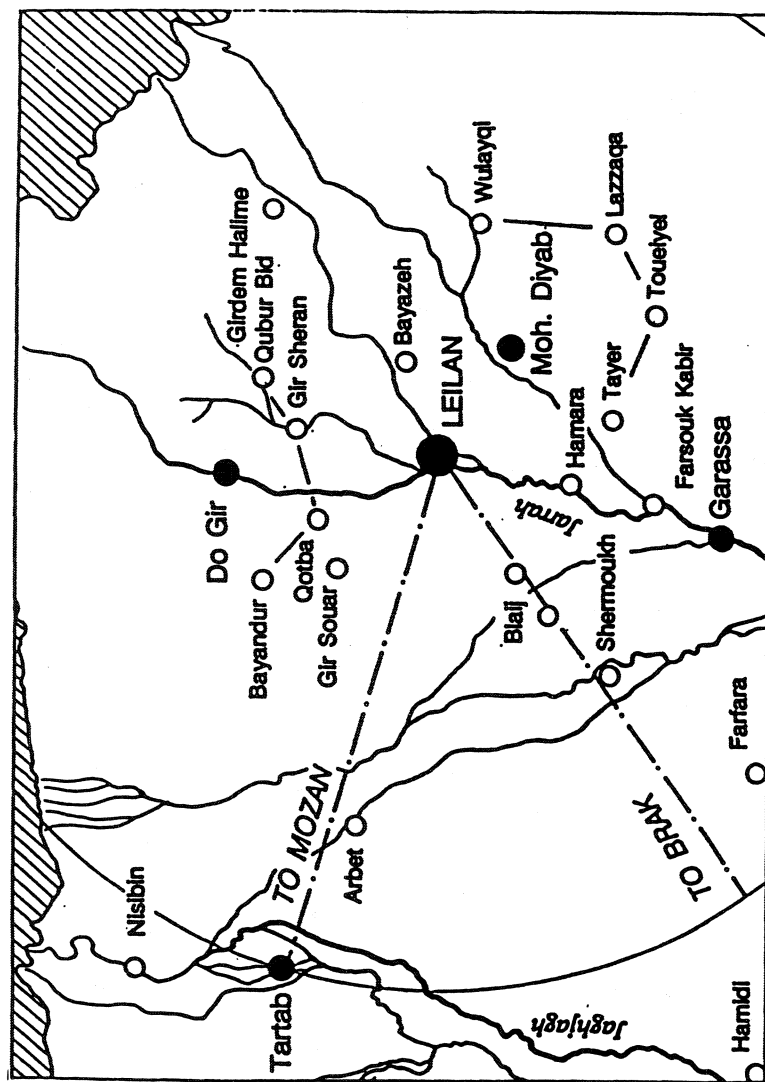


Fig. 4.  
Tell Leilan region settlement,  
ca. 2600-2300 B.C.

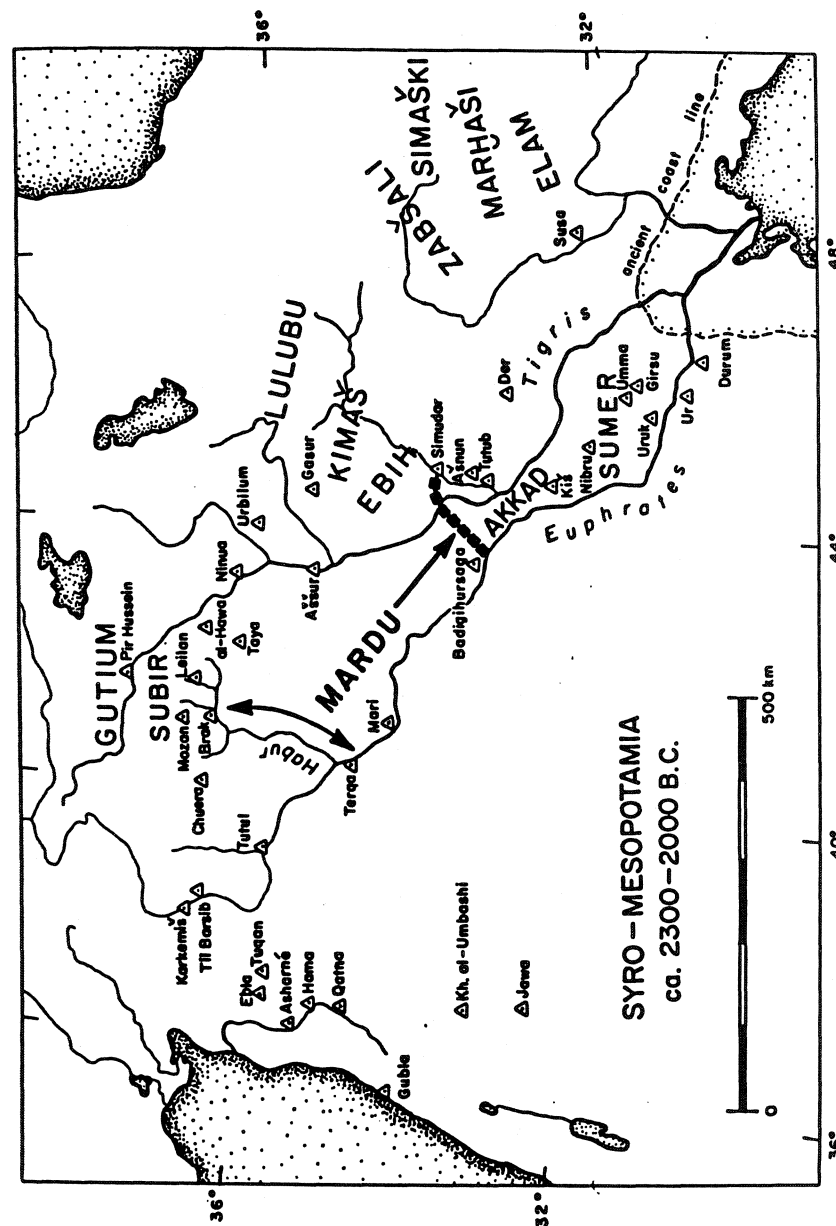
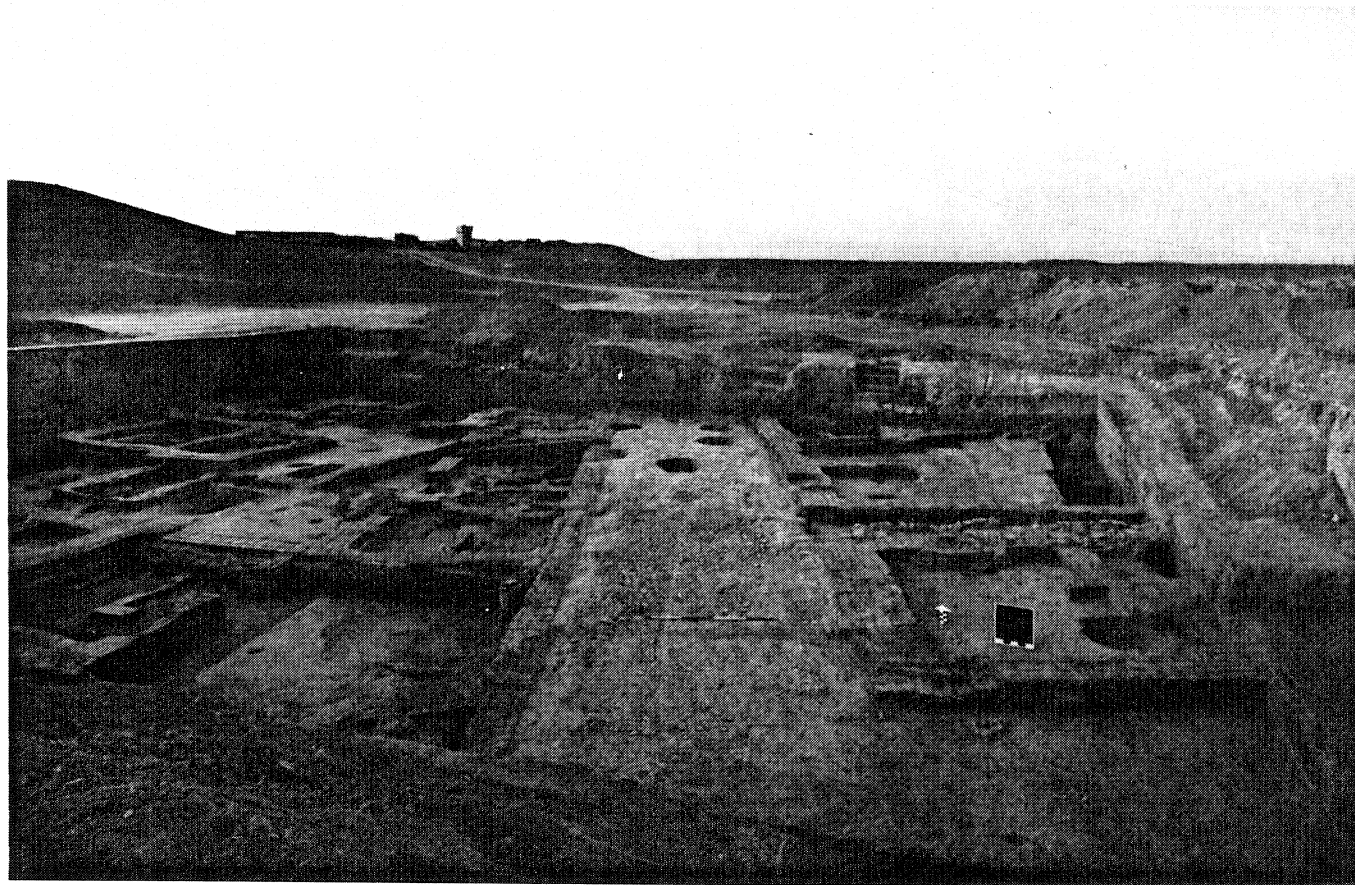
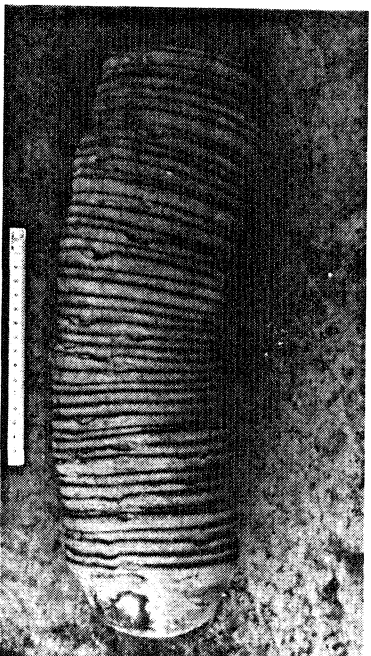


Fig. 5: Syro-Mesopotamia ca. 2300-2000 B.C.



Tell Leilan Lower Town South, 1989, period IIb, view from the south (photo: H. Weiss).

PLATE 6



HW#3, L85 Op3A 38, V = 0.265 liters.



HW#9, L87 Op5, 76G20 30, V = 1.052 liters.



HW#5, L89 Op5, 76F20 143, V = 1.522 liters.

Tell Leilan "sila bowl" stacked kiln wasters.